

SUBREGIONAL WORKSHOP ON IMPROVING SMALL-SCALE WATER SUPPLY AND SANITATION FOR BETTER HEALTH

Meeting report

10-12 October 2017
Belgrade, Serbia





**World Health
Organization**

REGIONAL OFFICE FOR **Europe**

Subregional workshop on improving small-scale water supply and sanitation for better health

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ABSTRACT

This workshop was organized by the European Centre for Environment and Health of the WHO Regional Office for Europe. It was targeted at national decision-makers in the health, water, sanitation and rural development sectors from Albania, Bosnia and Herzegovina, Croatia, Montenegro, Romania, Serbia and the former Yugoslav Republic of Macedonia. The workshop sought to facilitate a subregional exchange of experiences relating to safe, sustainable small water-supply and sanitation services in rural areas, and to promote good practices to improve the safety and sustainability of such services.

Participants reviewed regulatory requirements and institutional responsibilities for the management and public health surveillance of small water and sanitation systems, discussed relevant challenges, identified methods for improvement, presented policy tools and internationally recognized good practices, shared national experiences with these tools and practices, described the benefits and principles of implementation of the WHO-recommended water and sanitation safety planning approaches for small systems, and discussed future actions to improve the management of small systems, including possible targets under the Protocol on Water and Health.

Keywords

DRINKING WATER
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Executive summary

Background and objectives

Supported by the United Nations Economic Commission for Europe (UNECE) and the WHO Regional Office for Europe, the Protocol on Water and Health aims to protect human health and well-being through better water management and the prevention and control of water-related diseases. Last June, ministers from across the WHO European Region recognized the Protocol as a practical framework for realizing both the water, sanitation and hygiene commitments they made in the Declaration of the Sixth Ministerial Conference on Environment and Health (the Ostrava Declaration), and the aspirations of the 2030 Agenda for Sustainable Development, particularly the call to combat waterborne diseases in Goal 3 and to provide equitable, universal access to safely managed drinking-water and sanitation services for all in Goal 6.

Evidence from across the entire Region has shown that small water and sanitation systems face a range of organizational, managerial and financial challenges in ensuring the universality, equity and safety of services. Improving the situation of small water-supply and sanitation services and promoting the safe and efficient management of these services are two key priorities in the programme of work for 2017–2019 adopted by the Parties to the Protocol.

This workshop, which took place in Belgrade, targeted national decision-makers in the sectors of health, water, sanitation and rural development from seven countries in south-eastern Europe: Albania, Bosnia and Herzegovina, Croatia, Montenegro, Romania, Serbia and the former Yugoslav Republic of Macedonia. It aimed to facilitate the subregional exchange of experiences relating to safe, sustainable services for small water-supply and sanitation systems in rural areas and to promote good practices to improve them. The workshop had several specific objectives:

- to review the regulatory requirements and institutional responsibilities for the management and public health surveillance of small water-supply and sanitation systems;
- to discuss specific challenges and identify methods for addressing them;
- to introduce policy tools and internationally recognized good practices and discuss country experiences in improving these small systems;
- to describe the key steps and benefits of implementing both the water and sanitation safety planning approaches for such systems;
- to provide an update on the revision of the WHO Guidelines for Drinking-Water Quality, specifically the sanitary inspection forms for small supplies; and
- to discuss future actions to strengthen the management and performance of small systems, including the setting of targets under the Protocol.

The workshop was designed to strengthen national capacities for improving the safe management of small water-supply and sanitation systems and to inspire relevant policy actions and programmes, including through the setting and implementation of targets under the Protocol on Water and Health.

Workshop programme

In addition to the opening and closing sessions, the workshop was divided into seven thematic sessions over the course of three days.

- Session 1 outlined why small water-supply and sanitation systems are of concern. Representatives from the focus countries described how they are addressing key issues.
- Session 2 presented the water safety plan (WSP) approach for small systems. It examined a risk-assessment tool, a national WSP implementation roadmap and several case studies.
- Session 3 was devoted to education, qualification and networking for the operators of small water supplies.
- Session 4 addressed monitoring and surveillance of drinking-water quality and sanitary conditions in small water supplies, with a special focus on sanitary inspections.
- Session 5 turned to the issues of sustainable financing. It featured a hands-on exercise on estimating direct support costs and discussion of how to finance them.
- Session 6 introduced the sanitation safety plan (SSP) approach for small systems. It included an interactive rural planning exercise and group work on implementation.
- Session 7 was a round-table discussion of concrete steps that the focus countries can take to improve the safety and sustainability of small water-supply and sanitation systems.

Conclusions

Rationale

- Small water-supply and sanitation systems pose a persistent challenge to Member States throughout the Region, regardless of their socioeconomic status.
- National challenges include a broad lack of policy, regulations (or at least enforcement), data, human resources and funding for small systems. Other major issues are unresolved questions of ownership and poor compliance with existing regulations.

Policy

- The Sustainable Development Goals support attention to small-scale water, sanitation and hygiene (WASH) services.
- The Ostrava Declaration provides a regional platform for national action on small systems.
- The Protocol on Water and Health can help countries in translating global and regional aspirations into national targets and actions.
- Small systems should be explicitly included in national target-setting under the Protocol.

General recommendations for small systems

- Institute regulatory requirements to clarify questions of ownership, establish which body has the legal authority to conduct monitoring and surveillance, stipulate improvements and leverage financing.
- Establish interagency working groups on small-scale water supplies and sanitation – ideally based on existing mechanisms – to help focus attention and provide guidance.
- Develop a national registry of small-scale systems.
- Undertake baseline analysis, using for instance a rapid assessment, to help prioritize policy actions.
- Develop guidance, technical standards and tools for private water supplies (such as individual wells) and sanitation systems.

WSPs

- The WSP approach is an internationally recognized public-health benchmark for providing safe drinking-water. Its effectiveness has been demonstrated for small supplies.

Several countries in the Region have introduced or plan to introduce WSP approach in their regulations, including those covering small systems.

- Expanding the use of WSPs for small supplies requires a phased approach and long-term support. A good national roadmap is invaluable in this effort; it should cover advocacy work in multiple sectors, cultivation of national and local expertise, pilots to demonstrate feasibility and assess resource needs, laws that include WSP provisions, nationally adapted tools, training programmes and auditing.
- WSP targets should be set using the framework of the Protocol and of the Ostrava Declaration on Environment and Health.

Surveillance of small water supplies

- Water quality surveillance is a core public health function, and surveillance authorities should also play an advisory role for small supplies.
- It is important to identify an effective mechanism for enforcing surveillance requirements for small systems and improve the use of surveillance data for policy improvements.
- Risk-based approaches such as WSPs facilitate the prioritization of surveillance efforts.
- Water quality monitoring should focus on core parameters as well as any other locally relevant parameters. Guidance is needed for public health offices on parameter selection and risk assessment.
- While water testing remains important, surveillance should focus more on sanitary inspections and WSP audits. Although sanitary inspections are well established in some countries, they often lack a risk-based focus. They help overcome the shortcomings of microbiological water quality testing and support the implementation of WSPs. The WHO sanitary inspection forms can be readily adapted to national and local conditions.
- Monitoring of small systems should also include service-level indicators, such as the quality, quantity, accessibility, continuity and reliability of water supplies.
- Where practicable, national surveillance should be harmonized with regional and global monitoring instruments, including those from the Protocol, the Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP) and the Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS).

Education and qualification of water-supply operators

- The biggest reason for engaging small-system operators is to improve their accountability for water-supply safety.
- Recommended actions for increasing operator expertise include the following:
 - establish minimum qualifications for operators of small supplies;
 - amend existing training and testing schemes to address water quality and WSPs;
 - use a training-of-trainers programme with the public health network;
 - integrate water-supply topics into other local networking and training activities; and
 - integrate such topics into university and professional continuing education programmes.

Financing of small water-supply services

- Public water-supply services are typically funded by a combination of taxes, tariffs and occasionally transfers.
- Direct-support services are financed chiefly through state and local taxes.
- For small systems, tariffs usually do not cover costs or services are not paid by the consumers.

