World Health Organization

A global overview of national regulations and standards for drinking-water quality

A global overview of national regulations and standards for drinking-water quality

ISBN 978-92-4- 151376-0

Contents

Abbreviations and acronyms

Bq/l	Becquerel per litre
BSS	Basic Safety Standards
cfu	colony forming units
EU	European Union
Euratom	European Atomic Energy Community
GDWQ	Guidelines for Drinking-water Quality
GL	Guidance level
GV	Guideline value
HBV	health-based value
ICRP	International Commission on Radiological Protection
µg/l	micrograms per litre
mg/l	milligrams per litre
mSv/year	milli Sieverts per year
NTU	Nephelometric turbidity unit
PAHO	Pan American Health Organization
pCi/l	pico Curie per litre
RegNet	WHO International Network of Drinking-water Regulators
TCU	true colour unit
WHO	World Health Organization
WHOPES	WHO Pesticide Evaluation Scheme

Role of the WHO Guidelines for Drinking-water Quality

The Guidelines for Drinking-water Quality (GDWQ) are one of the longest-standing normative publications of the World Health Organization (WHO), with the first edition published in 1958. The GDWQ are an international reference point for the establishment of national or regional regulations and standards for water safety. They are addressed to water and health regulators, policy-makers and their advisors, mainly to assist them in the development of national standards. The GDWQ are also used by many others as a source of information on water quality and health and on effective management approaches.

The GDWQ include an assessment of the health risks presented by the various microbial, chemical, radiological and physical contaminants that may be present in drinking-water. Where applicable, they derive maximum concentration guideline values for these hazardous constituents. Through a Framework for Safe Drinking Water, the GDWQ support the development of health-based targets, implementation of preventive risk management strategies (through water safety planning), and independent surveillance. Health-based water quality targets define drinking-water that does not represent any significant risk to health, generally over a lifetime of consumption. These numeric targets include 'guidance levels' (GL), 'guideline values' (GV) and 'health-based values' (HBV) for constituents in drinking-water or indicators of water quality (Box 1).

Box 1. Guidance levels, guideline values, and health-based values

The term 'guidance levels' is used for radiological parameters, while 'guideline values' or 'health-based values' is used for all other parameters. Generally, health-based values have been established for some chemicals in the GDWQ, rather than a formal guideline value, in order to provide guidance to Member States when there is reason for local concern. Establishing a formal guideline value for such substances may encourage Member States to incorporate a value into their national standards when this may be unnecessary.

In the case of manganese, a health-based value was established rather than a guideline value as manganese is not of health concern at levels normally causing acceptability problems in drinking-water (e.g. staining of laundry). However, there are circumstances in which manganese can remain in solution at concentrations of health concern in some acidic or anaerobic waters, particularly groundwater. It may therefore be appropriate to incorporate manganese in national standards under these circumstances and to consider both aesthetic as well as health aspects when confirming the acceptability of drinking-water.

In addition, a number of provisional guideline values have been established based on the practical level of treatment performance or analytical achievability (Box 2). In these cases, the guideline value is higher than the calculated health-based value.

Recognizing the benefits of a risk management approach, the GDWQ are not promoted as mandatory international standards, but as guidance that should be adapted to the specific circumstances, needs and resources of countries. Therefore, national or regional drinking-water quality regulations should only include a subset of the values included in the GDWQ and may have different parameter limits than what is specified in the GDWQ.

Many countries use the GDWQ directly or indirectly in setting national drinking-water quality standards. To better understand the extent to which the GDWQ are used and reflected in these standards, a global review of various country regulations and policies was conducted. This report summarizes information from 104 countries and territories on values specified in national drinking-water quality standards for aesthetic, chemical, microbiological and radiological parameters. The aim of the report is to enable regulators and other key stakeholders to access and compare data when setting or revising national drinking-water quality standards, although comparison should be approached with caution. The report is not intended to provide guidance on selecting appropriate parameters and parameter limits for drinking-water quality standards. The separate publication, *Developing Drinking-water Quality Regulations and Standards* (WHO, in press) should be consulted for such guidance.

Box 2. Provisional guideline values

For several chemical parameters, the GDWQ suggest guidelines values which may be provisional for the following reasons:

- A: provisional guideline value set at the achievable quantification level;
- P: provisional guideline value because of uncertainties in the health database;
- T: provisional guideline value set at the practical treatment level); and
- D: provisional guideline value set considering possible health effects and the need to maintain adequate disinfection. Adequate disinfection of drinking-water remains paramount.

For some chemicals, GVs are designated with a "C". This indicates that the concentration of the substance at or below the guideline value may affect the appearance, taste or odour of the water, which may lead to consumer complaints.

Data sources and methods

The data reviewed in the report were obtained from members of the WHO International Network of Drinking-water Regulators (RegNet)[1], WHO regional and country office contacts, through internet searches or purchased from the relevant standards organizations. Data were collected for 104 countries and territories (Figure 1) up to 2015, and were reviewed and validated. The data validation entailed an online public review, as well as review by WHO regional and country office contacts, and RegNet members, who were asked to clarify inconsistencies and provide data updates wherever relevant.

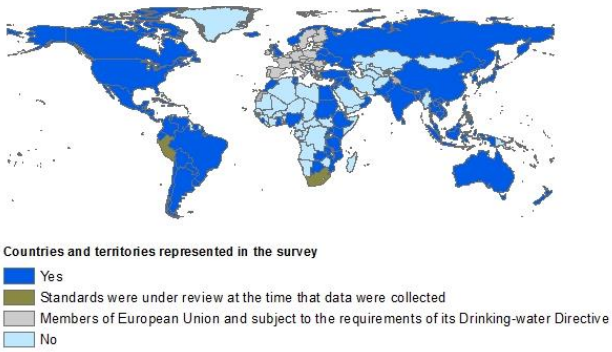

Figure 1: Countries and territories represented in the survey

These countries and territories have a total population of approximately 6.5 billion people, representing approximately 89 % of the world population[2]. Countries that are members of the European Union (EU) are subject to the requirements of its Drinking-water Directive and European Atomic Energy Community (Euratom) which specifies radionuclide requirements. However, all these countries have their own regulations, some of which differ from the

[1] Information about RegNet can be found at the following link: http://www.who.int/water_sanitation_health/water-quality/regulation/regnet/en/

[2] Based on mid-year population estimates for 2017: United Nations, Department of Economic and Social Affairs, Population Division (2017). *World Population Prospects: The 2017 Revision. Wallchart*

Directive with more stringent requirements or include additional parameters. In addition, it is understood that the following countries and territories use the standards specified in the GDWQ without currently publishing separate documentation listing regulatory parameters and values at the time that data for this report were collected: Burkina Faso, Kiribati, Kuwait, Mali, Nauru, Senegal, Solomon Islands, Tonga and Tuvalu.

Countries and territories specify parameter values for drinking-water quality in a variety of formats; regulations, standards, specifications, laws, decrees, requirements and norms. For the purposes of this report these are all referred to as standards. The drinking-water quality standards specified by countries and territories for inorganic chemicals, organic chemicals, aesthetic and microbiological parameters were compared to the GV or HBV; and radiological parameters were compared to the GL of the fourth edition of the GDWQ (WHO, 2011)[3].

This report does not include detailed background information on the parameters, including derivation and adaptation of guideline values and appropriate risk management strategies; the report should be read in conjunction with the GDWQ to provide this information. The report also does not include the extent and effectiveness of compliance monitoring by national regulatory authorities against national standards, including information on how many samples are required or taken for each parameter; or whether drinking-water quality in each country and territory meets the values specified.

Documentation and the report

According to the documentation reviewed, the oldest specifications of values for drinking-water in current use date back to 1978. Fourteen countries and territories' values, (42 including the members of the European Union (EU) through the European Drinking-water Directive) date to the 1990s. However, many EU Member States have implemented the Directive through more recent documentation but these have not been included in the survey because they differ little in requirements from the original Directive. The other 62 countries and territories have produced documentation in the year 2000 and later. As countries and territories often review their legislation and values, these findings are constantly subject to change.

[3] The most recent edition of the GDWQ is the fourth edition, first addendum published in 2017. For the first addendum, risk assessments for the following parameters have been revised, resulting in updated guideline or health-based values: barium, bentazone, diquat and MCPA. As the first addendum was published after the cut-off date for the review and further, as countries have had little time to consider the first addendum in their national standards, an analysis against these updated values has not been included in this document. Information on the changes made in the first addendum to the fourth edition of the GDWQ can be found at the following link: http://www.who.int/water_sanitation_health/publications/gdwq4-1st-addendum/en/

Thirty-seven countries and territories directly reference the GDWQ in their standards, although this number is likely to be higher because the full documentation was not available in all cases. Botswana and Pakistan list the WHO GV alongside their values.

Although the GDWQ encourage countries and territories to set their own water-quality standards to ensure they are locally relevant in terms of parameters included, limits, etc., none of the documentation received includes a full explanation on why parameters are included and how countries and territories derived their values, including where they differ from the WHO GV. However, this is now becoming more readily available in separate documentation such as that produced by Health Canada. Others more generally reference WHO and other countries and territories' values, such as those of the European Union, the United States of America, Nigeria and South Africa. Some countries and territories' standards also reference the analytical method required. In some cases the names of the members of expert committees who drew up the values are listed.

Some countries and territories include in their standards details of the likely origin of parameters and their associated risk. This may help the understanding of those who have to control and analyze drinking-water quality. Examples are Australia, the Dominican Republic, Fiji, India, New Zealand, Nigeria, Pakistan, the Philippines, South Africa, Uruguay and the USA. Other countries and territories may provide similar information in separate documentation or consider the information included in the GDWQ sufficient.

In addition to setting values for specific parameters, many countries and territories' documentation includes a general statement along the lines of: "water intended for human consumption should: not contain concentrations of compounds which could, either alone or in combination with other compounds, be harmful to human health; and not contain any micro-organisms and parasites in such a number that could be harmful to human health".

For the purposes of this report, all values for chemical parameters have been converted to mg/l. The values used in this report are the highest listed by countries and territories in their standards for normal (non-emergency or severe weather-affected) water supplies. Not all the values countries and territories have listed are mandatory; some are advisory, for guidance or occasionally described as operational. This applies particularly to the aesthetic and other parameters. The GDWQ suggest values with a wide margin of safety, and countries and territories are advised to adapt their drinking-water quality standards to local conditions and circumstances.

For clarity and convenience this report has adopted the terms “higher” or “above” for values greater than those specified in the GDWQ and “lower” or “below” for values less than those specified in the GDWQ. Countries and territories may have good reasons to specify a value more, or less stringent than WHO based on an overall risk-benefit strategy to protect public health, whereby scarce resources directed to provide greatest public health benefits. In addition, differences in the number of parameters specified by countries and territories are to be expected, according to the relevance of the parameters to the countries and territories concerned. A list of source documentation used in this survey is provided at the end of the report.

Inorganic parameters

The 4th edition of the GDWQ includes GVs or HBVs for 24 inorganic parameters. All 104 countries and territories specify values for copper, lead and nitrate, and all but one specify values for manganese. The least specified inorganic parameters were: beryllium (12 out 104 countries); glyphosate (11); and uranium (17). All the median values equalled or were below the GV except for cadmium (GV 0.003 mg/l, median 0.005 mg/l).

Antimony

WHO Guideline value	0.02 mg/l
Number of countries and territories setting a regulatory / guideline value	76 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	1
Number of countries and territories setting the WHO Guideline	13
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	62
Maximum value set	0.05 mg/l
Minimum value set	0.003 mg/l
Median value	0.005 mg/l

The majority of countries and territories (62/76) set a value for antimony below the GV, with 50 countries and territories setting 0.005 mg/l.

Arsenic

WHO Guideline value	0.01 mg/l (provisional A, T)
Number of countries and territories setting a regulatory / guideline value	102 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	22
Number of countries and territories setting the WHO Guideline	79
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	0.5 mg/l
Minimum value set	0.007 mg/l
Median value	0.01 mg/l

Arsenic is one of the parameters with a value set by most countries and territories (102/104). The majority of countries (79/102) specified the provisional GV; only one country set a value below the provisional GV.

Barium

WHO Guideline value	0.7 mg/l[4]
Number of countries and territories setting a regulatory / guideline value	52 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	11
Number of countries and territories setting the WHO Guideline	35
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	6
Maximum value set	2.0 mg/l
Minimum value set	0.1 mg/l
Median value	0.7 mg/l

The majority (35/52) of those countries and territories setting a value for barium specified the GV.

Beryllium

WHO Guideline value	None specified
WHO Health-based value	0.012 mg/l
Number of countries and territories setting a regulatory / guideline value	12 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Health-based value	1
Number of countries and territories setting the WHO Health-based value	0
Number of countries and territories setting a regulatory / guideline value less than WHO Health-based value	11
Maximum value set	0.06 mg/l
Minimum value set	0.0002 mg/l
Median value	0.004 mg/l

Beryllium is one of the least specified parameters; with only 12 out of the 104 countries and territories surveyed setting a value.

[4] The GV has been increased to 1.3 mg/l in the first addendum to the 4th edition of GDWQ (WHO, 2017), which is available here: http://apps.who.int/iris/bitstream/10665/254637/1/9789241549950-eng.pdf?ua=1

Boron

WHO Guideline value	2.4 mg/l
Number of countries and territories setting a regulatory / guideline value	73 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	2
Number of countries and territories setting the WHO Guideline	1
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	70
Maximum value set	5 mg/l
Minimum value set	0.2 mg/l
Median value	1 mg/l

No country set the revised GV for boron in the 4th edition of the GDWQ (WHO, 2011); most countries and territories had based their value on the previous provisional GV of 0.5 mg/l.

Bromate

WHO Guideline value	0.01 mg/l (provisional A,T)
Number of countries and territories setting a regulatory / guideline value	60 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	8
Number of countries and territories setting the WHO Guideline	51
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	0.025 mg/l
Minimum value set	0.005 mg/l
Median value	0.01 mg/l

Most countries and territories specified a value for bromate at or close to the provisional GV.

Cadmium

WHO Guideline value	0.003 mg/l
Number of countries and territories setting a regulatory / guideline value	101 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	59
Number of countries and territories setting the WHO Guideline	38
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	4
Maximum value set	0.05 mg/l
Minimum value set	0.001 mg/l
Median value	0.005 mg/l

Cadmium is the inorganic parameter for which the most countries and territories specified a higher value than the GV, as demonstrated by the median value. Only four countries and territories specified a value below the GV.

