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EXPLANATORY NOTE

HOW THE COMMENTS RECEIVED DURING THE PUBLIC CONSULTATION WERE TAKEN INTO ACCOUNT FOR THE FINAL SCHER OPINION ON FLUORIDATION OF DRINKING WATER

This note sets out the rationale for the modifications made, after a public consultation, to the opinion of the European Commission's Scientific Committee on Health and Environmental Risks (SCHER) titled: "Critical review of any new evidence on the hazard profile, health effects, and human exposure to fluoride and the fluoridating agents of drinking water".

Introduction

In May 2009, the European Commission requested the Scientific Committee on Health and Environmental Risks (SCHER) to critically review any new evidence about the effects of fluoride on the environment and human health. A SCHER Working Group (WG) was formed comprising of members of SCHER, experts from the Scientific Committee on Consumer Safety (SCCS), and from academia with experience on the subject. The WG produced a draft opinion which was discussed and adopted by the SCHER plenary on 1 March 2010 as a preliminary opinion suitable for public consultation.

In line with its procedures for stakeholder dialogue, implemented in the Rules of Procedures of the Scientific Committees set up by Commission Decision 2008/721/EC of 5 September 2008, the European Commission Health and Consumers Directorate General (DG SANCO) conducted a public consultation on the preliminary opinion of SCHER between 18 June and 22 September 2010. In addition, a public hearing was held on 17 September 2010.

Results/participation

By the deadline of 22 September 2010, DG SANCO received a total of 44 comments. This was complemented by additional comments/documentation which were submitted during the public hearing. All contributions were reviewed by the SCHER Working Group and, where appropriate, modifications were introduced into the text of the opinion. The revised opinion was adopted as the final opinion by SCHER via written procedure on 16th of May 2011.

Modifications to the opinion

The opinion has been modified to take into account those submitted comments which were assessed by SCHER to be pertinent and relevant for the subject matter taking into account the clear separation between risk assessment and risk management that underpins the Scientific Advisory Structure of the European Commission. Comments on policy, risk management, legal clarification, ethics, the precautionary principle, were not considered as although pertinent to the subject matter are outside the remit of the Scientific Committees.

Detailed explanations of the SCHER's response to the comments received are provided below. The numbering of paragraphs and lines correspond to the sections of the final opinion adopted by the SCHER on the 16th of May 2011 and published together with this document.

Comments on section 4.1

A total of 44 comments were received for this section. However, text was *not* included in 15 of these comments because 13 were largely in agreement with SCHER's position and provided no additional elements for consideration, one had been left blank, and for one comment supporting evidence was not found in the publicly available scientific literature. A total of 29 comments and responses on this section have been summarised below (14 mostly agreed, one disagreed and 14 mostly disagreed).

Comments that led to a modification of the text of the opinion:

Although many of the comments are in agreement with the conclusions of the SCHER on section 4.1, there are two specific areas, bone fractures and osteosarcoma, where the respondents felt that the evidence points more strongly to an absence of harm than suggested in the SCHER opinion. Numerous references have been provided in support of the comments on these two areas, but many of them refer to older data and have not been included in the opinion as they were reviewed previously by other panels (e.g. SCCP 2005, EFSA 2005). The mandate specifically requested SCHER to consider any new evidence not reviewed before.

Osteosarcoma

Several comments mention a water fluoridation scheme which was implemented in Birmingham in 1964 to combat unacceptably high levels of dental caries in children. A significant improvement in dental health attributable to water fluoridation has been observed over the past 46 years despite the high levels of social deprivation in many parts of the city. Furthermore, no evidence of adverse health effects (from consumption of fluoridated water at a concentration of 1 mg/L) has been found. This broadly reflects SCHER's conclusions regarding an absence of adverse effects from water fluoridation. However, SCHER's conclusions that some epidemiological studies seem to indicate a possible link between fluoride in drinking water and osteosarcoma have been called into question and the following studies are cited in the comments:

- There was no evidence of an elevated incidence of osteosarcoma in the general population or in young people from the study undertaken by the West Midlands Cancer Intelligence Unit (WNCIU) from 1989 to 2005.

