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Contribution by WHO

to the CSTD 2022-2023 priority theme on "Ensuring safe water and sanitation for all: a solution by science, technology and innovation"

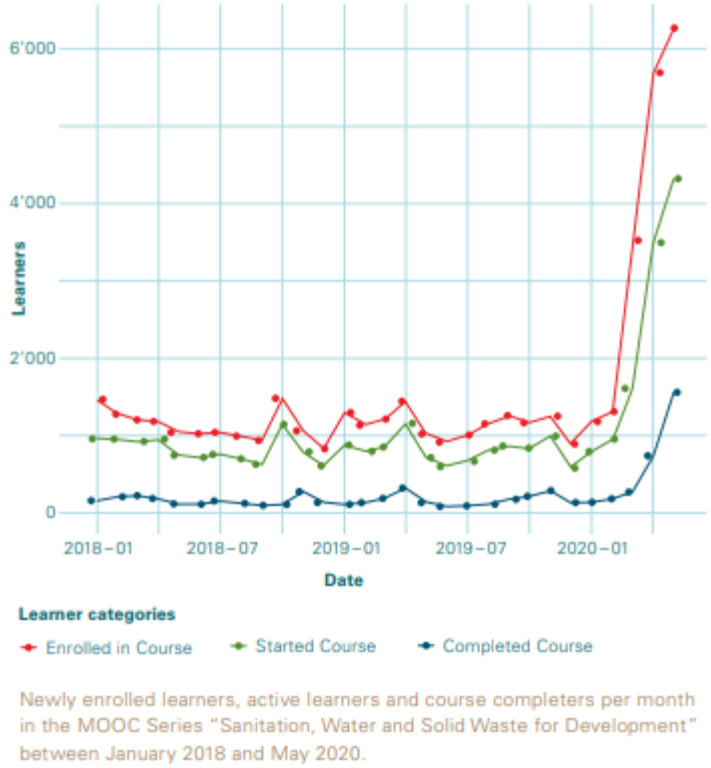
World Health Organization

PRIORITY THEME 2: *Ensuring safe water and sanitation for all: a solution by science, technology and innovation*

A	**Household water treatment** Over 2 billion people globally drink water that is faecally contaminated. One solution, at least in the short term, is to treat drinking water at the household level to make it safe to drink. A large number of technologies are available which reportedly can be applied for household water treatment (HWT), but many of these have not been independently evaluated. In response, WHO established an international scheme to evaluate HWT technologies. There are a number of different HWT methods that aim to remove microbial pathogens from drinking-water. These different treatment methods vary in their ability to remove the main classes of enteric pathogens that pose health risks: bacteria, viruses and protozoa. To assist Member States in the evaluation and selection of HWT technologies, WHO developed global recommendations, detailing criteria and guiding principles for evaluating HWT performance. These recommendations provide the basis for evaluating and classifying HWT into three levels of performance: 3-star (★★★); 2-star (★★) and 1-star (★), based on their ability to remove pathogens from drinking-water. To date, two rounds of evaluations have been made, covering a wide range of technologies including chemical, solar and ultraviolet disinfection, and ceramic and membrane filtration. 40 technologies have received a star rating, while 6 technologies did not meet the minimum performance criteria. Results of the evaluations have informed countries in their procurement of technologies to promote for household water treatment. https://www.who.int/tools/international-scheme-to-evaluate-household-water-treatment-technologies
B	**Remote sensing to improve drilling success rates in Madagascar and Ethiopia** Ethiopia and Madagascar have plentiful groundwater resources, but in both countries drilling success rates are low due to hydrogeological complexity, a weak knowledge base and low capacity within the drilling sector. Reliable groundwater investigations are vital to improve drilling success rates and reduce the overall costs of failed boreholes. However, conventional methods of generating large-scale hydrogeological maps require considerable human, logistical and financial resources. In the past, these have taken a long time and produced limited results in the most complex areas. In contrast, a new hybrid methodology that uses satellite remote sensing to scan the earth and identify high potential sites for the extraction of groundwater combined with on-the-ground geophysics investigations has changed this. This new methodology, developed by the European Union's Joint Research Centre enables more reliable identification of the most suitable sites for borehole drilling. The governments of both countries are being supported by UNICEF to use remote sensing technology. These initiatives are helping to significantly increase the efficiency and cost-effectiveness of borehole drilling. In Ethiopia, remote sensing helped increase drilling success rates from less than 50% to over 90%. The methodology is being expanded to additional countries in East Africa.