Chlorate

WHO Guideline value	0.7 mg/l (provisional D)
Number of countries and territories setting a regulatory / guideline value	16 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	3
Number of countries and territories setting the WHO Guideline	10
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	3
Maximum value set	1.0 mg/l
Minimum value set	0.05 mg/l
Median value	0.7 mg/l

Only 16 countries and territories set a value for chlorate. On these, 10 set the provisional GV of 0.7 mg/L.

Chlorine

WHO Guideline value*(C)	5.0 mg/l (as free chlorine)
Number of countries and territories setting a regulatory / guideline value	66
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	0
Number of countries and territories setting the WHO Guideline	13
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	53
Maximum value set	5.0 mg/l
Minimum value set	0.1 mg/l
Median value	0.9 mg/l

*It is possible to reduce the concentration of chlorine effectively to zero (<0.1 mg/l) by reduction; however, it is normal practice to supply water with a chlorine dioxide residual of a few tenths of a milligram per litre to provide some protection against microbial regrowth during distribution.

Chlorine is the inorganic parameter with the largest range between minimum and maximum. No country had a value above the GV. Thirty two countries and territories specified a level below 1 mg/l. Eleven countries and territories specified the GV. Some countries and territories set a range, specifying minimum and maximum levels. It was not always clear if the set value referred to free or total chlorine.

Chlorite

WHO Guideline value	0.7 mg/l (provisional D)
Number of countries and territories setting a regulatory / guideline value	28 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	6
Number of countries and territories setting the WHO Guideline	12
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	10
Maximum value set	1.0 mg/l
Minimum value set	0.05 mg/l
Median value	0.7 mg/l

Twenty eight countries and territories set a value for chlorite, and of these, 12 specified the GV.

Chromium (total)

WHO Guideline value	0.05 mg/l (provisional P)
Number of countries and territories setting a regulatory / guideline value	99 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	3
Number of countries and territories setting the WHO Guideline	94
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	0.5 mg/l
Minimum value set	0.04 mg/l
Median value	0.05 mg/l

Most countries and territories set a value for total chromium, and the great majority set the provisional GV.

Copper

WHO Guideline value*	2.0 mg/l
Number of countries and territories setting a regulatory / guideline value	104 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	2
Number of countries and territories setting the WHO Guideline	51
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	51
Maximum value set	3.0 mg/l
Minimum value set	0.05 mg/l
Median value	1.5 mg/l

*The GDWQ also notes that copper causes aesthetic issues including staining of laundry at concentrations above 1 mg/l

Copper is one of only three inorganic parameters with a value set by all the countries and territories in the survey. The majority specified the GV, or specified lower values. Only two countries set values above the GV.

Cyanide

WHO Guideline value	No value established in fourth edition, previously 0.07 mg/l*
WHO Health-based value	0.5 mg/l (rounded value, for short-term exposure)
Number of countries and territories setting a regulatory / guideline value	101 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than the WHO health-based value	11
Number of countries and territories setting the previous WHO health-based value	30
Number of countries and territories setting a regulatory / guideline value less than the previous WHO health-based value	60
Maximum value set	0.6 mg/l
Minimum value set	0.01 mg/l
Median value	0.05 mg/l

*The GV was changed to a HBV in the 4th edition of the GDWQ.

The majority of countries and territories (101/104) set a value for this parameter, and over half specified values below the GV.

Fluoride

WHO Guideline value	1.5 mg/l
Number of countries and territories setting a regulatory / guideline value	102 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	8
Number of countries and territories setting the WHO Guideline	77
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	17
Maximum value set	4.0 mg/l
Minimum value set	0.6 mg/l
Median value	1.5 mg/l

All but two countries specified a value for this parameter, and the majority set the GV. Many specified a lower value for higher water temperatures. In some cases where a low value was set, a higher value was allowed under certain circumstances.

Glyphosate

WHO Guideline value	None specified
WHO health-based value	0.9 mg/l
Number of countries and territories setting a regulatory / guideline value	11 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Health-based value	1
Number of countries and territories setting the WHO Health-based value	0
Number of countries and territories setting a regulatory / guideline value less than WHO Health-based value	10
Maximum value set	1 mg/l
Minimum value set	0.01 mg/l
Median value	0.7 mg/l

The GDWQ link together glyphosate and its major metabolite aminomethylphosphonic acid (AMPA). Because of their low toxicity, the health-based value derived for AMPA alone or in combination with glyphosate is orders of magnitude higher than concentrations of glyphosate or AMPA normally found in drinking-water. Under usual conditions, therefore, the presence of glyphosate and AMPA in drinking-water does not represent a hazard to human health. For this reason, the establishment of a formal guideline value for glyphosate and AMPA is not deemed necessary. Glyphosate is one of the least specified parameters; with only 11 out of the 104 countries and territories setting a value. No country or territory specified a value for AMPA.

Lead

WHO Guideline value	0.01 mg/l (provisional; A, T)
Number of countries and territories setting a regulatory / guideline value	104 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	19
Number of countries and territories setting the WHO Guideline	84
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	0.1 mg/l
Minimum value set	0.005 mg/l
Median value	0.01 mg/l

Lead is one of only three inorganic parameters with a value specified by all countries and territories in this survey. The majority set the GV, while some countries and territories allowed

time for the 0.01 mg/l standard to apply. Of the countries and territories that set a value above the GDWQ, most specified 0.05 mg/l.

Manganese

WHO Guideline value	No value established in the fourth edition, previously 0.4 mg/l
WHO Health-based value (4th edition)*	0.4 mg/l
Number of countries and territories setting a regulatory / guideline value	103 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than the previous WHO Guideline	19
Number of countries and territories setting the previous WHO Guideline	11
Number of countries and territories setting a regulatory / guideline value less than the previous WHO Guideline	73
Maximum value set	0.5 mg/l
Minimum value set	0.05 mg/l
Median value	0.1 mg/l

*The GV was changed to a HBV in the 4th edition of the GDWQ, recognizing that manganese is not of health concern at levels normally causing acceptability problems in drinking-water. Manganese can cause aesthetic issues, including taste impacts and staining of laundry at concentrations above 0.1 mg/l. However, there are circumstances in which manganese can remain in solution at concentrations of health concern in some acidic or anaerobic waters, particularly groundwaters. Therefore, aesthetic as well as health aspects should be considered in the establishment of standards and confirming the acceptability of drinking-water.

All countries and territories in the survey set a value for manganese with the exception of one. The majority set a value below the previous GV. Some countries and territories listed the parameter as aesthetic, some as inorganic, and some as both.

Mercury

WHO Guideline value	0.006 mg/l
Number of countries and territories setting a regulatory / guideline value	100 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	1
Number of countries and territories setting the WHO Guideline	4
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	95
Maximum value set	0.007 mg/l
Minimum value set	0.0005 mg/l
Median value	0.001 mg/l

The majority of countries and territories (100/104) set a value for this parameter. Only four countries specified the GV; the most specified values below the GV.

Molybdenum

WHO Guideline value	0.07 mg/l
Number of countries and territories setting a regulatory / guideline value	26 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	2
Number of countries and territories setting the WHO Guideline	22
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	2
Maximum value set	0.25 mg/l
Minimum value set	0.05 mg/l
Median value	0.07 mg/l

The majority (22/26) of the countries and territories setting a value for molybdenum specified the GV.

Nickel

WHO Guideline value	0.07 mg/l
Number of countries and territories setting a regulatory / guideline value	82 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	3
Number of countries and territories setting the WHO Guideline	7
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	72
Maximum value set	0.1 mg/l
Minimum value set	0.01 mg/l
Median value	0.02 mg/l

Most countries and territories specifying a value for nickel set it below the GV, at 0.02 mg/l.

Nitrate

WHO Guideline value	50 mg/l* (as NO_3^-)
Number of countries and territories setting a regulatory / guideline value	104 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	2
Number of countries and territories setting the WHO Guideline	69
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	33
Maximum value set	75 mg/l (as NO_3^-)
Minimum value set	40 mg/l (as NO_3^-)
Median value	50 mg/l (as NO_3^-)

*The GDWQ also include a value for combined nitrate plus nitrite as: The sum of the ratios of the concentrations as reported or detected in the sample of each to its guideline value should not exceed 1.

Nitrate is one of only three inorganic parameters with a value set by all countries and territories in the survey. Many quoted their value as 10 mg/l (as N) which has been converted to 45 mg/l (as NO_3^-) for the purposes of this report but counted as being at the GV. Several countries and territories including the European Union countries included a formula that reduces the nitrate value as the nitrite level increases.

Nitrite

WHO Guideline value	3 mg/l* (as NO_2^-)
Number of countries and territories setting a regulatory / guideline value	96 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	2
Number of countries and territories setting the WHO Guideline	39
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	55
Maximum value set	3.3 mg/l (as NO_2^-)
Minimum value set	0.003 mg/l (as NO_2^-)
Median value	0.5 mg/l (as NO_2^-)
Median value	50 mg/l (as NO_3^-)

*The GDWQ also include a value for combined nitrate plus nitrite as: The sum of the ratios of the concentrations as reported or detected in the sample of each to its guideline value should not exceed 1.

Many countries and territories' values for nitrite have been based on older WHO guidance. Only two countries had values above the revised GV. Thirty-nine countries and territories specified the revised GV (or its equivalent as mg N/l). Several countries and territories

including the European Union countries included a formula that reduces the nitrate value as the nitrite level increases.

Selenium

WHO Guideline value	0.04 mg/l (provisional, P)
Number of countries and territories setting a regulatory / guideline value	96 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	2
Number of countries and territories setting the WHO Guideline	1
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	93
Maximum value set	0.05 mg/l
Minimum value set	0.007 mg/l
Median value	0.01 mg/l

Only one country specified the new provisional GV of 0.04 mg/l; almost all others specified the previous value of 0.01 mg/l.

Uranium

WHO Guideline value	0.03 mg/l (provisional P)
Number of countries and territories setting a regulatory / guideline value	17 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	0
Number of countries and territories setting the WHO Guideline	0
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	17
Maximum value set	0.1 mg/l
Minimum value set	0.002 mg/l
Median value	0.015 mg/l

Uranium is one of the least specified parameters; with only 17 out of the 104 countries and territories setting a value. The majority specified a value based on the previous GV, with no country specifying the latest.

Organic parameters

The 4th edition of the GDWQ includes GVs or HBVs for 89 organic parameters. The most specified organic parameters are: aldrin and dieldrin (71 out of 104 countries and territories); benzene (77); tetrachloroethene (71); and 1,2 dichloroethane (67). Among the least specified values are: 2-phenylphenol (1); fenitrothion (2); nitrobenzene (3); and N-nitrosodimethylamine (NDMA, 3). No country or territory specified a value for cyanuric acid, sodium dichloroisocyanurate or hydroxyatrazine.

Seven countries and territories did not specify values for any inorganic parameters, while some included notes with general requirements for low levels of pesticides. For the organic parameters that had specifications, all but four had median values equal to or below the GV. The exceptions were: cyanazine (GV 0.0006 mg/l, median 0.0007 mg/l), but only specified by five countries and territories; dibromoacetonitrile (GV 0.07 mg/l, median 0.0775), specified by 16 countries and territories; dichloroacetonitrile (GV 0.02 mg/l, median 0.06 mg/l), specified by 17 countries and territories; and vinyl chloride (GV 0.0003 mg/l, median 0.0005 mg/l), specified by 60 countries and territories.

Forty-six countries and territories do not specify values for most individual pesticides other than aldrin and dieldrin, heptachlor and heptachlor epoxide. Instead, they include a blanket statement that the value for all individual pesticides is 0.0001 mg/l, and for total pesticides 0.0005 mg/l (where "total pesticides" is defined as the sum of all individual pesticides detected and quantified in the monitoring procedure), or similar requirement. Where a country or territory does not specify a value for an individual parameter in its standards, it is not included in the tables below.

Acrylamide

WHO Guideline value	0.0005 mg/l
Number of countries and territories setting a regulatory / guideline value	56 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	0
Number of countries and territories setting the WHO Guideline	20
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	36
Maximum value set	0.0005 mg/l
Minimum value set	0.0001 mg/l
Median value	0.0001 mg/l

Almost half of the countries and territories (56/104) set a value for acrylamide. No country set a value greater than the GV; the majority set 0.0001 mg/l.

Alachlor

WHO Guideline value	0.02 mg/l
Number of countries and territories setting a regulatory / guideline value	24 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	1
Number of countries and territories setting the WHO Guideline	19
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	4
Maximum value set	0.15 mg/l
Minimum value set	0.002 mg/l
Median value	0.02 mg/l

Most countries and territories (19/24) set the GV; and only one set a higher value.

Aldicarb

WHO Guideline value	0.01 mg/l
Number of countries and territories setting a regulatory / guideline value	22 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	0
Number of countries and territories setting the WHO Guideline	17
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	5
Maximum value set	0.01 mg/l
Minimum value set	0.003 mg/l
Median value	0.01 mg/l

Only five out of 22 countries and territories set values that differed from the GV.

Aldrin and Dieldrin

WHO Guideline value	0.00003 mg/l
Number of countries and territories setting a regulatory / guideline value	71 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	6
Number of countries and territories setting the WHO Guideline	62
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	3
Maximum value set	0.001 mg/l
Minimum value set	0.00001 mg/l (0)
Median value	0.00003 mg/l

Most countries and territories (62/71) specified the GV, and only three set values that were lower.

Atrazine and its chloro-s-triazine metabolites

WHO Guideline value	0.1 mg/l
Number of countries and territories setting a regulatory / guideline value	28 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	1
Number of countries and territories setting the WHO Guideline	0
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	27
Maximum value set	0.5 mg/l
Minimum value set	0.0015 mg/l
Median value	0.002 mg/l

There was wide deviation from the GV in the values set for this parameter. Only one country set a value above the GV, all the other countries and territories were well below.

Bentazone

WHO Guideline value	None specified
WHO health-based value	0.3 mg/l[5]
Number of countries and territories setting a regulatory / guideline value	11 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Health-based value	2
Number of countries and territories setting the WHO Health-based value	4
Number of countries and territories setting a regulatory / guideline value less than WHO Health-based value	5
Maximum value set	0.4 mg/l
Minimum value set	0.03 mg/l
Median value	0.03 mg/l

Only 11 countries and territories set a value for bentazone, and the majority set below the HBV of 0.3 mg/L specified in the 4th edition of the GDWQ (WHO, 2011).

