

Summary report of Hungary in accordance with article 7 of the Protocol on Water and Health

Executive summary

Please provide an overall evaluation of the progress achieved in implementing the Protocol in your country during the reporting period. Please provide a short description of the main steps taken and highlight important achievements, key challenges, success factors and concrete good practice examples.

Suggested length: maximum 2 pages

Hungary ratified the Protocol on Water and Health in 2001, and the ratification was officially published in 2005 in the Government Journal (Government Decree 213/2005). The implementation is the joint task of the ministers responsible for environment and health, and an intersectorial body, the Expert Committee on Water and Health was established to coordinate work under the Protocol. As of 2014 the Committee has been operating as a panel of experts. The expert panel is responsible not only for the Protocol, but as an intersectorial platform it also contributes to other tasks in the fields of water and health, e.g. GLAAS reporting.

National targets were set in 2008 and revised in 2010. After 2010, the expert panel, typically as part of the country report, revised the earlier targets, evaluated the progress, and set new targets if necessary. The revised targets did not receive government approval earlier, but in the current reporting cycle the goal is to have a broader public participation and official approval for the targets. The Report includes the progress towards relevant earlier targets and the targets of the previous reporting cycle, along with the planned new targets indicating the baseline situation and rationale.

The targets are connected to the water and health targets of the relevant national strategies, such as the National Water Strategy (2017), the 4th National Environment Protection Programme (2015-2020), and the National Climate Change Strategy (2018). There are two other factors that determine future target setting. One is the COVID-19 pandemic: although it is not a waterborne disease, its prevention relies on adequate water supply and hygiene practice. The other is the issue of the (EU)2020/2184 on the quality of water for human consumption (recast Drinking Water Directive) that came into force in January of 2021. The recast Directive generates new obligations in many priority areas, including water quality, improving equitable access, the performance of water distribution systems, the protection of drinking water resources, and recognised good practices in drinking water supply. The new targets will reflect these new obligations.

The national targets cover most of the Protocol's priority areas. Drinking water quality has not changed significantly since the last reporting cycle. Non-compliance of arsenic, boron, fluoride, nitrate, and ammonium of water resource origin have been resolved in nearly every settlement by 2019, as a result of the Water Quality Improvement Programme. A national survey was carried out on lead exposure via drinking, indicating potential risk of lead exposure in historic areas of Budapest and other large cities. Further drinking water quality improvement targets will focus on new pollutants and secondary drinking water quality deterioration in the water distribution system.

The incidence of waterborne diseases in Hungary is low. There was no significant waterborne outbreak since the last reporting cycle, only small, sporadic clusters of legionellosis were detected. The electronic infectious disease reporting system allows for the faster detection of and immediate response to water-borne infections. Hungary developed a wastewater monitoring based early warning system for tracking the COVID-19 pandemic.

Hungary assessed equitable access to safe drinking water and sanitation in 2016 using the Scorecard on Equitable Access to Water and Sanitation. The connection rate to public utility drinking water supply reached the highest economically feasible level, 95% increased to 82.8% for centralised sewerage. National targets are being developed in accordance with the transposition of the recast Drinking Water Directive.

Water safety planning is a legal obligation for all drinking water supplies; its uptake was extended to small supplies in the past triennium. By the end of 2018, practically all public supplies (~1500) operated under a water safety plan. Based on the experiences since the introduction of the legal obligation, new guidelines were published for developing and auditing water safety plans. Future work will focus on reducing the risks of private wells and in accordance with the recast Drinking Water Directive, will have a greater emphasis on risk assessment of water resources and domestic distribution system of buildings.

Developments in sanitation cover several priority areas: the completed investments in large agglomerations increased the number of connections, reduced the volume of untreated wastewater discharge almost to zero, and contributed to good management practices. Where public utility sewage treatment is not economically feasible, the decentralised systems are planned using cost-efficient, environmentally sustainable solutions.

The protection of drinking water resources is an on-going task, and extends to the next triennium. Surface waters used for bathing or for aquaculture require further research to identify the reasons behind fluctuating water quality and to assess the impact of human use. In case of pools and spas, better water quality can only be achieved by improving both operational practices and bather habits by legislative tools and awareness raising.

Water management in Hungary is subject to continuous improvement. The revised River Basin Management Plan of Hungary (RBMP3, 2021) that was adopted by Government Order 1242/2022 on 28th April, provides an even clearer picture on the chemical and ecological status of surface water bodies and the quantitative and qualitative status of groundwater. Based on the previously identified significant water management problems, RBMP3 outlines measures and interventions to achieve the targets under the Water Framework Directive. The remediation of the identified contaminated sites is one of these measures. Strengthening water retention and developing integrated municipal water management in line with the requirements of the Water Framework Directive (on good ecological status) are strategic priorities.

Communication of water quality and water related risks towards the public improved significantly. The 1st Climate Change Action Plan contains the water management targets corresponding to the national priority area of climate adaptation.

Hungary also engaged on international level in the implementation of the 2020-2022 Programme of Work under the Protocol by co-leading two programme areas: PA3 on Institutional water, sanitation and hygiene with Georgia and Moldova, and PA6 on Equitable access to water and sanitation with France. Hungary also contributed to the assessment of the

status of legionellosis in the pan-European region and was the virtual host of the expert meeting on the topic.

Hungary is also active in global water policy: after the third Water Summit in 2019, Budapest hosted the Planet Budapest Sustainability Expo and Summit, where the importance of international cooperation on water was also an important theme.

Hungary also takes a leading role in promoting and supporting the global opening of the Water Convention by taking an active role in the leadership and task force of the convention. Along with the Philippines, Hungary is a founder of the Group of Friends in Support of Water, Sanitation, and Hygiene (WASH) in Healthcare Facilities.

In 2019, Hungary chaired the International Commission for the Protection of the Danube River (ICPDR). Hungary is also the co-coordinator of the priority area on water quality and environmental risks under EU DSR, involving 14 countries of the Danube catchment since 2011. In this role, Hungary is the instigator and participant of several international projects.

Part one

General aspects

1. Were targets and target dates established in your country in accordance with article 6 of the Protocol?

Please provide detailed information on the target areas in part two.

YES NO IN PROGRESS

If targets have been revised, please indicate the date of adoption and list the revised target areas. Please provide detailed information in part two.

The targets are revised regularly by the Expert Group on Water and Health, the intersectorial body (working group), which is responsible for the implementation of the Protocol in Hungary, usually in connection with the country report. Progress towards the targets is evaluated during the revision and, if necessary, new targets are set, along with target dates and the responsible bodies. The relevant sections of Part 2 contain the proposed new targets. Previously the revised targets were not officially approved by the government, but during this cycle new targets are planned to be officially recognized and published after a broad public consultation. Targets in related national strategies (e.g. National Climate Change Strategy, National Environment Protection Programme) have already received official approval.

2. Were targets and target dates published and, if so, how?

Please explain whether the targets and target dates were published, made available to the public (e.g., online, official publication, media) and communicated to the secretariat.

Previously adopted targets (2008) and the first revision (2010) were published on the dedicated website of the Protocol. It was communicated to the joint secretariat, and it was also uploaded to the UNECE Protocol on Water and Health page. The revised targets will be published and communicated to the secretariat following government adoption.

3. Has your country established national or local arrangements for coordination between competent authorities for setting targets? If so please describe, including information on which public authority(ies) took the leadership and coordinating role, which public authorities were involved and how coordination was ensured.

The Government Decree 213/2005 (X.5.) on the ratification the Protocol appointed the ministers responsible for health and environment to lead the national implementation. The responsibilities related to water and health are shared between several government actors: the Ministry of Human Capacities (health and social aspects) and its background institution, the National Public Health Centre (public health, drinking and bathing water quality), the Ministry of Interior (water resource and water utility management) and its background institutions, the General Directorate for Water Management (water management, surface and groundwater quality) and General Directorate for Disaster Management (water disaster management and protection), the Ministry of Agriculture (environment protection, remediation of contaminated sites), the Ministry of Innovation and Technology (water utility improvement programmes), the Ministry of Foreign Affairs (international cooperation), the Hungarian Energy and Public Utility Regulatory Authority (water tariffs), and the Hungarian Central Statistical Office (monitoring of indicators). On local level, the public health departments of the county and district Government Offices and the county Disaster

Management Directorates are involved in the implementation of water and health related interventions.

Representatives of the above organizations form a working group (formerly termed the Special Committee on Water and Health) to coordinate the implementation of the Protocol. The working group is also a platform for cooperation in other related activities which require intersectoral cooperation, such as the preparation of the GLAAS report. The working group is led by the National Public Health Center (appointed by the Ministry of Human Capacities), which convenes working group meetings according to the current tasks. Non-government organizations also participate in the working group: the Hungarian Waterworks Association, the Hungarian Water Association, the Hungarian Pool and Spa Association and the Global Water Partnership Hungary.

4. Was a programme of measures or action plan developed to support implementation of the targets? If so, please briefly describe that programme or plan, including how financial implications were taken into account.

There is no comprehensive action plan to support the implementation of the targets. Each ministry or organisation individually designs and carries out interventions within its area of responsibility. However, many of the previous and revised targets are in line the actions outlined in the National Water Strategy (adopted in 2017) and Action Plan of the 3rd River Basin Management Plan (revised in 2021). The Széchenyi 2020 Operative Programs support various water management programs (e.g. wastewater collection and treatment and drinking water quality) projects. The adaptation strategy of the Second National Climate Change Strategy and the Climate Change Action Plan also contain relevant elements related to water and agriculture. The implementation of the 4th National Environmental Programme (2015-2020), which placed high emphasis on environmental measures related to water and human health, also contributed to the achievement of the targets. Many of the new targets will be included in the next, 5th National Environmental Programme, which is pending clearance.

Those actions which are adopted by legislative acts are circulated between ministries, available to the public on the government website prior to their adoption, and accompanied by impact assessment and financial analysis (for RBMP3, impact assessment is available at https://vizeink.hu/wp-content/uploads/2021/07/VGT3_SKV18.pdf).

5. What has been done in your country to ensure public participation in the process of target setting in accordance with article 6, paragraph 2, and how was the outcome of public participation taken into account in the final targets set?

Hungary – in addition to its obligation under the Protocol – is committed to ensuring public participation, being party to various international treaties, such as the Aarhus Convention and of the treaties establishing the European Union. In the target setting process, public involvement was mostly through professional associations, such as the Hungarian Water Utility Association. These organizations have internal information on the challenges and deficiencies of the sector, thus their involvement in defining targets and the potential means of improvements is indispensable. Non-government organizations (e.g. human rights or environmental protection societies) also provide a complementary viewpoint.

The general public receives information, but does not provide input for the target setting process. Information on water and health related topics is available from the website of various ministries and their background institutions.

6. Please provide information on the process by which this report has been prepared, including information on which public authorities had the main responsibilities and what other stakeholders were involved.

The report request from the Secretariat was sent to the Ministry of Interior, Ministry of Agriculture and the Ministry of Human Capacities. The main responsibility of Protocol implementation and reporting lies with the Ministry of Human Capacities, and the task of coordinating the reporting process was delegated to the National Public Health Center, in accordance with previous practice. The National Public Health Center prepared a working document containing the previous and the proposed target. The working document was distributed to working group members by the Ministry of Human Capacities with an invitation to provide input. The following organisations were addressed:

- Ministry of Interior and its background institutions (General Directorate of Water Management and National Directorate General for Disaster Management)
- Ministry of Agriculture and its background institutions (National Agricultural Research and Innovation Centre, National Food Safety Authority)
- Ministry of Innovation and Technology
- Hungarian Energy and Public Utility Regulatory Authority
- Hungarian Central Statistical Office
- Office of the Commissioner for Fundamental Rights
- Hungarian Water Utility Association
- Ministry of Foreign Affairs (provided comments on the draft country report)

The National Public Health Center now includes the former National Centre for Epidemiology. The following departments were addressed within the National Public Health Center: Department of Epidemiology, Department of Public Health, Department of Public Health Laboratories.

The organizations mainly relied on previously compiled and analysed data, such as for example:

- Drinking water quality reports from the water utilities and public health offices
- Annual reports from public health authorities
- Bathing water quality reports from the laboratories
- Child and youth hygiene reports
- Survey on the environmental health status of hospitals (within the framework of WHO BCA)
- Surface and subsurface quality data from the Water Directorates
- Water use data from yearly statistical reports
- Communicable disease reports
- Census reports

If data was not available, it was requested from the responsible organizations. Contributions were sent to the National Public Health Center for the compilation of the report. The report was submitted through the Ministry of Human Capacities for Government approval.

Data compiled for recent international reporting (GLAAS and JMP) were also used for the report.

All stakeholders providing data for the report were invited to report on further progress in the previous target areas (where applicable) and to provide rationale and baseline information for the proposed revised targets within their area of responsibility.

7. Please report any particular circumstances that are relevant for understanding the report, including whether there is a federal and/or decentralized decision-making structure.

There were no special circumstances.

Part two

Targets and target dates set and assessment of progress

For countries that have set or revised targets and target dates, please provide information specifically related to the progress towards achieving them. If you have not set targets in a certain area, please explain why.

For countries in the process of setting targets, please provide information on baseline conditions and/or targets considered under the relevant target areas.

Suggested length: one page (330 words) per target area.

I. Quality of the drinking water supplied (art. 6, para. 2 (a))

Target 1: To supply 96 % of the population with chemically compliant drinking water. Target date: 2015. National level target. Intermediate target: To supply 80 % of the population with chemically compliant water by 2010.

Baseline situation: Drinking water quality in Hungary is regulated by Government Decree 201/2001 (X.25) implementing the European Union (EU) Directive 98/83/EC. In 2010, over 15 % of the population was supplied with drinking water that was non-compliant with the parametric values of arsenic, boron, fluoride, nitrite or nitrate, and over 30 % was non-compliant for some chemical indicator parameters (iron, manganese, ammonium, hardness). The most relevant of these (both in the scale of the problem and its health risk) was the arsenic exceedance in drinking water. The primary target therefore was to achieve full compliance with the national and EU requirements in the public utility supplies by 2015.

Actions and progress: The first National Drinking Water Quality Improvement Programme was launched in 2007. Its priority was the reduction of arsenic, boron and fluoride in the supplied water and the prevention of nitrite formation in the water treatment plant or the distribution system by the removal of ammonium from the source water. Until projects were completed, the local public health authorities ordered temporary actions to reduce arsenic

content and to provide safe water from alternate supply (mobile installations for arsenic removal or water delivery trucks). Most improvement projects were finalized by the end of 2020, in 11 municipalities the developments are still ongoing. The remaining problems are planned to be solved by mid-2022. Based on the 2020 water quality data, ammonium in drinking water is no longer a problem. The intermediate target was reached by 2012 and the final target was reached by 2017 (Figure 1a). Due to the complex improvements, ammonium, iron and manganese non-compliance also decreased (Figure 1b), but further improvement is needed for full compliance, focusing mainly on the reconstruction of distribution network.

The operation of newly installed technologies is still a challenge for some operators. Advancement of good operational practices, use of risk-based approach in practice (see chapter VII, water safety planning) is likely to be achieved in the near future.

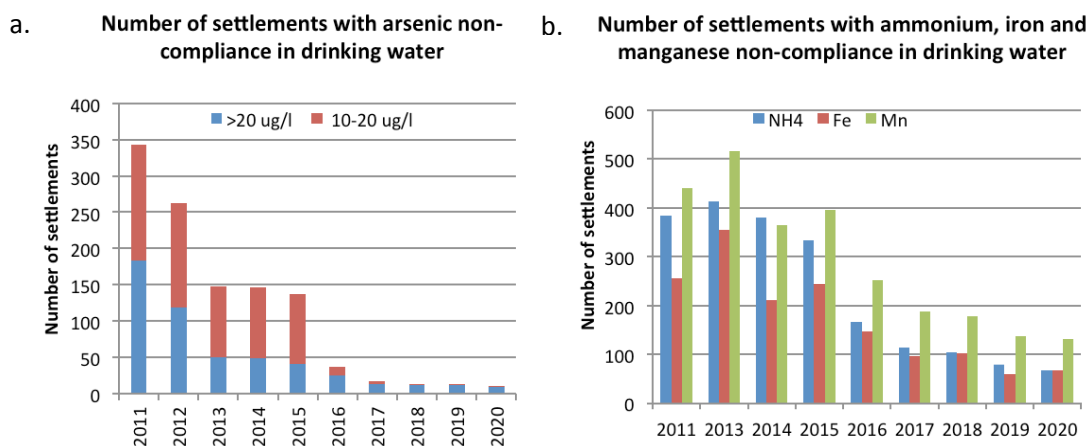


Figure 1. The number of water supply zones non-compliant with the national parametric value for arsenic (a) and ammonium, iron and manganese (b) in Hungary between 2011 and 2020.