- The findings of a study carried out between 1980 and 2005 by researchers at the Universities of Leeds, Newcastle and Oxford (McNally et al. 2010), in which osteosarcoma cases in the UK population up to the age of 50 were reviewed, suggest no statistically significant difference in osteosarcoma rates between areas with fluoride levels of 1 mg/L in drinking water and those with lower fluoride levels.
- A US National Cancer Institute Study (NRC 1993) identified no trends in cancer risk that could be ascribed to the consumption of fluoridated water.

The opinion has been slightly modified in response to these comments, and SCHER have now concluded that the epidemiological studies do not indicate a clear link between fluoride in drinking water and osteosarcoma, and cancer in general. Although the UK study carried out by McNally et al. (2010) is mentioned in the revised opinion, SCHER cannot make an affirmative statement on non-carcinogenicity because the data from the study was not available for full evaluation, but only as an abstract..

Bone fracture

The respondents felt that the evidence concerning fluoride in drinking water and bone fracture shows a stronger link to an absence of an adverse effect than is conveyed in the draft report. The following reports are cited in the comments:

- In 2000, the York report concluded that there was no association between fluoridated water and bone fractures based on an analysis of 29 bone fracture studies included in its systematic review, the majority of which showed little or no effect either way (McDonagh et al. 2000).
- A report by the Australian National Health and Medical Research Council, published in 2007 (AU-NHMRC 2007), concurred with these findings after also considering two other systematic reviews of bone health and fluoridation (Jones et al. 1999 and Demos et al. 2001).

The effect of fluoride on bone strength and fractures has been re-addressed and the text modified slightly (section 4.1.1, page 15, section on the effect on bone strength and fractures). The York report (McDonagh et al. 2000) is referenced in the revised opinion and a reference from AU-NHMRC (2007) which indicates that water fluoridation at levels of 0.6 to 1.1 mg/L may actually lower overall fracture risk has been added. However, based on the total weight of evidence available, the SCHER's overall conclusion remains that there are insufficient data to evaluate the risk of bone fracture at the fluoride level seen in areas with fluoridated water.

Skeletal fluorosis

A comment was raised concerning skeletal fluorosis and the effects of fluoride on bone strength and fractures, the issue being how 1 ppm in water will affect people over a longer period of time (e.g. 20 years or more), and how other sources of fluoride will increase the potential effects of fluoride. The section on bone fracture and skeletal fluorosis has been modified slightly, but most of the literature provided in support of this comment refers to older data which has already been reviewed and it is not applicable to the exposure levels that are seen in the EU.

Neurotoxicity

The data on neurotoxicity of fluoride in animals and humans in the draft opinion have been reconsidered, including the new material that was submitted. Although the text has been modified (section 4.1.3, page 17, sections on animal studies and human studies) to accommodate the comments, the final conclusions are unchanged because the available studies do not support the link between fluoride exposure in drinking water and neurotoxicity at the levels of exposure seen in the EU.

IQ

The series of studies on the developmental effects of fluoride, carried out mostly in China, have been reconsidered and the text changed accordingly (section 4.1.3, page 17, section on human studies). The conclusion is unchanged and SCHER agrees that a biological plausibility for the link between fluoridated water and IQ has not been established.

Dental Fluorosis

A clearer distinction has been made in the text between mild dental fluorosis which has no cosmetic importance and moderate levels of fluorosis which do have aesthetic significance. The term *mild* fluorosis has been removed. Most of the information provided in support of the comments on fluorosis is from official reports and not peer-reviewed scientific papers.

Comments that did not lead to a modification of the text of the opinion:

Many of the comments received on section 4.1 are broadly in agreement with the SCHER opinion. However, some important points were raised concerning the effects of fluoride ingestion on tooth and bone development, and the consequences of developmental delays for the assessment of caries findings. These issues are still the subject of debate in the academic community as to whether they constitute adverse effects and were not considered by SCHER to be within with the current mandate to evaluate the potential adverse effects of fluoride.

