

All Party Parliamentary Group

Primary Care and Public Health

INQUIRY INTO WATER FLUORIDATION

March 2003

All-Party Parliamentary Group on Primary Care and Public Health Inquiry into Water Fluoridation

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1. Acknowledgements

The All-Party Group wishes to thank the Faculty of Public Health Medicine and the NHS Confederation for their kind assistance in organising the early stages of this inquiry. Further thanks are due to all those who have taken time to submit evidence, either oral and/or written, for consideration.

Finally, the biggest debt of gratitude owed by the All-Party Parliamentary Group is to our inquiry assistant, Zoe Marshman, Lecturer/Specialist Registrar at the University of Sheffield School of Clinical Dentistry/Doncaster West PCT who has greatly assisted us in the drawing up of this report.

As ever, the contents of this report, are the sole responsibility of the All-Party Group.

2. Forward

This is the fifth report by the All-Party Group. Since 1998 the All-Party has held independent inquiries into issues which are both topical and relevant to the evolving public health agenda, particularly as it relates to, and/or impacts on, primary care.

The All-Party Group chose to investigate issues surrounding the fluoridation of public water supplies in the UK because the Medical Research Council (MRC), following the York review in 2000, recently made a number of recommendations to the Department of Health concerning the need for further research. The Government has yet to formally respond to the MRC report and our report, which will be submitted to Ministers, is intended to influence the Department of Health's response.

1. Executive Summary

The conclusion and recommendations sections (on page 15, 16 and 17) provide a resume of the Groups findings

4. Structure of the Inquiry

Several groups were invited to present oral evidence to the Group reflecting the full range of opinions on this subject. The Medical Research Council gave evidence at the first oral session, Water UK and Dr Peter Mansfield presented at the second and the British Dental Association, British Medical Association, British Fluoridation Society and the Royal College of Nursing gave their oral evidence at the final session. The Green Party and the National Pure Water Association declined.

Thirty-one groups were requested to submit written evidence to the Group (see Appendix B for groups submitting written evidence).

The oral and written evidence was considered together in the compilation of the final report.

5. Introduction

5.1. Five million people in the UK now receive water in which the fluoride content has been artificially increased to a level of 1 part fluoride per million parts of water. In addition, about 500,000 people in this country receive water which naturally contains fluoride at a lower level, but which still confers some dental benefits. This translates to 10% of the total population of the UK. Worldwide, around 360 million people drink water-containing fluoride, 317 million people in 39 countries benefit from artificially fluoridated and an additional 40 million benefit from water supplies which are naturally fluoridated.

In the United States, since the mid 1990s, several large metropolitan areas have started fluoridation including Los Angeles, and Las Vegas. Many other US cities have been fluoridated for years New York, Chicago, Dallas etc. Forty-seven of the US's 50 largest cities are now fluoridated (66% of the population).

1. In the UK the reason that water fluoridation remains an outstanding issue, having had an 'in principle' decision in favour already taken at

governmental level, is because the 1985 Water (Fluoridation) Act which governs this issue, is inadequate. Despite many attempts no new schemes have been established since 1985.

1. Government policy

The Independent Inquiry into Inequalities in Health stated that water fluoridation should decrease inequalities in dental caries between areas and between socio-economic groups (Acheson 1998).

In “Saving lives-our healthier nation” (Department of Health 1999), the government indicated that they agreed in principle to extend fluoridation, but announced it was commissioning a systematic review of evidence relating to the safety and effectiveness of water fluoridation.

2. The York review

1. The systematic review of water fluoridation was commissioned from the University of York (NHS Centre for Reviews and Dissemination) and published its findings in September 2000 (McDonagh, Whiting et al. 2000). The remit from the Department of Health was to conduct a systematic review of the evidence for the safety and effectiveness of water fluoridation based on the currently available evidence from population-based studies. The aim of the Review was to assess the evidence on the positive and negative effects of population-wide drinking-water fluoridation strategies to prevent dental decay. A rigorous inclusion procedure was used to ensure evidence of the highest possible quality was included in the research on the benefits of fluoridation but less strict criteria were applied to evidence of safety to allow consideration of all possible health risks. The result was that the estimates tended to be conservative with respect to the benefits of fluoridation. The Review looked at several key areas.