Target 2: To reduce microbiological non-compliance in small water supplies (served population less than 5000). (Numerical target and target date was not set.)

Baseline situation: In Hungary, the number of water supplies supplying less than 5,000 people or 1000 m³/day is 2788 (95%), and they supply drinking water to almost half of the population (approximately 4 million people). One million people are supplied from systems under 100 m³/day. According to the National Drinking Water Database, the incidence of microbiological non-compliance in small water supplies is significantly higher than in large supplies, due to the more frequent use of unprotected water sources, lack of water treatment technologies, and the lack of sufficient resources for the adequate operation of the water distribution system and the treatment technology. Microbiological non-compliance in large and small water supply systems in 2019 is illustrated in Figure 2.

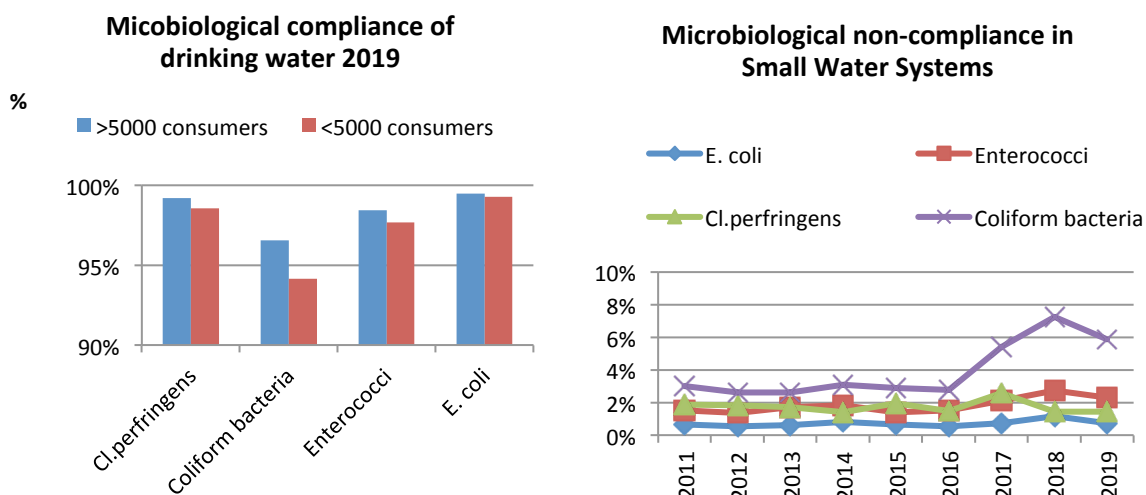


Figure 2. Microbiological water quality of Hungarian water supply systems (a) percentage of compliant water samples in large (>5000 consumers) and small (<5000 consumers) water supplies (b) changes in microbiological non-compliance between 2011 and 2019.

Actions and progress: Microbiological quality of small water supplies has not changed significantly in recent years. We expect measurable improvement in the water quality of small water supplies, especially of indicator and microbiological parameters, from the uptake of risk-based approach in operation. The requirement for risk-based operation applies also to small water supply system since 2017 (see chapter VII). However, the transposition of the approach into operational practice is time-consuming, and in most water supply systems, especially in small ones, it has not yet been realized, thus its impact on microbiological water quality will be more pronounced in the future (Figure 2).

Aging of the distribution networks is also a significant factor in microbiological quality, especially in the case of small water supplies. Improvement in the secondary contamination (bacterial regrowth) of drinking water can only be expected as a result of a significant major reconstruction program.

Targets set in the previous reporting cycle

Target 1: National risk assessment of lead in drinking water. Target date: 2021. Responsible agency: Ministry of Human Capacities, National Public Health Centre

Rationale and baseline situation: The lead concentration of tap water in Hungary is regularly monitored in accordance with the drinking water quality legislation. Based on the results, compliance was on average 98-99% between 2017-2019. However, this only represents the quality of supplied drinking water. Previous targeted studies indicated that in certain areas, mainly historic city centers, non-compliance is more common. Investigative monitoring is necessary in order to identify, the affected area, and the size of the population exposed to lead via drinking water.

Actions and progress: The planned investigative monitoring was implemented within the framework of the EFOP 1.8.0-VEKOP-17-2017-00001 projekt titled "The technical and methodological development of the health-care system" between 2017-2020 by the National Public Health Center. The basic unit of the investigation was the municipality, if it had fewer than 5000 inhabitants, or districts in larger cities. Units were sorted into 54 categories based

on four factors (type of settlement, lead risk in the distribution system, lead risk within the buildings, municipal water quality). At least one unit from each category was selected for sampling. Sampling was carried out for six months in a total of 58 sites in randomly selected buildings. Based on the results, the risk level of each area was calculated. In large municipalities, risk levels were determined by blocks of buildings. A searchable risk map that was developed (<https://efop180.antsz.hu/temak-konyezetegeszsegugy/olom-az-ivovizben/olomkockazati-terkep.html>). Results indicate that nationally approximately 80 000 buildings are high or very high risk for lead exposure, which affects approximately 746 000 individuals mainly in Budapest and other large cities.

The project ended in September of 2020. Information materials, guidelines, and risk calculation aids were developed. Potential solutions for mitigating lead exposure were also evaluated (e.g. water filter jugs) and opportunity was provided for pregnant women, families raising young children, and those living in the affected areas to have their tap water tested free of charge.

Target 2: A national survey of pollutants of geological origin in groundwater drinking water sources. Date: 2022. Responsible agency: NPHC, Ministry of Interior

Rationale and baseline situation: European Union and national legislation on drinking water quality and water resource protection requires monitoring of nearly 150 different parameters from drinking water and drinking water abstraction wells. These do not include the analysis of certain metals of geological origin. Most of these monitored parameters serve to indicate anthropogenic contamination. In the absence of a legal obligation for monitoring and reporting, limited information is available on the presence of naturally occurring metals. However, there are many natural elements that have a direct (favourable or unfavourable) impact on consumers' health. The prevalence and concentration of these compounds in the deep aquifers is primarily determined by geological conditions. The uptake of risk based approach in water quality monitoring in Hungary necessitates investigative monitoring of previously overlooked compounds.

Actions and progress: Between 2018-2021, the National Public Health Centre in cooperation with the drinking water suppliers initiated a survey on the prevalence and concentration of previously not tested metals in the majority of domestic drinking water supply systems (~80%). The survey covers both the raw water and the supplied water; more than 2300 samples have been analyzed. The tested metals were lithium, beryllium, boron, sodium, magnesium, potassium, calcium, titanium, vanadium, cobalt, zinc, selenium, molybdenum, barium, and uranium. Evaluation of the results and health impact assessment is expected to be completed in 2022.

II. Reduction of the scale of outbreaks and incidents of water-related disease (art. 6, para. 2 (b))

Target: general target to reduce and prevent water related infections. Target date: continuous.

Baseline situation: The incidence of traditional drinking waterborne outbreaks is low in Hungary, due to the high access to public water supply and centralized sewerage. Smaller public water supplies where the protection of the catchment is inadequate, and the population

without access to piped water are at higher risk. There were no significant waterborne outbreaks between 2019-2021.

Domestic distribution systems in buildings are often neglected risk areas. Among the pathogens associated with premise plumbing, *Legionella* sp. is responsible for most cases. Though the number of cases in Hungary is low (6-10 cases/1 million inhabitants/year), the government adopted a ministerial decree (49/2015 (XI. 4.) Decree of the Ministry of Human Capacities) on public health requirements of Legionella risk environment as a proactive measure to prevent outbreaks. Under the Decree, all public facilities are required to assess the risk of *Legionella* colonisation, and priority premises (healthcare and longterm-care facilities, hotels, aerosol generating pools and cooling towers) are subject to monitoring obligation. The implementation of the regulation was supported by the development of a guidance document by the National Public Health Centre (https://www.nnk.gov.hu/attachments/article/950/Modszertani%20level_Legionella_2021.pdf). The document includes a step-by-step guide on risk assessment and risk management including survey templates for the assessment of good operational practices. Training sessions were organised on risk assessment (participants were facility operators and risk assessment professionals) and on risk assessment auditing for the local public health offices.

Action and progress: Healthcare facilities are the highest risk environments due to the presence of immunocompromised patients. Chemical water treatment was installed in many facilities for *Legionella* prevention. The efficiency of the on-site water treatment is under assessment. With regard to *Legionella* risk mitigation, it is evident that since the introduction of the corresponding ministerial in 2016, both service providers and the authorities gained experience in risk assessment. Reports of the public health authority indicate fewer instances of non-compliance every year.

The recast Drinking Water Directive addresses risk management in the domestic distribution systems and specifically the risk of *Legionella*. The relevant Hungarian legislation will have to be updated accordingly. Development of new guidance materials for water professionals and the general public aiming at *Legionella* risk reduction of smaller, private facilities will be an important part of the regulatory updates. These guidance materials addressing professionals working with water distribution system and the general public should describe *Legionella* risk of private water systems and the options for risk reduction in a concise, easy-to-understand manner.

Further guidance documents were developed by the National Public Health Centre on infection control for the prevention of waterborne infections (<http://www.oek.hu/oek.web?to=16&nid=444&pid=1&lang=hun>):

- Legionnaire's disease and its prevention
- Infection control in dialysis centres
- Infection control in dentistry
- Prevention of infections by multiresistant pathogens.

Targets of the previous reporting cycle

Target 1: Baseline analysis of water, sanitation and hygiene (WASH) in healthcare facilities and definition of national advanced targets. Target date: 2020. Responsible agencies: Ministry of Human Capacities, National Public Health Centre.

Rationale and baseline situation: There are several global initiatives which call for improving WASH in healthcare facilities, including Sustainable Development Goals (6.1, 6.2 and 3.9), the WHO resolution on WASH in healthcare facilities and the Ostrava Declaration. In Hungary, piped water supply and centralized sewerage is available in every healthcare facility, but the 2018 reporting under the Joint Monitoring Programme revealed that there is no reliable data of national coverage on the WASH conditions. Therefore it is necessary to carry out a survey to set the baseline and define the advanced level targets required under SDG 6.1 and 6.2.

Actions and progress: Water, sanitation and hygiene situation of healthcare facilities was assessed under the bi-annual cooperation agreement (BCA) for 2018/2019 of the Ministry of Human Capacities and WHO Regional Office for Europe. The assessment was carried out by the NPHC including the review of the regulatory environment and scientific evidence the literature, as well as self-reporting survey completed by inpatient care facilities. According to the results of the assessment, most areas (with the exception of menstruation hygiene) are regulated in legislation, standards or guidelines, but further measures are necessary to monitor implementation. Scientific literature focuses mainly on antimicrobial resistance and infection control, in other areas there is limited available evidence. The questionnaire survey confirmed that basic service according to the JMP definition is almost fully achieved in drinking water supply, environmental cleaning, and waste management. In field of sanitation, the number of toilets accessible with limited mobility and suitable for menstruation hygiene management should be increased, and in hand hygiene, consumables (soap and hand sanitiser) should be ensured to meet the definition of basic service in 100%. The survey was completed before the COVID-19 pandemic. During the pandemic, the number of hand hygiene points increased along with the use of hand disinfectants both in healthcare institutions and in other public places. A similar survey now would probably yield better results.

Target 2: Reduction of water related nosocomial infections through the development of guidance on WASH in healthcare facilities. Target date: 2023. Responsible agency: Ministry of Human Capacities, National Public Health Centre

Rationale and baseline situation: A pilot survey on environmentally sustainable healthcare facilities in 2016 revealed that there is limited awareness in healthcare facilities on the potential role of the environment as a reservoir and transmitter of nosocomial pathogens. Health care institutions with individual wells (26 facilities) were investigated further in 2017: 69 % used drinking water from their own wells and 31 % mixed water of centralized supply and own wells. More than half of the institutions (58%) supplied fewer than 500 people. 73% of institutions used some kind water treatment (most often iron and manganese removal), 74% had permanent disinfection, and 13% had intermittent disinfection. Only a small percentage of institutions (8%) had a water safety plan and 46% were in the process of developing WSP. Water quality non-compliance was higher than in public supplies, coliforms were the most frequent cause of microbiological non-compliance (25 %), but occasional non-compliance was observed due to the presence of *E. coli*, *Enterococcus* and *Clostridium perfringens*. Of the chemical parameters, manganese exceedance was the most frequent (46%), but arsenic and nitrite non-compliance, as well as iron and ammonium were common. A collection of

good operational practice was compiled as a response to the first survey outcome, but further elaboration on WASH aspects is necessary.

Actions and progress: The baseline survey (see previous target) forms the basis of the development of the guideline of WASH requirements. The guideline, due to the pandemic, is only expected to be completed by 2023.

Proposed target

Development of a methodology guideline on reducing the risks of the internal drinking water pipe systems of buildings. Strengthening public information. Assessing the lead risk of childcare facilities. Target date: For developing a comprehensive national methodology: 2027. Public information materials: 2029. Assessing childcare facilities: 2029. Responsible agency: Ministry of Human Capacities. National Public Health Centre

Rationale and baseline situation: The primary source of certain drinking water pollutants (metals, organic materials, microorganisms) is the water distribution systems and their concentration can change significantly within the system. Of the parameters associated with secondary water quality deterioration, lead is mainly harmful to children, therefore the assessment of the lead risk in the drinking water of childcare facilities is vital for the adequate planning of risk reduction interventions. The risk assessment of building plumbing systems also emerges as a new task under the recast Drinking Water Directive. Quality deterioration in the premise plumbing systems can be primarily linked to sections in the systems that are the responsibility of the buildings' owners; therefore information of the residents is also important.

III. Access to drinking water (art. 6, para. 2 (c))

The target dates of the previous targets have expired, but the revised targets reappear as new targets.

Target 1: Development of an action plan based on the outcomes of the Scorecard Assessment. Target date: 2023. Responsible agency: Ministry of Human Capacities.

Baseline and rationale: On December 22, 2020 the European Parliament and Council passed Directive 2020/2184 on the quality of water intended for human consumption (recast). The transposition of this Directive into Hungarian regulation is still in progress, but actions and responsibilities aimed at improving access will be featured strongly. One of the main goals of the new regulation is to improve access to drinking water of groups that have limited or no access. The safest form of drinking water provision and the one with the lowest public health risk is public utility water service. The level of access among those with limited access or no access to public utility has to be assessed and programs and actions need to be developed to improve their access. Informing the public of the potential risks of public utility water supply and the ways of reducing the risks is of key importance. Particular attention must be paid to pregnant women and parents raising small children. Development of the regulation is based in part on the survey conducted in 2016 using the Equitable Access to Water and Sanitation Scorecard. The Action Plan will be developed after the regulation has been adopted.

Target 2: Revision of tariff policy, tariff structure and tariff support system to ensure affordability and full cost recovery in the water utility sector. Target date: 2022.

Responsible agency: Ministry of Innovation and Technology, Hungarian Energy and Public Utility Regulatory Authority.

Baseline and rationale: The National Water Strategy lists safe, high quality, affordable and sustainable public utilities as one of its key objectives. One of the main prerequisites for this is to establish financial conditions for safe operation, the framework of which is set out in the National Water Utility Strategy. The Government Decision 1828/2021 (30.11.2021) on the measures necessary for the enabling conditions of the National Water Utility Strategy has been adopted.

Target 3: Tracking progress towards equitable access by the repeated application of the Scorecard. Target date: 2024. Responsible agency: Ministry of Human Capacities, National Public Health Centre.

Baseline and rationale: The assessment was originally planned to be repeated in 2021, five years after the original baseline assessment. However, this was not realised due to COVID-19 pandemics. Since the recast Drinking Water Directive sets new obligations on access to drinking water, it is more reasonable to carry out the assessment after its transposition enters into force.

IV. Access to sanitation (art. 6, para. 2 (d))

Target: Collection and treatment of communal sewage by biological treatment, nitrogen and phosphorous removal in incremental steps:

- 1. In agglomerations over 10000 person equivalents (PE) on sensitive areas, target date: end of 2008,**
- 2. In agglomerations over 15000 PE, target date: end of 2010,**
- 3. In agglomerations between 2000-15000 PE, target date: end of 2015.**

National level target.

