LIAQUAT UNIVERSITY
OF MEDICAL & HEALTH SCIENCES
JAMSHORO





OVERALL REPORT

on SDG-6

Clean Water and Sanitation





Sustainability Report

2025

LIAQUAT UNIVERSITY
OF MEDICAL & HEALTH SCIENCES
JAMSHORO

LUMHS Contribution Towards SDG 6 (Clean Water and Sanitation)

Liaquat University of Medical & Health Sciences (LUMHS) is committed to advancing Sustainable Development Goal 6 by promoting safe water, sanitation, and hygiene across its campuses, teaching hospitals, and surrounding communities. Through responsible water management, improved sanitation infrastructure, public health education, and research on water-related health challenges, the University seeks to protect health, conserve water resources, and support equitable access to clean water in Sindh and beyond.

Establishment of Water Testing & Surveillance Laboratory (WT&SL), Liaquat University of Medical & Health Sciences (LUMHS), Jamshoro

Liaquat University of Medical & Health Sciences (LUMHS) has established a **Water Surveillance Laboratory** to strengthen water-quality monitoring, support public health, and provide an important community service, particularly for populations exposed to unsafe or inadequately monitored water sources. The laboratory provides facilities for the **testing and surveillance of water quality**, enabling the assessment of water samples for parameters relevant to public health and helping identify potential contamination and risks associated with drinking and community water supplies. Through this initiative, LUMHS extends its scientific and technical expertise beyond the university campus to serve the wider community and support evidence-based public-health interventions.

The Water Surveillance Laboratory contributes directly to **SDG 6: Clean Water and Sanitation** by promoting systematic monitoring of water quality and generating evidence that can support efforts to improve access to safe water for general community free of cost. It also contributes to **SDG 3: Good Health and Well-being**, as contaminated water is an important public-health concern and regular surveillance can help identify risks before they contribute to waterborne disease. The laboratory supports community engagement by facilitating **water-quality testing for community organizations, public institutions, schools, and other stakeholders**, where applicable, and by providing technical information that can guide appropriate remedial measures.

The initiative demonstrates LUMHS's role as a **community-oriented health sciences university**, using its laboratory infrastructure, academic expertise, and scientific capacity to address real-world environmental and public-health challenges. Water surveillance data can also contribute to awareness, preventive health planning, research, and collaboration with relevant government departments and community partners. By establishing a dedicated facility for water-quality surveillance, LUMHS is strengthening the link between **health, environmental sustainability, scientific evidence, and community service**, supporting a healthier and more resilient society.

Water Surveillance Laboratory: Community Engagement, Education and Capacity Building

The **Water Surveillance Laboratory at Liaquat University of Medical & Health Sciences (LUMHS)** serves not only as a facility for water-quality testing and surveillance but also as an important platform for **community engagement, public awareness, education, and capacity building**. In addition to providing water-testing services, the laboratory actively engages with schools, educational institutions, community organizations, and other stakeholders to increase awareness about the importance of safe water, water contamination, hygiene, sanitation, and their relationship with public health. Through awareness and educational sessions conducted at different schools and organizations, laboratories and university experts communicate basic concepts of water safety, sources of contamination, safe water practices, and the potential health consequences of consuming contaminated water. These activities help translate scientific knowledge into practical information that communities can use to protect their health.

The laboratory also provides opportunities for **schoolchildren and young learners to visit the facility and observe water-quality testing processes**. During these educational visits, students are introduced to the role of laboratory science in protecting public health and are given an opportunity to understand how water samples are collected, processed, examined, and assessed. Such visits promote scientific curiosity and environmental awareness among young people while demonstrating the practical application of health sciences, laboratory technology, and environmental monitoring. By opening its laboratory environment to students, LUMHS contributes to science education and encourages the next generation to develop an interest in public health, environmental sustainability, and scientific inquiry.

