HISTORY OF GUIDELINE DEVELOPMENT

Cyanobacterial toxins: Microcystins (MCs)

Cyanobacterial toxins were not evaluated in the 1958, 1963 and 1971 WHO *International Standards for Drinking-water* or in the first two editions of the *Guidelines for Drinking-water Quality*, published in 1984 and 1993. In the addendum to the second edition of the Guidelines, published in 1998, it was concluded that there were insufficient data to derive a guideline value for any cyanobacterial toxins other than MC-LR. A health-based guideline value of 0.001 mg/L was derived for total MC-LR (free plus cell-bound) based on hepatic effects. The guideline value was designated as provisional, as its scope is limited to MC-LR, the toxicological database is limited and new relevant data were still being generated. This guideline value was brought forward to the third edition of the Guidelines, published in 2004, and the fourth edition of the Guidelines, published in 2011. In a background document to the *Guidelines for Drinking-water Quality* and *Guidelines for Safe Recreational Water Environments*, published in 2020, the provisional (lifetime) health-based drinking-water guideline value of 0.001 mg/L was retained and a short-term health-based guideline value of 0.012 mg/L was derived. The guideline values were based on toxicological data for MC-LR and designated as provisional due to the high level of uncertainty—it is based on data for only MC-LR, and the database is limited, as reflected in the composite uncertainty factor of 1000 applied to derive the lifetime guideline value. As MC-LR is one of the most toxic and common MCs, MCs usually occur as mixtures and in the absence of oral toxicity data for other congeners, the guideline values are for total MCs (sum of all congeners, free plus cell-bound). It was further recommended that alternative safe water sources should be provided for bottle-fed infants and small children when MC concentrations are greater than 0.003 mg/L even for short periods, as a precautionary measure. The guideline values and associated guidance were incorporated in the fourth edition of the Guidelines incorporating the first and second addenda, published in March 2022.

The background document, which established a provisional recreational water health-based guideline value of 0.024 mg/L, informed the update of the WHO *Guidelines for Safe Recreational Water Environments*, published in 2021 as *Guidelines on Recreational Water Quality*.