Actions and progress: The situation of waste water collection and treatment is constantly improving due to investment projects on sewerage systems. The proportion of households connected to public sewerage system increased to 82.8% by 2020. The length of the public sewerage system exceeded 52,000 km in 2020. The difference between the number of households with public utility drinking water supply and sewerage system (utility gap) was 12.2% in 2020. Tertiary treatment is in place in every wastewater treatment plant in the designated sensitive catchment areas.

Targets set in the previous reporting cycle:

Target 1: Development of wastewater treatment in agglomerations below 2000 PE. Target date: 2030. Responsible agency: Ministry of Interior, Ministry of Innovation and Technology.

Wastewater treatment in settlements of less than 2,000 inhabitants is necessary for the implementation of SDG 6.2 and 6.3 Sustainable Development Goals and contributes to the

protection of aquatic habitats (SDG 6.6). Though 91/271/EEC Directive on urban wastewater treatment (UWWTD) does not set an obligation or deadline for wastewater treatment in settlements under 2000 PE, this initiative is in line with the requirements of the 2000/60/EC Water Framework Directive to reduce water pollution and to achieve and maintain good ecological status in order to improve water quality and public health. The aim is to ensure the adequate treatment and safe disposal of wastewater in all settlements in accordance with current requirements.

As of 1st January 2021, the number of municipalities in Hungary with less than 2,000 inhabitants is 2,377 (with a total population of 1,658,304 people). 1142 of these municipalities under 2000 inhabitants are included in the National Wastewater Collection and Treatment Implementation Program, with a total population of 984,482 people. Wastewater treatment in these municipalities have already been solved or is in the process of being solved.

Hungary is assessing the possibility of up-to-date wastewater treatment and decentralised wastewater treatment solutions in municipalities with less than 2,000 inhabitants. Planning of the national program began in 2022.

Due to the specificities of the small settlements, cost efficiency of conventional wastewater treatment needs to be evaluated. The fundamental environmental protection and water management requirement for the installation and operation of cost efficient and environment friendly, professional individual wastewater treatment facilities is to ensure that the quality of surface- and groundwater does not deteriorate. Based on the preliminary environmental and water resource protection studies, it will be necessary to install sewerage system and local or regional wastewater treatment plants in the vast majority of the municipalities affected by the remaining investments. For solving wastewater issues in small municipalities, a pilot project is planned to install sewerage and wastewater treatment in 23 municipalities in the 2021-2027 project planning cycle.

Target 2: Reducing the water utility gap below 10%. Target date: 2023. Responsible agency: Ministry of Innovation and Technology.

After significant developments of water utilities realized in the last decade, drinking water supply reached nearly full coverage, and due to investments in sewerage system, the water utility gap was reduced to manageable level. The reduction of the secondary water utility gap (from 41.1% in 2000 to 12.3% in 2019) reflects that the length of sewerage pipelines and the number of households connected to the sewerage and wastewater treatment system closed in on the corresponding values of the drinking water system. However, taking cost efficiency of operation into account in certain areas with specific technological properties, full closure of the water utility gap cannot be expected. Based on the ongoing investments, a rate close to the target value can be expected by the given deadline, and by carrying out future planned developments, further reduction of the gap can be forecasted.

Difference of households connected to the public utility drinking water supply and sewerage, %	2018	2019	2020
Total	13.31	12.34	12.62
Urban	6.84	5.77	6.41

Difference of households connected to the public utility drinking water supply and sewerage, %	2018	2019	2020
Rural	30.27	29.59	29.13

Source: Hungarian Central Statistical Office;

https://www.ksh.hu/stadat_files/kor/en/kor0041.html

https://www.ksh.hu/stadat_files/kor/en/kor0042.html

https://www.ksh.hu/stadat_files/kor/en/kor0067.html

Notes: Urban: Budapest and other towns; rural: villages according to the administrative status of 1 January of the given year. Data refer to 31 December of the year.

Target 3: Increasing the connection to already existing wastewater collection systems, including social support to marginalised groups. Target date: 2025. Responsible agency: Ministry of Innovation and Technology, Ministry of Human Capacities.

V. Levels of performance of collective systems and other systems for water supply (art. 6, para. 2 (e))

Targets set in the previous reporting cycle:

Target 1: Reduction of water loss in the distribution system to below 20% through reconstruction. Target date: 2030. Intermediate target: 22% by 2023 (tbc). Responsible agency: Ministry of Innovation and Technology, Hungarian Energy and Public Utility Regulatory Authority, Ministry of Interior.

Baseline situation: Water loss in the drinking water distribution system is nationally 27.9% (close to 180 million m³ water/year). The value differs significantly between water supply systems, and it is close to EU average. Water loss in the distribution system is mainly leakage due to the aging pipelines requiring reconstruction, in some cases in a condition preceding pipe failure. Loss of drinking water can be reduced by reconstruction of the distribution system, replacement or lining pipes or by investments of new technical concepts, all of which required considerable funding. Reducing water loss is a priority in water utility developments under the Environment and Energy Efficiency Operative Programme Plus (KEHOP Plus), which is currently under adoption.

Actions and progress: Reducing leakage is also a target in the recast Drinking Water Directive. The first step is the definition of a harmonised leakage index and the application of the harmonised national approach for the analysis of operational parameters of water utility services (the final aim of the EU is an EU-level harmonised measurement approach). According to the recast Drinking Water Directive, a harmonised target value is expected to be defined, and in case of water loss above the target, an action plan shall be developed and measures shall be taken to reduce leakage. The target and financial planning for the target are under development.

Target 2: Replacement of lead connection pipes. Target date: 2027. Responsible agency: Ministry of Innovation and Technology.

Lead connection pipes make up 0.18% of the full length of the connection pipelines, their overall length amounts to 42.9 km. Replacement of lead pipes by the water supply operators is ongoing, as part of their reconstruction tasks. No obstacles can be identified in reaching the targets by the set target dates.

VI. Levels of performance of collective systems and other systems for sanitation (art. 6, para. 2 (e))

Target was not set in this priority area previously. The proposals for future targets are under discussion by the stakeholders. Sustainability has to be taken into account during every public water utility development project in accordance with the requirements of the National Water Strategy, e.g. by using alternative power systems when installing energy-intensive units. The above described public water utility reconstruction target of the National Water Strategy covers not only water distribution systems, but also sewers. As of the January 2022, 109 development projects are in progress for wastewater developments.

VII. Application of recognized good practices to the management of water supply (art. 6, para. 2 (f))

Target 1: Provide the entire population using public supplies by drinking water from safely managed services by 2017.

Baseline situation: In Hungary, water safety planning (WSP) is a legal requirement for all water suppliers serving more than 50 people (including employees in workplaces) or supplying more than 10 m³/day (on yearly average). WSP is based on a complex hazard analysis (HA) and risk assessment (RA) that covers the whole supply chain from the catchment area to the point of consumption. The results of the HA and RA are integrated into the water quality control monitoring programme of the water supply system. In line with the results of RA, the suppliers apply preventive and control measures and continuously monitor their effectiveness. Requirement on WSP came into force in a rolling manner depending on the size of the supply zone and it extends to supply systems serving fewer than 5000 people since 2017. WSPs are subject a dual auditing and approval: the National Public Health Centre evaluates the technical aspects (especially the suitability of risk and hazard prioritization), and official approval is granted by the local public health authority, who can take into account the local conditions, and make on-site sanitary visits. The WSPs are revised by suppliers in every year and by local authority in every 5 years. After the recast Drinking Water Directive is transposed into the Hungarian legislation, revision cycle is likely to be modified to 6 years.

Actions and progress: Most water suppliers met the legal obligation for developing and operating WSPs. By the end of 2018, approximately 1500, by the end of 2019, approximately 1600 public utility WSPs were audited by the competent authority, and 170 individual systems developed a WSP. This means that almost the entire population using public water utilities are supplied by water from services using water safety plan approach. This represents a 40% increment since 2014. In 2019, the National Public Health Center assessed the technical compliance and effectiveness of the WSPs based on the review of the public health expert opinions and data provided by the local public health authorities. Based on this assessment, the methodology guidance developed by the National Public Health Center on the

required content of WSPs was also revised in 2019. The National Public Health Center issued a guidance document in 2020 for the auditing and official revision of water safety plans.

Target 2: Develop an online tool for the risk assessment of small and very small supplies by 2017.

Baseline situation: In Hungary, water suppliers and the local authorities report the results of water quality monitoring, the exceedance of limit values, hazard events posing a risk of water pollution and the corresponding interventions to an online database (Information System on Water for Human Use (HUMVI)). This system was planned to be expanded with a special function for water suppliers for WSP development, with a HA and RA tool.

Action and progress: The planned online function in the HUMVI online system was developed by the end of 2017. In April 2017, an off-line WSP template (consisting of a document template and a risk calculator spreadsheet) was developed by the National Public Health Centre to assist suppliers to accomplish the obligation of WSP development. In 2019 The main benefits of using the off-line WSP templates was the development of adequate hazard and risk analyses, as shown by the 2019 assessment of the WSPs by the National Public Health Center.

Targets set in the previous reporting cycle:

Target 1: Develop a guideline on drinking water safety in buildings. Target date: 2022. Responsible agency: National Public Health Centre.

Rationale and baseline: The water suppliers are only responsible for the drinking water quality until the point of supply. Within the building, the owner is the responsible for any quality deterioration. Secondary contamination (mostly microbiological colonisation and migration of harmful substances from pipes and other materials) is higher risk in premise plumbing compared to the mains distribution system. The quality of drinking water can vary within the building (depending on level, apartments, and customer's habits, etc.). Purpose of the guideline is to advise building operators and users on the risk assessment in premise plumbing and on efficient and economic operation.

Action and progress: Between 2017-2020, lead content in the tap waters of Hungary was assessed on a national level as part of a project. Results confirmed that the lead concentration of tap water can change significantly within a building thus lead risk of a building cannot be determined by analysing a sample from a single sampling site. Furthermore, operators and owners of buildings have very little information on the impact of materials in the plumbing system and of operating practices on drinking water quality, on their responsibilities, and on the potential interventions they have at their disposal to maintain water quality. The planned target was achieved. The National Public Health Center developed a methodology for the assessment of the lead risk in buildings and then reviewed it based on the project's results in 2020. Sampling sites can be designated based on the design of the building, structure of the plumbing system, and the position and type of the water points. The evaluation of the results allows facilities and apartment buildings to reduce the lead intake of consumers through drinking water.

Target 2: Collection and evaluation of the experiences of suppliers and local authorities on water safety plan implementation. Target date: 2020. Responsible agency: National Public Health Centre.

Baseline and rationale: First water safety plans were completed in 2012, and all water suppliers now have experience on the use of WSP. Therefore it is useful to collate experiences and use it for the revision of existing guidelines on the development of WSPs, and develop a guidelines on auditing to support official supervision.

Action and progress: The target was achieved. The National Public Health Center assessed the technical compliance, completeness and effectiveness of the water safety plans as part of the 2018/2019 BCA between the Ministry of Human Capacities and the WHO Regional Office for Europe, using the public health expert opinions and data collected from the competent local authorities. The assessment indicated that plans differ greatly both in substance and form. The greatest challenge for operators was completing hazard analysis and risk assessment in sufficient detail, and defining intervention levels and preventive and control measures specifically for the water supply system. The most challenging parts for the operators are the risk assessment of water resource and consumer points. The National Public Health Center issued a methodology in 2020 for the auditing and official investigation of water safety plans.

Target 3: Development of methodology and template for water safety planning and risk management in single household private supplies. Target date: 2020. Responsible agency: National Public Health Centre.

Rationale: Private wells supplying individual households pose a greater risk to health than public supplies. In Hungary, all recorded water-related methemoglobinaemia cases in the past 20 years were associated with private wells. Though monitoring of private wells is a legally required since 2016 (one sample in every 3 years for basic microbiological and chemical parameters, and locally relevant additional parameters), many well users are unaware of this obligation. The planned guidance is an easy-to-use, simple language guidance document and an online simplified risk assessment tool for private well users.

Action and progress: Neither the public health, nor the water authorities have sufficient information on the number and quality of private wells used in Hungary for drinking water supply. Therefore the associated health risk to the consumers cannot be evaluated. The National Public Health Center initiated a survey in 2019 to assess the water quality, operating conditions and health risks of private wells. For the evaluation of operating conditions and health risks of private wells, a simple risk assessment sheet was developed. Preliminary results show that a third of the wells have microbiologically non-compliant water quality, a sixth of the wells contain nitrate in concentration above the parametric value, thus the consumption of water poses a risk of methaemoglobinemia to pregnant women and children under the age of 3. Pesticide residues were not detected in the wells.

VIII. Application of recognized good practice to the management of sanitation (art. 6, para. 2 (f))

Previously there were no targets set in this field. The technological aspects of decentralised wastewater treatment are discussed in the *Access to sanitation* targets. For public utilities, the Government Decree No. 379/2015. (XII. 8.) *on the Municipality Registry recording the status of municipal wastewater collection and treatment in Hungary and the delineation of sewerage agglomerations* outlines the economic criteria for designating agglomerations. The Hungarian Water Utility Association (MAVIZ), and the Hungarian Water Association (MASZESZ) as professional associations of the water industry and water utilities, actively contribute to benchmarking, peer-to-peer training and sharing best practices through regular professional meetings (e.g. on energy efficiency, decentralised systems etc.). No quantified targets have been determined yet.

IX. Occurrence of discharges of untreated wastewater (art. 6, para. 2 (g) (i))

Target 1: No untreated sewage shall be discharged from settlements over PE 2000. Target date: 2015. National level target.

Action and progress: The development of wastewater collection in agglomerations above 2000 PE, as described in section IV. Access to sanitation, is implemented jointly with the development of wastewater collecting and treatment. While the volume of collected wastewater increased due to the new connections, the discharge of untreated wastewater has decreased to a negligible rate.

The treatment rate of collected wastewater in the country was 99.8%, the ratio of collected wastewater discharged without treatment or with only mechanical treatment was 0.2% by the end of 2018. The proportion of households connected to collection systems was 81.7%. The target can be considered completed.

Target 2: No new combined sewer systems shall be laid and the existing ones should be transformed into separated systems on a continuous basis. Target date: Continuous. National level target.

Action and progress: There is continuous reduction of load on the combined sewer systems. The water authorities set individual limits value for combined sewage overflows.

Operators of treatment plants with existing combined collection systems build stormwater storage tanks or increase existing storage capacity to reduce the volume and frequency of combine sewage overflows.

Newly installed sewerage networks are exclusively separated systems.

X. Occurrence of discharges of untreated storm water overflows from wastewater collection systems (art. 6, para. 2 (g) (ii))

Targets set in the previous reporting cycle:

Target 1: Develop a new basis for municipal precipitation management, including methodology development, action planning and implementation. Target date: 2030.

Responsible agency: Ministry of Interior. Intermediate target date for methodology development is under discussion.

Rationale and baseline:

The professional objective is to reduce the load from overflows of the combined systems, to install the missing, separated system for rainwater collection according to up-to-date professional criteria for municipal stormwater management, and to implement the integrated municipal water management plan (hereinafter: ITVT). In 2021, a methodological guideline for the preparation of the ITVT was developed, and the General Directorate for Water Management developed three pilot plans for three different types of municipalities (Magyaregregy, Lakitelek and Boldva). Development of the plan is currently not mandatory, however, TOP Plus 1.2.1.-21 “Liveable settlements” operation supports integrated municipal water management planning, so in 2022 further plans are expected to be developed.

The LIFE-MICACC project coordinated by the Ministry of Interior was implemented between 1st September 2017 and 30th November 2021, with the aim of introducing the topic of water retention and adaptation primarily to Hungarian municipalities and presenting practical local solutions as good practices for natural water retention. To this end, water retaining measures (reservoirs, seeping log dam) have been implemented in 5 pilot municipalities, which greatly contribute to establishing a new professional framework for municipal precipitation management on country level, by setting best practice example to other municipalities. Within the framework of the project, several publications and other developments were completed (training materials, e-learning materials, case studies, thematic booklets, explanatory infographics, brochure, adaptation guide, application, water risk calculator). Most of these can be downloaded from the website: <https://vizmegtartomegoldasok.bm.hu>

Also under the coordination of the Ministry of Interior, the LIFE LOGOS 4 WATERS project was launched on 1st October 2021. The overall objectives of the project is to improve climate resilience and coordination potential of local municipalities through demonstration of integrated nature-based water management solutions on catchment scale and the promotion of nature-based water retention measures to support increased uptake on municipal and catchment level to improve the negative water-balance status of Hungary. The project implementation is scheduled to be completed by 30th September 2025.