Benzene

WHO Guideline value	0.01 mg/l
Number of countries and territories setting a regulatory / guideline value	77 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	1
Number of countries and territories setting the WHO Guideline	31
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	45
Maximum value set	0.03 mg/l
Minimum value set	0.001 mg/l
Median value	0.005 mg/l

Benzene is the most specified organic parameter among the 104 countries and territories surveyed. The majority specified values below the GV of 0.01 mg/L, and only one country specified a higher value.

[5] The HBV has been increased to 0.5 mg/l in the first addendum to the 4th edition of GDWQ (WHO, 2017), which is available here: http://apps.who.int/iris/bitstream/10665/254637/1/9789241549950-eng.pdf?ua=1

Benzo[a]pyrene

WHO Guideline value	0.0007 mg/l
Number of countries and territories setting a regulatory / guideline value	65 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	0
Number of countries and territories setting the WHO Guideline	15
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	50
Maximum value set	0.0007 mg/l
Minimum value set	0.000005 mg/l
Median value	0.00001 mg/l

Where countries and territories also had a value for polynuclear aromatic hydrocarbons (PAH; see additional parameters), this parameter was usually quoted separately. The majority of countries and territories set a value below the GV, and no country set a value higher than the GV.

Bromodichloromethane

WHO Guideline value	0.06 mg/l*
Number of countries and territories setting a regulatory / guideline value	29 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	0
Number of countries and territories setting the WHO Guideline	22
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	7
Maximum value set	0.06 mg/l
Minimum value set	0.015 mg/l
Median value	0.06 mg/l

*See total trihalomethanes (THMs) for information on how to account for additive toxicity with other individual THM compounds

Of the 29 countries and territories specifying a value for this parameter, the majority (22) specified the GV. Some countries and territories which did not specify a value for this parameter included it in their value for total trihalomethanes.

Bromoform

WHO Guideline value	0.1 mg/l*
Number of countries and territories setting a regulatory / guideline value	23 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	0
Number of countries and territories setting the WHO Guideline	21
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	2
Maximum value set	0.1 mg/l
Minimum value set	0.075mg/l
Median value	0.1 mg/l

*See total trihalomethanes (THMs) for information on how to account for additive toxicity with other individual THM compounds

All but two of the countries and territories specifying a value for this parameter used the GV. Some countries and territories which did not specify a value for this parameter included it in their value for total trihalomethanes.

Carbofuran

WHO Guideline value	0.007 mg/l
Number of countries and territories setting a regulatory / guideline value	26 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	7
Number of countries and territories setting the WHO Guideline	10
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	9
Maximum value set	0.09 mg/l
Minimum value set	0.0035 mg/l
Median value	0.007 mg/l

Twenty-six countries and territories specified a value for carbofuran, with the majority (16) setting values greater or less than the GV.

Carbon tetrachloride

WHO Guideline value	0.004 mg/l
Number of countries and territories setting a regulatory / guideline value	34 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	8
Number of countries and territories setting the WHO Guideline	10
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	16
Maximum value set	0.005 mg/l
Minimum value set	0.0013 mg/l
Median value	0.004 mg/l

Twenty-four of the 34 countries and territories specifying a value for this parameter differed from the GV. Eight countries and territories specified 0.005 mg/l.

Chloral hydrate (trichloracetaldehyde)

WHO Health-based value	0.1 mg/l (rounded figure)
Number of countries and territories setting a regulatory / guideline value	11 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO health-based value	0
Number of countries and territories setting the WHO health-based value	2
Number of countries and territories setting a regulatory / guideline value less than WHO health-based value	9
Maximum value set	0.1 mg/l
Minimum value set	0.01 mg/l
Median value	0.01 mg/l

Only 11 countries and territories specified a value for chloral hydrate, and nine of these set values below the HBV.

Chlordane

WHO Guideline value	0.0002 mg/l
Number of countries and territories setting a regulatory / guideline value	33 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	9
Number of countries and territories setting the WHO Guideline	23
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	0.003 mg/l
Minimum value set	0.00015 mg/l
Median value	0.0002 mg/l

The majority of countries and territories specifying a value for chlordane set the GV (23/33), and only one specified a lower value.

Chloroform

WHO Guideline value	0.3 mg/l*
Number of countries and territories setting a regulatory / guideline value	36 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	1
Number of countries and territories setting the WHO Guideline	6
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	29
Maximum value set	0.4 mg/l
Minimum value set	0.03 mg/l
Median value	0.2 mg/l

*See total trihalomethanes (THMs) for information on how to account for additive toxicity with other individual THM compounds

The majority of countries and territories specifying a value for this parameter set a value below the GV, most specifying 0.2 mg/l. Some countries and territories did not specify a value for this parameter but included it in their value for total trihalomethanes.

Chlorotoluron

WHO Guideline value	0.03 mg/l
Number of countries and territories setting a regulatory / guideline value	12 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	1
Number of countries and territories setting the WHO Guideline	10
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	0.04 mg/l
Minimum value set	0.02 mg/l
Median value	0.03 mg/l

The majority of countries and territories specifying a value for chlorotoluron set the GV (10/12).

Chlorpyrifos

WHO Guideline value	0.03 mg/l
Number of countries and territories setting a regulatory / guideline value	16 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	3
Number of countries and territories setting the WHO Guideline	12
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	0.09 mg/l
Minimum value set	0.01 mg/l
Median value	0.03 mg/l

The majority of countries and territories specifying a value for this parameter set the GV (12/16).

Cyanazine

WHO Guideline value	0.0006 mg/l
Number of countries and territories setting a regulatory / guideline value	5 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	3
Number of countries and territories setting the WHO Guideline	2
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	0
Maximum value set	0.01 mg/l
Minimum value set	0.0006 mg/l
Median value	0.0007 mg/l

Only five countries and territories specified a value for cyanazine, and none set a value below the GV.

Cyanogen Chloride

WHO Guideline value	No value specified in fourth edition, previously 0.07 mg/l
WHO Health-based value	0.6 mg/l (rounded value)
Number of countries and territories setting a regulatory / guideline value	13 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than previous WHO Guideline	0
Number of countries and territories setting the previous WHO Guideline	0
Number of countries and territories setting a regulatory / guideline value less than previous WHO Guideline	13
Maximum value set	0.07 mg/l
Minimum value set	0.05 mg/l
Median value	0.07 mg/l

The 4th edition of the GDWQ specifies a HBV of 0.6 mg/l for cyanogen chloride, a change from the GV of 0.07 mg/l previously specified in the 3rd edition. All the thirteen countries and territories setting values for this parameter set values lower than the HBV. All countries and territories specified the former GV (0.07 mg/l) except one (0.005 mg/l).

Cyanuric Acid

WHO Guideline value	40 mg/l
Number of countries and territories setting a regulatory / guideline value	0 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	0
Number of countries and territories setting the WHO Guideline	0
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	0

No country in the survey set a value for this parameter.

2,4-D (2,4-Dichlorophenoxyacetic Acid)

WHO Guideline value	0.03 mg/l
Number of countries and territories setting a regulatory / guideline value	42 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	9
Number of countries and territories setting the WHO Guideline	31
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	2
Maximum value set	0.1 mg/l
Minimum value set	0.01 mg/l
Median value	0.03 mg/l

The majority of countries and territories setting a value for this parameter designated the GV; only two set values less than the GV.

2,4-DB (2,4-Dichlorophenoxybutyric Acid)

WHO Guideline value	0.09 mg/l
Number of countries and territories setting a regulatory / guideline value	16 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	4
Number of countries and territories setting the WHO Guideline	11
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	0.1 mg/l
Minimum value set	0.067 mg/l
Median value	0.09 mg/l

Only 16 countries and territories designated a value for this parameter, with most setting the GV.

Dichlorodiphenyltrichloroethane (DDT) and metabolites

WHO Guideline value	0.001 mg/l
Number of countries and territories setting a regulatory / guideline value	42 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	18
Number of countries and territories setting the WHO Guideline	24
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	0
Maximum value set	0.05 mg/l
Minimum value set	0.001 mg/l
Median value	0.001 mg/l

Forty-two countries and territories specified a value for DDT, with over half (24/42) setting the GV.

Di(2-ethylhexyl)phthalate

WHO Guideline value	0.008 mg/l
Number of countries and territories setting a regulatory / guideline value	11 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	1
Number of countries and territories setting the WHO Guideline	7
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	3
Maximum value set	0.009 mg/l
Minimum value set	0.002 mg/l
Median value	0.008 mg/l

Eleven countries and territories designated a value for this parameter, and only one set a value greater than the GV.

Dibromoacetylnitrile

WHO Guideline value	0.07 mg/l
Number of countries and territories setting a regulatory / guideline value	16 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	9
Number of countries and territories setting the WHO Guideline	6
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	0.1 mg/l
Minimum value set	0.01 mg/l
Median value	0.0775 mg/l

Only 16 countries and territories designated a value for this parameter, and only one set a value less than the GV.

Dibromochloromethane

WHO Guideline value	0.1 mg/l*
Number of countries and territories setting a regulatory / guideline value	29 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	1
Number of countries and territories setting the WHO Guideline	23
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	5
Maximum value set	0.15 mg/l
Minimum value set	0.01 mg/l
Median value	0.1 mg/l

*See total trihalomethanes (THMs) for information on how to account for additive toxicity with other individual THM compounds

Among the twenty-nine countries and territories designating a value for dibromochloromethane, the majority specified the GV, and only one set a greater value.

1,2-Dibromo-3-chloropropane

WHO Guideline value	0.001 mg/l
Number of countries and territories setting a regulatory / guideline value	21 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	2
Number of countries and territories setting the WHO Guideline	16
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	3
Maximum value set	0.007 mg/l
Minimum value set	0.0002 mg/l
Median value	0.001 mg/l

Only five out of 21 countries and territories set values that differed from the GV for 1,2-Dibromo-3-chloropropane.

1,2-Dibromoethane

WHO Guideline value	0.0004 mg/l
Number of countries and territories setting a regulatory / guideline value	8 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	0
Number of countries and territories setting the WHO Guideline	7
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	0.0004 mg/l
Minimum value set	0.00001 mg/l
Median value	0.0004 mg/l

Only eight countries and territories specified a value for this parameter, and the majority set the GV.

Dichloroacetic acid

WHO Guideline value	0.05 mg/l (provisional, D)
Number of countries and territories setting a regulatory / guideline value	16 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	0
Number of countries and territories setting the WHO Guideline	14
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	2
Maximum value set	0.05 mg/l
Minimum value set	0.02 mg/l
Median value	0.05 mg/l

Of the 16 countries and territories specifying a value for dichloroacetic acid, only two did not specify the provisional GV.

Dichloroacetonitrile

WHO Guideline value	0.02 mg/l (provisional, P)
Number of countries and territories setting a regulatory / guideline value	17 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	9
Number of countries and territories setting the WHO Guideline	7
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	0.09 mg/l
Minimum value set	0.01 mg/l
Median value	0.06 mg/l

Seventeen countries and territories specified a value for dichloroacetonitrile, and of these, almost half (9/17) set values above the provisional GV.

1,2-Dichlorobenzene

WHO Guideline value	1 mg/l (C)*
Number of countries and territories setting a regulatory / guideline value	26 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	2
Number of countries and territories setting the WHO Guideline	15
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	9
Maximum value set	1.5 mg/l
Minimum value set	0.0005 mg/l
Median value	1 mg/l

*Concentrations at or below the health-based guideline value may affect the appearance, taste or odour of the water, leading to consumer complaints

There was wide variation in values specified for this parameter according to whether countries and territories followed the WHO health-based GV or a value based on taste and odour thresholds. Some specified values for both.

1,4-Dichlorobenzene

WHO Guideline value	0.3 mg/l (C)*
Number of countries and territories setting a regulatory / guideline value	25 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	1
Number of countries and territories setting the WHO Guideline	15
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	9
Maximum value set	0.4 mg/l
Minimum value set	0.0004 mg/l
Median value	0.3 mg/l

*Concentrations at or below the health-based guideline value may affect the appearance, taste or odour of the water, leading to consumer complaints

As with 1,2- Dichlorobenzene, countries and territories also specified health-based GVs or values based on taste and odour thresholds, and some specified values for both.

1,2-Dichloroethane

WHO Guideline value	0.03 mg/l
Number of countries and territories setting a regulatory / guideline value	67 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	2
Number of countries and territories setting the WHO Guideline	18
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	47
Maximum value set	0.05 mg/l
Minimum value set	0.003 mg/l
Median value	0.003 mg/l

Of the 67 countries and territories specifying a value for this parameter, 33specified the lowest value of 0.003 mg/l, and only 2 specified values greater than the GV.

1,1-Dichloroethene (Vinylidene chloride)

WHO Guideline value	No value established in the 4th edition, previously 0.03 mg/l
WHO Health-based value	0.140 mg/l
Number of countries and territories setting a regulatory / guideline value	30 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than the previous WHO Guideline	0
Number of countries and territories setting the previous WHO Guideline	0
Number of countries and territories setting a regulatory / guideline value less than the previous WHO Guideline	30
Maximum value set	0.1 mg/l
Minimum value set	0.0003 mg/l
Median value	0.03 mg/l

The 4th edition of the GDWQ specify a HBV of 140 µg/l (0.140 mg/l) for 1,1-dichloroethene, a change from the GV of 0.03 mg/l previously specified in the 3rd edition. All the thirty countries and territories setting values for this parameter set values less than the HBV.

1,2-Dichloroethene

WHO Guideline value	0.05 mg/l
Number of countries and territories setting a regulatory / guideline value	23 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	4
Number of countries and territories setting the WHO Guideline	17
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	2
Maximum value set	0.1 mg/l
Minimum value set	0.035 mg/l
Median value	0.05 mg/l

Of the 23 countries and territories setting a value for this parameter, the majority (17/23) did not differ from the GV.

Dichloromethane

WHO Guideline value	0.02 mg/l
Number of countries and territories setting a regulatory / guideline value	28 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	2
Number of countries and territories setting the WHO Guideline	21
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	5
Maximum value set	0.05 mg/l
Minimum value set	0.003 mg/l
Median value	0.02 mg/l

Of the 28 countries and territories setting a value for this parameter, the majority (17/23) did not differ from the GV.

