

WHO Guidelines for Drinking Water Quality and Health Risk Assessment of Disinfectants and Disinfection By-products

**By Hend Galal-Gorchev / World Health Organization
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Introduction

An established goal of the World Health Organization (WHO) and its member states is that "All people, whatever their stage of development and their social and economic conditions have the right to have access to an adequate supply of safe drinking water."

The word "safe" cannot be overemphasized, since the impact of contaminated drinking water on health has been well documented, from massive outbreaks of infectious and parasitic diseases to subtle toxicological effects (United Nations Conference on Environment and Development 1992). How safe should the water be, and how can its safety be ensured? These questions must be answered if clear policies and programs on water quality are to be established and maintained.

To assist governments in dealing with these and related questions, WHO *completed Guidelines for Drinking-Water Quality* (Guidelines), an assessment of the health risks of waterborne pathogens and some 128 chemical contaminants. Health-based acceptable levels of exposure from drinking water or guideline values (GVs) are recommended for 95 of these contaminants, taking into account all sources of exposure.

The WHO Guidelines include chemicals that are considered potentially hazardous to human health, those detected relatively frequently in drinking water, those detected in relatively high concentrations, and those of international concern. Based on these selection criteria, contaminants evaluated included chlorinated alkanes, ethylenes and benzenes, aromatic hydrocarbons, pesticides, inorganic chemicals, disinfectants, and disinfectant by-products (DBPs). Only the most widely used water disinfectants were evaluated; these include chlorine, chlorine dioxide, chloramine, ozone, iodine, and their primary reaction by-products. GV's are recommended for two disinfectants (chlorine and chloramine) and 15 DBPs. No GV's were established for ozone or chlorine dioxide because of their rapid breakdown in aqueous solution. Since no adequate data were available for iodine and iodine DBPs, GV's were not recommended for this disinfectant or its by-products. Undoubtedly, the third edition of the Guidelines, planned for the year 2002, will include additional disinfectants and their reaction products.

WHO Guidelines for Drinking-water Quality

The first WHO publication dealing specifically with drinking water quality, *International Standards for Drinking-Water*, was published in 1958; it was subsequently revised in 1963 and in 1971 under the same title. In 1984, *Guidelines for Drinking-water Quality* was