INTERNATIONAL STANDARDS FOR DRINKING-WATER

Third Edition

WORLD HEALTH ORGANIZATION
GENEVA
1971

First edition, 1958
Second edition, 1963
Third edition, 1971

PRINTED IN SWITZERLAND

CONTENTS

PREFACE

International Standards for Drinking-Water *was first published by WHO in 1958 as an aid to the improvement of water quality and treatment. The standards have been adopted in whole or in part by a number of countries as a basis for the formulation of national standards, and were cited in the International Sanitary Regulations as applicable in deciding what constitutes a pure and acceptable water supply at ports and airports.*

In 1963 a second, revised, edition of the International Standards *was published. Increasing knowledge of the nature and effect of various contaminants, and improved techniques for identifying and determining their concentrations, have led to a demand for further revision of the recommendations. Accordingly, WHO convened an Expert Committee in Geneva in March 1971, and this third edition is the outcome of the Committee's deliberations.*

The present volume is considerably shorter and more manageable than the second edition, more than two-thirds of which was devoted to a detailed description of approved methods of water examination. As these appear in other readily available publications the present edition simply refers the reader to descriptions published elsewhere. Certain other material has been omitted, such as the list of suggested subjects for research, and less space is devoted to the evidence considered by the Committee when recommending limits for the concentrations of individual substances. Research workers interested in such matters are referred to the Committee's report,[1] *in which its reasoning is more fully discussed.*

In the preparation of the material for this publication, use was made of many sources, including earlier editions of the International Standards, *the 1970 edition of the* European Standards for Drinking-Water,[2] The Bacteriological Examination of Water Supplies *(26), the 1962 edition of* Public Health Service Drinking Water Standards *(86), the 12th edition of* Standard Methods for the Examination of Water and Wastewater *(3),* Water Treatment and Examination *(42), and the water standards of the Ministry of Health of the USSR.*[3]

In publishing this revised edition of International Standards for Drinking-Water, *WHO hopes to stimulate further investigations of such problems as the provision of safe and potable water to all communities, the function of*

---

[1] Who Expert Committee on Health Criteria for Water Supplies, *Report* (unpublished document).
[2] *European standards for drinking-water*, 1970, Geneva, World Health Organization, 2nd ed.
[3] The numbers in brackets refer to the list of references on page 64.

water quality in maintaining public health and reducing disease, and the improvement of treatment processes to ensure the maintenance of high standards in water supplied to consumers. It is recognized that the criteria embodied in these standards cannot be considered final and that future developments may make further revision necessary. Constructive criticism and suggestions based upon experience will be welcomed by WHO.

---

1. Introduction

Water intended for human consumption must be free from organisms and from concentrations of chemical substances that may be a hazard to health. In addition, supplies of drinking-water should be as pleasant to drink as circumstances permit. Coolness, absence of turbidity, and absence of colour and of any disagreeable taste or smell are of the utmost importance in public supplies of drinking-water. The situation, construction, operation, and supervision of a water supply, its reservoirs, and its distribution system must be such as to exclude any possible pollution of the water.

Some countries have established national standards of quality and have achieved a certain degree of uniformity in methods of analysis and in the expression of the results of such analyses. Others, however, still lack official standards of quality or have no recognized methods for assessing quality. At regional and international conferences sponsored by the World Health Organization, the problems of establishing standards of quality for a safe and acceptable water supply and of devising suitable methods for the examination of water have been discussed by groups of experienced hygienists and engineers. Great progress could be achieved throughout the world if the various methods of examination could be made easily comparable by the adoption of uniform methods of expressing the results; furthermore, outbreaks of water-borne disease could be avoided through stricter control by the responsible health authorities of the quality of the water distributed for drinking purposes. The World Health Organization has therefore studied the situation, in collaboration with member governments and with the assistance of a number of experts, in an effort to offer technical guidance to the health administrations of countries wishing to revise their regulations on water-quality control and to bring them up to date.

1.1 Purpose

It is hoped that this publication will be of value to operators of water supply systems and others concerned with the treatment and distribution of water, and that it will be of assistance to countries wishing to establish their own national standards or to revise existing standards. It is also hoped that it will be of particular value to health authorities in ensuring that the supplies of water that reach the public are safe and pleasant to use. Some guidance is given on the principles to be adopted in choosing a source of water to be used as a public supply.

1.2 Scope

This publication is concerned with the minimum requirements as to chemical and bacterial quality that supplies of water for domestic use can reasonably be expected to satisfy. Though it is desirable that the quality of the water supplied to individuals and small communities should not be inferior to that of water supplied to the public in large communities, it is not considered that all such water could reasonably be expected to conform to the standards suggested for supplies distributed through a piped distribution system. It is, however, important that local health authorities should exercise some control over at least the bacterial quality of water supplied to individuals and small communities.

Some countries are fortunate in having an abundant supply of water from deep wells and underground springs, while others have to make extensive use of rivers, lakes, and other sources of surface water. In yet other areas, the provision of an adequate volume of water is the most pressing problem. It is felt, however, that the recommendations as to chemical and bacterial quality made in the main body of the publication should apply, whatever the original source of the water may have been.

The standards of chemical and bacterial quality and the various methods recommended here are not, and cannot be, the last word on the subject. New methods are constantly being introduced and developed, and it is expected that the methods suggested, and even the standards, will be revised from time to time.

Sections on virological examination, pesticides and polynuclear aromatic hydrocarbons have been added to this edition. Much more information is required on these topics and also on the danger to health of the toxic or potentially toxic substances that may be found in water—for some of these, tentative limits have been proposed in a later section. Mention is also made in a later section of the new chemicals that are from time to time introduced for the treatment of water, and it is essential to ensure that no danger of toxic hazards arises from their use.