1,2-Dichloropropane

WHO Guideline value	0.04 mg/l (provisional P)
Number of countries and territories setting a regulatory / guideline value	20 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	1
Number of countries and territories setting the WHO Guideline	6
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	13
Maximum value set	0.05 mg/l
Minimum value set	0.005 mg/l
Median value	0.02 mg/l

Twenty countries and territories set a value for this parameter, and the majority (13/20) specified values less than the GV.

1,3-Dichloropropene

WHO Guideline value	0.02 mg/l
Number of countries and territories setting a regulatory / guideline value	16 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	1
Number of countries and territories setting the WHO Guideline	14
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	0.1 mg/l
Minimum value set	0.015 mg/l
Median value	0.02 mg/l

The majority of countries and territories (14/16) setting a value for 1,3-Dichloropropene specified the GV.

Dichlorprop

WHO Guideline value	0.1 mg/l
Number of countries and territories setting a regulatory / guideline value	19 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	0
Number of countries and territories setting the WHO Guideline	18
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	0.1 mg/l
Minimum value set	0.075 mg/l
Median value	0.1 mg/l

None of the 19 countries and territories specifying a value for dichlorprop set a value above the GV.

Di(2-ethylhexyl)phthalate

WHO Guideline value	0.008 mg/l
Number of countries and territories setting a regulatory / guideline value	17 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	3
Number of countries and territories setting the WHO Guideline	10
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	4
Maximum value set	0.1 mg/l
Minimum value set	0.001 mg/l
Median value	0.008 mg/l

The majority of countries and territories (10/17) specified the GV for di(2-ethylhexyl)phthalateJapan of 0.1 mg/l.

Dimethoate

WHO Guideline value	0.006 mg/l
Number of countries and territories setting a regulatory / guideline value	12 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	3
Number of countries and territories setting the WHO Guideline	9
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	0
Maximum value set	0.08 mg/l
Minimum value set	0.006 mg/l
Median value	0.006 mg/l

Only three countries out of 12 specified values above the GV for dimethoate, and none specified values below.

1,4-Dioxane

WHO Guideline value	0.05 mg/l
Number of countries and territories setting a regulatory / guideline value	5 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	0
Number of countries and territories setting the WHO Guideline	5
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	0
Maximum value set	0.05 mg/l
Minimum value set	0.05 mg/l
Median value	0.05 mg/l

All five countries specifying a value for this parameter set the GV.

Diquat

WHO Guideline value	None
WHO Health-based value	0.006 mg/l[6]
Number of countries and territories setting a regulatory / guideline value	7 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	7
Number of countries and territories setting the WHO Guideline	0
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	0
Maximum value set	0.07 mg/l
Minimum value set	0.007 mg/l
Median value	0.02 mg/l

All seven countries and territories that specified a value for diquat set values above the HBV of 0.006 mg/L.

Edetec Acid (EDTA)

WHO Guideline value	0.6 mg/l
Number of countries and territories setting a regulatory / guideline value	18 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	1
Number of countries and territories setting the WHO Guideline	8
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	9
Maximum value set	0.7 mg/l
Minimum value set	0.15 mg/l
Median value	0.425 mg/l

Of the eighteen countries and territories specifying a value for EDTA, only one set a value above the GV.

[6] The HBV has been increased to 0.03 mg/l in the first addendum to the 4th edition of GDWQ (WHO, 2017), which is available here: http://apps.who.int/iris/bitstream/10665/254637/1/9789241549950-eng.pdf?ua=1

Endrin

WHO Guideline value	0.0006 mg/l
Number of countries and territories setting a regulatory / guideline value	16 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	4
Number of countries and territories setting the WHO Guideline	9
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	3
Maximum value set	0.002 mg/l
Minimum value set	0.0001 mg/l
Median value	0.0006 mg/l

The majority (9/16) of countries and territories setting a value for endrin specified the GV.

Endosulfan

WHO Guideline value	None
WHO Health-based value	0.02 mg/l
Number of countries and territories setting a regulatory / guideline value	9 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	2
Number of countries and territories setting the WHO Guideline	3
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	4
Maximum value set	0.03 mg/l
Minimum value set	0.00035 mg/l
Median value	0.02 mg/l

Nine countries and territories set a value for endosulfan.

Epichlorohydrin

WHO Guideline value	0.0004 mg/l
Number of countries and territories setting a regulatory / guideline value	54 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	3
Number of countries and territories setting the WHO Guideline	16
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	35
Maximum value set	0.0005 mg/l
Minimum value set	0.0001 mg/l
Median value	0.0001 mg/l

Over half of the countries and territories in the survey specified a value for this parameter, with the majority (35/54) setting a value below the GV of 0.0004 mg/L. Thirty-two countries and territories specified 0.0001 mg/l; and one country specified 0.0002 mg/l as a treatment standard only where epichlorohydrin is used in treatment.

Ethylbenzene

WHO Guideline value	0.3 mg/l (C)*
Number of countries and territories setting a regulatory / guideline value	27 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	3
Number of countries and territories setting the WHO Guideline	21
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	3
Maximum value set	0.7 mg/l
Minimum value set	0.0024 mg/l
Median value	0.3 mg/l

*Concentrations at or below the health-based guideline value may affect the appearance, taste or odour of the water, leading to consumer complaints

The majority (21/27) of countries and territories specified the GV for ethylbenzene.

Fenitrothion

WHO Guideline value	None
WHO Health-based value	0.008 mg/l
Number of countries and territories setting a regulatory / guideline value	2 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	1
Number of countries and territories setting the WHO Guideline	0
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	0.04 mg/l
Minimum value set	0.007 mg/l
Median value	0.0235 mg/l

Fenitrithion is one of the least specified organic parameters, with only two countries specifying a value.

Fenoprop

WHO Guideline value	0.009 mg/l
Number of countries and territories setting a regulatory / guideline value	14 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	2
Number of countries and territories setting the WHO Guideline	11
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	0.01 mg/l
Minimum value set	0.006 mg/l
Median value	0.009 mg/l

Of the 14 countries and territories specifying a value for fenoprop, there is little variation from the GV of 0.009 mg/L

Heptachlor and Heptachlor Epoxide

WHO Guideline value	None specified
WHO Health-based value	0.00003 mg/l
Number of countries and territories setting a regulatory / guideline value	21 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO health-based value	5
Number of countries and territories setting the WHO health-based value	16
Number of countries and territories setting a regulatory / guideline value less than WHO health-based value	0
Maximum value set	0.0002 mg/l
Minimum value set	0.00003 mg/l
Median value	0.00003 mg/l

Of the 21 countries and territories specifying a value for heptachlor and heptachlor epoxide, none set a value less than the HBV.

Hexachlorobenzene

WHO Guideline value	None specified
WHO Health-based value	0.001 mg/l
Number of countries and territories setting a regulatory / guideline value	22 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO health-based value	0
Number of countries and territories setting the WHO health-based value	16
Number of countries and territories setting a regulatory / guideline value less than WHO health-based value	6
Maximum value set	0.001 mg/l
Minimum value set	0.00001 mg/l
Median value	0.001 mg/l

The majority of countries and territories (16/22) specifying a value for hexachlorobenzene set the HBV, and none set values greater.

Hexachlorobutadiene

WHO Guideline value	0.0006 mg/l
Number of countries and territories setting a regulatory / guideline value	19 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	2
Number of countries and territories setting the WHO Guideline	12
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	5
Maximum value set	0.0007 mg/l
Minimum value set	0.0004 mg/l
Median value	0.0006 mg/l

The majority of countries and territories (12/19) specifying a value for hexachlorobutadiene set the GV.

Hydroxyatrazine

WHO Guideline value	0.2 mg/l
Number of countries and territories setting a regulatory / guideline value	0 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	0
Number of countries and territories setting the WHO Guideline	0
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	0

None of countries and territories in the survey specified a value for this parameter.

Isoproturon

WHO Guideline value	0.009 mg/l
Number of countries and territories setting a regulatory / guideline value	19 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	1
Number of countries and territories setting the WHO Guideline	17
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	0.01 mg/l
Minimum value set	0.007 mg/l
Median value	0.009 mg/l

There was little variation from the GV in the values specified for isoproturon, with only 2/19 countries and territories specifying the GV.

Lindane

WHO Guideline value	0.002 mg/l
Number of countries and territories setting a regulatory / guideline value	44 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	7
Number of countries and territories setting the WHO Guideline	32
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	5
Maximum value set	0.01 mg/l
Minimum value set GV	0.0002 mg/l
Median value	0.002 mg/l

Of the 44 countries and territories specifying a value for lindane, the majority set the GV.

MCPA (4-(2-Methyl-4-chlorophenoxy) acetic acid)

WHO Guideline value	0.002 mg/l[7]
Number of countries and territories setting a regulatory / guideline value	22 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	3
Number of countries and territories setting the WHO Guideline	19
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	0
Maximum value set	0.1 mg/l
Minimum value set	0.002 mg/l
Median value	0.002 mg/l

All countries and territories specifying a value for MCPA set the GV, with the exception of three that set values greater values.

Mecoprop

WHO Guideline value	0.01 mg/l
Number of countries and territories setting a regulatory / guideline value	16 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	0
Number of countries and territories setting the WHO Guideline	14
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	2
Maximum value set	0.01 mg/l
Minimum value set	0.001 mg/l
Median value	0.01 mg/l

Mecoprop was specified by 16 countries and territories, and only two did not specify the GV.

[7] The guideline value has changed to 0.7 mg/l in the first addendum to the 4th edition of GDWQ, which can be found here: http://www.who.int/water_sanitation_health/publications/drinking-water-quality-guidelines-4-including-1st-addendum/en/

Methoxychlor

WHO Guideline value	0.02 mg/l
Number of countries and territories setting a regulatory / guideline value	38 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	8
Number of countries and territories setting the WHO Guideline	29
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	0.9 mg/l
Minimum value set	0.015 mg/l
Median value	0.02 mg/l

Most countries and territories (29/38) specified the GV but there was considerable variation in the nine other values for this parameter.

Methyl parathion

WHO Guideline value	None
WHO Health-based value	0.009 mg/l
Number of countries and territories setting a regulatory / guideline value	8 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	3
Number of countries and territories setting the WHO Guideline	1
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	4
Maximum value set	0.1 mg/l
Minimum value set	0.0003 mg/l
Median value	0.008 mg/l

Eight countries and territories set a value for methyl parathion, and only one of them specified the GV.

Metolachlor

WHO Guideline value	0.01 mg/l
Number of countries and territories setting a regulatory / guideline value	21 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	2
Number of countries and territories setting the WHO Guideline	18
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	0.3 mg/l
Minimum value set	0.007 mg/l
Median value	0.01 mg/l

All 21 of the countries and territories specifying a value for metolachlor specified the GV, with the exception of three countries.

Microcystin-LR

WHO Guideline value	0.001 mg/l (provisional, P)
Number of countries and territories setting a regulatory / guideline value	14 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	2
Number of countries and territories setting the WHO Guideline	12
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	0
Maximum value set	0.0015 mg/l
Minimum value set	0.001 mg/l
Median value	0.001 mg/l

Microcystin-LR was specified by 14 countries and territories, and of these, only two did not specify the provisional GV of 0.001 mg/L.

Molinate

WHO Guideline value	0.006 mg/l
Number of countries and territories setting a regulatory / guideline value	20 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	1
Number of countries and territories setting the WHO Guideline	17
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	2
Maximum value set	0.007 mg/l
Minimum value set	0.004 mg/l
Median value	0.006 mg/l

Of the 20 countries and territories specifying a value for molinate, only three did not specify the GV.

Monochloramine

WHO Guideline value	3 mg/l
Number of countries and territories setting a regulatory / guideline value	19 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	3
Number of countries and territories setting the WHO Guideline	15
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	4 mg/l
Minimum value set	2 mg/l
Median value	3 mg/l

Of the 19 countries and territories specifying a value for this parameter only four did not specify the GV. One country specified 3 mg/l post-treatment, but 0.05 mg/l in distribution.

Monochloroacetic Acid (Monochloroacetate)

WHO Guideline value	0.02 mg/l
Number of countries and territories setting a regulatory / guideline value	7 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	1
Number of countries and territories setting the WHO Guideline	6
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	0
Maximum value set	0.2 mg/l
Minimum value set	0.02 mg/l
Median value	0.02 mg/l

Only seven countries and territories specified a value for monochloroacetate, and almost all specified the GV.

Nitrilotriacetic Acid

WHO Guideline value	0.2 mg/l
Number of countries and territories setting a regulatory / guideline value	18 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	1
Number of countries and territories setting the WHO Guideline	16
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	0.4 mg/l
Minimum value set	0.15 mg/l
Median value	0.2 mg/l

Of the 18 countries and territories specifying a value for this parameter only two did not specify the GV.

Nitrobenzene

WHO Guideline value	None
WHO Health-based value	0.03 mg/l (short term) 0.008-0.063 mg/l (long term exposure, depending on end-point and approach used)
Number of countries and territories setting a regulatory / guideline value	3
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	2
Number of countries and territories setting the WHO Guideline	0
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	0.2 mg/l
Minimum value set	0.004 mg/l
Median value	0.102 mg/l

The GDWQ derive two HBVs for nitrobenzene; one for short- and the other for long-term exposure, based on the limited available information. Only three countries specified a value for this parameter.

N-Nitrosodimethylamine (NDMA)

WHO Guideline value	0.0001 mg/l
Number of countries and territories setting a regulatory / guideline value	3 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	0
Number of countries and territories setting the WHO Guideline	1
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	2
Maximum value set	0.0001 mg/l
Minimum value set	0.000012 mg/l
Median value	0.00004 mg/l

NDMA is among the least specified organic parameters, with only three countries and territories specifying a value.

Parathion

WHO Guideline value	None
WHO Health-based value	0.01 mg/l
Number of countries and territories setting a regulatory / guideline value	7 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	5
Number of countries and territories setting the WHO Guideline	1
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	0.05 mg/l
Minimum value set	0.003 mg/l
Median value	0.02 mg/l

The majority of countries and territories setting values for this parameter (5/7) specified values above the HBV of 0.01 mg/L.