The reporting of dental and skeletal fluorosis within the same conclusion in section 4.1.1 has been called into question since dental fluorosis is a minor cosmetic issue in the European context and is therefore entirely different from skeletal fluorosis which has not been reported in the EU. No modifications have been made to the text in response to this comment as the effects, although different in their potential severity, are caused by similar underlying mechanisms.

The WG did not find sufficient quality data to address a comment concerning the absence of adequate coverage of the neurotoxic effects of H_2SiF_6 and Na_2SiF_6 . Furthermore, as stated in the opinion, exposure of these compounds is expected to be minimal since they are rapidly hydrolysed.

Comments on section 4.2

A total of 44 comments were received for this section. However, changes were not introduced for 18 of these comments because 14 were largely in agreement with SCHER's position, three had been left blank, and for one comment supporting evidence was not found in the publicly available scientific literature. Therefore, a total of 26 comments and responses for this section have been summarised below (one agreed, five mostly agreed, one disagreed, nine mostly disagreed and ten were uncertain).

Comments that led to a modification of the text of the opinion:

Several respondents expressed concerns that the intake calculations presented in the opinion represented an unrealistic worst-case scenario. In the pre-consultation opinion, SCHER assumed that children living in artificially fluoridated areas could also receive daily fluoride supplements of 0.5 mg F/day, which could in theory result in the UL being exceeded. The respondents felt that this scenario is unlikely to occur in the UK. The Department of Health and the British Association for the Study of Community Dentistry specifically advises against the use of fluoride supplements in children over 6 months in any areas where fluoride levels, whether natural or artificial, are above 0.7 mg/L. Furthermore, the use of fluoride supplements in children aged between 6 months and 3 years in areas where the water supply contains more than 0.3 mg/L of fluoride is also advised against. Thus, respondents to the public consultation felt that the estimates of fluoride intake in this section are considered high and not representative of the situation in the UK.

After consultation with the EFSA expert participating in the Working Group, the contribution from dietary supplements has been modified to 0.25 mg F/day (Section 4.2.1, page 22, section on dietary supplements and fluoridated salts). The integrated fluoride exposure assessment has been recalculated in the revised version of the SCHER opinion (Section 4.2.2) assuming the lower value of 0.25 mg F/day from supplemented food with dietary additives. Different scenarios have also been used for toothpaste usage; 0.075 mg F/day from the application of 0.15% fluoride toothpaste (low end) and 0.225 mg F/day (high end). The total daily systemic fluoride exposure levels presented in the tables in the revised opinion are now lower for the following age groups:

- Adults and children older than 15 years of age.
- Children under 15 years old.
- Children aged between 12 and 15 years.
- Children aged between 1 and 12 years.

As a result of this change to the calculations, the upper tolerable intake level (UL) is only exceeded in the case of consuming 1.5 L/day of drinking water.

The section on exposure of infants up to 12 months of age has been modified; in infants up to 6 months old, the proposed upper intake level is exceeded at fluoride levels of 0.8 mg/L depending on the infant formula used.

The estimated fluoride intake tables have been restructured to improve the readability. The contribution of the different sources to the total fluoride burden is explained more clearly in the revised opinion. In general, the text in this section of the opinion has been revised for clarity.

In response to concerns that there may be some confusion resulting from the way in which SCHER uses the term 'fluoridated water', the opinion has been modified to differentiate between naturally occurring fluoride in water and water which has had fluoride added to it for dental health promotion.

A reference from the 1994 UK-DoH Report of the Panel on Dietary Reference Values of the Committee on Medical Aspects of Food Policy (COMA) which states that 0.22 mg F/kg bw/day was safe has been deleted as no justification was found for this recommendation.

A reference from UK COT (2003) which suggests a daily water consumption of between 0.8 and 1.3 L has been deleted for clarity. The estimation of fluoride exposure in children is based on water consumption at 0.5, 1.0 and 1.5 L since current data on water consumption are sparse.