7.2. Water fluoridation and effects on the incidence of caries

Water fluoridation was associated with a reduction in levels of dental decay, both as measured by the proportion of children who are caries-free and by the mean change in the number of decayed, missing and filled teeth score. They estimated that the size of the benefit would be an approximate 15% increase in the proportion of children with no experience of tooth decay and a reduction in the mean number of teeth affected by decay of approximately 2.2 teeth. Campaigners against fluoridation, state the benefits found by the York Review were less than had previously been claimed.

Water fluoridation had an increased caries reduction effect over the beneficial effects of fluoride toothpaste.

7.3. Water fluoridation and inequalities

There was some evidence that water fluoridation reduces the inequalities in dental health across social classes in 5- and 12-year-olds, using the decayed/missing/filled measure. The data from the review suggested that the effect of fluoridation is greater in those areas that have higher baseline levels of decay experience.

7.4. Water fluoridation and dental fluorosis

Dental fluorosis is a form of developmental defect of the tooth enamel. Clinically it ranges from barely visible white striations through gross defects and staining of enamel. There are around 90 different causes of enamel defect making the differential diagnosis difficult. Minor forms of fluorosis are not aesthetically troublesome and may even enhance the appearance of enamel.

There was a dose-response relationship between the amount of fluoride in the water and the levels of dental fluorosis. Roughly 6 people would have to drink fluoridated water for one additional person to develop fluorosis (when compared with drinking non-fluoridated water). This rises to 22 people for dental fluorosis severe enough to be of aesthetic concern causes. The review also concluded that 12.5% of the population would be affected by fluorosis of aesthetic concern in fluoridated areas and 6.3% in non-fluoridated areas.

7.5. Water fluoridation and fractures

The best available evidence shows no association

7.6. Water fluoridation and mortality from cancer

No association was detected between water fluoridation and mortality from any cancer or with bone or thyroid cancers specifically.

7.7. Differences between natural and artificial water fluoridation

No major differences were apparent, but the evidence was not adequate to reach a conclusion

7.8. Conclusions

By today's standards of research little high quality research had been undertaken in the field of water fluoridation. The authors suggest that the evidence on the positive and negative effects need to be considered along with the ethical, environmental, ecological, financial and legal issues that surround any decisions about water fluoridation.

Subsequently, the Department of Health commissioned the Medical Research Council to take forward the conclusions and recommendations of the York review and consider what further research was required to improve knowledge about fluoridation and health

8. The Medical Research Council Report

The Medical Research Council Working Group was established in February 2001 and the review published in September 2002.

8.1. Key issues

1. The absorption of fluoride from naturally fluoridated and artificially fluoridated water.

This is particularly important because if the bioavailability is the equivalent, many of the findings relating to natural fluoride can also be related to artificial fluoridation

1. The main health outcomes of interest are dental fluorosis, bone health and cancer. The MRC Report found no conclusive evidence of a link between fluoride and cancer or hip fractures
 1. There is a need to examine the caries reduction brought about by water fluoridation with the background of toothpaste considering factors such as social class, economics, well-being and caries reduction in adults.
- 8.2. The MRC report followed on from the York Report and took account of additional information that did not fall within the scope of York. Also, in some areas, the MRC interpretation of the strengths and weaknesses of the existing evidence base differs from that of the York group.
- 8.3. The Public Health Minister has asked the Chief Medical Officer and the Chief Dental Officer to advise on the implications of the MRC report for government policy on fluoridation.
- The current Government position is that they will be encouraging Health Authorities with particular dental health problems to consider fluoridating their water as part of their overall oral health strategy. The York Review and the MRC Report will help ensure that local decisions are evidence based.

9. Further evidence since the York Review

Since the publication of the York Review and in addition to the MRC Report, other research has been conducted to add to the body of existing evidence.