Pendimethalin

WHO Guideline value	0.02 mg/l
Number of countries and territories setting a regulatory / guideline value	20 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	1
Number of countries and territories setting the WHO Guideline	18
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	0.4 mg/l
Minimum value set	0.015 mg/l
Median value	0.02 mg/l

Of the 20 countries and territories specifying a value for pendimethalin, only two did not specify the GV.

Pentachlorophenol (PCP)

WHO Guideline value	0.009 mg/l
Number of countries and territories setting a regulatory / guideline value	35 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	5
Number of countries and territories setting the WHO Guideline	23
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	7
Maximum value set	0.06 mg/l
Minimum value set	0.0001 mg/l
Median value	0.009 mg/l

The majority of countries and territories specifying values for PCP specified the GV.

Permethrin

WHO Guideline value	No value established in fourth edition, previously 0.3 mg/l
WHO Health-based value*	0.3mg/l
Number of countries and territories setting a regulatory / guideline value	17 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than the previous WHO Guideline	0
Number of countries and territories setting the previous WHO Guideline	3
Number of countries and territories setting a regulatory / guideline value less than the previous WHO Guideline	14
Maximum value set	0.3 mg/l
Minimum value set	0.02 mg/l
Median value	0.02 mg/l

*The GV was changed to a HBV in the 4th edition of the GDWQ, recognizing that it is not recommended for direct addition to drinking-water as part of WHO's policy to exclude the use of any pyrethroids for larviciding of mosquito vectors of human disease

Permethrin was specified by 17 countries and territories. The majority specified values less than the HBV of 0.3 mg/L, with 13 countries and territories specifying 0.02 mg/l.

2-Phenylphenol and its sodium salt

WHO Guideline value	None
WHO Health-based value	1 mg/l
Number of countries and territories setting a regulatory / guideline value	1
Number of countries and territories setting a regulatory / guideline value greater than the previous WHO Guideline	1
Number of countries and territories setting the previous WHO Guideline	0
Number of countries and territories setting a regulatory / guideline value less than the previous WHO Guideline	0
Maximum value set	1.4 mg/l
Minimum value set	1.4 mg/l
Median value	1.4 mg/l

2-Phenylphenol is among the least specified organic parameters; only one country set a value for this parameter.

Pyriproxyfen

WHO Guideline value*	No value established in 4th edition, previously 0.3 mg/l
Number of countries and territories setting a regulatory / guideline value	5 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than previous WHO Guideline	1
Number of countries and territories setting the previous WHO Guideline	4
Number of countries and territories setting a regulatory / guideline value less than previous WHO Guideline	0
Maximum value set	0.4 mg/l
Minimum value set	0.3 mg/l
Median value	0.3 mg/l

*Under the WHO Pesticides Evaluation Scheme (WHOPES) the recommended dosage of pyriproxyfen in potable water in containers should not exceed 0.01mg/l.

Pyroproxifen is a pesticide used for vector control in drinking-water sources and containers. While the 3rd edition of the GDWQ included a GV of 0.3 mg/l, the 4th edition of the GDWQ does not specify a value for pyriproxyfen as it is not considered appropriate to establish guideline values for vector control pesticides. However, it has been included here because a

GV was set in the 3rd edition, and five of the countries and territories retain a value for this parameter.

Simazine

WHO Guideline value	0.002 mg/l
Number of countries and territories setting a regulatory / guideline value	24 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	4
Number of countries and territories setting the WHO Guideline	19
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	0.02 mg/l
Minimum value set	0.0015 mg/l
Median value	0.002 mg/l

Simazine was specified by 24 countries and territories, with the majority specifying the GV.

Sodium Dichloroisocyanurate

WHO Guideline value	50 mg/l
Number of countries and territories setting a regulatory / guideline value	0 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	0
Number of countries and territories setting the WHO Guideline	0
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	0

No country set a value for this parameter.

Styrene

WHO Guideline value	0.02 mg/l (C)*
Number of countries and territories setting a regulatory / guideline value	24 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	5
Number of countries and territories setting the WHO Guideline	18
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	1
Maximum value set	0.1 mg/l
Minimum value set	0.015 mg/l
Median value	0.02 mg/l

*Concentrations at or below the health-based guideline value may affect the appearance, taste or odour of the water, leading to consumer complaints

Twenty-four of the 104 countries and territories surveyed specified a value for styrene, with the majority specifying the GV.

Terbuthylazine

WHO Guideline value	0.007 mg/l
Number of countries and territories setting a regulatory / guideline value	7 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	2
Number of countries and territories setting the WHO Guideline	5
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	0
Maximum value set	0.01 mg/l
Minimum value set	0.007 mg/l
Median value	0.007 mg/l

Seven countries and territories specified a value for terbuthylazine, and of these, five specified the GV.

Tetrachloroethene

WHO Guideline value	0.04 mg/l
Number of countries and territories setting a regulatory / guideline value	70 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	2
Number of countries and territories setting the WHO Guideline	22
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	46
Maximum value set	0.05 mg/l
Minimum value set	0.001 mg/l
Median value	0.01 mg/l

Tetrachloroethene is among the most specified organic parameters, and one of few parameters where the majority of countries and territories specifying a value set it below the GV.

Trichloroacetic acid

WHO Guideline value	0.2 mg/l
Number of countries and territories setting a regulatory / guideline value	18 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	0
Number of countries and territories setting the WHO Guideline	10
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	8
Maximum value set	0.2 mg/l
Minimum value set	0.02 mg/l
Median value	0.2 mg/l

Ten out of 18 countries and territories specifying a value for trichloroacetic acid specified the GV.

1,1,1-Trichloroethane

WHO Guideline value	None specified
WHO Health-based value	2 mg/l
Number of countries and territories setting a regulatory / guideline value	16 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO health-based value	1
Number of countries and territories setting the WHO health-based value	7
Number of countries and territories setting a regulatory / guideline value less than WHO health-based value	8
Maximum value set	2 mg/l
Minimum value set	0.03 mg/l
Median value	1.15 mg/l

Of the 16 countries and territories specifying a value for 1,1,1-trichloroethane, seven specified the GV.

Trichloroethene

WHO Guideline value	0.02 mg/l (provisional P)
Number of countries and territories setting a regulatory / guideline value	68 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	21
Number of countries and territories setting the WHO Guideline	7
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	40
Maximum value set	0.07 mg/l
Minimum value set	0.001 mg/l
Median value	0.01 mg/l

Almost two thirds of the 104 countries and territories surveyed specified a value for trichloroethene, with the majority (40/68) specifying values less than the provisional GV. Several countries and territories specified 0.01 mg/l jointly with tetrachloroethene.

2,4,6-Trichlorophenol

WHO Guideline value	0.2 mg/l (C)*
Number of countries and territories setting a regulatory / guideline value	30 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	2
Number of countries and territories setting the WHO Guideline	18
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	10
Maximum value set	0.3 mg/l
Minimum value set	0.002 mg/l
Median value	0.2 mg/l

*Concentrations at or below the health-based guideline value may affect the appearance, taste or odour of the water, leading to consumer complaints

The majority of countries and territories (18/30) specifying a value for this parameter specified the GV.

2,4,5-T (2,4,5-Trichlorophenoxy acetic acid)

WHO Guideline value	0.009 mg/l
Number of countries and territories setting a regulatory / guideline value	24 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	5
Number of countries and territories setting the WHO Guideline	17
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	2
Maximum value set	0.1 mg/l
Minimum value set	0.002 mg/l
Median value	0.009 mg/l

Twenty-four countries and territories specified a value for 2,4,5-Trichlorophenoxy acetic acid, and the majority of these parameter specified the GV.

Trifluralin

WHO Guideline value	0.02 mg/l
Number of countries and territories setting a regulatory / guideline value	19 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	3
Number of countries and territories setting the WHO Guideline	16
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	0
Maximum value set	0.09 mg/l
Minimum value set	0.02 mg/l
Median value	0.02 mg/l

Of the 19 countries and territories that specified a value for trifluralin the majority specified the GV.

Trihalomethanes (Total)

WHO Guideline value (the sum of the ratios of the concentrations for Bromodichloromethane, Bromoform, Chloroform and Dibromochloromethane to their guideline values)	≤1
Number of countries and territories setting a regulatory / guideline value	66 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	0
Number of countries and territories setting a regulatory / guideline value at the WHO Guideline	9
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	57
Maximum value set	1
Minimum value set	0.001
Median value	0.1

The GDWQ set out a fractionation approach for total trihalomethanes (THMs), in which the sum of the ratios of concentrations for bromodichloromethane, bromoform, chloroform and dibromochloromethane to their Gvs should not exceed 1. Information on these individual compounds is presented earlier in the section on organic parameters. The majority of the 66 countries and territories specifying a value for total THMs set a value below the GV, and only 10 specified a value for total THMs and a value for each of its constituent parameters.

Toluene

WHO Guideline value	0.7 mg/l (C)*
Number of countries and territories setting a regulatory / guideline value	34 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	4
Number of countries and territories setting the WHO Guideline	22
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	8
Maximum value set	1 mg/l
Minimum value set	0.024 mg/l
Median value	0.7 mg/l

*Concentrations at or below the health-based guideline value may affect the appearance, taste or odour of the water, leading to consumer complaints

Thirty-four countries and territories specified a value for toluene, with the majority specifying the GV.

Vinyl Chloride

WHO Guideline value	0.0003 mg/l
Number of countries and territories setting a regulatory / guideline value	61 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	50
Number of countries and territories setting the WHO Guideline	11
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	0
Maximum value set	0.02 mg/l
Minimum value set	0.0003 mg/l
Median value	0.0005 mg/l

The majority of countries and territories specifying a value for vinyl chloride set 0.0005 mg/l, greater than the GV of 0.0003 mg/L.

Xylenes

WHO Guideline value	0.5 mg/l (C)*
Number of countries and territories setting a regulatory / guideline value	31 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline	6
Number of countries and territories setting the WHO Guideline	20
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline	5
Maximum value set	10 mg/l
Minimum value set	0.05 mg/l
Median value	0.5 mg/l

*Concentrations at or below the health-based guideline value may affect the appearance, taste or odour of the water, leading to consumer complaints

Thirty-one countries and territories specified a value for xylenes, and almost two thirds of these set the GV.

Parameters relating to acceptability, taste and odour and appearance

The GDWQ identify 26 chemically derived parameters and four biologically derived parameters relating to acceptability, taste, odour and appearance. The importance of these parameters is that if the water is unacceptable to consumers, it may lead to rejection of the water, and use of other aesthetically more acceptable but potentially less-safe waters. Generally the concentrations that cause rejection are significantly lower than those of concern for health. As such, with the exception of manganese, which is widely found in drinking-water sources, it may not be appropriate to directly regulate or monitor such parameters, as they may be addressed through a general requirement in the national standard or regulation that water be acceptable to the majority of consumers. For these parameters, the GDWQ may include a HBV, or a GV(C) in order to assist in determining a response when problems are encountered (and to provide reassurance with regard to possible health risks).

Some parameters have recommended values, mainly based on consumer acceptance. All the countries and territories in the survey specified values for some of the chemical and physical parameters. Three countries and territories included general statements that potable water should be free of algae. Most of the values that were set were guidance or indicator levels rather than mandatory standards.

The acceptability parameters most often specified were pH (hydrogen ion) (specified by 103 countries and territories), chloride (100), iron (99), aluminium and sulfate (97). The least specified parameters were petroleum oils (3), and dissolved oxygen (4). In addition, 79 countries and territories had descriptive requirements for the taste parameter, and 78 for the odour parameter, such as: “acceptable to most consumers”, “not offensive”, “not objectionable”, “acceptable to consumers and no abnormal change”. Eighteen countries and territories had numerical values for the odour parameter and eleven for the taste parameter.

The details for copper, chlorine, 1,2- and 1,4-dichlorobenzene, ethylbenzene, manganese, styrene, toluene, 2,4,6-trichlorophenol and xylenes appear already in the sections on inorganic or organic parameters as appropriate.

Aluminium

WHO Guidance	A GV has not been established for aluminium although the GDWQ note that average residuals should not exceed levels needed to optimize coagulation in drinking-water plants that use aluminium-based coagulants (0.1-0.2 mg/l). It also notes that a health-based value of 0.9 mg/l could be derived, but this exceeds practicable levels based on coagulation in treatment plants.
Number of countries and territories setting a regulatory / guideline value	97 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline recommendation of 0.2 mg/l	4
Number of countries and territories setting a regulatory / guideline value at the WHO Guideline recommendation of 0.2 mg/l	84
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline recommendation of 0.2 mg/l	10
Maximum value set	0.5 mg/l
Minimum value set	0.03mg/l
Median value	0.2 mg/l

GDWQ also note that aluminium concentrations greater than 0.1-0.2 mg/l can lead to aesthetic issues

All but fourteen of the 97 countries and territories specifying a value for aluminium set a value of 0.2 mg/l.

Ammonium

WHO Guideline value	None set
Number of countries and territories setting a regulatory / guideline value	81 (out of 104)
Maximum value set	3 mg NH_4/l
Minimum value set	0.05 mg NH_4/l
Median value	0.2 mg NH_4/l

The threshold odour concentration of ammonia at alkaline pH is approximately 1.5 mg/l, and a taste threshold of 35 mg/l has been proposed for the ammonium cation. Ammonia is not of direct relevance to health at these levels, and no health-based guideline value has been

proposed. Eighty-one countries and territories specified a value for ammonium, with 47 specifying 0.5 mg NH_4/l; 20 specifying 1.5 mg NH_4 /l, and the rest specifying values ≤ 1 mg NH_4 /l.

Calcium

WHO Guideline value	None specified
Number of countries and territories setting a regulatory / guideline value	31 (out of 104)
Maximum value set	500 mg/l
Minimum value set	30 mg/l
Median value	150 mg/l

The GDWQ advise a taste threshold for calcium ion of 150 – 300 mg/l, depending on the associated anion. Thirty-one countries and territories specified a value for this parameter, although it was not always clear if the value specified was quoted as calcium ion or as a calcium salt.