Target 2: Development of an adaptation guide for municipalities and policy package for the Government on natural water retention measures. Target date: 2021. Responsible agency: Ministry of Interior.

Rationale and baseline:

The LIFE-MICACC project produced an “Adaptation Guide - Climate Change for Municipalities” publication. In the document, the role of local governments, possibilities for action, possible ways of water retention, additional benefits, individual steps of creating nature-friendly solutions, and effective methods of involving stakeholders are presented. The guide can be downloaded in Hungarian, English, Romanian and Slovakian from the bilingual website:

<https://vizmegtartomegoldasok.bm.hu/hu/dokumentumok>

<https://vizmegtartomegoldasok.bm.hu/en/documents>

A Government Report was prepared about the project, summarizing the recommendations arising during the project. The aim was to create a supportive legal environment for natural water retention. The report was adopted by the Government on 12th November 2021.

XI. Quality of discharges of wastewater from wastewater treatment installations (art. 6, para. 2 (h))

Although no quantifiable target was set in the field previously, there is continuous progress. The situation of wastewater treatment has improved significantly since the last reporting cycle. The proportion of treated wastewater also subject to tertiary treatment increased from 88% (2018) to 95% (2020).

The rate of nitrogen removal was 81.69%; and phosphorous removal rate was 86.14% in 2019. (Source: General Directorate of Water Management, Hungary)

The compliance of wastewater treatment plants with a load above 2000 PE with the minimum requirements of the UWWTD on 31st December 2018 is shown in Figure 3.

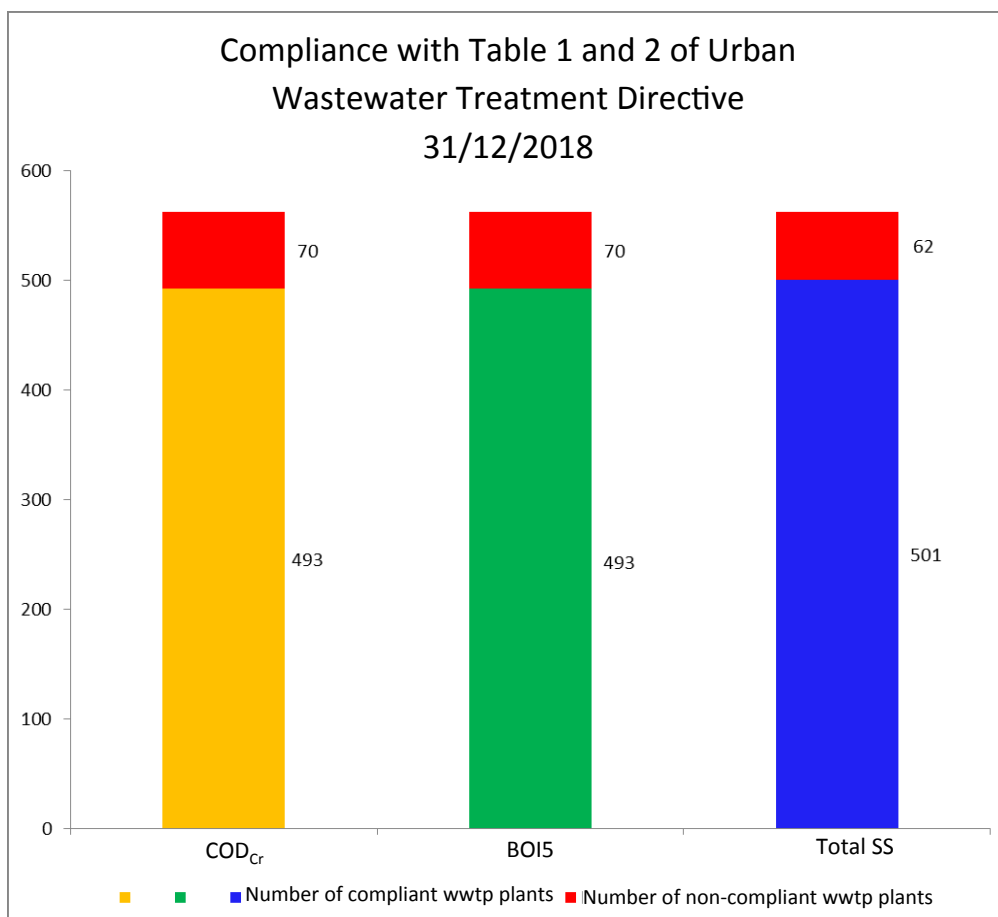


Figure 3. The number of wastewater treatment plants with > 2000 PE load complying with the legal quality requirements (2018)

Source: <https://cdn.kormany.hu/uploads/document/4/42/42a/42a8e801d4b0bfc5db6ec34a8a78c65c111b312d.pdf>

The increase in the number of non-compliant wastewater treatment plants compared to the status of 31st December 2016 is generally due to the reconstruction needs of the plants.

In 2021, the efficiency of microplastic removal was investigated in five wastewater treatment plants along the Hungarian section of the Danube, in cooperation with the Hungarian Water Utility Association, financed by the Hungarian national coordinator of EUSDR.

Planned targets:

Target 1: Further reduction of pollutant load (especially phosphorus) from conventional wastewater treatment (to a reasonable and economically feasible minimum). Target date: 2030. Responsible agency: Ministry of Interior

Target 2: Introduction of 4th treatment stage for the removal of micropollutants in the areas relevant for drinking water abstraction. Target date: 2030. Responsible agency: Ministry of Interior

Both targets are included in the National Water Strategy.

XII. Disposal or reuse of sewage sludge from collective systems of sanitation or other sanitation installations (art. 6, para. 2 (i))

Target set in the previous reporting cycle:

Target: Increase the energy reuse of sewage sludge to 70,000 ton dry weight/year. Target date: 2027. Responsible agency: Ministry of Innovation and Technology, Ministry of Interior.

The proper disposal and utilisation of sewage sludge from municipal wastewater treatment plants will be a key issue in the future, since the possibility of disposal in landfill will be reduced in accordance with the relevant waste legislation. The annual amount of municipal sewage sludge is currently ca. 230 000 tons. Municipal sewage sludge can contain significant amount of water depending on the treatment. Almost the entire volume of generated sewage sludge is utilised currently in Hungary, however almost half of it is used for recultivation purposes. Energy utilisation of sludge mainly is justified if its use is not possible as a material (agricultural or recultivation utilisation).

Partial utilisation of sewage sludge for energy purposes will be inevitably necessary on long term. Currently only Mátra Power Plant, three cement plants, some hazardous waste incinerators and a few smaller sewage sludge incinerators operate in the country. The energy utilisation potential of sewage sludge with already low calorific value is limited, as the heat energy generated during its incineration is largely used for drying. The gross amount of sewage sludge utilized for energy purposes was 243 768 tons in 2020. Disposal of sewage sludge in landfill declined significantly in the last decade in Hungary. Official permissions on landfill allow limited disposal of sewage sludge per site, in the magnitude of 250-500 tons/year. The amount of the sewage sludge is expected to increase from the current 180 000 tons solids to 237 000 tons solids by 2023 and 250 000 tons solids by 2027. Disposal and utilisation structure of the increasing amount will be significantly transformed. The main

reason for this is the gradual reduction of possibility for recultivation utilization, the decrease of the area available for recultivation. Decrease of recultivation use and increase of annually generated sludge infer additional demand for utilisation in the agriculture and energy.

Capacity developments of energy utilisation should be designed to be suitable for sewage sludge utilization, and capture and energy utilization of methane from sewage sludge should also be achieved. The suggested target is in line with the Sewage Sludge Treatment and Utilization Strategy. The implementation of the Sewage Sludge Treatment and Utilization Strategy is highlighted in the National Water Strategy, including regional development of state-of-the-art wastewater treatment technologies.

In 2021, an investigative study was compiled on the overview of sewage sludge treatment practices in countries of the Danube catchment, and on sharing international best practices. The study was funded by the Hungarian national coordination of EUSDR.

XIII. Quality of wastewater used for irrigation purposes (art. 6, para. 2 (i))

Quantitative targets have not been set previously, use of wastewater for irrigation purposes is currently not common in Hungary. The regulation (EU) 2020/741 of the European Parliament and the Council on minimum requirements for the reuse of water, published on 25th May 2020, generated a new situation. The regulation contains requirements and quality standards for the use of treated municipal wastewater for irrigation in agriculture. The regulation must be transposed by 26th June 2026. Taking into account the wastewater treatment technologies used in pilot plantations, treated wastewater is mainly used for the irrigation of D produce category of Annex I, Section 2, Table 1 of the regulation (industrial plants, energy plants, seed production facilities) in Hungary. Prioritizing water retention, the potential utilization of graywater as reclaimed water is also being investigated. The normative text for the amendment of the Hungarian legal regulations has been completed; it is expected to be published in the second half of 2022. Target will be set after that.

XIV. Quality of waters which are used as sources for drinking water (art. 6, para. 2 (j))

Target 1: Detailed investigation of surface waters assigned as drinking water resources or to prepare protection measures for compliance with Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy (Water Framework Directive) target and the revised Drinking Water Directive. Target date: continuous. Responsible agency: Ministry of Interior

Target 2: Development and implementation of detailed protection plans. Target date: continuous. Responsible agency: Ministry of Interior

Actions and progress: The scope of the relevant regulation, Government Decree 123/1997. (VII. 18.) covers water resources used for drinking water supply, mineral- and medicinal water utilisation, both the ones already exploited and those designated for future uses. It also covers installations serving the treatment, storage and distribution of water for such uses, serving at least 50 persons on daily average. Enhanced protection of such water resources and facilities should be ensured by the designation of protection shapes or protection zones around

water abstraction sites. Within these zones, legal requirements apply for the restriction of certain activities and the establishment and operation of a monitoring system. Measures for the protection of drinking water sources were also included to the national River Basin Management Plan as a requirement under the Water Framework Directive.

The measures set out in the River Basin Management Plan for the protection of drinking water resources are targeted to improve the status of water catchments. The 13th package of measures includes the following 6 measures:

- Ensuring drinking water quality at the tap, in accordance with the 98/83/EC directive on the quality of water for human consumption (current Drinking Water Directive) (Completion of the Drinking Water Quality Improvement Program, monitoring)
- Protection of drinking water resources in line with the recast Drinking Water Directive
- Designation and revision of drinking water protection zones
- Regulation and modification of drinking water resource protection activities
- Solutions outside the drinking water protection regulations (individual solutions, favorable land use change in terms of drinking water protection, encouragement of good practices, agreement with land users)
- Implementation of water safety plans, further develop in line with the recast Drinking Water Directive

Many drinking water sources have specific water protection measures in place; such as groundwater enrichment, riverbed protection in internal and external protection areas (bank filtration), water quality remediation.

Only about half of the drinking water sources have officially designated protection zones. The designation of protected areas should be accelerated and the protection of the water resources should be effectively implemented in everyday practice. There are currently no project funds available to carry out water resource diagnostics, thus the cost of new diagnostics need to be covered by the operator, or government financing should be allocated. In addition to the drinking water resource programme financed from government budget, operators carried out diagnostics for 618 water resources. The implementation of the water resource protection programme implies compliance with the provisions of the protected area designating decision, which applies to area owners and users. The programme of measures promotes grassland or forest land use in the outer protection zone of drinking water abstraction, and the designation of water protection forest areas. By 2021, 1695 drinking water safety plans have been completed and evaluated from a public health perspective. The recast Drinking Water Directive (EU 2020/2184) prescribes a risk-based approach to water safety, covering the whole supply chain from the catchment area through water abstraction area, water treatment, water storage and distribution to the point of compliance set out in Article 6. Actions on water safety plans are described in Section VII.

Proposed target:

Target 3: National survey of the PFAs in drinking water sources of the water supply systems. Target date: 2025. Responsible agency: Ministry of Human Capacities

Rationale and baseline: The recast Drinking Water Directive requires monitoring of several currently not monitored parameters, but it allows for reducing monitoring frequency in water supply systems where these parameters are not present in the source water and where risk assessment indicates that their emergence in the tap water is unlikely. Of these new

parameters, national data is not available on the prevalence of PFAs (perfluoroalkyl and polyfluoroalkyl substances) in the Hungarian water resources or their risk to human health. A national survey is necessary to analyse the baseline situation.

XV. Quality of waters used for bathing (art. 6, para. 2 (j))

Target: Status assessment of the identified bathing waters under the River Basin Management Plan, design and implementation of action plans to reduce contamination. Target date: 2015. National level target.

Rationale and baseline: The current legislation in Hungary on natural bathing waters came into effect in 2008, thus we have more than 10 years of data available. Accredited laboratories perform the sampling and water quality analyses (based on the detection of fecal indicator organisms) on behalf of the operator of the bathing site. On national level, monitoring data is compiled and analysed by the National Public Health Center. Initially, the frequency of monitoring was inadequate at many bathing sites, but as a result of the annual training of the local health authorities, of the 274 bathing sites operating during the 2021 bathing season, monitoring was only insufficient for one site. Of the classified bathing sites (241), 167 were classified as excellent, 64 as good, 6 as sufficient, and 4 as poor. 23 new bathing sites were designated in the past 3 years, 9 of them in 2021. In order to support the management of weather extremities and other unexpected incidents the National Public Health Center created a faster access route that is in continuous operation, allowing public health authorities and bathing site operators to receive bathing-site-specific information about the possible and necessary interventions for improving water quality.

Bathing waters are designated before the bathing season, and the number of designated bathing sites varies from year to year, depending on current needs and compliance with public health requirements. The protection area of the bathing site is the surrounding land area and water surface, designated in order to preserve the quality of the water. Designation of the protection area is the responsibility of the bathing site operator. When designating a new bathing area, the minimum required distance from treated wastewater discharge must be taken into account. If a treated wastewater discharge is newly introduced into the surface water, the already designated bathing area should be considered. The protection distances must also be checked existing bathing areas, and upon the establishment of a new beaches and/or new treated wastewater discharges distance requirements should be included in the planning.

The package of measures within the River Basin Management Plan ensuring the protection of bathing areas in our natural waters is the “Regulation according to the Bathing Water Directive”. Measures concern the ecological and public health criteria for the designation, operation and delisting of natural bathing areas. Consequently, the measures identify those interventions which are adequate both from ecological and public health perspective, and are appropriate jointly enforce the requirements of the Gov. Decree 78/2008. (IV. 3.) on the quality, designation and operation of natural bathing waters and the ecological requirements of the WFD.

Targets set in the previous reporting cycle:

The targets set in this area have not been achieved due to the COVID-19 pandemic and thus new target dates have been set.

Target 1: Characterization of water quality fluctuation in correlation with weather or within a shorter period as a pilot to support predictive modelling. Target date: 2025. Responsible agency: National Public Health Centre

Baseline: It is unclear if bathing water quality deterioration observed in the past years and reported in the previous reporting cycle is due to the natural fluctuation of water quality, the unusual weather of the past years, or if it is a general negative trend. The general monitoring frequency of once per month does not allow the detection of these changes. International studies have shown that the quality of natural bathing waters can significantly change even within one day. The National Public Health Center carried out a pilot investigation of weekly samplings at three sites (a main river branch, a river bay and a reservoir). Investigations showed that water quality of the reservoir was not affected by weather, but intensive rainfalls increased the detected *E. coli* counts by 1-2 orders of magnitude at the main river branch and at the bay. Other water quality parameters, such as faecal enterococci or cyanobacteria did not show significant change. However, further studies are necessary to investigate the day-to-day, or even hourly water quality changes both in flowing and standing waters.

Target 2: Water quality monitoring of non-designated bathing sites which are used by many bathers. Target date: 2025. Responsible agency: National Public Health Centre, government offices.

Baseline: In 2021, 63 water bodies were used for bathing in Hungary. Of the 274 bathings sites, 56% is on the great lakes (134 at Lake Balaton, 13 at Lake Velence, and 6 at Lake Tisza) and 15% are on rivers. The rest were designated on smaller standing waters (lakes, oxbow lakes, reservoirs, and pit lakes). However, many people choose non-designated sites for bathing, where the water quality is unknown. At the majority of these sites safety and public health criteria of bathing are not met. Due to convenience or economic reasons, many people choose to bathe at sites close to designated or closed bathing sites where the water quality is unknown or where bathing is explicitly forbidden. As the first step of controlling frequently visited but not designated bathing sites, the public health authorities started to identify these sites in 2019. After the registration of the sites, an action plan and schedule will be developed for monitoring, or at sites where bathing is unsafe, on more efficient prohibitive measures. However, this process was put on hold due to additional tasks related to the COVID-19 pandemic. Some public health authorities already undertook monitoring of non-designated bathing sites, but for most offices, administrative, financial and human resource need of the sampling is a challenge. Two district offices in cooperation with the Laboratory Department of the Government Office of Budapest, and the National Public Health Center started the test monitoring of 7 well-known non-designated bathing sites in the vicinity Budapest in 2019. Some of the monitored sites have since become designated bathing sites. Further investigations are required to inform bathers and to reduce the number of illegal bathing sites.