- Calculation of direct support costs and funding gaps are useful in advocating for better funding of WASH-related public health services.

Small sanitation systems

- There is a persistent lack of adequate sanitation in rural areas. Rural sanitation tends to be a neglected, poorly funded policy area.
- Centralized systems are not appropriate for all rural environments, and decentralized alternative solutions need to be available.
- A wide variety of stakeholders need to be involved to address risks in the entire sanitation chain.
- Countries need to raise community awareness about the importance of proper sanitation, provide local authorities with financing tools, institute regulatory requirements for small sanitation systems and establish monitoring and surveillance of such systems.

SSPs

- SSPs provide a framework for addressing the full range of exposure groups and pathways, and a coordinated approach for safely managing the entire sanitation chain.
- Ways to build capacity for SSP implementation in small systems include developing and disseminating appropriate guidelines, tools and training materials; lobbying local and national decision-makers; providing training that targets public health professionals as well as small operators; incorporating SSPs in relevant academic curricula; educating children on basic WASH principles; and developing an auditing system.

Introduction

Together, Serbia and Germany jointly lead the programme area on small-scale water supply and sanitation in the Protocol on Water and Health, an area that has been confirmed as a priority for the entire European Region. The workshop was hosted in Belgrade by the Serbian Ministry of Health and the Institute of Public Health of Serbia on 10–12 October 2017. It was organized by the European Centre for Environment and Health of the WHO Regional Office for Europe within the framework of the United Nations Development Account (UNDA) project “Strengthening Governments’ and water operators’ capacity to ensure equity of access to water and sanitation in countries with economies in transition in the Economic Commission for Europe region, with a particular focus on small-scale water supplies and sanitation in rural areas”.

The three-day workshop targeted national decision-makers in the sectors of health, water, sanitation and rural development from the south-eastern European countries of Albania, Bosnia and Herzegovina, Croatia, Montenegro, Romania, Serbia and the former Yugoslav Republic of Macedonia. The 47 participants also included WHO temporary advisers from Germany, the Netherlands, Portugal and the United Kingdom who shared their experiences with small water-supply and sanitation systems, as well as a sizeable contingent of representatives from United Nations offices in Belgrade. See Annex 1 for the full list of participants.

Opening session. Background, objectives and expected outcomes

The workshop was opened by Ferenc Vicko, State Secretary from the Serbian Ministry of Health, who described what a useful framework the Protocol on Water and Health has proven to be for Serbia in improving population health and complying with international standards. The other countries in the subregion face similar challenges, he said, which the workshop promised to help them address with common tools and solutions. Verica Jovanovic, Director of the Institute of Public Health of Serbia, then noted how efforts to improve water and sanitation were a collaborative effort of various national and regional bodies. Zsófia Pusztai, Head of the WHO Country Office in Serbia, observed that while we soon will be able to send people to Mars, many people in the subregion still do not have access to adequate sanitation and safe drinking-water, and 14 people in the European Region die every day from diarrhoeal diseases.

There followed an overview of the workshop background and objectives, starting with the Protocol. Supported by the UNECE and the Regional Office, the Protocol aims to protect human health and well-being through better water management and the prevention and control of water-related diseases. The Protocol offers a practical framework to help countries realize incrementally the aspirations of the 2030 Agenda for Sustainable Development, particularly the call to combat waterborne diseases in Goal 3 and to provide equitable, universal access to safely managed drinking-water and sanitation services for all in Goal 6. Notwithstanding its reputation for being a developed region, 60 million of the 900 million people living in the European Region in 2017 still lack access to piped water, with 2 million relying on surface water for drinking. At the same time, 36 million residents lack access to basic sanitation, while 328 thousand still practice open defecation.

Evidence from across the Region shows that small water and sanitation systems face a range of organizational, managerial and financial challenges in ensuring the universality, equity and safety of services. Improving the situation of small water-supply and sanitation systems and promoting the safe and efficient management of their services are two of the key priorities in the Protocol programme of work for 2017–2019. In 2016, to support policy action under the Protocol to improve these small systems, the Regional Office published the guidance document

Taking policy action to improve small-scale water supply and sanitation systems: tools and good practices from the pan-European region.

The Protocol covers the entire water cycle. Half of the Member States in the Region have ratified it, including all of the workshop focus countries except Montenegro and the former Yugoslav Republic of Macedonia. In addition, the Ostrava Declaration – adopted in June at the Sixth Ministerial Conference on Environment and Health – calls on European Member States to develop national portfolios of action by the end of 2018, mapping out what they want to achieve in next five years in various areas, including WASH.

The workshop aimed to facilitate the subregional exchange of experiences relating to the safety and sustainability of small water-supply and sanitation systems in rural areas, and to promote good practices to improve their services. The workshop had several specific objectives:

- to review the regulatory requirements and institutional responsibilities for the management and public health surveillance of small water-supply and sanitation systems;
- to discuss specific challenges and identify methods for addressing them;
- to introduce policy tools and internationally recognized good practices and discuss country experiences in improving these small systems;
- to describe the key steps and benefits of implementing both the water and sanitation safety planning approaches for such systems;
- to provide an update on the revision of the WHO Guidelines for Drinking-Water Quality, specifically the sanitary inspection forms for small supplies; and
- to discuss future actions to strengthen the management and performance of small systems, including the setting of targets under the Protocol.

The workshop was expected to encourage cooperation within the subregion, to strengthen national capacities for improving the safe management of small water-supply and sanitation systems and to inspire relevant programmes and policy actions, including the establishment of national targets under the Protocol.

After a round of participant introductions, Bettina Rickert (German Environment Agency) and Dragana Jovanovic (Institute of Public Health of Serbia) were selected to chair the meeting in their capacity as representatives of the two Parties leading the Protocol programme area on small-scale water supply and sanitation. (See Annex 2 for the workshop programme, which also specifies the titles of presentations and the names of individual presenters.) Biljana Majstorovic and Mirko Jakovljevic served as English–Serbian interpreters, and Misha Hoekstra as rapporteur.

Session 1. Situation of small water-supply and sanitation services

The first thematic session provided background on the state of small water-supply and sanitation services in the European Region, particularly in the seven focus countries.

Nearly 30% of the population in the Region lives in rural areas, where small water and sanitation systems are often necessary for technical, hygienic and economic reasons. Less than 60% of rural households have piped water, and just 70% have improved sanitation facilities. Within the workshop subregion, more than 90% of the population has access to basic drinking-water service. Small water and sanitation systems are both diverse and numerous – they number in the hundreds of thousands in the European Region – posing enormous support and monitoring challenges.

There is no universal definition of “small systems”; countries define them by number of people served or volume of water supplied; by management type (publicly, community or privately managed); or by type of system (centralized or decentralized). Typical features and challenges: small systems are not sufficiently addressed by national regulations; ownership is often unclear; financial resources are limited; and staff frequently lack training, an understanding of health risks and access to technical support. Common pollution risks include ageing infrastructure, inadequate sanitation protection and practices, poor management of animal waste and vulnerability to heavy rainfall. Moreover, water quality surveillance is usually minimal, with at best a single sample taken annually. The consequences include unsafe services, infrastructure breakdowns, drinking-water shortages and poor compliance with standards – and increased health risks. Although data are limited, particularly for rural areas, a study of the Nordic countries found that more than a third of waterborne disease outbreaks there were linked to single-household supplies. An analysis by Hunter et al. found that in three European subregions, investing in improvements had a benefit–cost ratio in preventing acute diarrhoeal illness that ranged from 2.5:1 to 21:1.

Across the European Region, countries are recognizing the importance of policy action to provide safe, sustainable water and sanitation services to protect public health. Insofar as safe, clean drinking-water and sanitation are essential to the full enjoyment of all human rights, it is critical to ensure that people served by small systems enjoy the same level of protection as those served by large ones.