Chloramines

WHO Guideline value	None set
Number of countries and territories setting a regulatory / guideline value	6 (out of 104)
Maximum value set	4 mg/l
Minimum value set	0.15 mg/l
Median value	3.5 mg/l

A GV of 3 mg/L is set for monochloramine, and the information is presented in the inorganic parameters section. No HBV or GV is set for di- and trichloramines, as the available data is inadequate to derive a health-based GV. For dichloramine, the organoleptic effects between 0.1 and 0.5 mg/l were found to be "slight" and "acceptable". Odour and taste thresholds of 0.15 and 0.13 mg/l were reported, respectively. An odour threshold of 0.02 mg/l has been reported for trichloramine, and it has been described as "geranium". Six countries and territories set a value for chloramines, ranging from 0.15 to 4 mg/l.

Chloride

WHO Guideline value	None set
Number of countries and territories setting a regulatory / guideline value	100 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline recommendation of 250 mg/l	15
Number of countries and territories setting a regulatory / guideline value at the WHO Guideline recommendation of 250 mg/l	77
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline recommendation of 250 mg/l	8
Maximum value set	1200
Minimum value set	20
Median value	250

Chloride is one of the most specified aesthetic parameters, with 100 countries and territories specifying a value. The GDWQ mention that concentrations in excess of 250 mg/l are increasingly likely to be detected by taste, and most countries and territories specified this value.

Chlorobenzene

WHO Guideline value	None set
Number of countries and territories setting a regulatory / guideline value	7 (out of 104)
Maximum value set	0.3 mg/l
Minimum value set	0.001 mg/l
Median value	0.1 mg/l

No GV has been set for chlorobenzene, however the GDWQ mention that odour thresholds of 0.002–0.01 and 0.0003–0.03 mg/l have been reported for 1,2- and 1,4-dichlorobenzene, respectively. Odour thresholds of 0.01, 0.005–0.03 and 0.05 mg/l have been reported for 1,2,3-, 1,2,4- and 1,3,5-trichlorobenzene, respectively. A taste and odour threshold concentration of 0.03 mg/l has been reported for 1,2,4-trichlorobenzene. Seven countries and territories specified a value for chlorobenzene, ranging from 0.001 to 0.3 mg/L.

Chlorophenols (other than 2,4,6-trichlorophenol)

WHO Guideline value	None set
Number of countries and territories setting a regulatory / guideline value	9 (out of 104)
Maximum value set	0.3 mg/l
Minimum value set	0.0001 mg/l
Median value	0.003 mg/l

Chlorophenols generally have very low taste and odour thresholds. The taste thresholds in water for 2-chlorophenol, and 2,4-dichlorophenol are 0.0001,and 0.0003 mg/l, respectively. Odour thresholds are 0.01 and 0.04 mg/l, respectively. Nine countries and territories specified a value for this parameter, ranging from 0.0001 to 0.3 mg/L.

Colour

WHO Guideline value (true colour units)	None set
Number of countries and territories setting a regulatory / guideline value	80 with numerical values (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO Guideline recommendation of 15 TCU mg/l	20
Number of countries and territories setting a regulatory / guideline value at the WHO Guideline recommendation of 15 TCU mg/l	44
Number of countries and territories setting a regulatory / guideline value less than WHO Guideline recommendation of 15 TCU	16
Maximum value set	50 TCU
Minimum value set	0.5 TCU
Median value	15 TCU

The GDWQ suggest 15 TCU as the level for consumer acceptance. The majority (44/80) of countries and territories setting a value for the colour parameter set 15 TCU. Twenty-two countries and territories had only an advisory statement of “acceptable to consumers and no change”, and one country specified “colourless”.

Dissolved oxygen

WHO Guideline value	None set
Number of countries and territories setting a regulatory / guideline value	4 (out of 104)
Maximum value set	8 mg/l
Minimum value set	4 mg/l
Median value	6 mg/l

Dissolved oxygen is one of the least specified parameters, with only four countries and territories specifying values ranging from 4 to 8 mg/L.

Hardness

WHO Guideline value	None set
Number of countries and territories setting a regulatory / guideline value	57 (out of 104)
Maximum value set	1000 mg $CaCO_3$/l
Minimum value set	100 mg $CaCO_3$/l
Median value	500 mg $CaCO_3$/l

It was assumed that all quoted figures referred to mg $CaCO_3$/l although this was not always clear, especially when no method was specified. Fifty-seven countries and territories set a value for this parameter, and several others also had target or desirable levels below their maximum value.

Hydrogen sulphide

WHO Guideline value	None set
Number of countries and territories setting a regulatory / guideline value	27 (out of 104), with numerical values
Maximum value set	0.1 mg/l
Minimum value set	0 mg/l
Median value	0.05 mg/l

All 27 countries and territories set values within the taste threshold of 0.05 – 0.1 mg/l quoted in the GDWQ.

Iron

WHO Guideline value	None set*
Number of countries and territories setting a regulatory / guideline value	99 (out of 104)
Maximum value set	2 mg/l
Minimum value set	0.2 mg/l
Median value	0.3 mg/l

*However, the GDWQ indicates a precautionary level of 2 mg/l, which does not present a hazard to health

Almost all countries and territories set a value for this parameter. Fifteen countries and territories set a value above the GDWQ aesthetic limit of 0.3 mg/l at which staining of laundry and fixtures may occur. Thirty-five countries and territories specified the lowest value of 0.2 mg/L.

Magnesium

WHO Guideline value	None specified
Number of countries and territories setting a regulatory / guideline value	34 (out of 104)
Maximum value set	1,000 mg/l
Minimum value set	10 mg/l
Median value	100 mg/l

The GDWQ advise that the taste threshold for magnesium is probably less than the 150 – 300 mg/l range for calcium. Thirty-four countries and territories specified a value for this parameter, although it was not always clear whether the value specified was quoted as magnesium ion or as a magnesium salt.

Monochlorobenzene

WHO Guideline value	None specified
WHO Health-based value	0.3 mg/l
Number of countries and territories setting a regulatory / guideline value	14 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO health-based value	0
Number of countries and territories setting the WHO health-based value	4
Number of countries and territories setting a regulatory / guideline value less than WHO health-based value	10
Maximum value set	0.3 mg/l
Minimum value set	0.003 mg/l
Median value	0.1 mg/l

Taste and odour thresholds of 0.01–0.02 mg/l and odour thresholds ranging from 0.04 to 0.12 mg/l have been reported for monochlorobenzene. Of the 14 countries and territories setting a value for this parameter, the majority specified a value below the HBV.

Odour

WHO Guideline value	None set
Number of countries and territories setting a regulatory / guideline value	19, with numerical values (out of 104)
Maximum value set	6 DN
Minimum value set	2 DN
Median value	3 DN

All countries and territories specifying a numerical value set dilution number (DN) as 3, except for two countries that specified 2 and 6. Seventy-eight countries and territories had an advisory statement such as “acceptable to consumers and no abnormal change”, “non-objectionable” or “not detectable”.

Petroleum Oils

WHO Guideline value	None set
Number of countries and territories setting a regulatory / guideline value	3 (out of 104)
Maximum value set	0.3 mg/l
Minimum value set	0.1 mg/l
Median value	0.2 mg/l

Petroleum oils can give rise to the presence of a number of low molecular weight hydrocarbons that have low odour thresholds in drinking-water. Benzene, toluene, ethylbenzene and xylenes (BTEX) are considered in the organic parameters section. Only three countries and territories set values for this parameter.

pH Maximum

WHO Guideline value	None set
Number of countries and territories setting a regulatory / guideline value	103 (out of 104)
Maximum value set	pH 9.7
Minimum value set	pH 8
Median value	pH 8.5

The GDWQ do not establish a GV for pH, as it usually has no direct impact on consumers at levels found in drinking-water. It is however an important operational parameter, and the GDWQ indicate an optimum pH range of 6.5-8.5. Only one country out of the 104 included in the survey did not specify a value for this parameter. Forty-eight countries and territories specified a value above the GDWQ suggested pH 8.5, but many included the note that chlorine disinfectant is only effective below pH 8. The highest value of pH 9.7 was set by one country, and was described as an operational limit.

pH Minimum

WHO Guideline value	None set
Number of countries and territories setting a regulatory / guideline value	102 (out of 104)
Maximum value set	pH 7
Minimum value set	pH 5
Median value	pH 6.5

Only two countries did not specify a value for this parameter. Eight countries and territories specified a value below the optimum range discussed in the GDWQ of pH 6.5.

Sodium

WHO Guideline value	None set
Number of countries and territories setting a regulatory / guideline value	81 (out of 104)
Maximum value set	400 mg/l
Minimum value set	100 mg/l
Median value	200 mg/l

The GDWQ notes that at room temperature, the average taste threshold for sodium is 200 mg/l. Seventy-one of the 81 countries and territories set this value, and only seven set a higher value.

Sulfate

WHO Guideline value	None set
Number of countries and territories setting a regulatory / guideline value	97 (out of 104)
Maximum value set	800 mg/l
Minimum value set	50 mg/l
Median value	250 mg/l

The GDWQ suggest taste impairment is minimal below 250 mg/l but can be up to 1,000 mg/l for calcium sulfate. Ninety-seven countries and territories set a value for this parameter, and the majority (66) specified 250 mg/l.

Synthetic Detergents (Anionic) (Surfactants)

WHO Guideline value	None specified
Number of countries and territories setting a regulatory / guideline value	33 (out of 104)
Maximum value set	2 mg/l
Minimum value set	0.01 mg/l
Median value	0.5 mg/l

The GDWQ advise that the concentration of detergents in drinking-water should not be allowed to reach levels giving rise to either foaming or taste problem. Thirty-three countries and territories specified a value for this parameter, of these, 14 set 0.5 mg/l.

Taste

WHO Guideline value	None set
Number of countries and territories setting a regulatory / guideline value	12 (out of 104), with numerical values
Maximum value set	6 DN
Minimum value set	2DN
Median value	3 DN

Twelve countries and territories specified numerical values for taste, and nine of these specified 3 DN. Seventy-nine countries and territories had an advisory statement such as "acceptable to consumers and no abnormal change", "non-objectionable" or "inoffensive".

Temperature

WHO Guideline value	None set
Number of countries and territories setting a regulatory / guideline value	18 (out of 104)
Maximum value set	35°C
Minimum value set	15°C
Median value	25°C

None of the values for temperature were mandatory, being guiding levels or operational goals. None of the countries and territories' documents indicated what would happen if temperatures rose above the suggested value. In addition to those with numerical values, seven countries and territories had descriptive levels such as: 2.5 °C above normal; "not objectionable"; "air temperature plus 3 °C"; "acceptable"; and "ambient".

Total dissolved solids

WHO Guideline value	None set
Number of countries and territories setting a regulatory / guideline value	66 (out of 104)
Maximum value set	2500 mg/l
Minimum value set	200 mg/l
Median value	1000 mg/l

Sixty-six countries and territories set a value for this parameter. There was a wide range of values; from 200 mg/l to 2,500 mg/l. Thirty-six countries and territories specified 1000 mg/l, eleven specified 500 mg/l.

Trichlorobenzenes (total)

WHO Guideline value	None specified
WHO Health-based value	0.02 mg/l
Number of countries and territories setting a regulatory / guideline value	11 (out of 104)
Number of countries and territories setting a regulatory / guideline value greater than WHO health-based value	3
Number of countries and territories setting the WHO health-based value	8
Number of countries and territories setting a regulatory / guideline value less than WHO health-based value	0
Maximum value set	0.03 mg/l
Minimum value set	0.02 mg/l
Median value	0.02 mg/l

Eleven countries and territories specified a value for trichlorobenzenes, and of these, eight set the HBV of 0.02 mg/l. Odour thresholds of 0.01, 0.005–0.03 and 0.05 mg/l have been reported for 1,2,3-, 1,2,4- and 1,3,5-trichlorobenzene, respectively. A taste and odour threshold concentration of 0.03 mg/l has been reported for 1,2,4-trichlorobenzene.

Turbidity

WHO Guideline value	None set
Number of countries and territories setting a regulatory / guideline value	85 (out of 104), with numerical values
Maximum value set	25 NTU
Minimum value set	0.3 NTU
Median value	5 NTU

The GDWQ notes that turbidity should ideally be <1 NTU for water to be disinfected and that large well-run municipal supplies should be able to achieve turbidity levels of < 0.5 NTU at all times, with an average of </= 0.2 NTU. It also notes that turbidity levels of 4 NTU and above is visible to the naked eye. Sixteen countries and territories specified a value of 1 NTU or less. Many values were accompanied by comments, including one country that specified 20 NTU but stated that the monthly average of results must not exceed 2 NTU; and another that quoted 5 as an aesthetic limit but 1 NTU as an operational limit. Fifteen countries and territories had descriptive statements only such as “acceptable to consumers and no abnormal change”.

Zinc

WHO Guideline value	None set
Number of countries and territories setting a regulatory / guideline value	74 (out of 104)
Maximum value set	15 mg/l
Minimum value set	1 mg/l
Median value	5 mg/l

The GDWQ note that zinc concentrations at around 4 mg/l may affect the taste of water. Thirty-five out of 72 countries and territories reporting a value for this parameter specified 3 mg/l or less.

Radiological parameters

The GDWQ suggest screening levels for gross alpha and gross beta activity, as the process of identifying individual radionuclides is too cost-intensive for routine monitoring given their generally low concentration. If the screening levels for gross alpha and gross beta activity suggested by WHO are not being exceeded, the individual dose criterion (i.e. total dose) of 0.1 milliSieverts per year (mSv/year) will usually not be exceeded either. The idea of screening levels is that radioactivity should be assessed against these during routine monitoring. If the screening levels are being exceeded after having taken further samples to validate the findings, the contribution of K-40 (beta) should be subtracted from the gross beta activity following a separate determination of total potassium. If the screening values are still being exceeded, an analytical strategy for individual radionuclides should be determined.

In general, countries and territories that specified values for radiological parameters did not deviate significantly from the GDWQ. Forty-eight countries and territories specified screening values for gross alpha and gross beta activity, two in terms of a ratio or annual dose. Some expressed their values in terms of Picocurie per litre (pCi/l); these have been converted to their equivalents as Becquerel per litre (Bq/l) for this report. Thirty five countries and territories specified a value for total dose in terms of mSv/yr. Only three of these also specified values for gross alpha and beta activity.

The GDWQ list guidance levels for 191 radionuclides. However, most countries and territories specified values for only a few of these, including: radon (seven); radium-226 (seven); strontium-90 (five). Where countries and territories specified values for gross alpha and beta activity and total dose, most included advice on the steps that should be taken if any of these values were exceeded.