Concerns over the safety of silicofluorides, H_2SiF_6 and Na_2SiF_6 , used in drinking water fluoridation and potential impurities in these chemicals have been addressed, and the opinion rephrased where necessary (section 3.1, pages 10-11). Information on the safety of these compounds is very limited. However, as stated in the opinion, when added to water, silicofluorides are rapidly and completely hydrolysed to the fluoride ion and no residual fluorosilicate intermediates have been reported. Therefore, SCHER considered that the fluoride ion had to be the main focus of this opinion.

SCHER has adopted the assumption that the dose applied is 0.8 (normal dose) and 1.5 mg/L, based on the Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption (see section 4.2.1, human part).

Comments that did not lead to a modification of the text of the opinion:

Many of the comments received on section 4.2 were broadly in agreement with the SCHER opinion, although the following points were raised by the respondents:

- The estimated fluoride intakes in the opinion are higher than the actual fluoride intakes for the age groups concerned.
- All EU water fluoridation schemes now operating have a target level of no more than 1 mg/L of fluoride in the water supply and higher levels are as a result of naturally occurring fluoride.
- The worst case scenario of 3.0 mg F/L in drinking water in parts of Finland is extremely unrealistic (local public health authorities would actively recommend avoidance of fluoride toothpaste and other products in this case).
- Simply establishing that fluoride intakes for a group are below the UL is not sufficient to demonstrate protection of the age group from adverse health effects due to fluoride ingestion.
- The beneficial effects of fluoride have been underestimated.

As the exposure data are sparse and there are not enough quality data on sources of levels of fluoride to perform a full uncertainty analysis within the European context, the SCHER conducted a conservative exposure assessment in the SCHER opinion is very conservative. The consumption data used to develop the scenarios are based on information from the EFSA (2005) opinion and the toothpaste intake is from the SCCP

opinion (2005). The following concentrations of fluoride in drinking water were used in the scenarios: 0.1 mg/L (mean occurrence in Europe); 0.8 mg/L (mandatory water fluoridation in Ireland); 1.5 mg F/L (WHO guideline value); and 3.0 mg/L (worst case scenario which takes into consideration a small fraction of the population based on the 97.5th percentile). Better exposure data are recommended as a research need.

At present, there are no reliable biomarkers to assess fluoride exposure. The Working Group and SCHER expressed concern over the use of urinary biomarkers as indicators of fluoride exposure because they are considered to be unreliable due to fluctuations in urinary flow and pH which influence fluoride output. Therefore data from the UK National Diet and Nutrition Survey of 2000-2003 providing evidence of 24-hour urinary fluoride output and water fluoride concentration have not been presented in the opinion. A paragraph to this effect has been added to the SCHER opinion, and development and validation of appropriate biomarkers recommended as a research need.

The need for caution when using 97.5th percentiles in the development of the exposure scenarios was expressed in one comment. However, a proper statistical analysis could not be performed by the SCHER because the exposure data obtained were very fragmentary. Hence, the use of the 97.5th percentile was considered to be scientifically acceptable by the SCHER.

Another comment raised the point that no study to date takes a comprehensive view of all fluoride exposures from the environment, especially in the UK. As reported in the SCHER opinion, exposure to fluoride occurs orally (major route), by inhalation and by dermal exposure. Contributions from other environmental sources are extremely low, except in occupational settings (e.g. aluminium workers) and in people living close to plants processing fluoride containing minerals), but these two groups have not been included in the exposure assessment as they were not the focus of this opinion.

Comments on section 4.3

A total of 45 comments were received on section 4.3. Text was *not* included for 14 of these comments; nine were largely in agreement with SCHER's position, four had been left blank, and one comment was not supported by evidence in the scientific literature. The remaining 31 comments were very extensive (two agreed, five mostly agreed, six disagreed, 15 mostly disagreed and three were uncertain). SCHER noted the comments, but decided against further exploring those largely scientific and/or socio-economic issues which go beyond the scope of this opinion (e.g. the role of fluoridated water for caries prevention among children of lower economic classes; whether delayed tooth eruption accounts for the lower incidence of caries in areas with fluoridated water; the differentiation between those fluoride vehicles which require no effort of the part of the individual and those that require action or a behaviour change, etc.). In general, SCHER considers that the risks and benefits of water fluoridation are difficult to assess due to the poor quality of the available data.