Yet how does a country proceed if it has minimal information about its small systems? To answer this question, the session considered how the host country, **Serbia**, addressed a widespread lack of data on its small water supplies. One of the targets it set under the Protocol was to undertake a baseline analysis of drinking-water supply systems in rural areas. To meet this target and close the knowledge gap, the Institute of Public Health conducted a rapid survey of small rural supplies in 2016, based on the WHO model presented in *Rapid assessment of drinking-water quality: a handbook for implementation*. The Institute used cluster sampling to provide a representative picture of water supplies while keeping costs down. It prepared ten questionnaires, each consisting of 10 risk questions geared to a particular type of water supply or network. The survey found that among individual supplies, the majority were either protected springs (most of them unfenced) or boreholes (where latrines and other pollution sources were common). Invaluable data were also collected on chemical and microbiological compliance, system age and operator training. The rapid assessment has created a strong foundation for deciding on programming priorities to address threats to public health, as well as strong arguments for making WSPs mandatory, developing action plans and raising public awareness. The WHO European Centre for Environment and Health provided Serbia with technical assistance, which it also offers to other countries that want to conduct rapid assessments.

The remainder of the session was dedicated to situation reports from the remaining six focus countries. In **Albania**, a national strategy and a national master plan guide activities in the water and sanitation sector. Last year the country was divided into 61 municipalities, each with a single responsible water utility. About 70% of the Albanian population receives their water from receives their water from these utilities. The remaining population receives water from small water supplies managed by local government or from private wells. While half of this covered population is also served by sewerage, in rural areas it is less than 7%. The government is now surveying private water sources, though it is not testing water quality. Not all water utilities have lab capacity, and while the regional public health authorities do not have enough capacity for regular monitoring of rural water supplies. Major challenges include a lack of baseline data, especially for rural areas, which also face poor coverage, poor conditions, minimal monitoring,

insufficient management and meagre funding. The country representative requested the WHO European Centre for Environment and Health to consider providing support in undertaking a rapid assessment. Challenges include the poor condition of small water supplies, a lack of sanitary protection zones, no application of fines for violations, poor financial sustainability.

In **Bosnia and Herzegovina**, 86% of the population has access to piped drinking-water. There is little information on small sanitation systems; while 83% of urban households have access to piped sewerage, 58% of rural households use septic tanks. In the Republic of Srpska, its public health institute monitors water quality; in the other major area, the Federation of Bosnia and Herzegovina, the cantonal public health institutes monitor water quality, though the big problem is that there is no overall register of small supplies. Among the many other challenges are the poor condition of small supplies, the lack of sanitary protection zones around sources, a lack of training, an absence of clearly defined responsibilities, no fines for violations, poor financial sustainability and unresolved ownership.

The proportion of people connected to public water supplies in **Croatia** has risen to 88%, with most of the remaining people using private wells. After acceding to the European Union (EU) in 2013, Croatia started monitoring small community-managed supplies; more than half of the most recent samples tested unsafe microbiologically and 13% chemically. Thirty outbreaks of waterborne diseases have been registered in the past quarter century, chiefly connected to these small systems. A new law requires WSPs for both small and large supplies, but they will be difficult to implement with small supplies due to unclear ownership and a lack of enforcement. For sanitation, only 47% of Croatians are connected to wastewater treatment systems, chiefly in urban areas, and those systems treat only 30% of their wastewater. Data coverage is spotty for rural areas, which rely primarily on septic tanks. While more treatment systems are being built, the priority right now is large systems.

While **Montenegro** has a legal and institutional framework in place for water and sanitation, it has very little data on small systems. There is a new monitoring program covering small water supplies, but it has no funding. Local authorities are responsible for providing and monitoring water. Unfortunately, ownership of small supplies is often unclear and no one has responsibility for their maintenance. Full testing is conducted only on new supplies and when requested; only 10 full tests had been performed so far in 2017 and *all* of them were non-compliant, chiefly due to faecal bacteria. With respect to sanitation, only 20% of Montenegrins have access to sewerage networks, with virtually no wastewater collection at all in rural areas.

In 2016, **Romania** had 2500 small water supplies, defined as systems supplying rural inhabitants with between 10 and 1000 cubic metres per day, serving more than 3 million people. The same year, there were more than a million individual wells, serving another 6 million people in rural areas. Fifty-two per cent of the population, chiefly in rural areas, lack access to a sanitation system. Recent legislation includes WSP provisions, but they are not compulsory for small systems. Challenges include ensuring safe water for everyone, improving access to information, educating the population about water conservation, facilitating stakeholder interaction and providing further training opportunities.

Finally, in **the former Yugoslav Republic of Macedonia**, 6% of the population depends on “self-supplies” (water sources serving no more than 20 people) and 12% on local community-managed sources. Non-compliance for these sources is quite high, exceeding 20% for physicochemical parameters and 35% for microbiological ones. Because rural water supply schemes are often in terrible shape, a large proportion of their existing infrastructure will be

overhauled by 2030 as a part of a larger plan to transfer responsibility for them from local communities to municipal water utilities.

Session 2. Scaling up the water safety plan (WSP) approach for small systems

The second session was devoted to why and how to implement WSPs for small systems. It featured presentation of a risk assessment tool from the United Kingdom; WSP implementation reports from Albania, Croatia and Serbia; and brainstorming on how to adopt the WSP approach in policy and practice.

WSPs support the shift in WHO guidelines from detecting problems to preventing risks. Part of the international push for safely managed services, WSPs can be used for any type or size of water supply, and they have been increasingly recognized as a benchmark in public health protection. Traditional compliance testing cannot detect short-term fluctuations in parameters, especially when testing is infrequent, and outbreaks can occur in the absence of faecal indicators. By contrast, WSPs provide an effective, proactive approach that focuses on the comprehensive assessment and management of risk.

The WSP cycle involves identifying, assessing and addressing potential health risks, implementing improvements and monitoring of the system – and repeating the entire cycle again and again. WSPs support the priorities articulated in the Sustainable Development Goals (SDGs), the Protocol on Water and Health and the Ostrava Declaration. While Annex 2 of the EU Drinking Water Directive does not require WSPs, it does provide an implicit push in that direction by requiring risk assessments. Hazard identification requires systematically examining every element of the individual supply system, from catchment to consumption, for potential contamination events. Each event is assigned a score based on likelihood and severity of risk, and that score is used in combination with resource assessment to prioritize improvements. Once improvements are made, operational monitoring requires both frequent water quality measurements and periodic assessment of the system's observable features; it should involve the community wherever possible. WSPs result in fewer contamination incidents, increased compliance and long-term health gains. Their adoption changes the role of surveillance agencies from compliance monitoring to WSP auditing, and they can guide public health surveillance and response. WSPs also require suppliers to be proactive rather than responsive. For small systems, WHO has developed *Water safety plan: a field guide to improving drinking-water safety in small communities*, in both English and Russian – an invaluable resource that is simple to understand and features hands-on instructions and templates.

The session then turned to the **United Kingdom** and a risk-assessment tool that local authorities in England and Wales have been using to monitor small private water supplies – a major cultural shift from taking samples. The Drinking Water Inspectorate has developed several versions of the tool, which consists of a series of simple questions to identify hazards from source to tap, as well as guidance for each hazard. This tool, based on Microsoft Excel, also captures contact details for everyone who uses the water, which facilitates notification if health risks arise. The severity of each risk is predetermined by the tool; the local authority assesses the likelihood of the risk, and then the tool calculates the resulting risk level. At the end, it summarizes all the risks, highlighting the high and very high risks; prompts the user for actions that can be taken to address them and who is responsible for doing so; and creates an action plan. There is room to add other potential hazards as well as comments, including the authority's overall confidence in the management of the supply. The tool is publicly available online for download and

localization and noncommercial use. After going through a sample risk assessment exercise, several participants expressed interest in adapting it for their countries.

Attention then turned to how three of the focus countries have started to implement WSPs for small supplies. **Albania** held a national workshop on small-scale water supply and sanitation in September 2016, where one of the recommendations was to introduce a WSP requirement into the national regulations. After the workshop a national working group was convened with the participation of several ministries, WHO and NGIZ, the Dutch nongovernmental organization. The group has now drafted national WSP guidelines that address small systems, and it is finishing a draft roadmap for implementing WSPs. The roadmap starts with the cultivation of political support, the establishment of the working group and the implementation of small pilots, followed by drafting regulatory instruments that mandate WSPs for public supplies, capacity-building, impact assessment, an auditing mechanism and development of resource materials in Albanian.

