

**3<sup>rd</sup> International Workshop  
On  
Fluorosis Prevention  
and  
Defluoridation of Drinking Water**

**Participants Comments  
on  
WHO Draft Publication  
WSH/DRATFT/99.9  
Fluoride in Drinking Water**

**World Health Organisation  
WHO Head Quarter  
1211 Geneva 27  
Switzerland.**

**Chiang Mai 24 Nov. 2000**

Dear Madam Director-General,

This letter is written as an outcome of 3<sup>rd</sup> International Workshop on Fluorosis and Defluoridation of Water, November 20-24, 2000, Chiangmai, Thailand. The participants agreed that their shared consensus should be presented to WHO as a basis to seriously reconsider certain parts of *WHO draft publication WSH/DRAFT/99.9 Fluoride in Drinking Water* before its mass publication.

As you might be well aware, about one hundred millions of people, by a conservative estimate, suffer from fluorosis, all dental, skeletal and none-skeletal. The main cause of the problem of this magnitude is the fluoride contamination in water for organic consumption. The question of fluoride body intake has therefore been a matter of serious concern among affected populations and among professionals in various fields of expertise. A group of the latter - comprising individuals and institutions from chemistry, dentistry, medicine, chemical engineering, health administration and social works – has been organizing workshops on an international basis every two to three years since 1995. The proceedings based on selected papers from the first and the second workshops (organized in Ngurdoto, Tanzania in 1995 and in Nazreth, Ethiopia in 1997 respectively) are herewith enclosed for your information.

The aforementioned 3<sup>rd</sup> workshop was jointly organized by the Intercountry Centre for Oral Health (in collaboration with WHO) Thailand, International Society for Fluoride Research and Danish Environmental Development Co-operation Group. It was attended by professionals from 13 countries. The proceedings, based on the presentation of thirty-one papers, are under preparation and will be made available in due course.

In addition to several topics related to the preventive measures of fluorosis and the techniques of defluoridation, the participants had a full session devoted to reviewing *WHO draft publication WSH/DRAFT/99.9 Fluoride in Drinking Water* (hereafter *WSH/DRAFT/99.9*). The review was initiated by the authors' invitation for comments as well as by our position regarding the problems of fluorosis. The discussion was conducted in a seminar-like fashion. Every participant had a copy of the monograph in question for thorough reading prior to the final session. Following an introductory part of a special presentation of the state of the art of the defluoridation technology, the session examined *WSH/DRAFT/99.9* in detail.

As we all know the utilization of groundwater resources has been increasingly more extensive. On the other side of the coin, however, the problems of fluorosis and its severity have increased. The participants are therefore highly appreciative of WHO efforts in providing useful information and in updating previous WHO publications and its *Guidelines* on fluoride in drinking water. These works are potentially and particularly beneficial to the developing countries where most of the fluorotic areas happen to be covered, and where the research capacities to set their own standards for fluoride body consumption are poor, if not altogether absent. This unfortunate situation, in spite of the availability of high standard of scientific works through information technology, will remain with us for the foreseeable future. Consequently, it raises the important status, and the advantage of the economy of scale, of WHO publications. In this context the *WSH/DRAFT/99.9* monograph, regardless of its intent as "guidelines" will well be regarded as authoritative, if not as "a Bible". It has often happened that the authorities in many developing countries merely follow the recommendations and even guidelines of WHO. This situation is double-edged. Likewise *WSH/DRAFT/99.9* could provide great service to a large section of humanity, providing the monograph proves to be of high scientific value.

Admirably, in the foreword the monograph states that its purpose is "the removal of excessive fluoride from drinking water". Coincidentally and fortunately the majority of our workshop participants happened to fall into the target group of readers. They, owing to their field experiences of fighting fluorosis, paid particular attention to Chapter 6. There is a high degree of consensus regarding the chapter in particular and the monograph in general. A number of important and agreed points are here summarized and raised for your deliberation.