XVI. Quality of waters used for aquaculture or for the production or harvesting of shellfish (art. 6, para. 2 (j))

Proposed target:

Target: Scientific research on the impact of natural or artificial water bodies used for aquaculture on water quality, to provide an evidence base for the development of water quality criteria in aquaculture. Target date: 2020. Responsible agency: Ministry of

Agriculture, Institute of Aquaculture Research of the National Agricultural Research and Innovation Centre.

Baseline and rationale: Water bodies used for aquaculture are potential sources of pollution for the downstream surface water, but can also contribute positively to water management as storm water reservoirs or through natural water purification processes. The impact of aquaculture on water quality should be investigated in more detail to identify best practices.

XVII. Application of recognized good practice in the management of enclosed waters generally available for bathing (art. 6, para. 2 (k))

The target dates of the previous targets have expired, but there are still remaining tasks, so the revised targets received new target dates. The additional tasks of the COVID-19 pandemic hindered the realization of the targets.

Target 1: Revision of the national regulation. Target date: 2022. Responsible agency: Ministry of Human Capacities

Baseline situation: Hungary is very rich in thermal waters due to its favourable geothermic conditions. Recreational and therapeutic bathing in enclosed waters (pools and spas) has been a popular activity for centuries, and it is one of the main touristic attractions of Hungary. The number of pools is continuously rising, and there is an increasing trend of operating pools in non-dedicated facilities as an additional attractive feature (e.g. in hotels, sport centres or apartment houses). There are approximately 1200 facilities in public use with nearly 3800 pools. The basic data of the facilities and pool can be found in the National Information System of Water in Human Use (HUMVI) database. Technology development and innovation in this sector are rapidly expanding, although COVID-19 pandemic proved to be a significant setback. The national legislation dates from over 25 years, and thus it cannot be applied to the regulation of novel treatment technologies, pool types, and attraction features. Aside from the legislation there is also a standard for good practices (MSZ 15234:2012) on pools with water circulation, but application of the standards is voluntary. Since the standard was issued in 2012, an update of it would also be timely.

Actions and progress towards the target: Most important target in order to improve the operation of enclosed bathing sites is the review of the 25-year-old legislation. Although the revised legislation has not yet been adopted, technical consultation on the new regulation has been ongoing in the past years. Inter-ministerial consultations are currently on-going. A central inventory of public pools was created within the Information System of Waters in Human use (HUMVI) operated by the National Public Health Centre. The information system contains all relevant information on the pool size, type of use, fill water characteristics etc. Data was provided by the local public health authorities who supervise the operation of the pools. The real-time reporting of water quality data will only be possible after the adoption of the new legislation.

Target 2: Development of best practice guidance documents and technical standards for the operators and the bathers. Target date: 2023. Responsible agency: National Public Health Centre, Hungarian Standards Institution.

Parallel to the legislative approach, the technical committee of the Hungarian Standards Institution (which includes operators, civil engineers, treatment specialists and public health

experts) launched a series of national standards on various aspects of pool design and operation. The best practices of pool design and operation are described in the standards; however the application of standards is voluntary. One of the key national standards on the water treatment of pools by coagulation and filtration (MSZ 15234:2012) is currently under revision: the recognised good practices and the new technologies developed since the adoption of the standards are going to be incorporated into the revised standard.

The implementation of the Ministerial Decree on *Legionella* risk assessment (49/2015 (XI. 6.), see Section II.) since February 2016 increased the awareness of pool operators on the best operational practices to avoid microbial colonisation in the pools. The guidance document developed and updated regularly by the National Public Health Centre outlines the basics of good operational practices and risk management measures. Since the Decree came into force, authorities report decreasing non-compliance rates. The operators are largely aware of the requirements of *Legionella* risk analysis and monitoring.

The pools are licensed and supervised by the district and county public health authorities. However, there is no national data collection system on water quality as there is for drinking water or natural bathing water. The local public health offices report yearly on the hygiene conditions and the water quality of the pools, but only aggregated data, which is insufficient for baseline analysis. Non-compliance in water quality of pools (especially therapeutic pools) is usually microbiological, but disaggregated data analysis is necessary to understand its scope and extent. Regular reporting of the monitoring data is a prerequisite for further action.

XVIII. Identification and remediation of particularly contaminated sites (art. 6, para. 2 (l))

Target: The identification and registration of contaminated sites, the reduction or elimination of the risk of contamination and the assistance of reduction or elimination of contamination (under the National Environmental Remediation Program (OKKP). Target date was not identified.

The previous target did not contain a specific target and target date; therefore it was revised during the previous reporting cycle.

Target set in the previous reporting cycle:

Target: To identify contaminated sites of significant importance to drinking water supply and vulnerable groundwater bodies and to promote remediation activities.

Date: 2023. Responsible: Ministry of Agriculture in collaboration with the Ministry of Interior

The aim of the National Environmental Remediation Program (OKKP), which has been operating since 1996, is to identify and investigate the accumulated pollution and damage left in the geological medium and groundwater, to reduce the risk of pollution, and remediation of contamination, regardless of the responsible entity. OKKP is part of the National Environmental Protection Program and, in addition to individual investments, also includes the general and national tasks required for the management and coordinated implementation of the program. Within the framework of OKKP, legal and technical rules for the management of contaminated areas, the registration system, the limit values for pollution, the measurement and diagnostic methods, applicable remediation technologies, and methods for calculating health and environmental risks have been developed. In sites where the polluting

users of the environment can no longer be found, remediation is state responsibility. According to the provisions of Section 41 of the Act LIII of 1995 on the general rules for the protection of the environment, Government is responsible for the remediation of severe environmental damage, if the responsible entity cannot be identified. Section 56 (1) of the Act further prescribes that such tasks shall be provided on government budget. Remediation duties of government responsibility are shared between ministries in OKKP sub-programs, in accordance with the division of responsibilities. The water sub-program is managed by the Minister of the Interior who is responsible for water.

According to the national summary of the data provided by the environmental protection authorities in 2019-2021, there are 1,054 active remediation cases in Hungary. 272 remediations were declared completed by the authorities. It means that no further action is required under the characteristic land use of the site (the limit value for remediation status “D” has been reached), however, the soil and groundwater may still exceed the pollution limit values of the Joint Ministerial Decree 6/2009. (IV. 14.) KvVM-EüM-FVM.

The number of the on-going active remediation cases is 782 in the registry of authorities. There are 70 cases where a diagnostical investigation has been done but the final documentation has not yet been officially approved. 463 cases are in the planning phase (technical intervention plan was submitted), and in other 261 cases are in the finalizing phase (the intervention final documentation was submitted to the authorities, which indicates that the spread of the plume is not expected; in these cases we can assume a decrease or, in the worst case, stagnation). Remediation monitoring provides information on the further presence of contamination. There are 225 cases where the intervention has taken place and the stabilization of pollution concentrations is being monitored for at least four years as required by law.

The largest group of pollutants is the aliphatic hydrocarbons (TPHs) group followed by the benzene and alkylbenzenes (BTEX) group, comprising nearly half of the pollutants identified in groundwater. This is followed by a group of polycyclic aromatic hydrocarbons (PAHs) and metals (all soluble) and semi-metals. This is followed by inorganic compounds and halogenated aliphatic hydrocarbons.

Almost 98% of the contaminated sites do not affect the protection area of drinking water resources. In total, only 25 contaminated sites affect the hydrogeological protection area of drinking water resources, in 17 of these cases the pollution remediation (intervention) has taken place or is in progress. For 8 water resources, the intervention has not yet started. (Source: <https://vizeink.hu/>)

XIX. Effectiveness of systems for the management, development, protection and use of water resources (art. 6, para. 2 (m))

The previously set target dates expired, but the tasks have remained, therefore the revised targets appear with new target dates.

Target 1. Diagnosis of the vulnerability and safeguarding of water resources. Updating vulnerability maps. Target date: 2020. Responsible agency: Ministry of Interior

Actions and progress: The 2nd River Basin Management Plan (RBMP2) was adopted in 2016. It contains a Programme of Measures, an Action Plan which summarizes the necessary measures for reaching the good status of waters at the latest by 2027.

In the period 2017–2020, the General Directorate of Water Management and the 12 regional water administration bodies (VIZIG) received extra budgetary funding to implement the WFD and RBMP2 (total of 1000 million HUF in 2017-2018 and total of 1132 million HUF in 2019-2020).

The key tasks carried out in 2019-2020 from this funding related to the WFD:

- Development of a technical guide for stormwater management dimensioning principles
- Revision of technical standards and guidelines for wells
- Register of wells under the jurisdiction of the municipal notaries - development of an online interface and database, preparation of public information materials, development of electronic administration procedure
- Measurement of substances required by the Sustainable Use of Pesticides Directive (SUD) in waters in addition to the WFD / EQS directives' requirements; tritium measurements
- Study of the complex development of the Ráckeve (Soroksári) Danube branch
- Establishment of a wastewater program as a measure of OVG2 that is in line with the objectives of the WFD
- Establishment of an oxbow lake rehabilitation program including sludge recovery
- Setting the basis for the extension of monitoring of agricultural loads and the implementation of the Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources (Nitrates Directive)
- Revision of surface water quality and drinking water resource protection legislation
- Study plan on the possibility of transfer and storage of water discharged into Sió canal to the territory of Mezőföld
- Modelling of runoff conditions in small watersheds from the point of view of water resources management
- Technical development of hydrographic monitoring ensuring WFD compatible measurements
- Development of a water data repository for WFD monitoring, ensuring compliance with the INSPIRE directive
- Defining professional requirements for pilot tests related to remediation, in particular in view of the remediation activities of VIZIGs and the WFD requirements
- Remediation related to the activities of VIZIGs (fuel tank parks)
- Technical development of water quality damage control for efficient aeration of oxygen-deficient water bodies
- Execution of monitoring tasks of VIZIG Sampling Working Group
- Public/municipal information program related to the Integrated Municipal Water Management tools; development of a methodological guide to support planning
- Further development of the drought monitoring network, network operation
- Modelling of soil moisture measurement
- Determination of water quality alert levels depending on different water uses
- Putting into service of the HEC-RAS and HEC-HMS models developed in the framework of dynamic water resources management on VIZIGs
- Supplementation of the Water Resources Management Module created within the VIZEK framework with the display of the results of dynamic water resources management models

- Methodological exploration of water resources management in lowland water systems
- Revision of the regulation on limit values and measurement of pollution for the protection of the geological medium and groundwater against pollution
- Delimitation of periodic water bodies, definition of simplified monitoring
- Putting into service of water quality databases on VIZIGs, data loading, practical training
- Investigation of water quality issues of inland water retention and utilization
- Hydromorphological monitoring of water bodies

The executed tasks related to RBMP2 in 2019-2020:

- Operation and quality assurance of accredited sampling teams
- Operational and maintenance tasks of future drinking water resources
- Water management tasks and monitoring measurements supporting the National Environmental Remediation Program (OKKP)
- Impact assessment of drainage of fishponds
- Preparation of Water Resources Management Spatial Plans (VkgTTs)
- Status assessment of Rakamaz-Tiszanagyfalui Nagy-morotva (oxbow lake), analysis of the effects of rehabilitation interventions
- Operation of the mobile measuring device at the Szamos-Csenger automatic sampling station (WFD operational monitoring)
- Water quality assessment of Lake Balaton
- Maintenance of hydrographic facilities and stations

In the light of the above described proceedings, it is necessary to review the previously assigned vulnerability status of the water resources. The data collection was already started. The assessment should cover climate vulnerability aspect to support intervention for increasing climate resilience.

On the international level, projects funded by the EUSDR water quality priority area should be mentioned. The objective of project “Danube Hazard m3c”, launched in 2020, was the management of hazardous pollutants based on monitoring and modelling. The study sites in Hungary are the catchments of Koppány and Zagyva. The transnational project Tid(y)Up for the assessment of plastic pollution on Tisza and Danube, led by Hungary, started in July 2020. The DEEPWATER-CE project, also led by Hungary, was launched in May 2019. It studies the potential use of different Managed Aquifer Recharge (MAR) and water containment technologies in Central Europe, taking strongly into account the potential future impact of climate change. The Hungarian study area is the Maros alluvium between Körös és Maros. The project is an important addition to the climate protection of groundwater resources and water use interventions through integration of subsurface water retention and containment methodology in the national water strategies. It also contributes directly to the implementation of the 1st Action plan of the 2nd National Climate Change Strategy, and links into the targets and implementation of the regularly revised RBMPs under the Water Framework Directives. The revised Integrated Tisza RBMP was completed in the framework of the transboundary project JOINTISZA, supported by the Hungarian coordination of EUSDR. The water ministers of the Tisza countries (Slovakia, Ukraine, Romania, Hungary and Serbia) signed a Cooperation Agreement on their 3rd meeting in Budapest, 26th September, 2019 to politically strengthen water cooperation between the parties, covering the entire river basin.

Target 2. Implementing the measures ensuring the protection of water resources against

nitrate pollution from agricultural sources. Performing the necessary investigations, updating the status assessment. Target date: 2020. Responsible agency: Ministry of Interior

Actions and progress: The implementation of the provisions of the Nitrates Directive are supported through the Rural Development Program (RDP) and greening of economy. RDP has maintained and expanded the measures to reduce the impact of nutrient load. Land use and nutrient intake requirements primarily affect the mitigation of nitrate pollution. The risk of potential groundwater contamination estimated on the basis of nitrogen balances is significantly lower than the real contamination of shallow groundwater bodies determined on the basis of the national monitoring network. This suggests that the current load in the assisted agricultural areas is generally lower than the historical load that has led to current pollution rates. This is also confirmed by the nitrate peaks moving downwards in groundwater. In order to refine the pressure-impact analyses, the processing of the farmer log data and the refinement of the corresponding model – MONERIS - continued in the years 2017-2018.

Hungary's Nitrate National Report for the period 2016-2019 was prepared in 2020. In 2013, mainly based on the results of the surface water status assessment, almost 70% of the territory of Hungary became nitrate sensitive after the review of the designation of nitrate sensitive areas; There has been no significant change in the designation of nitrate vulnerable zones during the current (2020) review.

The requirement of the 2020 Nitrates Report Guidance resulted in a significant change in the trophic classification of water bodies, as the use of the potentially eutrophic category was significantly restricted, thus increasing the proportion of eutrophic water bodies. 77% of the river water bodies are eutrophic, 32% of the lake water bodies are also eutrophic. The main cause of eutrophication is the accumulation of phosphorus in surface waters originating from soil erosion. Therefore in the National Report Hungary included measures to prevent erosion of soils in agricultural areas as well as to support the agricultural use of dredged sludge in the framework of the CAP Strategic Planning. The average and maximum values of nitrate concentrations in surface waters exceeded the value of 50 mg / l less than 10% of the sampling sites (average: 1%; maximum: 9%; winter average: 2%) in the examined period 2016-2019 and in the winter season, which especially indicates nitrate load. Based on the average nitrate concentration in groundwater, the trend calculated for all monitoring points is generally favorable, as we experience a weak increase of 8.7% and a strong increase of 7%, mainly in monitoring sites in vulnerable environments. It can be stated that in the vulnerable zone in the period between 2016 and 2019, compared to the previous period, outliers were measured in the nitrate content in several places, which may also be the result of extreme weather.

The first National Plant Protection Action Plan for the period 2013-2017 was adopted in November 2012 for the implementation of the Pesticides Directive. The first revision of the action plan was in 2019, and this revised plan is valid for the period 2019-2023.

XIX./B The frequency of the publication of information on the quality of the drinking water supplied and of other waters relevant to the targets (Article 6, (2) n)

Target: Development of information to the public on water quality and on risks associated with different aspects of drinking water use, including the use of private wells and home water treatment devices. Target date: 2021. Responsible agency: National Public Health

Centre.