The Water Surveillance Laboratory further strengthens its capacity through participation in national and international events, scientific meetings, awareness campaigns, workshops, conferences, and professional activities related to water quality, environmental health, laboratory sciences, public health, and sustainability. Participation in these platforms enables laboratory personnel to remain informed about emerging technologies, updated testing methodologies, international standards, surveillance approaches, quality-assurance practices, and new challenges related to water safety. Knowledge and experience gained through these activities are used to support continuous improvement of laboratory practices and to keep the facility responsive to evolving public health and environmental needs.

Through this integrated approach, LUMHS has positioned the Water Surveillance Laboratory as more than a diagnostic or testing unit. It functions as a community-facing scientific resource, connecting laboratory expertise with education, awareness, research, environmental monitoring, and public-health action. The initiative directly supports SDG 6: Clean Water and Sanitation through water-quality surveillance and awareness, while also contributing to SDG 3: Good Health and Well-being by promoting prevention of health risks associated with unsafe water. Its educational outreach supports SDG 4: Quality Education, while collaboration with schools, organizations, government stakeholders, professional bodies, and other partners contributes to SDG 17: Partnerships for the Goals. By combining testing services with community education, student engagement, professional development, and continuous

knowledge exchange, LUMHS demonstrates its commitment to using its institutional expertise and infrastructure to address practical challenges affecting the health and well-being of the wider community.

WHO/LUMHS Typhoid Surveillance Programme

Programme: Typhoid Surveillance Programme
Partners: World Health Organization (WHO) and LUMHS
Duration: 1 January 2025 – 31 December 2026
Location: LUMHS / Liaquat University Hospital, Jamshoro

Background

In 2019, Pakistan became the first country to introduce typhoid conjugate vaccines (TCV) into its routine childhood immunization programme. The country now has 22 surveillance sites, which function with WHO technical support and funding from Gavi, the Vaccine Alliance. WHO set up the typhoid sentinel sites in May 2020, selecting referral (tertiary) hospitals with qualified laboratory staff and well-equipped laboratories. LUMHS's participation from 2025 to 2026 forms part of this national effort.

Typhoid Surveillance and Water Quality Monitoring at LUMHS

Liaquat University of Medical & Health Sciences (LUMHS) participates in the national **typhoid surveillance programme during 2025–2026**, contributing to the broader public-health effort to monitor typhoid fever and assess the impact of Typhoid Conjugate Vaccine (TCV) introduction. The national programme comprises **22 surveillance sites**, functioning with technical support from the **World Health Organization (WHO)** and funding from **Gavi, the Vaccine Alliance**. WHO established typhoid sentinel surveillance sites in May 2020, selecting referral and tertiary-care hospitals with qualified laboratory personnel and appropriately equipped laboratories. LUMHS's participation forms part of this coordinated national and international surveillance network.

The surveillance programme aims to describe the epidemiology of typhoid fever, assess the outcomes and impact of TCV introduction, and estimate the proportion of **extensively drug-resistant (XDR) typhoid**. At LUMHS, the programme contributes to the generation of reliable, laboratory-confirmed typhoid data for Sindh, supports monitoring of antimicrobial resistance, including XDR *Salmonella* Typhi, and provides data that contribute to national and WHO assessments of vaccine impact and disease trends. Surveillance follows standardized WHO case definitions and laboratory procedures. A suspected case is defined as a patient with fever for at least three of seven consecutive days, while a confirmed case is a suspected case with a positive blood culture. Laboratory diagnosis relies on blood culture using **BACTEC blood culture bottles**, enabling identification of *Salmonella* Typhi and supporting antimicrobial-resistance surveillance.

In addition to clinical surveillance, the laboratory contributes to environmental and community-level monitoring of potential health risks associated with contaminated water. Water samples from affected or potentially high-risk areas can be assessed to identify water-quality concerns and support investigations where unsafe water may contribute to the transmission of waterborne diseases, including typhoid. This linkage between clinical disease surveillance and environmental water-quality monitoring strengthens the public-health response by helping identify potential sources and contributing factors associated with disease transmission. Laboratory findings can support evidence-based recommendations for appropriate preventive measures, community awareness, and engagement with relevant health and environmental authorities.

