The aim of national drinking-water laws and standards should be to ensure that the consumer enjoys safe potable water. The nature and form of drinking-water standards and regulations may vary among countries and regions. There is no single approach that is universally applicable.


Why is this issue important?

Regulations are a powerful tool that can be used to improve drinking-water quality and ensure a safe water supply. In the absence of regulations, accountability and liability may be compromised, leading to increased risks to public health that may go undetected among consumers until outbreaks of water-borne diseases occur. Even when in place, regulations are not always used to their full potential and best advantage to maximize public health benefits. For example, regulations do not always clearly indicate which stakeholders are accountable and liable for identifying, responding to and mitigating risks to drinking-water quality.

How is the issue addressed?

1. **Explicitly link regulations to the protection of public health**

Public health protection remains at the core of drinking-water-related regulatory frameworks. Therefore, regulations should explicitly identify public health protection as their primary objective:
   - the provision of drinking-water that is sufficient in quantity, safe, physically accessible, acceptable, affordable and reliable; and,
   - the prevention of water-borne disease.

The **Republic of Korea**’s Management of Drinking Water Act makes the link to public health in its first article: “The purpose of this Act is to prevent drinking-water from endangering public health and to contribute to the improvement of living conditions by rationally managing the quality and hygiene of drinking water.” (Republic of Korea 1995).

(translation from Korean)

The WHO Guidelines for Drinking-water Quality (2004) recommend setting health-based targets. Given that health-based targets should reflect national contexts and realities, a continuous effort should be made to maintain and improve drinking-water quality to the highest level possible. Regulators, therefore, may want to establish health-based targets in accompanying guidelines or standards that can be updated as socio-economic conditions progress and health outcomes evolve. The Guidelines describe four distinct types of health-based targets, applicable to all types of hazards and water supplies:
   - health outcome targets (e.g. tolerable burdens of disease);
   - water quality targets (e.g. guideline values for chemical hazards);
2. Implement regulations that facilitate the assessment, prioritization and management of risks to public health

The most effective means of consistently ensuring the safety of drinking-water and protecting public health is through an iterative process of linking risk assessments with risk management, via the definition of health-based targets and the assessment of health outcomes, adapted to specific national and local conditions. This systematic approach of assessing the risk profile of exposure and the incremental use of risk management measures is known as the Stockholm Framework.

The Stockholm Framework provides the conceptual skeleton for all WHO water-related guidelines and should be taken into consideration and reflected in regulations. This implies that the assessment of health risk should be used as a basis for decision-making and risks are managed accordingly. Non-health factors should also be taken into consideration as they can have a considerable impact on costs and benefits. Paramount is that regulations need to consider the human aspect, the people who are using the water.

The Water Safety Plan (WSP) approach, promoted by WHO since the third edition of its Guidelines for Drinking-water Quality, provides the instrument to implement the Stockholm Framework by encouraging those responsible for the operation and management of drinking-water supplies to proactively assess, prioritize and manage risks from source to consumer. Risk assessments identify hazards and characterize risks to water supplies relative to health-based targets. Risks are then prioritized and addressed according to their potential impact on public health. When all risks cannot be immediately addressed due to factors such as limited resources, a plan should be in place to make incremental improvements over time.

3. Design regulations to address factors influencing the safety of drinking-water from source to consumer using a multiple-barrier approach

Drinking-water regulations should apply to all water supply systems and services and require multiple barriers or controls at each stage, including source water, drinking-water treatment, distribution, use, wastewater and greywater. Regulations should not simply set the standard for the maximum or minimum allowable concentration of microbiological, chemical and radiological substances in drinking-water at the tap. For additional information, please refer to the issue sheet Key elements in this series.

The multiple-barrier approach encourages the use of validated controls, based on a risk assessment to:

- Prevent or reduce contaminants from entering the source water.
- Remove particles from the water.
- Remove chemicals and radiological hazards.
- Kill or inactivate pathogens.
- Prevent recontamination of water during distribution, storage and handling.

Aesthetic qualities such as appearance, taste and odour of the drinking-water should be acceptable to consumers.

Safety is enhanced if multiple barriers are in place—should one barrier fail, the effective operation of the remaining barriers will minimize the risk of contaminants passing through the water supply chain to consumers.