- 9.1. The WHO task group on environmental health criteria carried out a worldwide review of fluorides in 2002. The report found no statistically significant increase in the incidence of any tumour or evidence of any

mutagenic, reproductive or developmental effects from recent studies in animals. In humans, the relationship between consumption of fluoridated water and morbidity/mortality due to cancer revealed no consistent evidence of an association and there was no evidence of an association between drinking fluoridated water and spontaneous abortions/congenital malformations.

This report concluded that all organisms are exposed to fluoride from natural and/or anthropogenic sources. Very high intakes have been observed in areas worldwide in which the environment and groundwater has high levels of fluoride. Skeletal fluorosis is a major public health and socioeconomic consideration, which does affect millions of people in parts of China, Africa and India. Africa for example has natural fluoride levels up to 95ppm, in the UK the highest found naturally is up to 5.8ppm but this is reduced before people drink it to below 1.5ppm. A number of factors such as nutritional status and diet, climate (related to fluid intake) concomitant exposure to other substances and the intake of fluoride from sources other than drinking water are believed to play a significant role in development of the disease. A need for better characterisation of biological effects associated with fluoride exposure was called for.

The conclusions of this group are similar to the MRC report in that they do not support some of the UK anti-fluoridationists claims about effects of fluoride and ill health.

9.2. The Forum on Fluoride was established in Ireland in 2000 to review water fluoridation in Ireland since it was introduced in 1964 (75% of the population drink fluoridated water in Ireland). The Forum highlighted that some serious misconceptions with regard to aspects of fluoridation needed addressing. The Forum concluded that water fluoridation is very effective in improving the oral health of the Irish population, especially of children, but also of adults and the elderly. The prevalence of decay has fallen considerably over the past 40 years with greater reductions in fluoridated as opposed to non-fluoridated areas. The prevalence of decay is approximately 30-50% lower in fluoridated areas of the Republic of Ireland compared with

non-fluoridated areas in Northern Ireland. The Forum reports that recent studies have shown that combinations of water fluoridation and fluoride toothpastes give considerably greater benefit when used together than when used alone. The best available and most reliable scientific evidence to the Forum indicates that at the maximum permitted level of fluoride in drinking water (1ppm), human health is not adversely affected. The prevalence of fluorosis is of concern in Ireland and they have recommended reducing the levels in water to a target value of 0.7ppm and have made recommendations regarding toothbrushing. Fluoridation in Ireland is not targeted only to those areas with the highest levels of dental disease.

9.3 On the subject of hip fractures, a recent multi-centre study involving 10 000 women found long term exposure to fluoridation did not increase the risk of osteoporotic fracture among older women. The results showed that long term exposure to fluoridation might even reduce the risk of fractures of the hip and vertebrae in older white women. The authors stated that this finding may have enormous importance for public health, as it may be one of the most cost effective methods for reducing the incidence of fractures related to osteoporosis. In addition, the results supported the safety of fluoridation as a public health measure for the control of dental caries (Phipps et al 2000).

1. The Water (Fluoridation) Act

10.1. The Water (Fluoridation) Act 1985 allows water companies to accede to health authority requests to fluoridate but did not oblige them to do so. The 1985 Water (Fluoridation) Act was later subsumed into the 1991 Water Industry Act. By the early 1990s over 60 health authorities had undertaken the costly process of consultation about their fluoridation proposals only to have their subsequent requests for fluoridation refused by the water suppliers.

10.2. A judicial review was carried out in 1998 when Northumbrian water refused to accede to water fluoridation. The judge upheld the water

company's decision (Northumbrian Water Ltd ex parte Newcastle and North Tyneside health Authority (1999) Env.LR 715). The judge felt the fact that the water company did not have a public body duty and was entitled to take the interests of the shareholders into account and this was a legitimate reason for schemes not to go ahead. No new water fluoridation schemes have been implemented under the Act.

In Parliament the Minister for Public Health described the current legislation as "a mess" (Hansard 6 May 1998).