Action and progress: An online reporting system, the Information System on Waters in Human Use (HUMVI) managed by the National Public Health Centre is used for the collection of drinking water quality data. All water suppliers and local public health authorities, who share the responsibility of water quality monitoring, report to HUMVI. Though the legal requirement is 3-monthly reporting, many water suppliers report more frequently (up to weekly data provision). Data is validated by the public health authorities, and used for national and international reporting. The electronic data reporting allows for more timely information to the public. Drinking water quality data are available on the municipality level on the website of the National Public Health Center in a searchable, map format that are updated at least once a year (<https://www.nnk.gov.hu/index.php/terkepes-informaciok>).

Public information materials and posters were developed and published on NHPC website on the following topics:

- Risks of using private wells. <https://www.nnk.gov.hu/index.php/kozegeszsegugyi-laboratoriumi-foosztaly/kornyezetegeszsegugyi-laboratoriumi-osztaly/vizhigienes-laboratorium/ivoviz/728-tudnivalok-a-magankutakrol>
- Types and risks of home water treatment units and water dispensers. <https://www.nnk.gov.hu/index.php/kozegeszsegugyi-laboratoriumi-foosztaly/kornyezetegeszsegugyi-laboratoriumi-osztaly/vizhigienes-laboratorium/ivoviz/724-ivoviz-utotisztito-kisberendezesek-es-vizadagolok>
- Benefits and risks of consuming tap water and mineral water. <https://www.nnk.gov.hu/index.php/kozegeszsegugyi-laboratoriumi-foosztaly/kornyezetegeszsegugyi-laboratoriumi-osztaly/vizhigienes-laboratorium/ivoviz/727-tudnivalok-a-csapvizrol>
- Risks of lead contamination in drinking water and potential az ivóvízben esetlegesen jelen lévő ólom kockázatairól és beavatkozási lehetőségekről. <https://www.nnk.gov.hu/index.php/kozegeszsegugyi-laboratoriumi-foosztaly/kornyezetegeszsegugyi-laboratoriumi-osztaly/vizhigienes-laboratorium/ivoviz/727-tudnivalok-a-csapvizrol>

Methodology guidelines were prepared for the public, for public health authorities, and for water utility service providers on the following topics:

- Risks of wells for private use and assessing water quality. [https://www.nnk.gov.hu/attachments/article/728/Mo%CC%81dszertani%20u%CC%81tmutat%CC%81saja%CC%81t%20ce%CC%81lu%CC%81%20ivo%CC%81vi%CC%81zmu%CC%81Bvek%20\(maga%CC%81nkutak\)%20kocka%CC%81zata%CC%81ro%CC%81l.pdf](https://www.nnk.gov.hu/attachments/article/728/Mo%CC%81dszertani%20u%CC%81tmutat%CC%81saja%CC%81t%20ce%CC%81lu%CC%81%20ivo%CC%81vi%CC%81zmu%CC%81Bvek%20(maga%CC%81nkutak)%20kocka%CC%81zata%CC%81ro%CC%81l.pdf)
- Auditing of water safety plans. <https://www.nnk.gov.hu/index.php/kozegeszsegugyi-laboratoriumi-foosztaly/kornyezetegeszsegugyi-laboratoriumi-osztaly/vizhigienes-laboratorium/ivoviz/725-ivovizbiztonsagi-tervezes>
- Radiological investigation of drinking water and the assessment of the results. Publicly available on the NPHC's website through the following link:

https://www.nnk.gov.hu/attachments/article/727/Modszertani_utmutato_ivovizek_radiologiai_vizsgalatahoz.pdf

The Hungarian Energy and Public Utility Regulatory Authority coordinated the development of the database National Public Water Authority Cadastre **VIKKA** (<http://www.vikka.hu/>) which provides public information about availability of water utility services on web user interface. Project funding of 10 billion HUF was secured for this purpose.

XX. Additional national or local specific targets

Target: Development of the water management aspects of climate adaptation. Target date was not defined.

Actions and progress: In 2017, the Government adopted the National Water Strategy (NWS, Kvassay Jenő Plan) to establish the integrated water management policy of Hungary. The National Water Strategy is a framework strategy of the Hungarian water management until 2030 and the mid-term implementation plan for the period until 2020.

The Second National Climate Change Strategy (NCCS) was accepted by the government in 2018. In water management questions related to climate change the NCCS relies on the NWS. Climate change is regarded as a priority issue in the NWS because extreme weather events may reduce the amount of accessible water, while the social and economic demand is likely to increase. The Strategy states that conventional methods on their own are not sufficient in responding to the new challenges and instead inter-sectorial co-operation is necessary along with changes in social values and land use.

The new paradigm of the National Water Strategy is the prioritization of prevention over defence against damages caused by water. The target is to protect human life and national wealth to the highest reasonable achievable extent.

The central tasks of National Water Strategy (water retention for the better utilisation of our water resources, risk prevention-based water damage control, the gradual improvement of the status of waters until the sustainable good status is achieved, establishing high-quality public water utility services and precipitation management without causing intolerable financial burden to the consumers, improving the relationship between water and society, renewing planning and control, and revision the economic regulatory system of water management) are all related either directly or indirectly to climate adaptation. The action plan of the NCCS, the 1st Climate Change Action Plan set the following water management adoption goals by 2020:

- Identification, promotion and regulation of water efficient ways of using water for drinking and irrigation purposes
- Developing a methodology for municipalities in order to support them in developing water management plans that can flexibly adapt to climate effects
- Creating a foundation for modelling, forecasting, and risk analysis of surface and underground water resources
- Initiating the revision of the hazard mapping of inland waters
- Determining inland water floods based on remote-sensing

- Initiation a study aimed at investigating the options for underground water storage and retention
- Supporting investments aimed at improving the mechanical condition of public water utility systems, to achieve sustainable drinking water supply and wastewater collection.
- Preparatory work for a study on vulnerability assessment at the extreme flow regimes expected as a result of climate change

The inter-ministerial consultation on the 2nd Climate Change Action Plan is progress, the agreed targets shall be adaptable to the targets of the Protocol.

Part three

Common indicators¹

I. Quality of the drinking water supplied

1. Context of the data

1. What is the population coverage (in millions or per cent of total national population) of the water supplies reported under sections 2 and 3 below?

The rationale of this question is to understand the population coverage of the water quality data reported under sections 2 and 3 below.

Please describe the type of water supplies for which data is included in the following tables, and the population share covered by these supplies.

Please also clarify the source of the water quality data provided (e.g., data from regulatory authorities).

Drinking water quality and monitoring in Hungary is regulated by Government Decree 201/2001. (X. 25.), transposing the current Drinking Water Directive. The Decree requires all water supplies to carry out regular monitoring of the supplied water at the point of consumption. The number of required samples depends on the volume of the supplied water; small supplies are monitored less frequently, but at least once a year for every parameter. Public and private supplies, urban and rural areas are both covered by the decree; however, individual (single household) supplies are exempt from these monitoring requirements. Government Decree 147/2010. (IV. 29.) also requires private well users to monitor water quality (upon installation and once in every 3 years afterwards), however, data is not collected and evaluated on a national level.

The quality of the supplied water is supervised by the public health authorities (public health departments of the county or district government offices). Large supplies (serving more than 5000 inhabitants) are supervised by the county offices, while smaller supplies by the district offices. The public health authorities also perform water quality monitoring; the sample number is approximately 10 % of the suppliers' self-control samples. All water quality tests are done by accredited (private or state) laboratories.

Water quality data is reported directly by the laboratory to the Information System on Water for Human Use (HUMVI) every 3 months. Data is validated by the water supplier or the public health authority. Only validated data is used for analysis at the national level.

Approximately 95 % of the population is served by public utility water supplies and approximately 3 % by small institutional or private supplies. The population using individual wells is estimated to be 2 %. The former two categories both obliged to report to the national database, and thus their quality information is included in the tables below. However, private supplies do not always fully meet the reporting requirements. Thus the population coverage of the reported data is between 95 and 98 %.

¹In order to allow an analysis of trends for all Parties under the Protocol, please use wherever possible 2005 — the year of entry into force of the Protocol — as the baseline year.

2. Please specify from where the water quality samples reported in sections 2 and 3 below are primarily taken (e.g., treatment plant outlet, distribution system or point of consumption).

The rationale of this question is to understand where the samples were primarily taken from for the water quality data reported in sections 2 and 3 below.

The reported data is based on regular compliance monitoring at the point of consumption. Nitrite is also measured and reported at the point of supply. Results from other monitoring points (such as abstraction wells or the treatment technology) are also reported to HUMVI, though it is not a legal requirement and the dataset is incomplete. In the sections below, typically the results from the consumers' points are used for reporting, but in the case of aluminium, benzene, benzo(a)pyrene, boron, cyanide, cis-1,2-dichloroethylene, 1,2-dichloroethane, fluoride, mercury, hardness, chloride, sodium, pesticides, polycyclic aromatic hydrocarbons, selenite, tetrachlorethylene, trichlorethylene, and radioactivity parameters samples collected at the point of supply can also be taken into account.

3. In sections 2 and 3 below, the standards for compliance assessment signify the national standards. If national standards for reported parameters deviate from the World Health Organization (WHO) guideline values, please provide information on the standard values.

The rationale of this question is to understand any possible differences between the national standards for microbiological and chemical water quality parameters and the respective WHO guideline values.²

Compliance is assessed against the parametric values defined by the EU legislation. EU parametric values are (with few exceptions) in line with the WHO guideline values. For trihalomethanes, the national legislation defines a stricter limit value (50 µg/l), and a national acceptable range applies to total hardness (50-350 mg/l), and there is national requirement for monitoring microscopic biology parameters. For those parameters, which are not legally regulated, the WHO guideline values and the US EPA guide values are used as a basis of evaluation.

2. Bacteriological quality

4. Please indicate the percentage of samples that fail to meet the national standard for *Escherichia coli* (*E. coli*). Parties may also report on up to three other priority microbial indicators and/or pathogens that are subject to routine water quality monitoring.

If possible, please provide segregated data for urban and rural areas in the table below. If this is not possible, please consider reporting by alternative categories available in your country, for example by “non-centralized versus centralized” water supplies or by population number-based categories. If you do so, please indicate the reported categories by renaming the rows in the column “area/category” in the table below accordingly.

If data can be reported neither for urban and rural areas nor for alternative categories, please report total (national) values only.

Please comment on the trends or provide any other important information supporting interpretation of the data.

²

? The latest edition of the WHO *Guidelines for Drinking-water Quality* is available at: http://www.who.int/water_sanitation_health/publications/dwq-guidelines-4/en/.

<i>Parameter</i>	<i>Area/category(2005)</i>	<i>Baseline value</i>	<i>Value reported in the previous reporting cycle (2017)</i>	<i>Current value (2020)</i>
<i>E. coli</i>	Total	1.13*	0.5	0.4
	Urban		0.3	0.4
	Rural		0.6	0.5
<i>Enterococci:</i>	Total	0.58*	1.5	1.7
	Urban		0.9	1.5
	Rural		1.7	1.9

* *disaggregated data is not available*

The bacteriological water quality was practically unchanged in the past 3 years. Small supplies usually have higher incident rates of bacterial non-compliance than large supplies. While the overall percentages of non-compliance are relatively low, the aim is to achieve drinking water that is completely free from faecal contamination. Most non-compliance incidents are due to failures of the distribution system, thus significant improvement can only be achieved by major reconstructions. Reconstructions may also provide a solution to problems related to regrowth in the distribution system.

3. Chemical quality

5. Please report on the percentage of samples that fail to meet the national standard for chemical water quality with regard to the following parameters:

- (a) Arsenic;
- (b) Fluoride;
- (c) Lead
- (d) Nitrate.

6. Please also identify up to three additional chemical parameters that are of priority in the national or local context.

If possible, please provide segregated data for urban and rural areas in the table below. If this is not possible, please consider reporting by alternative categories available in your country, for example by “non-centralized versus centralized” sanitation systems or by population number-based categories. If you do so, please indicate the reported categories by renaming the rows in the column “area/category” in the table below accordingly.

If data can be reported neither for urban and rural areas nor for alternative categories, please report total (national) values only.

Please comment on the trends or provide any other important information supporting interpretation of the data.

<i>Parameter</i>	<i>Area/category(2005)</i>	<i>Baseline value (2005)</i>	<i>Value reported in the previous reporting cycle (2017)</i>	<i>Current value (2020)</i>
Arsenic	Total	41.0	5.1	2.4
	Urban		3.2	2.1
	Rural		5.6	2.6
Fluoride	Total	0.86	0.3	0
	Urban		0.3	0
	Rural		0.3	0
Lead	Total	0.9	1.5	1.4**
	Urban		2.1	1.6**
	Rural		1.3	1.3**
Nitrate	Total	1.48	0.1	0.1
	Urban		0.3	0.2
	Rural		0.02	0.02
Additional parameter 1: Ammonium	Total	13.7	7.8	7.2
	Urban		6.8	5.1
	Rural		8.2	9.2
Additional parameter 2: Nitrite	Total	0.5	0.6	0.5**
		(ex-waterworks: 5.9)	(ex-waterworks: 3.4)	
	Urban		0.4	(ex-waterworks: 2.1)**
			(ex-waterworks: 1.7)	
	Rural		0.7	0.3**
			(ex-waterworks: 4.2)	
				(ex-waterworks: 0.9)**

Parameter	Area/category(2005)	Value reported in the previous reporting cycle		
		Baseline value (2017)	Value reported in the previous reporting cycle (2017)	Current value (2020)
Additional parameter 3: Trihalomethanes	Total	1.43	4.3	0.7**
	Urban		0.6	(ex-waterworks: 3.0)**
	Rural		5.3	4.2

* disaggregated data is not available

** 2019 data

As a result of the National Drinking Water Quality Improvement Programme, chemical quality of drinking water improved significantly, especially regarding the five national priority parameters: arsenic, boron, fluoride, nitrate and nitrite, which were the main focus of the Programme. It also contributed to the reduction of iron and manganese non-compliance as these two are very often co-occur with arsenic and the oxidative arsenic removal technologies also remove these compounds. Developments in water supply systems also included ammonium removal technology, which has reduced ammonium non-compliance. Many supplies rely on breakpoint chlorination for ammonium removal, which resulted in the emergence of disinfection by-products.

II. Outbreaks and incidence of infectious diseases related to water

In filling out the below table, please consider the following points:

(a) For reporting outbreaks, please report confirmed water-related outbreaks only (i.e., for which there is epidemiological or microbiological evidence for water to have facilitated infection);

(b) For reporting incidents, please report the numbers related to all exposure routes. In your response:

(i) Please report cases per 100,000 population;

(ii) Please differentiate between zero incidents (0) and no data available (-).

Please extend the list of water-related diseases, to the extent possible, to cover other relevant pathogens (e.g., enteric viruses, *Giardia intestinalis*, *Vibrio cholerae*).

Please indicate how the information is collected (e.g., event-based or incidence-based surveillance)

Disease	Incidence rate per 100,000 population (all exposure routes)		Number of outbreaks (confirmed water-borne outbreaks)			
	Value reported in Baseline (2008)	Value reported in the previous reporting cycle (2020)	Current value (2020)	Baseline (2008)	Value reported in the previous reporting cycle (2020)	Current value (2020)

	<i>cycle (2017)</i>			<i>cycle (2017)</i>		
Cholera	0	0	0	0	0	0
Bacillary dysentery (shigellosis)	0.8	0.2	0.9	0	0	0
Enterohaemorrhagic E. coli.	-	0.1	0.08	0	0	0
Viral hepatitis A	1.7	3.7	0.3	0	0	0
Typhoid fever	0.01*	0.01*	0.01*	0	0	0
Cryptosporidiosis	0.1	0.07	0.04	0	0	0
Giardiasis	1.4	0.8	0.6	0	0	0
Legionellosis	0.3 [#]	0.6	1.0	-	-	0

*Please comment on the trends or provide any other important information supporting interpretation of the data. *imported cases
#imported and endemic cases*

The National Communicable Disease Reporting System is a combined case-based and event-based surveillance, where laboratories and clinicians (general practitioners, specialists and hospitals) are legally required to report cases and events. The system also allows for linking cases to outbreaks. However, the source of infection is only investigated for outbreaks, and not all outbreak investigations are successful in determining the source of infection. The number of suspected or confirmed water-related outbreaks is very low, generally less than one per year.

Data on the yearly legionellosis outbreaks cannot be retrieved from reporting system, as clusters often extend to more than one year, due to definition of related cases (6 months for nosocomial infections and 2 years for travel associated cases). There were no major outbreaks in the past decades, but there are several small clusters (2-5 related cases).