Although the comments have been noted, no significant changes have been made to this section (question 1-c1) of the opinion and the conclusions are unchanged. Minor edits only have been made to the text to improve the readability (page 29). A paragraph concerning the benefits of preventive systemic supplementations has been moved from the section on *Topical fluoride treatments* to the section on *Fluoridated foods and dietary supplements* (page 31) where it sits better. A reference from Health Canada

(2009) which concluded that the optimal concentration of fluoride in drinking water for dental health was 0.7 mg/L has been added (page 30).

Comments on section 4.4

A total of 45 comments were received for this section. Text was *not* included for 20 of these comments (11 agreed, five mostly agreed, two mostly disagreed and two were uncertain). The remaining 25 comments and responses have been summarised below (14 mostly agreed, two disagreed, eight mostly disagreed and one was uncertain).

Comments that led to a modification of the text of the opinion:

Many of the comments received on section 4.4 (question 1-c2) were in agreement with the SCHER opinion. No changes were made in direct response to individual comments. However, the conditions under which the ULs for the different age groups considered could be exceeded have been set out more clearly. A note on the non-essentiality of fluoride for human growth and development has been added (page 32), but this is not in response to a specific comment.

The following conclusions in which SCHER highlight the key findings from the integrated exposure assessment (section 4.2.2 pages 22-8) have been added to this section (page 33). The conclusions have been added in order to improve the clarity of the text, rather than in response to any specific comments from the respondents:

SCHER agrees that for adults and children over the age of 12 years the total intake of fluoride from all major sources is below the upper tolerable intake level (UL) in most part of EU including areas with fluoridated drinking water, except for those living in areas with water containing natural high fluoride (> 3 mg/L) and with a high intake of water based beverages.

SCHER concludes that for children between 6-12 years, the UL is not exceeded if the water consumption is less than 1.0 L/day for children living in areas with fluoridated water (below 1.5 mg/L) and using regular fluoridated toothpaste. For children between 1-6 yrs the UL is exceeded if they consume more than 0.5 L a day, and use more than the recommended quantity of regular fluoridated toothpaste.

There is no UL for infants up to 12 months of age. As shown in Table 8, when the fluoride concentration in drinking water is above 0.8 mg/L, the exposure to fluoride is estimated to exceed 0.1 mg/kg/day. This amount is 200 times higher than the amount found in breast milk.

Comments that did not lead to a modification of the text of the opinion:

Many of the comments were in agreement with the SCHER conclusion that children and adults in fluoridated areas do not exceed the ULs under normal consumption patterns. The respondents generally concur with SCHER's view that there is no strong evidence to indicate adverse health effects from fluoride exposure in people with endocrine disorders.

Several comments point out that the US Food and Nutrition Board dietary reference values for fluoride published in 1997 set a UL of 10 mg per day for older children and adults which is higher than the EFSA/SCHER value of 7 mg F per day for adults. This is noted in the opinion.

Based on the guidance currently followed in the UK, some of the respondents felt it would be extremely unlikely that the upper tolerable limits would be exceeded in an artificially fluoridated water supply at a concentration of 1 mg F/L. Conversely, other respondents expressed concerns that the ULs have been overestimated in the opinion and could be exceeded in fluoridated areas by young children and babies. Taking a number of scenarios into account which the SCHER views as covering essentially all possible EU situations, the exposure assessment in the SCHER opinion is considered to be conservative.

The issue concerning developmental delays of the teeth and the skeleton caused by ingestion of fluoride is beyond the scope of this opinion and is not considered further here.

The harmful human health effects associated with the residual oligomer of silicic acid have been discussed in one comment. The references provided in support of this comment refer to older data which has already been reviewed previously and have not been included in the present SCHER opinion.