In **Croatia**, it has been obligatory for all public water systems to use the hazard analysis and critical control points (HACCP) approach since 2004. Following its accession to the EU, the country has been incorporating Annexes 2 and 3 of the EU Drinking Water Directive into its national legislation – and as part of that effort, shifting from the HACCP to the WSP approach. In five years, the shift will be mandatory for supplies with flow rates over 1000 m³, and in 10 years for supplies with flow rates less than 1000 m³. Since small community-managed systems are not considered to be operated by legal persons, and thus cannot be legally mandated to implement WSPs, WSP requirements have had to be incorporated into a rulebook instead. At the same time, responsibility for auditing WSPs has shifted from sanitary inspectors to public health authorities. The national and county public health institutes have been preparing WSP resources in Croatian and otherwise helping local authorities to promote WSPs. Since it is the government that pays for monitoring and not the operators, and since WSPs are quicker and less expensive for local authorities to implement than existing requirements, WSPs will probably be adopted widely in less than 10 years.

Serbia introduced WSPs as part of its national targets set under the Protocol and WSP requirements are suggested to be included law on water for human consumption. The path to full adoption has proven to be a long one, however, and the country still needs to clarify who is responsible for implementation and increase the financial and human resources available. Other challenges have included the lack of a WSP guidebook and WSP training – needs that WHO is helping to address. Another key area that needs to be resolved is sanitary inspection and the training of sanitary inspectors; perhaps such training should be compulsory. Finally, there needs to be legal provisions for local authorities to conduct risk assessments. The Serbian delegates were interested in Croatia's approach of giving the public health institutions responsibility for auditing WSPs.

Participants then split into four groups to brainstorm on the steps that a country needs to take to implement the WSP approach for small supplies, and on the kinds of outside support that would be helpful. The actions they suggested anticipated the eight steps in the roadmap presented later in the session. Participants stressed the importance of setting and implementing specific targets on WSPs for small systems in the context of the Protocol. The groups also identified many kinds of support that that would be useful, including extra financing, guidance materials in the national language, training modules, help in training trainers, sanitary inspection guidelines, opportunities to exchange practical experience with other countries, provisions for WSPs in infrastructure plans, implementation of pilot projects, campaigns to promote the importance of drinking-water quality, and technical assistance and workshops.

Countries adopt and scale up the WSP approach in various ways, depending on whether the process is driven by the government, water suppliers, a donor, or a professional or industry group. To help, WHO has produced a document called *A road map to support country-level implementation of water safety plans*, available online in English and Russian. It outlines eight simplified steps for stakeholders to take to facilitate national implementation of WSPs.

1. Learn about WSPs and communicate their benefits to the water and health sectors.
2. Establish a preliminary vision with a multisectoral steering committee (and perhaps a technical working group) to coordinate and facilitate the process.
3. Pilot WSPs to demonstrate feasibility and develop practical expertise, national cases and national champions of the approach.
4. Develop a scale-up strategy to support the preliminary vision – the national WSP roadmap.
5. Establish support mechanisms, including training, using resources in the national language(s) to ensure relevance and a sense of national ownership.
6. Establish policy and regulatory instruments, starting with an enabling environment and ending with legal requirements, including a timescale for compliance.
7. Verify the effectiveness and quality of WSPs by auditing them.
8. Review WSP experiences on an ongoing basis to share the benefits of the approach and to identify implementation gaps and resource needs that need to be addressed.

Session 3. Education, qualification and networking of operators

This session focused on why and how to cultivate the skills and knowledge of the people operating small water supplies. It also considered the experiences of the focus countries and what they needed to improve their efforts in this area.

In the European Region, half of the Member States have not established minimum qualification requirements for the operators of small public water supplies. The benefits of training operators of small water and sanitation systems are self-evident: for the operators, a better understanding of their systems, an improved ability to assess and detect risks, and an enhanced sense of responsibility; and for the public, better health. Training options include minimum qualifications or competency testing; incorporating WASH topics in relevant degree curricula; and ongoing qualification and testing programmes. Countries can also support networking among small operators to encourage information exchange, invest in a skilled cadre of national trainers and develop training materials geared to national circumstances. It is crucial to educate other stakeholders as well, such as local authorities, community leaders and the operators of private wells.

Participants broke into buzz groups to discuss what their national situations were with respect to training and qualifications – and what could be done to improve them. Almost all the discussion focused on small water supplies, though small sanitation systems also came up a few times. While some of the focus countries require training and certification requirements for personnel at public utilities, training is rarely offered to operators of small systems, much less required of them.

In **Albania**, outside donors have made training a priority for small water and sanitation projects in rural areas, and the government is making training and certification mandatory for all water sector employees who operate or manage water supplies. **Bosnia and Herzegovina** requires everyone who works with food or water to be trained and certified every four years, though

facility owners resist having to pay for it. Managers and operators of small water supplies are exempt. **Croatia** has no legal requirements for small system operators. Authorities there tried organizing voluntary training for small operators in two counties, but only one person showed up to the trainings; financing appears to be a key issue. **Montenegro** will prepare a bylaw that includes qualification requirements for operators of large systems. For small community-managed systems, the provisions on WSPs and training requirements still need to be defined. **Romania** requires water operators to institute a quality management system. Training programmes exist independent of supply size, and county unemployment centres offer optional training courses. European infrastructure funds are being used for some training. **Serbia** is trying to re-establish a hygienic minimum requirement for everyone who comes in contact with food or water. Now that private wells are being mapped, there are plans to charge them a minimum fee, which will go at least in part to local operator training. However, the law only recognizes municipalities and utilities as operators, which makes it difficult to require anything from private or community-managed supplies, where ownership is often unclear. Local health councils might be able to address some of the training and experience challenges. **The former Yugoslav Republic of Macedonia** has established some requirements for operators; the national utility association organizes annual trainings for them and is establishing a national training centre. The requirements do not distinguish according to the size of the system. Local authorities are responsible for water supplies when there is no other management in place.

There was broad agreement among participants that, when it comes to training and qualifications for the operators of small systems, the biggest challenges are related to unclear ownership and a lack of funding. There was some discussion of the need to establish minimum education and qualification requirements for organized small operators – whether it makes more sense to incorporate training of small water-supply operators into existing hygiene programmes, which would be much easier to organize, or to establish a separate training offer, which would tend to be much more relevant for operators. There was agreement that, if hygiene training already exists, it makes sense to capitalize on it and ensure that the institute of public health can train operators on topics such as water quality requirements, WSPs and SSPs. Another common challenge is a dearth of trained trainers; outside support would be greatly appreciated. While it may not be feasible to make the training of small-system operators mandatory, there was interest in exploring other ways to improve their skills, including the provision of local opportunities to network and exchange experiences. Before training can be rolled out to small operators, many of the focus countries must first identify the existing systems and resolve who is actually responsible for each one.

Session 4. Monitoring and surveillance of small water supplies

This session covered monitoring and surveillance issues for small-scale water supplies. It included three case studies, on surveillance of private wells in Germany, regulation of private supplies in England and Wales, and sanitary inspections in Serbia. Participants also heard about the value of monitoring service-level and service-provider indicators, as well as the updating of the WHO sanitary inspection forms, and they discussed their own experiences with sanitary inspections.

An effective public health framework for safe drinking-water has three components: health-based targets, WSPs and independent surveillance. Key surveillance functions include monitoring compliance with water quality standards, conducting sanitary inspections, identifying contamination risks and causes, informing improvements and outbreak responses, analysing trends, auditing WSPs and advising suppliers and communities. Surveillance should not free suppliers from quality control. Although the sheer number of small supplies is vast, surveillance

resources tend to be very limited. While all the countries in the subregion monitor water quality in community-managed supplies, only three of the focus countries monitor household wells. Even where surveillance requirements are in place, they are often not followed – and the smaller the system, the lower the priority for surveillance.