III. Access to drinking water

If possible, please provide segregated data for urban and rural areas in the table below. If this is not possible, please consider reporting by alternative categories available in your country, for example by “non-centralized versus centralized” water supply systems or by population number-based categories. If you do so, please indicate the reported categories by renaming the rows in the table below accordingly.

If data can be reported neither for urban and rural areas nor for alternative categories, please report total (national) values only.

Please comment on the trends or provide any other important information supporting interpretation of the data with regard to access to drinking water.

Percentage of population with access to drinking water	Baseline value (2008)	Value reported in the previous reporting cycle (2017)	Current value (2020)
Total	93.98 %	95.23 %	95.42%
Urban	95.92 %	96.80 %	96.91%
Rural	89.82 %	91.14 %	91.53%

Source: Hungarian Central Statistical Office (https://www.ksh.hu/stadat_files/kor/en/kor0041.html)

Notes: Estimated data. Estimates are based on the ratio of household connected to the public drinking water networks. Urban: Budapest and other towns; rural: villages according to the administrative status of 1 January of the given year. Data refer to 31 December of the year.

The reported data represent the estimated proportion of population supplied with drinking water from centralised piped supply on premises. Based on the JMP report access to improved services is 100% in rural and urban areas.

Estimates provided by the WHO/United Nations Children’s Fund (UNICEF) Joint Monitoring Programme (JMP) for Water Supply and Sanitation. *JMP definitions are available at <http://www.wssinfo.org/definitions-methods/watsan-categories>.*

National estimates. Please specify how “access” is defined and what types of drinking-water supplies are considered in the estimates in your country.

In particular, please specify if the above percentage on “access to drinking water” refers to access to (tick all applicable):

- Improved drinking water sources (as per JMP definition)
- Supplies located on premises
- Supplies available when needed
- Supplies that provide drinking water free from faecal contamination

IV. Access to sanitation

If possible, please provide segregated data for urban and rural areas in the table below. If this is not possible, please consider reporting by alternative categories available in your country, for example by “non-centralized versus centralized” sanitation systems or by population number-based categories. If you do so, please indicate the reported categories by renaming the rows in the table below accordingly.

If data can be reported neither for urban and rural areas nor for alternative categories, please report total (national) values only.

Please comment on the trends or provide any other important information supporting interpretation of the data with regard to access to sanitation.

<i>Percentage of population with Baseline value access to sanitation</i>	<i>Baseline value (2008)</i>	<i>Value reported in the previous reporting cycle (2017)</i>	<i>Current value (2020)</i>
Total	71.28 %	81.46%	82.80 %
Urban	84.38%	89.77 %	90.50 %
Rural	41.11 %	59.70 %	62.40 %

Source: Hungarian Central Statistical Office (https://www.ksh.hu/stadat_files/kor/en/kor0042.html)

Notes: Estimated data. Estimations are based on the ratio of the dwellings connected to the public waste water collecting networks. Urban: Budapest and other towns; rural: villages according to the administrative status of 1 January of the given year. Data refer to 31 December of the year.

The reported figures represent the estimated percentage of the population connected to a centralized public sewage system.

Estimates provided by JMP. JMP definitions are available at <http://www.wssinfo.org/definitions-methods/watsan-categories>.

National estimates. Please specify how “access” is defined and what types of sanitation facilities are considered in the estimates in your country.

In particular, please specify if the above percentage on “access to sanitation” refers to access to (tick all applicable):

Improved sanitation facilities (as per JMP definition)

Facilities not shared with other households

Facilities from which excreta is safely disposed in situ or treated off site

V. Effectiveness of management, protection and use of freshwater resources

1. Water quality

1. On the basis of national systems of water classification, please indicate the percentage of water bodies or the percentage of the volume (preferably) of water³ falling under each defined class (e.g., for European Union countries and other countries following the European Union Water Framework Directive⁴ classification, the percentage of surface waters of high, good, moderate, poor and bad ecological status, and the percentage of groundwaters/surface waters of good or poor chemical status; for other countries, in classes I, II, III, etc.).

Compared to the previous report, there have been changes in the data and designation. The second review of the River Basin Management Plan has taken place, and the third National

³Please specify.

⁴Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.

River Basin Management Plan (OVGT3) is being adopted. The new evaluation results should be considered preliminary data, as the Government has not yet published OVGT3. The updated data available on the quality of surface water and groundwater refer to the period 2013-2019 (based on the manuscript of the National River Basin Management Plan 2021).

(a) For European Union countries and other countries following the European Union Water Framework Directive classification

(i) Ecological status of surface water bodies

<i>Percentage of surface water classified as:</i>	<i>Baseline value (specify 2007)*</i>	<i>Value reported in the previous reporting cycle (2012)**</i>	<i>Current value (2020)</i>
High status	2 % (8 %)	1 % (12%)	0.1 % (7 %)
Good status	15 % (44 %)	10 % (45 %)	11 % (43 %)
Moderate status	48 % (41 %)	52 % (28 %)	64 % (33 %)
Poor status	29 % (7 %)	35 % (11%)	16 % (13 %)
Bad status	6 % (0 %)	2 % (4 %)	8 % (4 %)
Total number/volume of water bodies classified	670 (800)	841 (846)	1072 (1057)
Total number/volume of water bodies in the country	1082	1078	1072

Ecological status based on biological, hydromorphological and physical-chemical parameter; in brackets only by physico-chemical assessment

** Covering sampling period of approximately 2004-2007, based mostly on non-WFD compatible monitoring results. Assessment results were published in 1st National River Basin Management Plan 2009.*

*** Covering sampling period of approximately 2008-2012, based on WFD compatible monitoring results. Assessment results were published in 2nd National River Basin Management Plan 2015.*

(ii) Chemical status of surface water bodies

<i>Percentage of surface water bodies classified as</i>	<i>Baseline value (2007)*</i>	<i>Value reported in the previous reporting cycle (2012)**</i>	<i>Current value (2020)</i>
Good status	51%	45%	54 %
Poor status	49 %	55%	46 %
Total number/volume of water bodies classified	59*	587	1072
Total number/volume of water bodies in the country	1082	1078	1072

* Because of the lack of monitoring data, 94.5 % of the surface water bodies were not assessed during 1st river basin management process. Data covers the sampling period of approximately 2004-2007, based mostly on non-WFD compatible monitoring results and only a limited number of parameters (heavy metals) Assessment results were published in 1st National River Basin Management Plan 2009

** Covering sampling period of approximately 2008-2012, based on WFD compatible monitoring results. Assessment results was published in 2nd National River Basin Management Plan 2015

(iii) Status of groundwaters

Percentage of groundwaters classified as	Baseline value (2007)*	Value reported in the previous reporting cycle (2012)**	Current value (2020)
Good quantitative status	85.4 %	80.0 %	80.0 %
Good chemical status	79.5 %	79.5 %	81.1 %
Poor quantitative status	14.6 %	20 %	20 %
Poor chemical status	20.5 %	20.5 %	18.9 %
Total number/volume of groundwater bodies classified	185	185	185
Total number/volume of groundwater bodies in the country	185	185	185

* Covering sampling period of approximately 2004-2007. Assessment results were published in 1st National River Basin Management Plan 2009

** Covering sampling period of approximately 2008-2012, based on WFD compatible monitoring results. Assessment results were published in 2nd National River Basin Management Plan 2015

(b) For other countries

(i) Status of surface waters

Percentage of surface water falling under class ^a	Baseline value (specify year)	Value reported in the previous reporting cycle (specify year)	Current value (specify year)
I			
II			
III			
IV			
V			
Total number/volume of water bodies classified			

	<i>Baseline value (specify year)</i>	<i>Value reported in the previous reporting cycle (specify year)</i>	<i>Current value (specify year)</i>
<i>Percentage of surface water falling under class^a</i>			

Total number/volume of water bodies in the country

^a Rename and modify the number of rows to reflect the national classification system.

(ii) *Status of groundwaters*

	<i>Baseline value (specify year)</i>	<i>Value reported in the previous reporting cycle (specify year)</i>	<i>Current value (specify year)</i>
<i>Percentage of groundwaters falling under class^a</i>			

I

II

III

IV

V

Total number/volume of groundwater bodies classified

Total number/volume of groundwater bodies in the country

^a Rename and modify the number of rows to reflect the national classification system.

2. Please provide any other information that will help put into context and aid understanding of the information provided above (e.g., coverage of information provided if not related to all water resources, how the quality of waters affects human health).

2. Water use

3. Please provide information on the water exploitation index at the national and river basin levels for each sector (agriculture, industry, domestic), i.e., the mean annual abstraction of freshwater by sector divided by the mean annual total renewable freshwater resource at the country level, expressed in percentage terms.

	<i>Baseline value (2006)</i>	<i>Value reported in the previous reporting cycle (2013)</i>	<i>Current value (2018)</i>
<i>Water exploitation index</i>			
Agriculture	0.27 %	0.33 %	0.46 %

<i>Water exploitation index</i>	<i>Baseline value (2006)</i>	<i>Value reported in the previous reporting cycle (2013)</i>	<i>Current value (2018)</i>
Industry ⁵	0.08 %	0.15 %	0.17 %
Domestic use ⁶	0.51 %	0.21 %	0.53 %
Other uses*	0.25 %	0.08 %	0.22 %
Energy cooling **	2.97 %	2.46 %	2.85 %

^a The figure includes abstractions for manufacturing industry

^b The figure refers only to public supply

* Figure refers to services, construction, etc. (the row added to the table by Hungary)

** Figure refers to abstraction for production of energy (only cooling waters) (the row was added to the table by Hungary)

⁵ Please specify whether the figure includes both water abstraction for manufacturing industry and for energy cooling.

⁶ Please specify whether the figure only refers to public water supply systems or also to individual supply systems (e.g., wells).

Part four

Water-related disease surveillance and response systems

1. In accordance with the provisions of article 8 of the Protocol:

Has your country established comprehensive water-related disease surveillance and early warning systems according to paragraph 1 (a)?

YES NO IN PROGRESS

Has your country prepared comprehensive national or local contingency plans for responses to outbreaks and incidents of water-related disease according to paragraph 1 (b)?

YES NO IN PROGRESS

Do relevant public authorities have the necessary capacity to respond to such outbreaks, incidents or risks in accordance with the relevant contingency plan according to paragraph 1 (c)?

YES NO IN PROGRESS

*Partial capacity is available, some sectors suffer from capacity problems

2. If yes or in progress, please provide summary information about key elements of the water-related disease surveillance and outbreak response systems (e.g., identification of water-related disease outbreaks and incidents, notification, communication to the public, data management and reporting). Please also provide reference to existing national legislation and/or regulations addressing water-related disease surveillance and outbreak response.

Hungary does not have a separate system for water related disease, however, the national infectious disease and outbreak response system, covers water related incidences as well. According to the Ministerial Decree 18/1998. (VI. 3.) of the Minister of Public Welfare on the epidemiological interventions for the prevention of infectious diseases and outbreaks (<https://net.jogtar.hu/jogszabaly?docid=99800018.NM>), the following potentially water related diseases fall under the reporting obligation of infectious diseases:

Amoebiasis

Anthrax

Botulism

Brucellosis

Campylobacteriosis

Cholera

Cryptosporidiosis

Echinococcosis

E. coli enteritis:

- enterohaemorrhagic

- enterotoxigenic

- enteroinvasive

- enteropathogenic

- enteroaggregative

- diffuse adhesive

Febris flava (as a vector-borne disease)

Giardiasis

Hepatitis (Hepatitis A and E virus)

Legionnaire's disease

Leptospirosis

Listeriosis

Malaria (as a vector-borne disease)

Paratyphus

Poliomyelitis

Rotaviral gastroenteritis

Salmonellosis

Shigellosis

Strongyloidosis

Tularemia

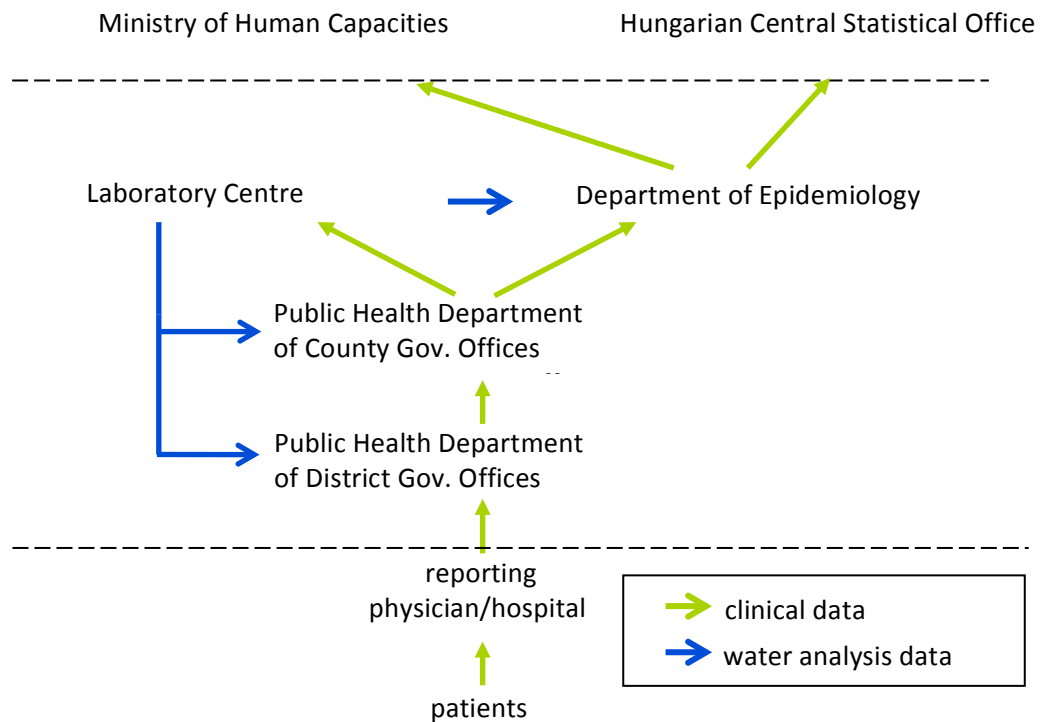
Typhus abdominalis

Yersiniosis

If the listed infections are suspected, the primary healthcare provider is obliged to report the case within 24 hours to the local public health office (usually the district government office according to the patient's residence). The infections indicated in bold are considered especially dangerous (legionellosis only if it is travel associated) and should be reported immediately (i.e. within 12 hours) according to the Ministerial Decree 1/2014 (I. 16.) of the Ministry of Human Capacities on the reporting requirements of dangerous infections (http://njt.hu/cgi_bin/njt_doc.cgi?docid=166265.360054). Reporting is carried out through an electronic system, the National Communicable Disease Reporting System (OSZIR), which is accessible for both the national and the local public health authorities (Figure 5.)

The requirements of epidemiological investigation and mitigation measures are also regulated in the Ministerial Decree 18/1998 and the Healthcare Act CLIV of 1997. Coordination is the responsibility of the local public health authorities.

REPORTING OF WATER RELATED OUTBREAKS



Water as a potential source is usually suspected when high number of cases emerges simultaneously, in a geographically well-defined area, and consumption of drinking water from a water supply or bathing at a same venue (or exposure to aerosol in case of legionellosis) is a common factor. Evidence is accepted as confirmed if the same pathogen strain is isolated from clinical and water samples. There are 6 local public health laboratories accredited for water analysis, but in case of viral or protozoa infections, the Laboratory Centre of the National Public Health Centre is contacted. They are also involved in the typing and comparison of the isolated strains.

3. Please describe what actions have been taken in your country in the past three years to improve and/or sustain water-related disease surveillance, early warning systems and contingency plans, as well as to strengthen the capacity of public authorities to respond to

water-related disease outbreaks and incidents, in accordance with the provisions of article 8 of the Protocol.

Although COVID-19 is not a water-borne disease, the virus also sheds with faeces and therefore, by examining raw sewage we can gain valuable information about the trends of the pandemic. Hungary was one of the first countries in Europe to introduce a national wastewater-based COVID-19 forecasting system. The National Public Health Center has been monitoring SARS-CoV-2 from sewage in Budapest since May 2020. The wastewater of every county seat (19) has been tested weekly since July 2020. In accordance with the Commission Recommendation (EU) 2021/472 of 17 March 2021 on a common approach to establish a systematic surveillance of SARS-CoV-2 and its variants in wastewaters in the EU, the sampling frequency in case of the largest cities (Budapest, Miskolc, Debrecen, Szeged, Pécs, Győr) has been increased to twice per week since October 2021.