2. The position of the water companies

Currently 5 companies provide fluoridated water and these schemes were established before 1985. These water companies have not expressed a wish to cease the fluoridation. The funding for these schemes currently comes from the health authorities. Water companies do not feel they should have an opinion on public health matters such as fluoridation. They see themselves as neutral contractors who are available to provide information to customers and organisations on technical issues such as the logistics of fluoridation. They feel the decisions should be made by the appropriate health bodies after thorough consultation. The water companies consider the current legislation to be unsatisfactory and require a new code of practice. Another main area of concern of the water companies is that the health authorities must in the future be responsible for all costs of fluoridation incurred by water operators such a building work, operational and maintenance costs, management time, training and full legal indemnity

12. Arguments against fluoridation

Several high profile anti-fluoridation groups and individuals have failed to participate in the enquiry and those that did become involved required much encouragement to do so.

12.1. The evidence received from the National Pure Water Association (NPWA) centred on the issues of:

1. The legal standpoint regarding the addition of the chemical of fluoride as a medicinal product to water
2. The ethics of water fluoridation which removes the right of an individual to refuse treatment
3. The issue of action being brought against water companies and health authorities in the future under the current legislation.

The safety of fluoridation was not disputed in their evidence.

12.2. The other main issues raised by anti-fluoridation campaigners are:

1. Other methods of caries reduction exist without the need to resort to fluoridation of the water supply
1. Deficiencies exist in the knowledge surrounding total personal fluoride intake (based on urinary excretion and levels of fluoride in bone)
1. They feel the dental profession have misrepresented the York Review and the benefits bestowed by fluoridation. One of the main campaigners, who has expressed concerns over the safety of fluoridation, was involved in the York Review and urges that the York Review is superior in quality, rigour and fairness when compared to other reviews. However, he also quotes widely the results of studies that were not deemed of sufficient quality to be included in the Review.
2. Some people have claimed water fluoridation has numerous adverse health effects including skeletal fluorosis, cancer, congenital malformations, back pain, kidney problems and effects on the immune system and intelligence. Millions of people drink fluoridated water world wide without obvious differences in health patterns. There is no scientific basis whatsoever to claims that fluoride in water is unsafe. Reviews of the evidence have found no conclusive link between water fluoridated to 1ppm and the various ill effects suggested. Experts from the fields of medicine, dentistry and nursing are satisfied that sufficient evidence exists to prove that fluoridated water is safe and effective.

13. The beneficial effects of fluoridation

The York Review confirmed the beneficial effects of water fluoridation at reducing caries in children. The MRC also highlighted other studies that did not fall within the scope of the York Review, which reported additional effects, such as reductions in the prevalence of both toothache and dental treatment needing general anaesthetic. In addition, the MRC Report drew attention to studies that have found a reduction in caries by water fluoridation in adults up to 75 years of age.

1. Inequalities

14.1. Dental decay is recognised as a disease of social deprivation. Dental diseases are chiefly found in the poorest sections of society and the inequalities in dental health are seen to be widening. High prevalence of toothache, abscesses and extractions needing general anaesthetics are associated with high caries experience recorded in children in deprived social groups in the UK. The two principle factors influencing caries are diet and fluoridated dental care products. Diets of socially deprived children are more conducive to caries than more affluent children and more affluent children brush their teeth more often than deprived. Fluoride is used by dentists as an effective way of reducing caries levels in the surgery and through the recommendation of fluoridated toothpaste. However, in socially deprived areas where high decay levels are observed and which tend to be densely populated, the most effective way of getting fluoride to these populations is via the water supply. The average number of decayed, missing and filled teeth of a five year old child in fluoridated Birmingham in 2001/2 was less than 1 compared with 2.5 in Greater Manchester and 2.9 in inner city London which do not receive fluoridated water. In 1998 the government set a target that, by 2003, 5 year old children should have no more than one tooth affected by decay.

14.2. Water fluoridation has been recognised by the government, the Royal College of Nursing, the Royal College of Physicians, the UK Public Health Association, the British Medical Association and the British Dental Association as being an effective method of tackling widening inequalities. The audit commission, an independent body responsible for ensuring public money is spent economically, efficiently and effectively carried out a review of primary dental care services 2002. The report drew attention to the fact that deprived areas have the worst dental health and would benefit the most from fluoridation and urged the government to focus resources on emphasising the prevention of dental disease including fluoridation of water supplies. Other methods of reducing caries do exist, but low social class groups are not likely to take up these preventive initiatives, extending pre-existing inequalities.