Site inspections are critical, but in practice, small supplies are tested at most for a single water sample annually. Annual testing misses weather events and seasonal variations and provides no opportunity to inspect the supply and inform improvements – two excellent reasons to adopt WSPs, with their emphasis on risk-based management and operational monitoring. When it comes to routine water testing, long lists of parameters have proven inefficient, and most parameters provide little added value. WHO emphasizes instead a few core parameters with public health significance: *Escherichia coli*, nitrates, turbidity, dissolved solids, colour and odour – and, where relevant, chlorine, fluoride and arsenic. Others should be added if locally of concern. Water quality monitoring should be complemented by sanitary inspections, another example of risk-based surveillance that can be performed regularly at low cost. To increase effectiveness, small-system surveillance should be prioritized to focus first on areas of concern, as identified through systematic reporting.

Germany has 200 000 private wells and springs, distributed unevenly throughout the country. They are all subject to independent monitoring, not only for water quality but also for whether operators fulfil their obligations. Drinking-water standards are the same for all supplies, though monitoring frequency, reporting and remediation requirements are less onerous for private sources serving single households. Although the goal is to provide everyone with the same level of health protection and to provide support to all operators, especially those who are not professionals, the great number of widely dispersed wells makes it challenging to conduct the regular surveillance visits for each system as required. Germany has established a multisectoral working group on small water supplies with representatives from all 16 federal states and several key national authorities to provide better support to both the operators and the local health authorities charged with surveillance. It has developed and disseminated guidance materials for both target groups, covering such topics as best practices, hazards and remedial measures.

In **England** and **Wales**, local authorities are responsible for monitoring single-dwelling water supplies. The Drinking Water Inspectorate provides them with technical support. Because large water companies are required to monitor untreated water, their data has allowed the Inspectorate to develop heat maps highlighting areas where there have been problems with the groundwater. Small private supplies provide only 1% of the population with water, yet that still covers some 53 000 sites. It was only when the law changed and the Inspectorate gathered locally held data that it became clear just how many sites there were. Though domestic well owners do not have to perform risk assessments, they must still hew to regulations. While the quality of private supplies has improved, thanks partly to regulatory changes, 4% of their water samples still do not satisfy standards. Risk-based assessment and monitoring were introduced for private supplies in 2010; those that serve more than one dwelling now have to do risk assessments and monitoring every five years, though there is no such requirement for single-dwelling supplies. About 15% of small supplies still exceed acceptable levels of enterococci and 15% *E. coli*. Local authorities can charge owners and users for monitoring, as well as for non-compliance or a failure to address issues. The local authorities require a great deal of training and support; they often are reluctant to enforce regulations and tend to act only on endpoint testing, while the Inspectorate continues to promote risk assessment.

While surveillance usually focuses on water quality, it is also important to collect data from service providers on other parameters such as water quantity, availability, accessibility and

affordability, and to monitor the performance of water suppliers and authorities. All seven focus countries monitor small public piped supplies for at least one of these additional parameters, but for small community-managed supplies, the only extra parameter that is tracked is accessibility, and that in only four countries. Two models for monitoring small supplies were presented. First, a model developed by the Portuguese Water and Waste Services Regulation Authority collects data on 16 service-level and service-provider indicators, including indicators that address economic and infrastructural sustainability and the adequacy of human resources. Second, a model used in Latin America, the Rural Water and Sanitation Information System (SIASAR), collects data via smartphones to assign performance rankings to small suppliers; among other things, it gathers information on community sanitation and the provision of technical assistance. This system is used to assign performance rankings that can then be made public. Major issues for small-system monitoring include continuity, quality control, coverage of private supplies and, in particular, coordinating data collection at the national level so that data can be used for planning, regulation and corrective action – which is what makes the monitoring worthwhile.

The second half of the session focused on sanitary inspections, a tool that is now 150 years old. Water sampling is only carried out rarely for small systems. In addition, it only provides a momentary snapshot of water quality, and it only identifies contamination after it has happened. Sanitary inspection, however, uses on-site observation of conditions, equipment and practices to identify and assess risks along the entire water chain, from source to tap – so that they can be addressed *before* they cause problems. Nonetheless, water quality monitoring and sanitary inspection should still be regarded as two necessary and complementary activities. While sampling requires laboratory access, sanitary inspections can be performed anytime, especially now that smartphones and tablets are widely available.

WHO has developed simple sanitary inspection forms for 13 kinds of small systems, for instance protected springs. Each comprises 10 questions – most of which can be answered by observation, some by interviews. These forms are being updated, as described below. They are especially effective for identifying risks from point sources, service reservoirs and households. Leaks and contamination in deep-laid pipes are more difficult to observe directly. As a simple kind of risk analysis, sanitary inspections support WSPs. They should be conducted routinely – at a minimum every time a sample is taken – and also in response to particular conditions such as heavy rainfalls, thaws, unexpected lab results and waterborne disease outbreaks. Together, the results of sanitary inspection and drinking-water quality analysis can help to prioritize future efforts, including remediation and additional inspections. Analysis can also highlight common problems that call for broader programmatic efforts.

In **Serbia**, sanitary inspections fall under the Ministry of Health and its public health institutes. Their challenges have included inconsistent methodology, weak enforcement in rural areas and gaps in knowledge. During its 2016 rapid assessment of small rural water supplies, the Institute of Public Health piloted WHO sanitary inspection forms for individual supplies, adapting the forms for local conditions (see the Serbian case in Session 1). The Serbian version of these questionnaires was tailored to eight kinds of piped and individual supplies, as well as to two kinds of piped distribution networks. To facilitate risk scoring, the questions were formulated so that a “yes” answer indicated the presence of risk, although that sometimes resulted in somewhat awkward wording. The resulting rapid assessment provided basic data on more than 1100 small water supplies, including what kinds of sources and risks were most prevalent. For instance, it found that two thirds of the piped supplies surveyed were springs, and that the most common risks for springs were a lack of fencing, an absent or non-functioning diversion ditch, and animal access to within 10 metres of the source. By combining the sanitary inspections with water quality sampling in a risk matrix, the Institute was then able to prioritize improvements. In

general, individual wells had higher risk scores than piped systems. The Serbian network of public health institutes now utilizes the forms in their surveys, using them to identify major risks, prioritize follow-up inspections and introduce risk-based surveillance. Among other benefits, the data have also proven invaluable in revising regulations, developing effective education programmes, improving drinking-water regulations, instituting a national register of small supplies and establishing a baseline for national target-setting. Moreover, this approach has turned out to be reliable, inexpensive, quick and easy to implement.

The existing WHO sanitary inspection forms for small-scale water supplies were published in the 1997 edition of the Guidelines for Drinking-Water Quality. They cover 11 kinds of piped and non-piped supplies. The forms are easy to use by non-professionals, and they permit standardized surveillance of sanitary conditions in rural settings where resources are limited. However, the subsequent introduction of the WSP approach has created a need for a new set of forms. WHO is now revising them, which is also enabling it to update the technical and management advice with the forms, provide better images for all the risk factors and assess the scientific validity of each factor. It has been interviewing expert practitioners, conducting a literature review and running targeted pilots. WHO European Centre for Environment and Health requested feedback from the workshop participants in the following weeks on several key questions to help improve the revised forms and make them more user-friendly and more relevant for the European Region. For instance, does it make more sense to use a qualitative or a risk-ranking approach? Participants indicated their willingness to provide honest feedback, so they should have received the relevant materials from the Centre shortly after workshop.