Comments on section 4.5

A total of 45 comments were received for section 4.5. However, text was *not* included for 20 of these comments because 13 were largely in agreement with SCHER's position, six had been left blank, and one comment was not supported in the literature. A total of 25 comments and responses on this section have been summarised below (two agreed, 10 mostly agreed, two disagreed, six mostly disagreed and five were uncertain).

Comments that led to a modification of the text of the opinion:

Many of the comments received on section 4.5 (question 1-d) were in agreement with the SCHER opinion. However, some of the respondents felt that this section suggests there are no beneficial effects associated with water fluoridation, only a negative effect of causing fluorosis. Specific concerns were raised that one of the statements could be misinterpreted to imply that water fluoridation may induce skeletal fluorosis. It has therefore been clarified that fluoride in drinking water has been shown to have a beneficial effect on caries prevention, but could induce *enamel* fluorosis within a very narrow margin of exposure (page 33).

The respondents also felt that it was not clear why additional research on potential health effects would be unlikely to provide new data to support the risk assessment process. This statement has been modified accordingly (page 33), but the actual recommendations for additional investigative work are unchanged.

Comments that did not lead to a modification of the text of the opinion:

Many of the respondents agreed with the SCHER recommendations for further epidemiological studies examining the benefits and risks of water fluoridation as well as the development of a valid fluoride exposure assessment tool. The respondents generally felt that there is insufficient evidence to evaluate the risk of osteosarcoma, developmental neurotoxicity and reproductive toxicity at the fluoride level seen in areas with fluoridated water.

Comments on section 4.6

A total of 45 comments were received for this section. Text was *not* included for 33 of the comments (29 agreed, one disagreed and three were uncertain). The remaining 12 comments and responses have been summarised below (two agreed, two mostly agreed, three disagreed, three mostly disagreed and two were uncertain).

Comments that led to a modification of the text of the opinion:

Many of the comments received on section 4.6 (question 2) were in agreement with the SCHER opinion and no further action was required. The following points have been clarified in the text (section 4.6.1, page 34):

- The exposure assessment carried out by SCHER focussed on losses through sewage treatment works.
- Direct soil contamination as a result of leakage from the water supply system or by irrigation using tap water was not considered due to a lack of exposure data.
- Contamination of the atmosphere and soil is expected to be very limited as most of the fluoride remains in solution during sewage treatment and passes to the aquatic environment in this way.

The aquatic effects data presented in this section are unchanged. However, a sentence has been added (section 4.6.3, page 35) stating that the review by Camargo (2003) provided sufficient information of good quality to perform a risk assessment for the environment.

SCHER decided to add conclusions to the effects section. The Predicted No Effect Concentrations (PNECs) for freshwater and marine water have been revised (section 4.6.3, page 37, conclusion on effects); the lowest No Effect Concentration (NOEC) is now 2.9 mg/L for the marine invertebrate *Grandidierella sp.*, derived from the Maximum Allowable/Acceptable Toxicant Concentration (MATC) of 4.0 g/L. As freshwater and marine water organisms are of similar sensitivity, a PNEC of 0.29 mg/L for both freshwater and marine water has been derived from the whole data set by applying an assessment factor of 10. However, SCHER concluded that using a PNEC derived in this way has no real meaning because levels of fluoride below toxic concentrations are considered beneficial. Therefore a threshold of 0.5 mg F/L was assumed to be safe for aquatic ecosystems based on effects data for ecologically sensitive endpoints.

The following changes have been made to the risk characterization (section 4.6.3, page 38-9, risk characterization). These changes have not been made in response to specific comments

- Effluent would have to be diluted in the receiving water by a factor of 3.5 (only 2 if the sensitive species safety threshold is considered) for the fluoride concentrations to be reduced below the worst case PNEC for both freshwater and marine water of 0.29 mg/L.
- RCRs for case 1 (dose of 0.8 mg F/L – normal dose for fluoridation of drinking water) and case 2 (dose of 1.5 mg/L based on the reference dose of WHO 2006) have been revised as follows:
 - Case 1 leads to an RCR of 0.276.
 - Case 2 leads to an RCR of 0.517.