1. **The Monograph's Title** "Fluoride in Drinking Water" is uninformative. A reader is at a loss as to what to expect from the monograph. The monograph in general does not seem to pursue a specific thesis in a coherent manner. It is rather like a collection of essays, each of which is completed only in reference to itself. The heart of the problem is with the monograph's conceptual framework, which is not crystallized, and its objectives, which are not apparent. The title is indicative of this overall lack of clearly stated goals.
2. **On Chapter 5 "Guidelines and Standards"** The figure "1.5" mg/L being associated with the WHO guideline, of which its advocacy is "a level at which

dental fluorosis should be minimal", has been puzzling us for over the past ten years. Why is it "1.5"?; what scientific data is the figure based on? Theoretically as well as empirically, the figure seems to be far above the proven safety level. There is already ample evidence that the so-called recommendation level of 1.5 mg/L could cause dental fluorosis for an entire community in a number of developing countries. Additionally if this chapter is read in conjunction with Chapter 3 "Human Health Risks", its meanings are immediately nullified. The amount of fluoride by itself is inconsequential to the occurrence of skeleton fluorosis. The comparison between the cases of the U.S. and of Senegal, argued at the end of chapter 3, is a good illustration. It is a matter of common sense that the difference is due to the level of water consumption, to diet cultures, or in short, to people's ways of life. The figure of fluoride alone cannot determine the severity of fluorosis, unless it is considered in the context of specific local conditions. Notwithstanding this point occasionally has also sensibly been pointed out by WHO, one can often notice that, as far as the issues of fluoride are concerned, different publications and different chapters within a publication of WHO seem to go in different directions.

In another publication "Fluoride and Oral Health" (1994), WHO has propounded the concept of "optimum concentration" of fluoride in drinking water, and the figure is set at 0.5-0.7 mg/L. The concept and its related figures subsequently invite at least two questions, namely, (i) how are they related to the figure "1.5", of which its conceptual base itself is ambiguous; (ii) which figure is more sensible than others? All other factors being equal, the recommended figure of "1.5" should be reduced as far down as "0.5" which is the figure that many of us ethically found to be the maximum tolerable range.

With all these shortcomings and ambiguities contained in the chapter, it is very necessary that it should be rewritten in a more scientific manner rather than as a series of unsupported statements.

- 3. On Chapter 6 "Removal of Excessive Fluoride"** If the monograph is to be true to its stated objective, this chapter should be at its heart. The value of the monograph should lie in the provision of an overview of simple methods for the defluoridation of water, together with their conceptual basis and detailed information on the rationale behind the given designs. It would be highly useful if the chapter on defluoridation dealt more extensively with appropriate technology – that is, knowledge that works well in local contexts and is answerable to local problems with the consideration on the application scale. It should include well-tried methods such as the Alumina and resin techniques. It could even consider reverse osmosis which, although more expensive, is now available in many countries. There are other techniques that have gone through experimentation and research in different scientific centres and communities, which *WSH/DRAFT/99.9* could well take into account and benefit from. Moreover though Chapter 6 gives the impression of being sophisticated and offers techniques of and information about defluoridation, it is far from being comprehensive enough for practical use. It lacks a detailed discussion on the problems of applications, which are essential for field projects.

4. **On Chapter 3 "Human Health Risks"** The majority of the participants, who are knowledgeable about fluorotic areas, are of the opinion that the information could completely misinform uninitiated readers. In addition to being an academic sketch and hence unsound, it principally looks at the danger of fluoride from the fluoridated water resources. That is why it stresses on the points such as "...the acute affects of fluoride exposure following fluoridation overdosing", "Crippling skeletal fluorosis is extremely rare in the US...", etc. Bearing in mind that millions and millions of people in China, India, East Africa and elsewhere have been suffering from fluorosis, this chapter totally misses the whole point. The problems of fluorosis are far more severe than they seem to be perceived by the author of this chapter. It is highly deplorable that the severity of the problem is being diluted as much as to an insignificant level. For the general readership, the chapter could be utterly misleading. For a population whose health is already at great risk by natural fluoride, it can be of little use, if any.
  