	Source: WHO, UNICEF and World Bank, State of the World's Drinking Water: An urgent call to action to accelerate progress on ensuring safe drinking water for all, WHO, Geneva (in press).
C	**Evaluation of portable water quality testing kits** Current options for carrying out microbiological water quality testing in field settings have a number of limitations that need to be considered; including the cost per test, the size of the equipment and how easy it is for someone to process a sample and read results. Most existing tests have a time to result of at least 18 hours, which impacts how the information can be used. WHO and UNICEF have been working with manufacturers to stimulate innovations in water quality testing equipment that could allow communities, governments, utilities and other actors to conduct water quality testing more efficiently, at lower cost, and in much shorter timeframes. A number of candidate products have been identified, using different processes such as conventional incubation, nucleic acid measurement, immunoassays, and tryptophan-like fluorescence. WHO has supported an independent laboratory assessment of 20 portable kits using conventional incubation, and UNICEF through its Rapid Water Quality Testing project is engaging with manufacturers to develop products that could be faster, cheaper, and easier than existing technologies. A set of field trials are being carried out in Nigeria and Indonesia using some of these new rapid tests, with results expected later in the year. https://www.unicef.org/innovation/rapid-water-quality-testing
D	**Wastewater based epidemiology** Wastewater surveillance adds an important and often cost-effective line of information to support public health communications and decisions making. For many years, surveillance for polio has included surveillance of wastewater to detect asymptomatic cases and changes in disease prevalence at the population level that are not picked up by clinical testing. Similar applications have been used for typhoid, illicit drugs and antimicrobial resistance. Wastewater surveillance was widely used and popularized during the COVID-19 pandemic where it assisted in response efforts by; providing early warning in increasing cases, motivating communities to seek testing and vaccination and maintain handwashing and distance, targeting responses to high prevalence areas, at risk communities and events, and tracking emergence and spread of known and novel variants. New applications are being investigated and applied for new targets such as monkeypox as the utility and methods for wastewater surveillance is more widely known. Ultimately researchers aim to developing multi-pathogen surveillance systems capably of tracking many diseases at once and methods that can be applied equally well in open drains for population not connected to sewers as for sewered populations. https://www.who.int/publications/i/item/WHO-HEP-ECH-WSH-2022.1 https://apps.who.int/iris/rest/bitstreams/1418639/retrieve
E	**Compendium of sanitation systems and technologies**

	Eawag, the Swiss Federal Institute of Aquatic Science and Technology (and a WHO Collaborating Center), along with the International Water Association (UWA) and the Water Supply and Sanitation Collaborative Council (WSSCC), in 2008 developed a Compendium of Sanitation Systems and Technologies which presented sanitation technologies in a systematic framework covering the entire sanitation 'chain', from toilets to treatment facilities. The Compendium became an essential resource in the sector, and in 2018 a second edition expanded the resource, simplifying user guidance and adding new technology information sheets and sanitation systems. The Compendium is widely used in capacity development initiatives, and is available in multiple languages as well as in an interactive digital format (the 'eCompendium'). https://www.eawag.ch/en/department/sandec/publications/compendium/ https://sswm.info/perspective/sanitation-systems-perspective
F	**WASH accounts** Adequate funding and effective financing for WASH are essential to deliver and sustain services, and to allow countries to make progress towards Sustainable Development Goal (SDG) 6 and other SDG targets. Yet many countries lack information on how much is being spent to improve WASH services. To identify and track financial flows in the WASH sector, WHO developed the TrackFin methodology. The TrackFin methodology supports the collection and mapping for WASH financial flows, in a comprehensive and comparable manner, based on standard TrackFin classifications. TrackFin produces WASH accounts which can be used for national benchmarking, cross-country comparisons and to provide an evidence base to better plan, finance, manage and monitor WASH services and systems. TrackFin and WASH accounts aim to answer four key questions: • What is the total expenditure in the WASH sector? • What are WASH funds being spent on? • Who pays for WASH services and how much do they pay? • Who are the main WASH service providers and how much are they spending? TrackFin has been initiated in over 20 countries with the support of a number of development partners, and countries around the world continue to show interest. https://www.who.int/teams/environment-climate-change-and-health/water-sanitation-and-health/monitoring-and-evidence/wash-systems-monitoring/un-water-global-analysis-and-assessment-of-sanitation-and-drinking-water/wash-accounts https://www.who.int/publications/i/item/9789240028432
G	**MOOCs** WHO has contributed to a series of Massive Open Online Courses (MOOCs), developed by Eawag, the Swiss Federal Institute of Aquatic Science and Technology (and a WHO Collaborating Center). Eawag's MOOC series on "Sanitation, Water and Solid Waste for Development" consists of four courses and has reached over 160 000 learners and 25 000 course completers, with high participation from low and middle-income countries. Enrolment in the MOOC series surged during the COVID-19 pandemic, as educational institutions and learners shifted to online resources.



Newly enrolled learners, active learners and course completers per month in the MOOC Series "Sanitation, Water and Solid Waste for Development" between January 2018 and May 2020.

https://www.eawag.ch/en/department/sandec/e-learning/moocs
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