The analyses are carried out by the National Public Health Center with the support of the operators of the wastewater treatment plants and the county government offices. The Chief Medical Officer and the Pandemic Operating Board are informed of the results twice every week. An infographic is published weekly on the NPHC website for the information of the public (<https://www.nnk.gov.hu/index.php/koronavirus/szenyvizvizsgalatok>).

Part five

Progress achieved in implementing other articles of the Protocol

Please provide a short description of the status of implementation of articles 9 to 14 of the Protocol, as relevant.

Suggested length: up to two pages

The National Water Strategy considers the improvement of the relationship of society and water a high priority. Public awareness should be directed towards the protection of water as part of a healthy environment and a resource for the next generations. The awareness raising is a joint task of all stakeholders in the water sector. The Strategy highlights the need for starting water education from primary school and continuing life long. Basic knowledge on water management should be part of teachers' training.

Water related higher education is traditionally strong in Hungary, especially in engineering. As of 2014, 17 universities offered 35 different water related courses and 9 institutions 15 post-graduate training. Educational modules cover different aspects from hydrogeology through civil engineering to water ecology.

Some examples of graduate programmes:

- Budapest Technical and Economy University – water management, water engineering
- Miskolc University – hydrogeologist
- National Public Service University – water management
- Kaposvár University
- Eötvös Lorand University – ecology, hydrology, hydrogeology
- Environmental engineer graduate programmes in several universities (St. István University, Pannon University)

Postgraduate:

- Budapest Technical and Economy University – water utility specialized engineer

Middle level trainings: technical schools for water technicians

The Strategy emphasises the need to raise the profile of water management as a carrier option. The employment, retention and advancement of young people in the water sector must be promoted for a quality workforce.

Life-long education comprises trainings and professional workshop provided by various actors of the sector: e.g. the National General Water Directorate (water management), National Public Health Centre (public health aspects, epidemiology, water laboratory capacity building), professional associations (Hungarian Water Utility Association – utility management, monitoring; Hungarian Water Association – wastewater treatment, water industry), civil associations (Hungarian Society of Hydrology, Hungarian Society of Hygienists).

All of the above-mentioned organisations contribute to wider awareness raising through publication of freely accessible information on their websites or through events (e.g. World Water Day). Information to the public is a key element of wider recognition of the importance of good water management. Ambitions of the Strategy in this fields are to increase the frequency of publishing information (e.g. daily information on drinking water service), and to bring closer the segregated information systems of water data for a comprehensive information database.

The Hungarian Academy of Sciences, as a coordinator of water research institutions, launched the National Water Programme in 2016. The Programme aims to advance water research on a national level and create a network of the currently fragmented water research institutions. An integrated and accessible water database was identified as a prerequisite of high level research as well.

The first major achievement of the National Water Programme was the development of the National Water Research Programme. Based on the national strategic framework, the overview of the status quo in various water-related scientific areas, international examples, and a wide stakeholder consultation, an inventory of the challenges and the identified priority research tasks was compiled by the Water Coordination Group. The scientific question are organised into 6 priority areas:

1. Safe drinking water
2. Water quality
3. Sustainable water use
4. Water management
5. Protection and restoration of aquatic ecosystems
6. Water-related social conflicts

The first project was already launched under the Research Programme: “Clean water – multidisciplinary assessment of safe drinking water production from source to tap” to investigate risks associated with bank-filtered drinking water.

A main platform of international cooperation in Hungary is the European Union. The national legislative framework on water issues largely relies on EU law, and the national experts actively contribute to cooperation on implementation and the renewal of the legislation. There are also bilateral agreements on water management with the neighbouring and several other countries, which also cover the sustainable use of water resources and the protection of drinking water sources.

As the water management is very vulnerable to the impact of climate change, water conservation and the long-term sustainable water management are considered high priority in the Second National Climate Change Strategy adopted in 2018. To this end, several short, medium and long-term actions have been formulated.

The presently launched National Water Science Laboratory (VTNL) is an integrative research hub that includes WASH areas, among other water issues. Its purpose is to provide professional assistance for integrated water management activities that

- forecasts low water levels in watercourses, formulates solutions for its management, ensures the improvement and long-term maintenance of water transferring capacity of floodplains;
- study and categorise the reactions of shallow lakes to environmental stress in order to optimize operational tasks;
- prepare for the new classification system of the Water Framework Directive, assist in the implementation of its measures and the overall monitoring assessment. All of the above should be carried out in such a way that the ecosystem services of the water bodies are improved and that the assessment of water quality is predictive and not only following quality changes.

Hungary is also highly active in water policy on the global level. The 2nd Budapest Water Summit was organised in 2016 with more than 1800 participants from 117 countries. The

most important questions and problems of water, sanitation and sustainable water management were discussed by attending presidents, heads of states, ministers, high-level officers of international organisations, as well as members of the scientific and civil society. The event was patronised by Mr. János Áder, the President of Hungary. The motto of the event was “Water Connects”. The 3rd Summit took place in 15 of October 2019, focusing on “Preventing water crisis”.

Budapest hosted Planet Budapest Sustainability Expo and Summit in 2021, where international cooperation on water was an main theme, similar to the Water Summits.

In 2019, Hungary chaired the International Commission for the Protection of the Danube River (ICPDR). The implementation of the 4th Joint Danube Survey was a key priority in the programme of the presidency. The scientific survey covering the entire length of the Danube and its main tributaries generated comparable and reliable water quality (chemical and biological) data and information. Renewal of the practical usability and operation of the Danube Accidental Early Warning System (AEWS) was also achieved. In connection to that, an international workshop titled Planning of Water Quality Remediation was organised involving the the parties of the Danube River Protection Convention and the Joint Expert Group of UNECE Water Convention and the Industrial Accident Convention.

With the support of the water quality priority area of the EU Danube Region Strategy (EUSDR), the project Danube Hazard m3c on management of hazardous pollutants based on monitoring and modelling was carried out between July 2020 and the end of 2022. The revised Integrated Tisza RBMP was completed in the framework of the transboundary project JOINTISZA, supported by the Hungarian coordination of EUSDR. The water ministers of the Tisza countries (Slovakia, Ukraine, Romania, Hungary and Serbia) signed a Cooperation Agreement on their 3rd meeting in Budapest, 26th September, 2019 to politically strengthen water cooperation between the parties, covering the entire river basin.

Hungary also supports the promotion of the global opening of the UN Water Convention and its implementation by taking an active role in the Convention’s presidency and work program.

The strategic objectives of the **4th National Environment Programme** (2015-2020) include both the improvement of environmental conditions for human health (e.g. ensuring healthy drinking water) and the protection and sustainable use of strategic natural resources, in particular water. The Programme also has a horizontal objective of raising environmental awareness. In order to provide information, awareness-raising and education on the protection of the aquatic environment, wetlands and natural water resources, as well as on the relationship between water and health, various activities were carried out during the period under review.

Our education for sustainability programs make children aware of the importance of water for the living world, including humans and human health from an early age. The **Green Kindergarten program**, launched in 2006, provides a framework for environmental education in preschool age; one of four children in Hungary can now attend Green Kindergarten. On the occasion of the 15th anniversary of the Program launch, an interactive puppet performance on the protection of waters, entitled "Grateful Waters" was prepared and presented in several places.

The education for sustainability of schoolchildren is supported by the **Eco-School programme**; 1,200 Hungarian public education and vocational training institutions have gained the title of eco-school or eternal eco-school.

In the framework of the **BISEL** program students of grades 7-12 examine the ecological status of small watercourses using simple methods, and solve a variety of creative tasks

related to water. In the 2020-2021 year competition 125 teams entered, 500 students participated. In 2020 and 2021, we also announced a BISEL **photo contest** with water-related topics, the best works of which could be seen both in the Hungarian Agricultural Museum and online.

Part six

Thematic part linked to priority areas of work under the Protocol

1. Water, sanitation and hygiene in institutional settings

1. In the table below, please provide information on the proportion of schools (primary and secondary) and health-care facilities that provide basic water, sanitation and hygiene (WASH) services.

Basic services refer to the following:

(a) *Basic sanitation service: Improved facilities (according to JMP definition), which are sex-separated and usable at the school or health-care facility;*

(b) *Basic drinking water service: Water from an improved source (according to JMP definition) is available at the school or health-care facility;*

(c) *Basic hygiene service: Handwashing facility with water and soap available to students (schools) or patients and health-care providers (health-care facilities).*

If the above definitions/categories do not apply in your country, please report for alternative categories for which data are available. In this case, please indicate the reported categories by renaming the rows in the table below accordingly.

Please indicate the source of data. If data is not available, please put (-).

<i>Institutional setting</i>	<i>Value reported in the previous reporting cycle (2017/2018)</i>	<i>Current value (2019/2020)³</i>
<i>Schools¹</i>		
Basic sanitation service	100 %	-
Basic drinking-water service	100 %	-
Basic hygiene service	100 %	-
<i>Health-care facilities²</i>		
Basic sanitation service	100 %	83%
Basic drinking-water service	100 %	100%
Basic hygiene service	100 %	92%

¹ Source: Child and youth hygiene survey, National Public Health Center (2017/2018)

² Source: national overview for the JMP report (2018).

³ Source: survey by the NPHC on the environmental status of hospitals.

Differences in the values for healthcare facilities does not represent a decline in quality, but a more precise assessment. In sanitation, the number of toilets accessible for people with limited mobility and suitable for menstrual hygiene management is the bottleneck for achieving the 100% basic service. In hygiene, the availability of soap or hand disinfection was the limiting factor. It should be noted, that data is only representative for secondary and tertiary care. The survey did not extend to primary care services.

2. Has the situation of WASH in schools been assessed in your country?

YES NO IN PROGRESS

3. Has the situation of WASH in health-care facilities been assessed in your country?

YES NO IN PROGRESS

4. Do approved policies or programmes include actions (please tick all that apply):

To improve WASH in schools

To improve WASH in health-care facilities

5. If yes, please provide reference to main relevant national policy(ies) or programme(s).

There are several legislative instruments which aim at the provision of good WASH services in schools and healthcare facilities. The regulation usually focuses on the mandatory requirements, which should be met by all institutions. Requirements cover the aspects of access (number of taps and toilets) for schools and healthcare facilities and for the latter, also aspects of infection control and waste management. Further regulatory development is necessary on accessibility and cleaning. In addition to the regulations, technical guidelines are also available e.g. on Legionella risk management, multiresistant pathogens, infection control in dentistry and dialysis units, best practice of operation for hospitals from an environmental health perspective etc.

WASH in schools regulation:

- Ministerial Decree 20/2012. (VIII. 31.) of the Ministry of Human Capacities on operation of educational institutions:

http://njt.hu/cgi_bin/njt_doc.cgi?docid=154155.359381

- Standard series MSZE 24203:2012, by the Hungarian Standards Committee

WASH in healthcare facilities regulation:

- Ministerial Decree 60/2003. (X. 20.) on the minimum requirements of healthcare service providers: <https://net.jogtar.hu/jogszabaly?docid=A0300060.ESC>

- Ministerial Decree 20/2009. (VI. 18.) on the prevention of nosocomial infections

<https://net.jogtar.hu/jogszabaly?docid=A0900020.EUM>

- Ministerial Decree 18/1998. (VI. 3.) on the epidemiological interventions for the prevention of infectious diseases and outbreaks

<https://net.jogtar.hu/jogszabaly?docid=99800018.NM>

- Government Decree 246/2015. (IX. 8.) on the identification and protection of critical healthcare infrastructure: <https://net.jogtar.hu/jogszabaly?docid=A1500246.KOR>

- Ministerial Decree 43/2014. (VIII. 19.) of the Ministry of Human Capacities on the disaster management plans of healthcare facilities

<https://net.jogtar.hu/jogszabaly?docid=A1400043.EMM>

- Ministerial Decree 12/2017 (VI. 12) of the Ministry of Human Capacities on waste management in healthcare facilities:

http://njt.hu/cgi_bin/njt_doc.cgi?docid=202428.360061

- Ministerial Decree 51/2013 (VII. 15.) of the Ministry of Human Capacities on the management of sharp object and the prevention of injuries in healthcare facilities: http://njt.hu/cgi_bin/njt_doc.cgi?docid=161942.351885
- Additional relevant guidelines are published by the National Public Health Center: <http://www.oek.hu/oek.web?to=16&nid=444&pid=1&lang=hun>; <https://www.antsz.hu/portal/jarvany?transactionid=-5706941083990727139>

2. Safe management of drinking-water supply

6. Is there a national policy or regulation in your country, which requires implementation of risk-based management, such as WHO water safety plans (WSPs), in drinking water supply?

YES NO IN PROGRESS

7. If yes, please provide reference to relevant national policy(ies) or regulatory documentation.

The legal obligation on the development of WSP for all drinking water supplies is declared in the Drinking Water Act (Government Decree 201/2001 (X.25)): http://njt.hu/cgi_bin/njt_doc.cgi?docid=58066.358492

8. In the table below, please provide information on the percentage of the population serviced with drinking-water under a WSP.

Please indicate the source of data. If data is not available, please put (-).

<i>Percentage of population</i>	<i>Value reported in the previous reporting cycle (2018)</i>	<i>Current value (2021)</i>
Total	~95%*	~95%*

* In Hungary, all public water supply systems are operated under WSP, except the very small supply systems (supplying less 10m³/d water and serving less 50 people). Thus the ratio of population serviced with drinking water under a WSP is equal to the proportion supplied from public centralised water supply.

3. Equitable access to water and sanitation

9. Has the equity of access to safe drinking-water and sanitation been assessed?

YES NO IN PROGRESS

10. Do national policies or programmes include actions to improve equitable access to water and sanitation (please tick all that apply):

- To reduce geographical disparities
- To ensure access for vulnerable and marginalized groups
- To keep water and sanitation affordable for all

11. If yes, please provide reference to main relevant national policy(ies) and programme(s).

- The transposition of the recast Drinking Water Directive, which is currently in progress, will determine primarily the duties and responsibilities of improving equitable access.

- The Hungarian Government lays emphasis on the reduction of household costs. As a part of this programme, water tariffs were immobilized in 2012, and nominal and actual water fees were nationally reduced in 2013 and 2014.

Act CCIX in 2011 on Water Utility Service:
<https://net.jogtar.hu/jogszabaly?docid=A1100209.TV>

Act No. LIV in 2013 on the implementation of household cost reductions:
<https://net.jogtar.hu/jogszabaly?docid=A1300054.TV>

- Other programs:

The National Assembly Resolution 1/2014. (I. 3.) on the National Development 2030 - National Development and Regional Development Concept:
http://njt.hu/cgi_bin/njt_doc.cgi?docid=166141.258698

Drinking Water Quality Improvement Program:
<https://www.palyazat.gov.hu/download.php?objectId=53467>

25/2002 on the National Program for the Implementation of Waste Water Treatment and Disposal (II. 27.) Government Decree:

http://net.jogtar.hu/jr/gen/hajt_doc.cgi?docid=A0200025.KOR

The Rural Development Program adopted by the European Commission:
<https://www.palyazat.gov.hu/download.php?objectId=54181>

Hungarian Rural Development Program 2014–2020: http://ec.europa.eu/agriculture/rural-development-2014-2020/country-files/en/factsheet-hungary_en.pdf

Farm Development Program Application: http://www.nakvi.hu/app/tanya/index_main.php

TÁMOP-5.3.6-11 / 1 Complex yard program: <http://palyazat.gov.hu/doc/3367>and

TÁMOP-5.3.6 / B-13/1 Complex yard program: <https://www.palyazat.gov.hu/doc/4267>

Part seven

Information on the person submitting the report

The following report is submitted on behalf of Hungary in accordance with article 7 of the Protocol on Water and Health.

Name of officer responsible for submitting the national report: Dr. Márta Vargha (lead expert, National Public Health Centre, Department of Public Health Laboratories)

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Telephone number: +36302496213

Name and address of national authority: National Public Health Centre, Albert Flórián út 2-6, Budapest, H-1097

Signature: 

Date: 31/08/2022

Submission

1. Parties are required to submit their summary reports to the joint secretariat, using the present template and in accordance with the adopted guidelines on reporting, 210 days before the next session of the Meeting of the Parties. Submission of the reports ahead of this deadline is encouraged, as this will facilitate the preparation of analyses and syntheses to be made available to the Meeting of the Parties.

2. Parties are requested to submit, to the two addresses below, an original signed copy by post and an electronic copy by e-mail. Electronic copies should be available in word-processing software.

Joint Secretariat to the Protocol on Water and Health

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