Total Dose / Individual Dose Criteria

WHO/IDC guidance	0.1 mSv/year*
Number of countries and territories setting a regulatory / guideline value	36 (out of 104)
Number of countries and territories setting a regulatory / guidance level greater than WHO/IDC guidance	2
Number of countries and territories setting the WHO IDC guidance	34
Number of countries and territories setting a regulatory / guidance level less than WHO/IDC guidance	0
Maximum value set	1 mSv/year
Minimum value set	0.1 mSv/year
Median value	0.1 mSv/year

*This value is translated into operational targets to be measured by water suppliers and regulators as the screening values (gross alpha and gross beta, which are listed in the tables below) and guidance levels (which are listed in Table 9.2 of Chapter 9 of the GDWQ). The GDWQ notes that the IDC represents a very low level of health risk and also refers to the International Radiation Basic Safety Standards (BSS), (IAEA, 2014) reference level. The BSS, which is co-sponsored by eight international organizations including WHO, has established a reference level for the radiation dose due to the consumption of drinking-water of 1 mSv/year. It is generally advisable for countries to establish a national standard between 0.1 and 1 mSv/year, where 0.1 mSv/year is achievable for most countries.

Almost all countries have established their IDC as 0.1 mSv/year, and the EC Council Directive 2013/51/EURATOM also adopted a total indicative dose of 0.1 mSv/year. Only two countries out of the 36 that specified a value for this parameter set a value above 0.1 mSv/year.

Gross alpha activity

WHO Screening level	0.5 Bq/l
Number of countries and territories setting a regulatory / guidance level	48 (out of 104)
Number of countries and territories setting a regulatory / guidance level greater than WHO Screening level	3
Number of countries and territories setting the WHO Screening level	12
Number of countries and territories setting a regulatory / guidance level less than WHO Screening level	33
Maximum value set	0.56 Bq/l
Minimum value set	0.01 Bq/l
Median value	0.1 Bq/l

Twelve countries and territories specified the WHO screening level (or its equivalent when their values are converted from pCI/l).

Gross beta activity

WHO Screening level	1 Bq/l
Number of countries and territories setting a regulatory / guidance level	48 (out of 104)
Number of countries and territories setting a regulatory / guidance level greater than WHO Screening level	5
Number of countries and territories setting the WHO Screening level	37
Number of countries and territories setting a regulatory / guidance level less than WHO Screening level	6
Maximum value set	2.0Bq/l
Minimum value set	0.1 Bq/l
Median value	1 Bq/l

Thirty-seven countries and territories specified the WHO screening level (or its equivalent when their values are converted from pCI/l). Five countries specified values above the WHO screening level, and six specified values less than the WHO screening level.

Microbiological parameters

The GDWQ identify 43 microbial parameters, which include bacterial, viral, protozoan, and helminth pathogens, as well as toxic cyanobacteria. The verification of microbial water safety is normally based on testing of indicator organisms, and the GDWQ include a GV for *Escherichia coli* (*E. coli*) or thermotolerant coliforms). Countries and territories in the survey designated numerical standards for 24 microbiological parameters. However, nine of these parameters were designated by only one country and a further nine by less than ten countries and territories.

Values for *E. coli* (or faecal coliforms or thermotolerant coliforms) were specified by 102 countries and territories, then total coliforms (97 countries and territories), enterococci (faecal streptococci) (46 countries and territories), sulphite-reducing Clostridia (*Clostridium perfringens*) (44 countries and territories), total heterotrophic bacteria at 22°C(19 countries and territories) and total heterotrophic bacteria at 37°C (13 countries and territories). The other parameters were: Enteric viruses and *Pseudomonas aeruginosa* (eight countries and territories); Cryptosporidium and Giardia (five countries and territories); Salmonella, somatic coliphages and *Staphlococcus aureus* (four countries and territories); pathogenic protozoa and Shigella (three countries and territories); and amoeba, *Vibrio cholera*, free living organisms, helminths, Legionella, nematodes, parasites and plankton (one country).

The normal value for microbiological parameters, other than heterotrophic bacteria, was zero or absent per volume (usually 100 ml for bacterial parameters and 10 litres for protozoa) although many countries and territories' values accepted that coliform bacteria would be detected in samples on occasions.

In addition to setting values for some microbiological parameters, many countries and territories' documentation included a statement the same as or similar to that in the European Drinking-water Directive that drinking-water "shall be free from any micro-organisms and parasites which, in numbers or concentrations, constitute a potential danger to human health".

Clostridium perfringens (Sulphite-reducing anaerobes)

WHO Guideline value	None specified
Number of countries and territories setting a regulatory / guideline value	44 (out of 104)
Maximum value set	0 per 100 ml
Minimum value set	0 per 100 ml
Median value	0 per 100 ml

The GDWQ state that *Clostridium perfringens* has only limited value as a possible indicator of enteric viruses and protozoan (oo)cysts but may be useful as an indicator of the effectiveness of filtration processes. All countries and territories specifying a value for this parameter specified zero per 100 ml (or in some cases 20 ml or 50 ml) for this parameter.

Coliform bacteria (Total)

WHO Guideline value	None specified
Number of countries and territories setting a regulatory / guideline value	98 (out of 104)
Maximum value set	150 per 100 ml
Minimum value set	0 per 100 ml
Median value	0 per 100 ml

The GDWQ highlight that total coliform bacteria include organisms that can survive and grow in water so they are not useful as an indicator of faecal pathogens. It recommends that total coliforms should be absent immediately after treatment and presence of these organisms indicates inadequate treatment. Few countries and territories appeared to recognize this in their setting values. While six countries and territories did not specify a value for total coliforms, the others generally specified a value of zero for this parameter. Some specified <1.1 per 100 ml for analysis by most probable number technique. Where the value specified was greater than zero (e.g. 10 per 100 ml; 6 per 100 ml; or 3 per 100 ml), in most cases this was qualified by not detecting coliform bacteria in two consecutive samples or 95% of annual samples or both. One country specified 10 per 100ml as an operational value; another specified 100 coliform bacteria per 100 ml in a maximum of 1% of samples;10 per 100 ml in a maximum of 4% of samples; and “not detected” in a minimum of 95% of samples. One country designated the highest value as a maximum allowable range of 50 – 150 per 100 ml, but a recommended maximum limit of 10 per 100 ml.

Enterococci (Faecal streptococci)

WHO Guideline value	None specified
Number of countries and territories setting a regulatory / guideline value	47 (out of 104)
Maximum value set	0 per 100 ml
Minimum value set	0 per 100 ml
Median value	0 per 100 ml

The GDWQ advise that intestinal enterococci can be used as an indicator of faecal pollution and may survive longer in water than *E coli*. All countries and territories specifying a value for this parameter specified zero per 100 ml, and one specified that the value should be zero per 100 ml in 95% of samples (where more than 20 are taken annually) and not be present in consecutive samples.

Escherichia coli (Faecal coliforms, Thermotolerant coliforms)

WHO Guideline value	Must not be detectable in any 100ml sample
Number of countries and territories setting a regulatory / guideline value	103 (out of 104)
Maximum value set	1 per 100 ml
Minimum value set	0
Median value	0

For the purposes of this survey, faecal coliforms and thermotolerant coliforms have not been counted separately where they have been specified by countries and territories in addition to *E coli* because the value has always been zero per 100 ml. The GDWQ advise that the presence of *E coli* (or thermotolerant coliforms) provides evidence of recent faecal contamination. All countries and territories specified a value of zero per 100 ml except one country which specified 1 per 100 ml in a maximum of 1% of samples. One country did not specify a value for this parameter, just specifying zero per 100 ml for coliforms.

Total heterotrophic bacteria 22ºC

WHO Guideline value	None specified
Number of countries and territories setting a regulatory / guideline value	19 (out of 104)
Maximum value set	10,000 cfu per ml
Minimum value set	5 cfu per ml
Median value	100 cfu per ml

The GDWQ advise that the test for this parameter has little value as an indicator of pathogen presence but can be useful in operational monitoring as a treatment and disinfectant indicator and for assessing the cleanliness of distribution systems. The objective is to keep numbers as low as possible. The EU countries specified "no abnormal change" for this parameter.

Total heterotrophic bacteria 37ºC

WHO Guideline value	None specified
Number of countries and territories setting a regulatory / guideline value	14 (out of 104)
Maximum value set	500 cfu per ml
Minimum value set	0 cfu per ml
Median value	100 cfu per ml

The GDWQ advise that the test for this parameter has little value as an indicator of pathogen presence but can be useful in operational monitoring as a treatment and disinfectant indicator and for assessing the cleanliness of distribution systems. The objective is to keep numbers as low as possible.

Additional parameters

In the documentation used for this survey countries and territories specified 865 numerical values for 287 inorganic, organic, aesthetic and physical parameters that do not have a WHO GV, HBV or aesthetic limit. The additional parameters with numerical standard values most often specified, and reported in this section are: Conductivity (51 countries and territories); total polynuclear aromatic hydrocarbons (PAH) (44); oxidizability (permanganate value) (43); phenols (35); formaldehyde (19); silver (24); potassium (12); and propanil (11).

Conductivity

WHO Guideline value	None specified
Number of countries and territories setting a regulatory / guideline value	51 (out of 104)
Maximum value set	2700 μS/cm
Minimum value set	170 μS/cm
Median value	2500 μS/cm

Almost half (51/104) of the countries and territories included in the survey specified a value for conductivity. A wide range of values were specified, from 170 to 2,700 μS/cm. Twenty-eight countries and territories specified 2500 μS/cm.

Formaldehyde

WHO Guideline value	None specified
Number of countries and territories setting a regulatory / guideline value	19 (out of 104)
Maximum value set	1 mg/l
Minimum value set	0.02 mg/l
Median value	0.9 mg/l

The GDWQ advise that this parameter occurs in drinking-water at concentrations well below those of health concern and specifies a tolerable concentration of 2.6 mg/l for ingested formaldehyde. Nineteen countries and territories specified a value for formaldehyde, and of these, eleven set 0.9 mg/l.

Oxidizability (permanganate value)

WHO Guideline value	None specified
Number of countries and territories setting a regulatory / guideline value	43 (out of 104)
Maximum value set	20 mg/l
Minimum value set	3 mg/l
Median value	5 mg/l

Forty-three countries and territories specified a value for this parameter, with the majority (37/43) setting mg/l.

Total Polynuclear Aromatic Hydrocarbons (PAH)

WHO Guideline value	None specified
Number of countries and territories setting a regulatory / guideline value	44 (out of 104)
Maximum value set	0.01 mg/l
Minimum value set	0.0001 mg/l
Median value	0.0001 mg/l

The GDWQ do not advise a health-based guideline value for total PAH. Benzo(a)pyrene has a health-based value of 0.0007 mg/l (see organic parameters). For fluoranthene it advises that it occurs in drinking-water at concentrations well below those of health concern but a health-based value of 0.004 can be calculated on available data. Forty-four countries and territories specified a value for total PAHs, of these, 33set 0.0001 mg/l.

Phenols

WHO Guideline value	None specified
Number of countries and territories setting a regulatory / guideline value	35 (out of 104)
Maximum value set	0.3 mg/l
Minimum value set	0.0003 mg/l
Median value	0.002 mg/l

The GDWQ do not advise a health-based guideline value for total phenols. 2,4,6-Trichlorophenol has a provisional GV (C) of 0.2 mg/l (see organic parameters), and summary information on chlorophenols other than 2,4,6-trichlorophenol is presented in the sections on acceptability parameters. Thirty-five countries and territories specified a value for phenols. Almost half (15/35) set 0.002 mg/l.

Potassium

WHO Guideline value	None specified
Number of countries and territories setting a regulatory / guideline value	12 (out of 104)
Maximum value set	50 mg/l
Minimum value set	1.5 mg/l
Median value	10 mg/l

The GDWQ advise that currently, there is no evidence that potassium levels in municipally treated drinking-water, even water treated with potassium permanganate, are likely to pose any risk for the health of consumers. It is not considered necessary to establish a health-based guideline value for potassium in drinking-water. Twelve countries and territories specified a value for potassium.

Propanil

WHO Guideline value	None specified
Number of countries and territories setting a regulatory / guideline value	11 (out of 104)
Maximum value set	0.7 mg/l
Minimum value set	0.02 mg/l
Median value	0.02 mg/l

The GDWQ advise that although a health-based value for propanil can be derived, this has not been done, because propanil is readily transformed into metabolites that are more toxic. Two of these metabolites, 3,4-dichloroaniline and 3,3′,4,4′-tetrachloroazobenzene, are more toxic and more persistent than the parent compound.

Therefore, a guideline value for propanil is considered inappropriate and there are inadequate data on the metabolites to allow the derivation of guideline values for them. All of the eleven countries and territories setting a value for propanil specified 0.02 mg/l except one, which specified 0.7 mg/l. No country or territory specified a value for metabolites of propanil.

Silver

WHO Guideline value	None specified
Number of countries and territories setting a regulatory / guideline value	24 (out of 104)
Maximum value set	0.1 mg/l
Minimum value set	0.01 mg/l
Median value	0.05 mg/l

The GDWQ advise that the available data is inadequate to permit the derivation of a health-based guideline value; however, a concentration of 0.1mg/l could be tolerated without risk to health. Twenty-four countries and territories specified a value for silver, and none set a value above 0.1 mg/l.

Conclusion

The GDWQ emphasize the importance of setting risk-based standards and adopting the specifications in the guidelines to local resources and needs. The GDWQ do not only provide guidance on standard-setting, but also on a holistic water safety framework that includes the establishment of national standards, as well as preventive risk management approaches (e.g. Water Safety Plans), and independent surveillance.

For the purpose of this report, only the standards that countries and territories are specifying for different water quality parameters were reviewed. In that context, it was found that the GDWQ play an overall significant role in countries and territories' setting of values that define drinking-water quality. More than half of the countries and territories in the survey reference the GDWQ directly (e.g. Iceland) or indirectly (e.g. Norway) by referencing other countries and territories which referenced the GDWQ. This figure is actually likely to be higher as the full value standard was not always available. Another limitation of this report is that direct comparison between countries and territories is difficult because standards in different countries and territories can be mandatory, recommended and/or risk-based. Direct comparison is further difficult and should be approached with caution, as national standards should be developed considering the local context. It must also be kept in mind that countries and territories review their specification for drinking-water quality with a different rhythm than to when updates to the GDWQ are published. However, the values included in the GDWQ and their role in providing orientation to countries and territories is underlined by the number of countries and territories making reference to the GDWQ in their specifications, and in a great many cases specifying GVs.