The session concluded with a discussion of national experiences in using sanitary inspection forms for small systems. In **Albania**, the sanitary inspectorate inspects utilities as well as the water supply systems, which it regards as high risk. It concentrates inspections before and during the tourist season and during the rainy system. The inspectorate assigns remedial actions and notifies public health bodies when relevant. It uses forms based on the national regulatory framework; once the regulations are revised to include WSPs, in line with the EU Drinking Water Directive, the forms will incorporate risk assessment – and ideally, they will be the revised WHO forms. In **Bosnia and Herzegovina**, sanitary inspectors use comprehensive questionnaires that are geared to larger supplies and focus on standard operating procedures, rather than the conditions at small supplies. Sanitary inspections are usually carried out only on request. The sanitary inspectorate has been awaiting the revised WHO forms eagerly. **Croatia** has done a rapid assessment of water quality, but because no one is legally responsible for community-managed supplies, it does not conduct regular sanitary inspections. Public health officials are the only ones who make site visits, using sanitary inspection forms that vary from county to county. In **Montenegro**, the two public health institutes have the best overview of water status. While water monitoring in the country leaves much to be desired, the expected adoption of a new law promises improvement. The two institutes use their own reports and templates to inform sanitary inspectors if there is a problem to investigate. The sanitary inspection forms do not include risk scoring. In **Romania**, county public health officials carry out sanitary inspections for water suppliers, checking compliance with hygiene rules. Their forms were updated in 2015, but they only cover from water from treatment to tap and not from the source. When suppliers do not address problems, the penalties are harsh. The officials also use a simple form for wells. Last year they checked more than 100 wells and found problems in more than 50. The Romanian participants said that, after the previous presentation, they now would like to update their forms and expressed a need for support. In **Serbia**, piloting the new WHO draft forms last year (as described above) has inspired the public health authorities to go into greater detail and helped them understand how to supervise rural inspections in practice. However, implementing all of the new forms will require a great deal of information technology

support. **The former Yugoslav Republic of Macedonia** also piloted the new forms, after first translating them into Macedonian in 2008, and they have been functioning excellently. Last year the authorities started to convert the forms so they can be used on smartphones and tablets, though they are still awaiting approval before making them available; because of the considerable work involved, they may choose to wait for the final WHO revisions.

Session 5. Sustainable financing of small water-supply and sanitation systems

This session addressed sustainable financing of small supplies, focusing on how to estimate and finance direct support costs.

Sustainable financing is essential if water and sanitation systems are not to fail. It necessitates a shift from thinking about undertaking discrete projects, which requires one-time investments, to thinking about delivering services over the long term, which involves recurrent costs and periodic upgrades. Understanding the sustainable financing requirements for a given system involves four steps:

1. assessing current assets and service levels
2. assessing current and ideal costs for sustainable service
3. assessing existing funding sources
4. comparing costs and funding resources (from Steps 2 and 3).

Then financing mechanisms can be chosen to cover the difference identified in Step 4. This session concentrated on Steps 2, 3 and 4. For Step 2, it is useful to divide the costs into the following categories:

- capital expenditure – hardware and software investments in new schemes;
- operational and minor maintenance expenditure – electricity, chemicals, etc.;
- capital maintenance expenditure – rehabilitation, replacement and major repairs;
- direct support costs – post-construction activities, including supervision, monitoring, surveillance, enforcement, technical assistance, planning and reporting;
- indirect support costs – macro-level planning and policy formulation, as well as training; and
- capital costs – loan interest.

Since south-eastern Europe already has high levels of coverage for safely managed water supplies, the water sector does not require much capital investment. Instead, the workshop countries should concentrate on allocating enough money for capital maintenance and direct support in the coming years. The participants therefore broke into country groups to do a costing exercise focusing on the direct-support costs of surveillance, using a costing tool from the IRC. The exercise involved first estimating the current costs of direct support for a representative water district, based primarily on the staff salaries needed to cover current surveillance activities, and then estimating the same costs for an ideal surveillance scenario. The groups' back-of-the-envelope estimates of current direct support costs for surveillance ranged from €1 to €3 per user for most countries; estimates of the *ideal* expenditure for the same budget line varied from being the same amount to more than double it. Comparison of these two costing scenarios – the current and the ideal – can facilitate priority-setting for surveillance activities, and the results can also be used to advocate for additional funding.

Step 4 requires making estimates for the three main types of funding sources: tariffs (from users), taxes (from the government) and transfers (from donors). The two cost categories most likely to face funding shortfalls are capital maintenance and direct support. Typically, the funding gap is reduced by increasing taxes, tariffs and refundable financing.

The costing tool also has separate sheets for calculating capital expenditure and maintenance. It can be obtained free online from the IRC at <http://ircwash.org>, along with a variety of other costing and budgeting tools (available under “Tools”) and occasional free online courses (under “News”). The WHO European Centre for Environment and Health will be working with the IRC to develop a guidance document on the sustainable financing of small-scale water supplies and sanitation and make it available in Russian, and it will invite feedback on them when they are in the draft stage.

Participants were asked how direct support services, particularly surveillance, are financed in their own countries. In **Albania**, in some cases the state subsidizes power costs and the water utilities are organized as joint-stock companies. The tariffs mainly cover direct or operational costs. **Bosnia and Herzegovina** uses taxes for small systems, and it uses tariffs and, in some cases, transfers for large systems. In **Croatia**, the costs of sanitary inspections and other direct support for small supplies are covered by the state budget (taxes). For large systems, these costs are covered by water consumption and protection fees (tariffs). For small supplies, **Montenegro** finances most direct support costs from tax revenue, allocated through the Ministry of Agriculture budget. It also collects fees (tariffs) for assessment, analysis and monitoring. **Romanian** operators pay for their direct support costs by charging users (tariffs), while taxes pay for the public health inspectorate. In **Serbia**, such activities are financed by a combination of tariffs and local taxes. Finally, **the former Yugoslav Republic of Macedonia** funds direct support costs with donor transfers in addition to tariffs and taxes. The country is in the process of implementing a “polluters pay” system, where the fines go directly to water services.

The public health sector is often subject to tremendous financial pressure. In the absence of major disease outbreaks, decision-makers frequently call the cost-effectiveness of water and sanitation surveillance into question. It is thus critical that people in the water and sanitation sectors do not ignore financing issues, or shy away from articulating the true costs of providing sustainable, safely managed services. Yet almost no one working in these sectors knows what these costs are – which makes it difficult to advocate effectively for the funding needed.

Session 6. The sanitation safety plan (SSP) approach

The sixth session provided an introduction to SSPs, featuring an interactive exercise and group work.

The more drinking-water in a community, the greater the flow of wastewater and its concomitant pathogen load. At the same time, good sanitation is a prerequisite for safe water – yet it tends to be a low priority politically, particularly in rural areas, where most households are on their own when it comes to building and operating sanitation systems. Not surprisingly, most of these systems do not function properly. They tend to be unregulated and to be operated by untrained personnel. Yet they can have significant adverse effects on the environment, water and food safety, and health. On average, there is a fivefold economic return on investments in sanitation.

In the European Region, 1 resident in 25 still does not have access to safe toilets; this lack of access is most common in rural areas. While effective, low-cost alternatives to centralized sanitation systems do exist for rural areas and small towns, they remain largely unknown. In

signing the Protocol, countries have committed themselves to ensuring adequate sanitation for everyone and safeguarding use of wastewater and sewage sludge in agriculture. Moreover, the Sustainable Development Goals have explicit targets that include universal access to adequate, equitable sanitation and an end to open defecation (Target 6.2), as well as halving the proportion of untreated wastewater and increasing safe reuse (Target 6.3).

The SSP is a stepwise tool to address health and environmental risks and ensure safe management of the entire sanitation chain, including wastewater treatment and reuse. It is based on the *WHO guidelines for the safe use of wastewater, excreta and greywater*. When wastewater is used for irrigation, SSPs encompass all the steps from waste generation and treatment to product use and consumption.

The workshop participants engaged in a roleplaying exercise involving the fictional town of Newtown, which utilizes both septic tanks and cesspits. They identified health risks and how they were being managed, assessed risk levels and then described how to minimize them and who should take action – creating, in essence, a simple SSP.

As the exercise demonstrated, a multistakeholder planning process is critical to SSP success; it should include representatives from throughout the sanitation chain. It is also important to engage the support of a lead agency, obtain financial and resource commitments and promote an enabling policy environment. An initial assessment should be conducted to map out the elements of the system and then characterize the constituents of the waste stream and the health hazards they pose (biological, chemical and physical). It is crucial to describe potential exposure routes and exposure groups, such as workers, farmers, local residents and consumers; the factors that affect system performance and vulnerability; and relevant technical and regulatory information.