Through this integrated approach, LUMHS contributes to a One Health-oriented public-health framework, connecting laboratory-confirmed disease surveillance with environmental monitoring and community protection. The initiative strengthens local capacity to detect and understand typhoid and antimicrobial resistance while also supporting efforts to identify environmental risks related to unsafe water. It therefore contributes directly to SDG 3: Good Health and Well-being through disease surveillance and prevention and to SDG 6: Clean Water and Sanitation through water-quality monitoring and promotion of safe water practices. The programme also demonstrates LUMHS's contribution to national and international public-health priorities through collaboration with WHO, Gavi-supported surveillance efforts, and relevant stakeholders.

Educational Visit to Water Testing and Surveillance Laboratory, LUMHS

Students visited the **Water Testing and Surveillance Laboratory at Liaquat University of Medical & Health Sciences (LUMHS), Jamshoro**, to develop practical knowledge about **water quality, water safety, and its importance to public health**.

During the visit, students were introduced to the procedures involved in the **collection, handling, and testing of water samples**. They observed laboratory demonstrations and gained an understanding of **physical, chemical, and microbiological water-quality tests** used to identify potential contamination.

The students were also briefed about **laboratory safety procedures**, appropriate sample handling, and the importance of accurate water-quality assessment in identifying risks associated with unsafe water.

Educational and Practical Impact

The visit provided students with an opportunity to connect their **theoretical knowledge with practical laboratory applications**. Through direct exposure to water-quality testing procedures, students developed a better understanding of how scientific evidence can be used to assess water safety and protect public health.

The activity also increased awareness among students regarding the importance of **clean and safe water, water-borne diseases, hygiene, and prevention of water contamination**. It encouraged students to recognize the relationship between environmental conditions and community health.







Student Awareness Session on Water Conservation and Sustainable Water Use

Liaquat University of Medical & Health Sciences (LUMHS) organized an awareness session for students on water conservation, responsible water consumption, and the importance of sustainable water management. The session aimed to educate and encourage students to adopt water-saving practices in their daily lives, both within the university campus and in their surrounding communities. Participants were sensitized to the growing challenges of water scarcity, water wastage, and the importance of protecting available freshwater resources.

The session highlighted practical measures such as avoiding unnecessary water use, preventing leakage, promoting responsible consumption, and encouraging collective action to conserve water. By engaging students in environmental awareness and education, LUMHS seeks to develop a sense of individual and collective responsibility towards sustainable water management.

LIAQUAT UNIVERSITY
OF MEDICAL & HEALTH SCIENCES
JAMSHORO





LIAQUAT UNIVERSITY
OF MEDICAL & HEALTH SCIENCES
JAMSHORO

Water Quality Testing and Monitoring at Downstream of River

Water Testing & Surveillance Laboratory (WT&SL), Liaquat University of Medical & Health Sciences (LUMHS), Jamshoro

The Water Testing & Surveillance Laboratory (WT&SL), LUMHS, Jamshoro conducted a field-based **water quality testing and monitoring activity at Kotri Downstream** on 22 May 2025. The activity involved the collection of water samples from the downstream area of the River Indus for laboratory analysis and assessment of water quality.

The activity was conducted under the supervision of **Dr. Zafar Ali Seenharo, Director, Water Testing & Surveillance Laboratory, LUMHS**. The collected samples were analyzed to assess the quality and potential contamination of the water and to support ongoing environmental water-quality surveillance.

Purpose and Significance

The activity aimed to generate evidence on the quality of surface water at the downstream location and contribute to the identification and monitoring of potential water contamination. Regular water-quality surveillance is important for protecting **aquatic ecosystems, public health, and communities dependent on river water resources**. Being a under resourced area of Sindh people consume this water

Impact and Institutional Contribution

The activity demonstrates LUMHS's commitment to **environmental sustainability, evidence-based water-resource monitoring, and protection of community health**. The data generated through water-quality surveillance can support environmental assessment, awareness, and informed decision-making regarding water safety and pollution control.

The activity also highlights the role of LUMHS as a health sciences institution contributing its laboratory and scientific capacity to address **environmental challenges affecting communities and ecosystems**.