2. Targeting of water fluoridation

15.1. The British Fluoridation Society and the British Dental Association feel water fluoridation should be targeted to areas where dental disease levels are high such as Glasgow, Belfast, inner London, Leeds and Manchester. Appropriate targeting would lead to increasing water fluoridation from 10% to about 30% of the population. Targeting of fluoridation would make it more cost effectiveness and would limit the prevalence of fluorosis in those that benefit the least from fluoridation.

15.2. A report by the York Health Economics Consortium (Sanderson 1998) commented that the effectiveness of water fluoridation would depend on the baseline level of caries and that capital costs were sensitive to economies of scale. This report suggested that water fluoridation should be targeted at those districts with mean decayed missing and filled teeth at age 5 years greater than 2.0 and with water supply schemes covering around 200,000 residents.

3. Public consultation

16.1. Four Gallup/NOP polls carried out over the past 18 years demonstrate overwhelming support for fluoridation. Four out of ten people think their water is already fluoridated, even though only 10% actually receive it. A study with focus groups in 3 non-fluoridated areas (Hounslow, Leeds, Oldham) indicated members of public wish to be informed of water fluoridation but do not see themselves as being appropriate arbiters of decisions about implementation (Lowry et al 2000).

16.2. The current Act requires health authorities to place advertisements two weeks in a row in local newspapers and that consultation with the relevant local authorities and community health councils must take place. Experience from previous consultations has shown that the more proactive health authorities are in publicising and promoting their proposals the more willing people are to accept fluoridation.

16.3. Numerous techniques have been developed and implemented in consultations in the North East and West Midlands. Initially campaigns through the media, posters, leaflets and presentations have been carried out on dental health locally and inequalities that exist. The consultation exercise has then included information packs to local authorities, community health councils and MPs, press conferences, newspaper advertisements and poster displays about water fluoridation. In addition, opinion polls have been conducted and telephone information lines set up. Other techniques that could be used in the future include focus groups comprising a cross section of the community and citizens' panels.

To evaluate public opinion following the consultation process, health authorities can use the results of opinion polls and focus groups and consider letters/petitions received. The water companies support a nationally agreed consultation process.

16.4. The MRC Report stated that there was a need for better ways of informing the public about fluoridation, as it is difficult to communicate complex choices where benefits and risks are of very different type. The Report suggested the public needs to know:

1. The actual coverage of water fluoridation
1. Consequences of not preventing caries such as morbidity, mortality and costs to the NHS
1. Strength of evidence on the efficacy of and alternatives to water fluoridation
1. Nature, effects and degree of aesthetic impact of fluorosis

4. Conclusions

17.1. The evidence revealed strongly held views, particularly by those who are opposed to water fluoridation. Due to these circumstances, particular attention was given by the All-Party Parliamentary Group to the examination of submissions, which did not support fluoridation. They raised two broad issues of public importance, namely: safety and civil liberties. Ultimately, on balance, neither facet of the “anti” case was convincing. The national body opposed to fluoridation, the National Pure Water Association, having refused to attend the oral evidence session, based their case solely on the legalistic ground of infringement of civil liberties. This contrasted sharply with their ex-President, Dr Peter Mansfield, who characterised his objections solely in terms of adverse health consequences. Dr Mansfield’s evidence was highly individualistic and suggestive. Finally, what made Dr Mansfield’s position hard to accept was his admission that he accepted the validity of the York Review, which, in essence, failed to support his view on issue of safety.

17.2. The civil liberties argument does not hold if water fluoridation is safe and efficacious as a public dental health measure. Was the current evidence sufficient to enable us to answer those questions? Looking at the wealth of

evidence available to us there is no credible research that provably links water fluoridation with adverse health outcomes such as bone fractures or cancer. Indeed at least one study reported a correlation between water fluoridation and decreased fractures in women over 50. It is further noted that for around 50 years in this country water has been artificially fluoridated and 5 million people receive artificially fluoridated water with no reported ill effects.