References and source documentation

Guidelines for Drinking-water Quality. Fourth Edition. Geneva: World Health Organization; 2011: (http://www.who.int/water_sanitation_health/publications/dwq-guidelines-4/en/, accessed 28 November 2017).

Developing Drinking-water Quality Regulations and Standards: General Guidance with a Special Focus on Countries with Limited Resources. Geneva: World Health Organization; in press.

Albania

Law on Regulations for Hygiene-Sanitation for the Control of Quality of Drinking-water, etc.

Decision Nr. 145, date 26.02.1998 approved by Council of Ministers.

Albanian Standard: STASH 3904:1997.

Argentina

Codigo Alimentario Argentino Resolution Conjunta 68/2007 y 196/2007 Modification

Australia

National Water Quality Management Strategy. Australian Drinking-water Guidelines 6 2011

Austria

Verordnung des Bundesministers für soziale Sicherheit und Generationen über die

Qualität von Wasser für den menschlichen Gebrauch (Trinkwasserverordnung – TWV) August 2001

Bangladesh

Water Safety Framework in Bangladesh, Ministry of Local Government, Rural Development and Cooperatives, Government of the People's Republic of Bangladesh. October 2011.

Belarus

Питьевая вода. Г игиенические требования к качеству воды централизованных систем питьевого водоснабжения. Постановлением Главного государственного

санитарного врача Республики Беларусь от 19 октября 1999 № 46

(Sanitary rules and norms "Drinking-water. Hygienic requirements for water quality of centralized drinking-water supply systems".) Decree of the Chief State Sanitary Doctor

The Republic of Belarus October 19, 1999 № 46

Belgium

L'arrêté du Gouvernement de la Région de Bruxelles-Capitale (AGRBC) du 24 janvier 2002 relatif à la qualité de l'eau distribuée par réseau

Le décret du 12.12.2002 (MB 14.01.2003 – err 20.05.2003) – relatif à la qualité de l'eau destinée à la consommation humaine.

Het besluit van de Vlaamse regering van 13 december 2002 houdende reglementeringen inzake de kwaliteit en levering van water bestemd voor menselijke consumptie,

Bolivia

Norma Boliviana NB 512 Agua Potable Requisitos 2004

Botswana

BOS 32 : 2009 Water Quality: Drinking-water

Brazil

Norma de Qualidade da Agua Para Consumo Humano, Portaria No 2914 2011

Cambodia

Drinking-water Quality Standards (Ministry of Industry, Mines and Energy) 2004

Canada

Health Canada. Guidelines for Canadian Drinking-water Quality 2010

Chile

Agua potable - Requisitos. Norma Chilena Oficial NCh409/1.Of2005

China

GB 5749-2006 Standards for drinking-water quality

Taiwan, China

Drinking-water Quality Standards (Drinking-water Management Act) 2009

Colombia

Normas oficiales para la calidad del agua Colombia 1994

Croatia

O Zdravstvenoj Ispravnosti Vode Piće (Ministarstvo Zdravstvai Socijalne Skrbi (1593) (Regulations on drinking-water) 2008, Ministry of Social Welfare

Costa Rica

Reglamento para la Calidad del Agua Potable 2005

Cuba

Agua Potable Requisitos Sanitarios NC 93-02:1997

Cyprus

The Quality of Water Intended for Human Consumption (Monitoring and Control) Law of 2001 (N.87(I)/2001) and Regulations.

Czech Republic

Vyhláška č. 252/2004 Sb. kterou se stanoví hygienické požadavky na pitnou a teplou vodu a četnost a rozsah kontroly pitné vody

Denmark

Bekendtgørelse om vandkvalitet og tilsyn med vandforsyningsanlæg 1) I medfør af § 5, § 8, § 8 a, § 55, stk. 7, § 56, § 57, stk. 2, § 58, stk. 3 og 4, § 59, stk. 1 og 3, § 60, stk. 2, § 69 a, § 71 a og § 84, stk. 2, i lov om vandforsyning mv, jf. lovbekendtgørelse nr. 1199 af 30. september 2013,

Dominican Republic

Decreto 42-05 Establece el Reglamento de Aguas Consumo Humano, Secretaría de Estado de Salud Pública y Asistencia Social (SESPAS) 2005

Ecuador

Norma Técnica Ecuatoriana NTE INEN 1 108:2011Agua Potable Requisitos

Egypt

Decree of Minister of Health No (108) and (301) 1995

El Salvador

Norma Salvadoreña Obligatoria: NSO 13.07.02:08 "Agua.Agua Envasada (Primera Actualizacion)"

Estonia

Joogivee kvaliteedi- ja kontrollinõuded ning analüüsimeetodid

Vastu võetud 31.07.2001 nr 82

Ethiopia

Drinking-water - Specifications ES 261:2001

European Union

Council Directive 98/83/EC on the quality of water intended for human consumption

Fiji

Fiji National Drinking-water Standards 2011

Finland

Terveysministeriön asetus talousveden laatuvaatimuksista 19.5.2000/461

France

Arrêté du 11 janvier 2007 relatif aux limites et références de qualité des eaux brutes et des eaux destinées à la consommation humaine mentionnées aux articles R. 1321-2, R. 1321-3, R. 1321-7 et R. 1321-38 du code de la santé publique

Germany

Verordnung über die Qualität von Wasser für denmenschlichen Gebrauch (Trinkwasserverordnung -TrinkwV 2001)

Ghana

Ghana Standard GS 175-1:2013. Water Quality - Specification for Drinking-water. 4th edition. Ghana Standards Authority.

Greece

Áñ. Öýëëïõ 892 11 Éïõëßïõ 2001

Guatemala

Norma Guatemalteca Obligatoria Agua Potable 2000

Honduras

República de Honduras Ministerio de Salud - Norma Técnica para la calidad del Agua 1995

Hungary

201/2001. (X. 25.) Korm. Rendelet az ivóvíz minőségi követelményeiről és az ellenőrzés rendjéről

Iceland

Reglugerd um neysluvatn 2001

India

Drinking-water Specification Second revision of IS:10500 2012

Indonesia

Nomor 492/Menkes/Per/IV/2010

Iraq

The Standardization's Specification No 417 2001

Ireland

Environmental Protection Agency Drinking-water Regulations 2014

Israel

Public Health Regulations (Sanitary Quality of Drinking-water) 1974 Consolidated Version 2000

Italy

Decreto Legislativo 2 febbraio 2001, n. 31

"Attuazione della direttiva 98/83/CE relativa alla qualita' delle acque destinate al consumo umano"

Japan

Ministerial Ordinance Concerning Drinking-water Quality Standards - 2010

Jordan

Jordan Institute for Standards and Metrology. Technical Regulations: Water – Drinking water; 2008. (286:2008-5th edition)

Kenya

Kenya Bureau of Standards. Specification fir Drinking-water KS 05-459: Part 1:1996

Lao People's Democratic Republic

Decree for drinking-water quality standard in Lao People's Democratic Republic and standard for checking of water resource No 953/MOH. 2003

Latvia

Ministru kabineta noteikumi Nr.235 Rīgā 2003.gada 29.aprīlī (prot. Nr.23 71.§)

Dzeramā ūdens obligātās nekaitīguma un kvalitātes prasības, monitoringa un kontroles kārtība

Lebanon

Ministry of Environment Decree No 52/1 - Standards for the Minimization of Pollution of Air, Water and Soil 2006

Lithuania

Dėl lietuvos higienos normos HN 24:2003 "Geriamojo vandens saugos ir kokebės reikalavimai"

Luxembourg

Règlement grand-ducal du 7 octobre 2002 relatif à la qualité des eaux destinées à la consommationhumaine

Malaysia

National Standard for Drinking-water Quality 2004

Malta

LN23 / 2004 Kwalità ta 'ilma maħsub għal regolamenti konsum tal-bniedem 2004

(LN23/2004 Quality of water intended for human consumption regulations 2004)

Mexico

Modificacion a la Norma Oficial Mexicana NOM-127-SSA1-1994, Salud ambiental. Agua para uso y consumo humano. Límites permisibles de calidad y tratamientos a que debe someterse el agua para su potabilización.

Morocco

Norm Marocaine NM 03.7.001 Qualité des eaux d'alimentation humane 2006

Mozambique

Regulamento sobre a Qualidade da Água para o Consumo Humano 2004

Nepal

National Drinking-water Quality Standards 2005

Netherlands

Wet van 18 juli 2009, houdende nieuwe bepalingen met betrekking tot de productie en distributie van drinkwater en de organisatie van de openbare drinkwatervoorziening (Drinkwaterwet)

New Zealand

Drinking-water Standards for New Zealand 2005 (Revised 2008)

Nicaragua

Norma Regional de Calidad del Agua

Comite Coordinador Regional de Instituciones de Agua Potable y Saneamiento de Centroamerica, Panama y Republica Dominicana – Capre 1994

Nigeria

Nigerian Standard for Drinking-water Quality NIS 554: 2007

Norway

FOR 2001-12-04 No 1372: Forskrift om vannforsyning og drikkevann

Oman

Omani Standard No 8/2006 Unbottled Drinking-water

Pakistan

National Standards for Quality Drinking-water 2009

Panama

Reglamento Técnico DGNT-COPANIT 23-395-99 Agua, Agua Potable Definiciones y Requistos Generales

Paraguay

Ley General del Marco Regulatorio y Tarifario del Servicio de Agua Potable y Alcantarillado Sanitario Ley No 1.614/2000

Peru

Reglamento de la Calidad del Agua para Consumo Humano. DS No 031-2010-SA

Philippines

Philippine National Standards for Drinking-water 2007

Poland

Rozporządzenia Ministra Zdrowia z dnia 29 marca 2007r. W sprawie jakości wody przeznaczonej do spoŜycia przez ludzi (Dz. U. Nr 61, poz. 417)

Portugal

Ministério do Ambiente, do Ordenamento do Território e do Desenvolvimento Regional

Decreto-Lei no 306/2007 de 27 de Agosto

Romania

Lege nr 458(r1) din 08/07/2002. Privind calitatea apei potabile

The Russian Federation

II.Предельно допустимые концентрации (ПДК) химических веществ в воде водныхобъектов хозяйственно-питьевого и культурно-бытового водопользования (Permissible concentration (MPC) of chemicals in the water for drinking, cultural and domestic use) Resolution of the Sanitary Inspector of the The Russian Federationn Federation (30.04.2003 Moscow № 78 Овведении в действие ГН 2.1.5.1315-03)

Rwanda

Potable Water - Specification. Rwanda Standard RS435:2009 Rev 1:2011

Samoa

Samoa National Drinking-water Standards 2008

Sierra Leone

Draft Guidelines for Drinking-water Policy (Water Supply and Sanitation for Sierra Leone, United Nations Economic Commission for Africa) 2007

Singapore

Environmental Public Health (Quality of Piped Drinking-water) Regulations 2008

Slovakia

Zbierka zákonov č. **496**/2010 ktorým sa mení a dopĺňa nariadenie vlády Slovenskej republiky č. 354/2006 Z. z., ktorým sa ustanovujú požiadavky na vodu určenú na ľudskú spotrebu a kontrolu kvality vody určenej na ľudskú spotrebu

Slovenia

Rules on water intended for human consumption. Based on the Act Regulating the Sanitary Suitability of Foodstuffs, Products and Materials Coming into Contact with Foodstuffs (Official Gazette of RS, no. 52/00 and 42/02),

Spain

Real Deccreto 140/2003, de 7 Febrero, por el que se establecen los criterios sanitarios de la calidad del agua de consume humano

South Africa

South African National Standard SANS241:2011 Drinking-water

Republic of Korea

Management of Drinking-water Act 2008

Sri Lanka

Sri Lanka Standards for potable water - SLS 614, 198

Sudan

Drinking-water Standard ICS 13.060.00 2002

Suriname

Anteproyecto de Ley 2003

Sweden

Livsmedelsverkets föreskrifter (SLVFS 2001:30) om dricksvatten

Syrian Arab Republic

Syrian Arab Republic - Drinking-water Quality Standards 1994

Switzerland

Criterès d'appréciation pour l'eau de boisson: composition chimique; composition microbiologie. SCVA VD / Inspection des eaux. Juillet 2008

The United Republic of Tanzania

TZS 789:2003 - Drinking (potable) water - Specification

Thailand

Notification of the Ministry of Industry, No. 322, B.E. 2521 (1978), issued under the Industrial Products Standards Act B.E. 2511 (1968)

Tunisia

Project of Tunisian Standard PTS 14.09 (1993)

Turkey

İnsani Tüketim Amaçli Sular Hakkinda Yönetmelik (Regulations on water for human consumption) 2005

Uganda

Uganda Standard US 201:2008 Drinking (potable) water - Specification

Ukraine

Гигиенические требования к воде питьевой, предназначенной для потребления человеком (ГСанПиН 2.2.4-171-10) (Hygienic requirements for drinking-water intended for human consumption) (GCanPiN 2.2.4-171-10): 2008

United Arab Emirates

The Water Quality Regulations (Fourth Edition) 2014. The Regulation and Supervision Bureau for the water, wastewater and electricity sector in the Emirate of Abu Dhabi.

United Kingdom

The Water Supply (Water Quality) Regulations 2000 (England and Wales) (Similar Regulations apply in Scotland and Northern Ireland)

Uruguay

Agua potable - Requisitos, Instituto Uruguayo de Normas Técnicas 833:2008

USA

National Primary Drinking-water Regulations 2009

Venezuela

Normas Sanitaias de Calidad del Agua potable 1998

Viet Nam

Nước cấp sinh hoạt - yêu cấu chất lượng TCVN 5502 : 2003 (Domestic supply water - Quality requirements)

West Bank and Gaza Strip

Palestine Standard 41 1997

Zambia

ZS 190:2010, ICS 13.060.20 (Drinking-water Quality - Specification), Zambian Bureau of Standards

For more information, contact:

Water, Sanitation, Hygiene and Health

World Health Organization

20, Avenue Appia

1211 Geneva 27

Switzerland

E-mail: gdwq@who.int

http://www.who.int/water_sanitation_health/water-quality/en/