LIAQUAT UNIVERSITY
OF MEDICAL & HEALTH SCIENCES
JAMSHORO





LIAQUAT UNIVERSITY
OF MEDICAL & HEALTH SCIENCES
JAMSHORO





LIAQUAT UNIVERSITY
OF MEDICAL & HEALTH SCIENCES
JAMSHORO

Water Quality Testing and Awareness Outreach at SOS Village, Jamshoro

On 11 February 2025, the Water Testing & Surveillance Laboratory (WT&SL), Liaquat University of Medical & Health Sciences (LUMHS), Jamshoro, carried out a community outreach activity at SOS Village, Jamshoro, in collaboration with the Department of Community Medicine, LUMHS. The activity was held alongside a medical camp for dental awareness.

Under the supervision of Dr. Zafar Ali Seenharo, Director, WT&SL, the laboratory team collected more than 15 water samples for chemical and microbiological analysis. An awareness session was also conducted on waterborne diseases, the health impact of contaminated water, and water conservation. It also heighted that poor sanitation can contaminate water and food and contribute to diseases such as **diarrhea, cholera, typhoid, and other infections**. Good sanitation therefore directly supports **SDG 6: Clean Water and Sanitation** and also contributes to **SDG 3: Good Health and Well-being**.

The activity shows how the University applies its laboratory expertise to the surveillance of drinking-water quality in the local community. It also promotes safe water practices and links water safety with public health through joint work between university departments.







LUMHS Promotes Community Health and Hygiene Awareness Through Outreach Programme at IRM Smart School

Liaquat University of Medical & Health Sciences (LUMHS), Jamshoro, organized a Health and Hygiene Community Outreach Programme at IRM Smart School to promote health awareness and encourage healthy hygiene practices among schoolchildren. The initiative aimed to educate students about the importance of personal hygiene, handwashing, oral health,

environmental cleanliness, safe drinking water, and preventive healthcare through age-appropriate health education and interactive awareness activities. The programme provided an opportunity for students to learn practical measures for maintaining personal cleanliness, preventing communicable diseases, and adopting healthy habits in their daily lives, both at school and at home. By engaging with the school community, LUMHS extended its health education initiatives beyond the university campus and contributed to developing health-conscious behaviours among children at an early age. This outreach activity reflects the University's commitment to community engagement, preventive healthcare, and health promotion, while strengthening collaboration between higher education institutions and local schools. The initiative directly supports SDG 3 (Good Health and Well-being) through disease prevention and health awareness, SDG 4 (Quality Education) by promoting health literacy among schoolchildren, and SDG 6 (Clean Water and Sanitation) through awareness of hygiene, sanitation, and safe water practices.



LIAQUAT UNIVERSITY
OF MEDICAL & HEALTH SCIENCES
JAMSHORO





LIAQUAT UNIVERSITY
OF MEDICAL & HEALTH SCIENCES
JAMSHORO







Provision of free water in the whole campus for students, faculty, and visitors

Liaquat University of Medical & Health Sciences (LUMHS) ensures access to free drinking water across its campus for students, faculty members, administrative staff, patients, and visitors. This initiative reflects the University's commitment to promoting public health, well-being, and equitable access to an essential human necessity. By providing accessible drinking-water facilities at various locations throughout the campus, LUMHS aims to ensure that members of its university community and visitors can meet their daily hydration needs without financial barriers.

The provision of free drinking water contributes to SDG 6: Clean Water and Sanitation, particularly by promoting equitable access to water, and SDG 3: Good Health and Well-being, by supporting hydration, health, and a healthier campus environment. It also reflects LUMHS's commitment to creating an inclusive and supportive institutional environment where essential facilities are accessible to everyone.