17.3. We have questioned those responsible for the MRC report carefully, and noted that the chair of the MRC Working Group, Dr Harrison, indicated his personal opinion that fluoride was safe to be added to water. In our view it became clear that the only area from the MRC report which remained to have any real necessity of further research was the question of the public's perception and impact of dental fluorosis.

17.4. Would fluoridation be beneficial? The evidence is strongly supportive of the view that fluoridated water is a cheap and effective way of helping prevent dental decay in vulnerable groups. There is a strong probability that this would be particularly so in terms of tackling health inequalities of inner city children when the example of dental disease levels in Manchester are compared with those in Birmingham.

17.5. That point having been made, we feel on balance that if water fluoridation was to be available it should be targeted to those areas where it would have the greatest impact in terms of dealing with health inequalities. Health authorities should be left to decide whether or not their local populations would benefit sufficiently from such a measure.

17.6. Finally, whilst the All-Party Parliamentary Group understand the caution taken over this issue, in practical policy terms it is hard not to have sympathy with the view expressed by the British Dental Association and others when they told us that they did not consider any further research was necessary. However, having said that, as indicated above, the question of

research into the public's concern for, and attitude to, dental fluorosis remains. Other than this the All-Party Parliamentary Group feel that the time is close at hand when a decision to enable water fluoridation to be effectively carried out be taken together with the necessary legislative changes.

18. Recommendations

- 18.1. That as a matter of public dental health policy, targeted water fluoridation be stated as a legitimate and effective means of tackling dental health inequalities.
- 18.2. That current legislation be amended to allow the responsible health body, who consider that the matters in recommendation 1 are relevant to their area, to require water companies to fluoridate as directed.
- 18.3. Health bodies in carrying out their function and in recommending fluoridation must fully consult the relevant population in an open, effective and transparent manner.
- 18.4. The Department of Health to agree a protocol/code of practice with the water utilities concerning matters such as costs and indemnities and if necessary legislate appropriately.

19. Appendices

Appendix A

Officers of the All-Party Parliamentary Group on Primary Care and Public Health

Chairs:

Baroness Eccles of Moulton
Dr Howard Stoate MP

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Stephen Hesford MP

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Baroness Northover
Baroness Pitkeathley
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Lord Rix
Helen Southworth MP
Gareth R Thomas MP
Mark Todd MP

Appendix B

Written submissions to the group

British Fluoridation Society

Royal College of Physicians

Department of Health

British Association for the Study of Community Dentistry

British Medical Association

Royal College of Nursing

British Dental Association

Dr Peter Mansfield

National Pure Water Association

Medical Research Council

Baroness Gardner of Parkes

Earl Baldwin of Bewdley

Water UK

British Society of Paediatric Dentistry

UK Public Health Association

Professor Peter Aggett, WHO task group on Environmental Health Criteria for Fluorides

Professor Jos Kleijnen, Director of the Centre for Reviews and Dissemination, University of York

Audit Commission Health Report “Primary dental care services in England and Wales”

Department of Health and Children 2002: Forum on Fluoridation Ireland

Environmental Health Criteria for fluorides, WHO Geneva 2002

Informing the Public about Fluoridation and Consulting on Specific Proposals for New Water Fluoridation Schemes 1999. Comments from a joint working group: British Dental Association, British Medical Association, British Fluoridation Society and Water UK

R. J. Lowry, B. Thompson, M. A. Lennon 2000. How much do the general public want to be involved in decisions on implementing water fluoridation? British Dental Journal Volume 188 (9) pages 500-502.

McDonagh M, Whiting P et al (2000). A systematic review of public water fluoridation. York: Publications Office, NHS Centre for Reviews and Dissemination, University of York

Medical Research Council Working Group Report “Water Fluoridation and Health” September 2002

Phipps K.R, Orwell E.S, Mason J.D. Cauley J.A. 2000. Community water fluoridation, bone mineral density, and fractures: prospective study of effects in older women. British Medical Journal 321:860-864