4. Base regulations on good practices

Typically, good practices have been proven to be appropriate and effective over time. This key principle should not be interpreted as basing regulations on best practices only; this would assume that a particular set of practices is better than others. Good practices must be evaluated to ensure it remains appropriate for particular regional, national, sub-national and local contexts. Historical knowledge of the water source, supply and issues affecting the water supply is key in this regard.
5. Use a variety of tools to build and ensure compliance with regulations

i) Education, Training and Capacity Building
Education, training and capacity building are critical for all stakeholders involved in the operation and management of water supplies. Stakeholders include watershed users, water supply operators, surveillance bodies and consumers. Promoting and supporting good practices by facilitating learning and capacity building lays the foundation for ensuring safe drinking-water and regulatory compliance. Targeted information sessions, guidance documents and manuals, and access to expert advice can all help facilitate awareness, understanding and compliance with regulatory requirements.

ii) Incentives to Encourage Good Practices
Incentives to encourage good practices or discourage undesirable practices can include economic incentives offered through subsidies or rebates. Public recognition and awards for good performance may also encourage suppliers to meet and exceed regulatory requirements and health-based targets.

iii) Penalties and sanctions
 Authorities need to be able to require or compel certain activities or actions if the safety of drinking-water supply is at risk. Mechanisms for enforcement include penalties or other forms of deterrent, such as warning letters, criminal charges or suspension/revocation of licences.

Under Singapore’s Environmental Public Health Act, it is an offence to sell or offer for sale polluted or unwholesome piped drinking water for human consumption, and sanctions include fines. (Government of Singapore, 1987)

In order for regulations to work optimally, a combination of all three tools should be used. The promotion of good practices and the use of incentives whether through regulations, policies or programmes, are primary tools. The enforcement of regulations using penalties is a secondary tool, used when all else fails.

6. Create realistic, achievable regulations within national, sub-national and local contexts
Regulators should be aware of the conditions, operations and context of water supplies in their jurisdictions. Environmental, social, economic and cultural characteristics can influence the organization, operations and outcomes associated with water supplies in a given region or country. These realities should be reflected in regulations and their supporting frameworks. This includes ensuring that policies, programmes and appropriate levels of funding support the implementation and enforcement of the regulations at all levels.

In both developed and developing countries, small community supplies are the most vulnerable to contamination and breakdown (WHO 2010).

Compared to large and professionally-run water utilities, resources and expertise for small community water supplies are often limited. In small community water supplies, operators may not be full-time and may not be trained or certified in water supply management and/or public health risks associated with drinking-water. A regulation requiring operators to be certified may not be realistic and achievable in this type of community setting. A more pragmatic regulatory approach could be on-site training, which is customized to the technical competency and educational level of the operators, with third-party oversight by a certified operator. Regulations that encourage the assessment and management of risks to public health should also be considered, as detailed under key principle #2.

7. Clearly define stakeholder roles and responsibilities in regulations
At minimum, regulations should clearly define the roles and responsibilities of those involved in providing drinking-water and public health protection, including how they should work together during normal operations and at times of emergency. People involved may work for government organizations or surveillance agencies, water suppliers, or industry, and be plumbers, engineers, inspectors, medical professionals or individual household users. Roles and responsibilities should be documented, shared and understood by all.

Belize’s Public Health Act contains extensive regulations on information collection and flow and response(s) to address potential public health risks, including those related to drinking-water (Government of Belize 2003). Under this Act and under certain conditions, health officers have the power to conduct visits and inspect tanks and receptacles for water. Health officers can order compliance and follow up to ensure enforcement (e.g. imprisonment and fines for wilfully fouling water in a tank). The Act also includes provisions on how to serve notices and orders, and penalties for resisting and obstructing health officers. When medical practitioners become aware of infectious diseases listed under the Act, including cholera and dysentery, they must notify the nearest medical officer of health. Officials, such as magistrates or police officers, who are notified of an infectious disease or related death must notify the district’s medical officer of health. This information is in turn reported to the Director of Health Services, who has the power to declare quarantines.

8. Design regulations to direct information collection, flow and consequential action
Regulations should ensure the right person gets the right information at the right time to undertake the required actions. Regulations should facilitate the identification of, and appropriate response to, potential drinking-
water contamination and water-borne illness events. In addition, regulations should provide for mitigation measures to be put in place to address risks and/or public health emergencies in an immediate and timely fashion.

9. Design regulations to be adaptable, to reflect changes in contexts, understanding and technological innovation

Regulations should be designed to be adaptable, evolving to reflect changes in understanding of water and health issues; regional, national, sub-national, and local contexts (e.g. capacity and resource availability); and technological innovations (e.g. remote monitoring of treatment processes that reduce on-site sampling and testing requirements). Technology continues to improve, as does our understanding of the effectiveness of regulations, policies, programmes and tools. Consequently, the way regulations are used to best protect public health and ensure drinking-water quality should also continue to evolve.

10. Ensure regulations are supported

Regulations are not a panacea. Simply developing and promulgating regulations does not necessarily ensure that public health will be protected. Regulations must be supported by adequate policies, programmes, guidelines, standards and codes of practice. They should be built on a foundation of good policies and practices and include the capacity to implement and enforce provisions.

Further Reading


Key References