One key component of an SSP is risk assessment – identifying and prioritizing all risks, including not only normal operating risks but also the risks of system failures and accidents, seasonal and climatic events, indirect hazards (such as vermin and upstream vectors) and cumulative hazards (such as chemical accumulation in soil). The results of the risk assessment should then be used to develop and implement an incremental improvement plan, followed by a monitoring plan that covers regular operational monitoring and periodic verification, SSP audits and review of the SSP itself.

Although both WSPs and SSPs are risk-based frameworks with many similarities, WSPs are convergent, using multiple barriers to prevent contamination of the water supply, while SSPs are divergent, using multiple barriers to prevent exposure to faecal waste along the sanitation chain. While WSPs focus on the water supplier, SSPs involve numerous exposure groups and actors. Cooperation across sectors is thus paramount for the success of SSPs.

The workshop participants rounded out the session by dividing up into groups to brainstorm on answers to four questions about the rural application of SSPs. For the first question, they identified key issues for safe management of rural sanitation: public ignorance of sanitation as a health issue, inadequate monitoring and surveillance, insufficient investment in infrastructure and protective equipment, untrained operators, improper agricultural use of wastewater and sludge, poor awareness of local conditions, a missing sense of urgency among local authorities, an inadequate legal framework for small sanitation systems and unfamiliarity with the SSP approach.

The groups also enumerated ways that the SSP approach provided opportunities to improve rural sanitation – by prioritizing resources, protecting the environment and public health, improving

coordination and communication among stakeholders, providing a clear roadmap for action, giving local economies a boost, introducing systematic risk assessment and management, reducing the spread of communicable disease, enabling the harmonization of national legislation with EU regulations and WHO guidelines, and improving the quality of drinking-water, food and general well-being.

Third, they identified what various stakeholders could do to help implement the SSP approach. Local governments could plan SSPs, establish working groups and provide financing; public utilities could monitor and assess risk; public health services could establish guidelines and operating procedures, conduct surveillance and analyse risk data; relevant ministries (health, environment, finance and education) could develop enabling legislation and implementation strategies and integrate SSPs into academic curricula; groups of local citizens could provide input and feedback; WHO could provide technical support; and international NGOs and agencies could help raise awareness and invest in technological innovation.

Finally, the groups discussed other ideas for how SSPs might be integrated into existing programmes, and what some of the challenges might be. For EU candidate countries, such as Montenegro and Serbia, small water and sanitation systems are part of accession negotiations, which provides an incentive to address SSPs explicitly, especially if new systems are being built with EU funds. It would also make sense for local governments to include SSPs in preparing environmental action plans for areas such as national parks, and for health impact studies, such as those being done in Romania. Common challenges that these efforts face include the large number of stakeholders involved SSPs, a lack of funding and human resources, and the need for training.

The SSP approach is fairly new, and SSPs now are at the stage that WSPs were a dozen years ago. Sanitation is typically the responsibility of the environmental sector, and health is only one of several other players. But because of its major consequences for health, WHO has made SSPs a major priority, though it also recognizes that it needs to persuade other sectors to buy in if the approach is to be adopted in the near future. Fortunately, the Protocol on Water and Health not only provides a good incentive for national health and environment ministries to adopt the SSP approach, but it also serves as a platform where the two can cooperate.

Session 7. Improving small water-supply and sanitation systems: next steps

Representatives from the seven participating Member States in the subregion were challenged to reflect on which aspects of small water and sanitation systems require the most attention in their respective countries, and what specifically they will try to achieve in the coming years.

Albania has an intersectoral working group that is preparing WSP guidelines. As soon as the health and infrastructure ministers approve them, the group will have the WHO country office help to organize a WSP workshop for various local and national stakeholders – and introduce the SSP concept at the same time. Albania has been reforming its water sector, and the new laws being written provide a good chance to include the WSP and SSP approaches. Local licensed water utilities will now have the sole responsibility for both water and sanitation, in cooperation with other stakeholders. Though the country is in the midst of reallocating ministry responsibilities, some promising processes have begun that participants hope will be fully realized. One is the training and certification of everyone in the water sector – not just local operators, but also people working in the national government. Another is a new data-monitoring programme for water and sewage utilities, which is using 2017 to establish baseline data.

Bosnia and Herzegovina also has an active multisectoral working group that is implementing the Protocol. The workshop participants will propose that this group address small supplies in their draft plan on water safety. As mentioned, the country has two large public health institutes, for the Federation of Bosnia and Herzegovina and the Republic of Srpska, respectively. Neither collects separate data on small water supplies, though some water quality data are gathered at the local level (albeit not for individual wells). There are plans to use local public health institutes to develop registers of small supplies, and to revise statistical reporting to disaggregate these small supplies from centralized ones.

Croatia has begun to incorporate WSPs into its regulations. Since its current sanitary inspection forms vary considerably, it would make sense to start piloting the draft WHO forms. The UK risk assessment tool provides extra incentive to switch from the HACCP to the WSP approach. The Institute for Public Health representatives will recommend amending drinking-water laws to require training for water utility personnel, and organizing training for operators of public water supplies, starting with large systems. The Institute will work with WHO and local public health institutes to develop local educational offerings for small supplies. It also plans to collaborate with WHO and Italian colleagues to take advantage of their expertise on SSPs.

The **Montenegrin** participants will share the workshop materials with their colleagues in water and sanitation, and concentrate this next year on educating water-supply operators about WSPs. Support from WHO, especially for the training of national trainers, will be crucial to this effort. Better intersectoral cooperation is also needed to develop surveillance of small supplies. The Institute of Public Health delegates will work on improving its checklists. Since current laws do not address WSPs or small sanitation systems, it makes sense to write bylaws to address them.

The **Romanian** delegates plan to share the workshop ideas directly with local officials through their own workshops and, they hope, an SSP pilot. Being in the middle of implementing WSPs should make it easier to promote SSPs. They said that the use of educational methods such as roleplaying in the workshop has been just as important as the costing tools and the cases from Germany and England and Wales. They will also share the workshop materials with their colleagues in the environment, health and water sectors.

For **Serbia**, the workshop brought together representatives from three different ministries, the Institute of Public Health and the national organization of local authorities. While these actors have already all been collaborating on water and sanitation issues in a national working group, the workshop strengthened their connections. Since Serbia is applying for EU membership, the health and the new environment ministry should apply for pre-accession funding to help train WSP and SSP personnel, implement joint projects and harmonize national water and sanitation laws with EU legislation. They expect a new law to implement WSPs to be adopted soon. After the workshop, the local authority representatives will promote local capacity-building to bring small water supplies in line with sanitary standards, and piloting WSPs in some of these small supplies.

While **the former Yugoslav Republic of Macedonia** does not yet have any legal requirements for WSPs, it too is a candidate for EU membership. That means it has been harmonizing its water legislation with Annex 2 of the EU drinking-water directive, which strongly encourages WSPs. The country has set targets for improving its approach to small water and sanitation systems by 2020. The first priority is to develop a WSP roadmap for amending legislation, establishing a working group, initiating a pilot project, assigning institutional responsibilities and assessing financial, human and informational needs.

Closing session. Conclusions

For the closing session, the workshop organizers and chairs drew up the following list of conclusions from the workshop sessions.

Rationale

- Small water-supply and sanitation systems pose a persistent challenge to Member States throughout the Region, regardless of their socioeconomic status.
- National challenges include a broad lack of policy, regulations (or at least enforcement), data, human resources and funding for small systems. Other major issues are unresolved questions of ownership and poor compliance with existing regulations.

Policy

- The Sustainable Development Goals support attention to small-scale water, sanitation and hygiene (WASH) services.
- The Ostrava Declaration provides a regional platform for national action on small systems.
- The Protocol on Water and Health can help countries in translating global and regional aspirations into national targets and actions.
- Small systems should be explicitly included in national target-setting under the Protocol.

General recommendations for small systems

- Institute regulatory requirements to clarify questions of ownership, establish which body has the legal authority to conduct monitoring and surveillance, stipulate improvements and leverage financing.
- Establish interagency working groups on small-scale water supplies and sanitation – ideally based on existing mechanisms – to help focus attention and provide guidance.
- Develop a national registry of small-scale systems.
- Undertake baseline analysis, using for instance a rapid assessment, to help prioritize policy actions.
- Develop guidance, technical standards and tools for private water supplies (such as individual wells) and sanitation systems.