Comments that did not lead to a modification of the text of the opinion:

The overall conclusions for section 4.6 are unchanged; SCHER is of the opinion that adding fluoride to drinking water at concentrations between 0.8 and 1.5 mg/L does not lead to unacceptable risks for the aquatic environment. There is still the possibility of soil contamination, but SCHER was not able to assess the risk to the soil ecosystem due to lack of exposure data.

Some of the respondents expressed concerns that: (i) associations between silicofluoride use and biological effects in humans, in particular elevated levels of blood lead in children and inhibition of acetylcholinesterase activity have been reported; and (ii) silicofluoride-treated drinking water can increase the leaching of lead from plumbing fixtures. Section 4.6 of the opinion is concerned with the potential environmental effects and risks of fluoridation of drinking water. The topics raised in these comments are related to human exposure and were dealt with in section 3.1 of the opinion (pages 10-11).

One respondent commented that no assessments have been done of the potential damage of fluoridated water on the environment from non-sewerage sources. The opinion presents a generic risk assessment focussing on the losses through sewage treatment works, but SCHER is not in a position to carry out on-site specific risk assessments due to a lack of exposure data.

Comments on section 5

A total of 45 comments were received for this section. However text was *not* included for 35 of these comments (eight agreed, 16 mostly agreed, one disagreed, nine mostly disagreed and one was uncertain), 24 of which were largely in agreement with the conclusions of the SCHER opinion. A total of 10 comments and responses on this section have been summarised below (three mostly agreed, two disagreed, three mostly disagreed and two were uncertain).

Comments that led to a modification of the text of the opinion:

Many of the comments received on section 5 were in agreement with the conclusions of the SCHER opinion. The main issues raised by the respondents were as follows:

- There is no clear evidence, or insufficient evidence, for osteosarcoma being linked with fluoridated drinking water.
- The statement concerning fluoride intake from drinking water and the effects on children's IQ levels is incorrect.
- The conclusions about the ULs being exceeded in children aged 6-12 years and 1-6 years living in areas with fluoridated drinking water (<0.8 mg F/L) contradict the text in section 4.2.

As indicated in the various sections of the opinion, SCHER has now concluded that the epidemiological studies do not indicate a clear link between fluoride in drinking water and osteosarcoma and cancer in general. The wording of the conclusion (point 4, page 39) has been changed accordingly.

The conclusion (point 5, page 39) on fluoridation of drinking water and children's IQ levels has been reworded so that it is consistent with the information given in section 4.1 of the opinion. Fluoride intake from drinking water at the levels occurring in the EU does *not* appear to hamper children's IQ levels.

SCHER has corrected points 9 and 10 (page 40). The ULs were exceeded in children aged 6-12 years (consuming more than 1 L water/day) and 1-6 years (consuming more than 0.5 L water/day) living in areas with fluoridated drinking water with levels *above* 0.8 mg F/L and using adult toothpaste containing 0.15% fluoride. SCHER has also concluded that for infants, exposure to fluoride is estimated to exceed 0.1 mg/kg/day when the fluoride concentration in drinking water is above 0.8 mg/L.

Comments that did not lead to a modification of the text of the opinion:

Some of the respondents are of the opinion that water fluoridation is the most efficient way of reducing population caries levels in terms of compliance and cost and therefore disagree with the SCHER's conclusion that topical application of fluoride is the more efficient measure. It was generally felt by the respondents that the opinion underestimates the dental benefits of water fluoridation for both children and adults. For reasons explained in its opinion and on the basis of the evidence available to it, the SCHER has maintained its view about the efficiency of the topical application of fluoride.

The statement that water fluoridation appears to prevent caries primarily in permanent dentition has been called into question by some of the respondents who believe that there is evidence of the beneficial effects of water fluoridation on both the primary and permanent dentition. On the basis of the evidence available and its expert judgement, the SCHER decided to maintain its view on the effects of fluoride primarily on permanent dentition.