5. **On Chapter 4 "Beneficial Use" and on Chapter 7 "Artificial Fluoridation"** It is strongly suggested that these two chapters should be omitted. This is not only because they do not conform to the main purpose of the monograph but also because the information is already amply and easily available elsewhere. If *WSH/DRAFT/99.9* is to be of greater use for those who suffer or will suffer from fluorosis, the focus needs to be on the toxicity of fluoride. The strategies for combating the problem are to publicize the danger of fluoride and to address the question of how we can ideally get rid of, or realistically reduce, fluoride quantity in water consumption. But the monograph tries instead to advocate the benefits of fluoride and justify artificial water fluoridation. Therefore, for any population acutely threatened by excessive fluoride, the information on the use of fluoride is irrelevant. It is ironic that while *WSH/DRAFT/99.9* could be more useful for the developing countries that cover the largest portion of the world fluorotic regions, the text seems to adopt a developed-country perspective, and for those inhabitants in fluoride-free areas. For them the chapters are redundant. Taken as a whole the monograph is not helpful to people who suffer from fluorosis, nor does it really serve those who do not encounter the problem anyway.

If the benefits of fluoride need to be mentioned, substantial recent research are available for studies and consultation. In principle they try to demonstrate that the use of fluoride, as a preventive measure for dental health, has impacts only on post-eruptive effects. The application of fluoride, regardless of its methods, is by no means effectual as a preventive measure aiming at pre-eruptive effects. Therefore the systemic application of fluoride, by means of water fluoridation for example, is medically as well as economically an unworthy undertaking. It could rarely bring the positive desired results. More importantly it can be seen as (i) spreading fluoride throughout one's body and (ii) giving fluoride throughout the whole population, be it a community or a city, which is tantamount to mass medication. Weighting the advantages and disadvantages of the use of fluoride, we should call for brushing teeth with fluoridated toothpaste as an alternative to putting fluoride in consumed water. It is beyond dispute that this topical application of fluoride directly to the teeth is an efficient and fairly safe measure to prevent caries. An easy question then is: "why do WHO not advocate this

simple, logical and highly sensible method, in stead of the controversial water fluoridation?"

6. **On the Overall Picture** The monograph, in its professed focus, has a variety of themes. It tries to incorporate mutually incompatible themes of defluoridation and artificial fluoridation in a limited quantity of pages. Different portions assume different levels of simplicity and sophistication on the part of readers. It is difficult enough to satisfy the curiosity of people who seek knowledge and judgement beyond the elementary level. The monograph even contains some serious factual errors as some participants pointed out. Substantial improvement could therefore be made to the text. This includes the style of writing and the way the text is conceptually organized. Although the monograph is in the form of a scientific treatise, the flow of prose and the choice of words, such as unnecessary euphemisms, should not be left aside, for they have a direct impact on the messages conveyed.
7. If all these suggestions cannot be accommodated for whatever reasons, be they scientific or otherwise, it would be highly appreciated if WHO could issue another publication primarily aimed at the mitigation of fluoride in water consumption. Such a publication would directly serve a great number of people in poor countries.

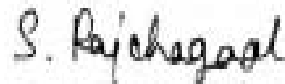
For reason of space, these comments are compressed and concerned only with the gist of the problems. The whole Workshop including the detailed discussion of *WSH/DRAFT/99.9*, is recorded on video and can be made available upon request.

On the behalf of the participants we would like to assure you of our gratitude for your initiative and efforts. We have learned much from the monograph and we all strongly felt that our deliberations have proved to be a valuable scientific exercise. It encourages us to venture into what we consider to be an attempt to make a substantive contribution, and we are very grateful for your generous stand in welcoming comments on the draft. We look forward now to ongoing discussion of these serious matters.

Yours sincerely,



Eli Dahi, Chairperson,  
International Organising Committee



Sunsanee Rajchagool, Chairperson  
3<sup>rd</sup> International Organising Committee