WSPs

- The WSP approach is an internationally recognized public-health benchmark for providing safe drinking-water. Its effectiveness has been demonstrated for small supplies. Several countries in the Region have introduced or plan to introduce WSP approach in their regulations, including those covering small systems.
- Expanding the use of WSPs for small supplies requires a phased approach and long-term support. A good national roadmap is invaluable in this effort; it should cover advocacy work in multiple sectors, cultivation of national and local expertise, pilots to demonstrate feasibility and assess resource needs, laws that include WSP provisions, nationally adapted tools, training programmes and auditing.
- WSP targets should be set using the framework of the Protocol and of the Ostrava Declaration on Environment and Health.

Surveillance of small water supplies

- Water quality surveillance is a core public health function, and surveillance authorities should also play an advisory role for small supplies.
- It is important to identify an effective mechanism for enforcing surveillance requirements for small systems and improve the use of surveillance data for policy improvements.
- Risk-based approaches such as WSPs facilitate the prioritization of surveillance efforts.
- Water quality monitoring should focus on core parameters as well as any other locally relevant parameters. Guidance is needed for public health offices on parameter selection and risk assessment.
- While water testing remains important, surveillance should focus more on sanitary inspections and WSP audits. Although sanitary inspections are well established in some countries, they often lack a risk-based focus. They help overcome the shortcomings of microbiological water quality testing and support the implementation of WSPs. The WHO sanitary inspection forms can be readily adapted to national and local conditions.
- Monitoring of small systems should also include service-level indicators, such as the quality, quantity, accessibility, continuity and reliability of water supplies.
- Where practicable, national surveillance should be harmonized with regional and global monitoring instruments, including those from the Protocol, the Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP) and the Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS).

Education and qualification of water-supply operators

- The biggest reason for engaging small-system operators is to improve their accountability for water-supply safety.
- Recommended actions for increasing operator expertise include the following:
 - establish minimum qualifications for operators of small supplies;
 - amend existing training and testing schemes to address water quality and WSPs;
 - use a training-of-trainers programme with the public health network;
 - integrate water-supply topics into other local networking and training activities; and
 - integrate such topics into university and professional continuing education programmes.

Financing of small water-supply services

- Public water-supply services are typically funded by a combination of taxes, tariffs and occasionally transfers.
- Direct-support services are financed chiefly through state and local taxes.
- For small systems, tariffs usually do not cover costs or services are not paid by the consumers.
- Calculation of direct support costs and funding gaps are useful in advocating for better funding of WASH-related public health services.

Small sanitation systems

- There is a persistent lack of adequate sanitation in rural areas. Rural sanitation tends to be a neglected, poorly funded policy area.

- Centralized systems are not appropriate for all rural environments, and decentralized alternative solutions need to be available.
- A wide variety of stakeholders need to be involved to address risks in the entire sanitation chain.
- Countries need to raise community awareness about the importance of proper sanitation, provide local authorities with financing tools, institute regulatory requirements for small sanitation systems and establish monitoring and surveillance of such systems.

SSPs

- SSPs provide a framework for addressing the full range of exposure groups and pathways, and a coordinated approach for safely managing the entire sanitation chain.
- Ways to build capacity for SSP implementation in small systems include developing and disseminating appropriate guidelines, tools and training materials; lobbying local and national decision-makers; providing training that targets public health professionals as well as small operators; incorporating SSPs in relevant academic curricula; educating children on basic WASH principles; and developing an auditing system.

Annex 1

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Annex 2

WORKSHOP PROGRAMME

Tuesday, 10 October 2017	
08:15–09:00	Registration
09:00–09:45	<p>Welcome and opening <i>Ferenc Vicko, State Secretary, Ministry of Health, Serbia</i> <i>Verica Jovanovic, Director, Batut Institute of Public Health of Serbia</i> <i>Zsófia Pusztai, Head, WHO Country Office Serbia</i> Background and objectives of the meeting (<i>Oliver Schmoll</i>) Introduction of participants Nomination of meeting officers</p>
09:45–10:45	<p>Session 1. Situation of small water-supply and sanitation services Why are we concerned with small-scale water supplies and sanitation? (<i>Enkhtsetseg Shinee</i>) Case study: Closing the knowledge gaps for policy-making through a rapid assessment in Serbia (<i>Dragana Jovanovic</i>) Questions and answers</p>
10:45–11:15	Morning break
11:15–12:30	<p>Session 1 (continued) Country presentations on the situation of small-scale water supply and sanitation systems:</p> <ul style="list-style-type: none"> - Albania - Bosnia and Herzegovina - Croatia - Montenegro - Romania - The former Yugoslav Republic of Macedonia <p>Questions and answers</p>
12:30–13:45	Lunch break
13:45–15:15	<p>Session 2. Scaling up water safety plan (WSP) approach for small systems Introduction to the WSP approach: rationale, key requirements and benefits (<i>Bettina Rickert and Oliver Schmoll</i>) Questions and answers Case study: a risk-assessment tool for small supplies in the United Kingdom: background and practical use (<i>Richard Phillips</i>) Questions and answers</p>
15:15–15:45	Afternoon break

15:45–17:30	<p>Session 2 (continued) Roadmap for uptake and scale-up of the WSP approach (<i>Oliver Schmoll</i>) Country statements: Albania, Croatia and Serbia Group work: key steps towards adopting the WSP approach in policy and practice for small scale systems</p>
17:30	Close of Day 1
19:30	Social dinner in the restaurant Three Hats

Wednesday, 11 October 2017	
09:00–10:15	<p>Session 3. Education, qualifications and networking of operators Rationale and good practice examples (<i>Bettina Rickert</i>) Buzz group: country experiences on education, qualification and training programmes for operators of small-scale systems Round-table discussion on improvement needs</p>
10:15–10:45	Morning break
10:45–12:15	<p>Session 4. Monitoring and surveillance of small water supply services Considerations for drinking-water quality surveillance in small-scale systems (<i>Enkhtsetseg Shinee</i>) Case study: drinking-water surveillance of private wells in Germany (<i>Bettina Rickert</i>) Case study: regulations on private water supplies in England and Wales (<i>Richard Phillips</i>) Monitoring water services: monitoring practices and use of data (<i>Marieke Adank</i>) Questions and answers</p>
12:15–13:30	Lunch break
13:30–15:00	<p>Session 4 (continued) The role of sanitary inspections in drinking-water quality surveillance in small systems (<i>Oliver Schmoll</i>) Case study: application of sanitary inspections in Serbia: benefits and lessons learnt (<i>Dragana Jovanovic</i>) Update of sanitary inspection forms in the WHO Guidelines for Drinking-water Quality (<i>Richie King</i>) Round-table discussion on country experiences with sanitary inspections</p>
15:00–15:30	Afternoon break
15:30–17:30	<p>Session 5. Sustainable financing of small water-supply and sanitation services Sustainable financing of small water-supply and sanitation services (<i>Marieke Adank</i>) Buzz groups exercise on cost categories Introduction to costing tools (<i>Marieke Adank</i>) Group exercise: estimating direct-support costs Feedback from group work Moderated discussion on financing of direct-support costs</p>
17:30	Close of Day 2
17:45	Cocktail reception at the meeting venue

Thursday, 12 October 2017	
09:00–10:45	Session 6. The sanitation safety plan (SSP) approach Issues in rural sanitation (<i>Raquel Mendes and Oliver Schmoll</i>) Introduction to SSPs: rationale and key principles (<i>Raquel Mendes</i>) Interactive exercise: key steps in sanitation safety planning Questions and answers
10:45–11:15	Morning break
11:15–12:30	Session 6 (continued) Rotating group work: how to move forward on using SSPs to improve sanitation in a small systems context
12:30–13:45	Lunch break
13:45–15:15	Session 7. Improving small water-supply and sanitation systems Concluding round-table discussion on key policy steps to improve the situation of small-scale water supplies and sanitation systems
15:15–15:30	Summary and conclusions
15:30	Close of the workshop and farewell refreshments

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