LIAQUAT UNIVERSITY
OF MEDICAL & HEALTH SCIENCES
JAMSHORO



Participation of Water Testing & Surveillance Laboratory (WT&SL), LUMHS, Jamshoro / Aab-e-LUMHS in Pak Water & Energy Expo 2025

The **Director, Water Testing & Surveillance Laboratory (WT&SL) and Aab-e-LUMHS**, represented Liaquat University of Medical & Health Sciences (LUMHS), Jamshoro, at the **Pak Water & Energy Expo 2025** held at Expo Centre Lahore On 22 September 2025. During the visit, the representative explored the latest technologies, equipment, and solutions related to **water testing, water treatment, purification, quality monitoring, and sustainable water management**. The visit also provided an opportunity to interact with exhibitors, industry professionals, and technology providers and to gain first-hand exposure to emerging developments in the water sector.

Objectives of the Activity

The participation aimed to:

- Enhance institutional knowledge of modern **water-quality testing and monitoring technologies**.
- Explore innovative approaches to **water treatment and purification**.
- Identify technologies that could strengthen the capacity of LUMHS water testing and surveillance activities.
- Promote awareness of sustainable and efficient **water-resource management**.
- Facilitate interaction with industry stakeholders and technology providers.
- Support continuous professional development and institutional capacity building.

Impact and Institutional Significance

The activity strengthened LUMHS's understanding of emerging technologies and contemporary practices in water quality management. Exposure to modern testing and treatment solutions can contribute to improving institutional capacity for **water-quality surveillance, environmental monitoring, and sustainable water management**.

The participation also created an opportunity for LUMHS to remain informed about technological developments that may support future initiatives under **Aab-e-LUMHS** and the Water Testing & Surveillance Laboratory.

By engaging with industry and exploring practical solutions for water-quality challenges, LUMHS demonstrated its commitment to addressing environmental sustainability and water-security issues through its academic, technical, and laboratory expertise.

The participation provides evidence of LUMHS's **practical engagement with water sustainability and environmental stewardship**. It demonstrates the University's efforts to build institutional capacity, learn from industry and technology providers, and explore innovative solutions for water-quality monitoring and sustainable water management.

LIAQUAT UNIVERSITY
OF MEDICAL & HEALTH SCIENCES
JAMSHORO







World Water Day 2025 – Water Quality Awareness Campaign

On 24 March 2025, the Water Testing & Surveillance Laboratory, Liaquat University of Medical & Health Sciences (LUMHS), Jamshoro, organized a public water-quality awareness initiative through LUMHS-FM 96.6 to commemorate World Water Day 2025. As part of this initiative, Dr. Zafar Ali Seenharo, Director, Water Testing & Surveillance Laboratory, LUMHS, delivered an awareness message highlighting the importance of access to clean and safe drinking water as a fundamental requirement for public health and healthy living. The broadcast emphasized the potential health risks associated with contaminated drinking water, including waterborne diseases and other preventable health complications, and highlighted the importance of regular water-quality monitoring, safe water storage, responsible water consumption, and protection of water resources from contamination. Through the university's FM radio platform, LUMHS extended important public health information beyond its campus, reaching the wider community and encouraging individuals and families to adopt safe water practices in their daily lives. The initiative also highlighted the role of scientific water testing, surveillance, and public awareness in preventing water-related health risks and protecting community well-being. This activity reflects LUMHS's commitment to public health education and environmental health promotion, contributing directly to SDG 3 (Good Health and Well-being) through the prevention of waterborne diseases and supporting SDG 6 (Clean Water and Sanitation) by promoting safe drinking water-quality awareness, and responsible water resource management.

The awareness message highlighted the importance of:

- Protecting water sources from pollution and contamination.
- Responsible disposal of domestic and other waste.

- Ensuring drinking water is appropriately treated or filtered.
- Maintaining safe water practices to prevent water-borne diseases.
- Promoting public awareness regarding water quality and environmental health.

Community and Public Awareness Impact

The initiative used **LUMHS-FM 96.6 as a public communication platform** to disseminate evidence-based information on water quality and health beyond the university campus. By communicating directly with the wider community, LUMHS contributed to greater public understanding of the relationship between **safe water, disease prevention, environmental protection, and healthy communities**.

The activity demonstrates the University's role in translating its scientific and laboratory expertise into accessible public-health information and promoting responsible stewardship of water resources.

The World Water Day awareness initiative provides evidence of **LUMHS's public engagement and community outreach on sustainable water management and health**. It demonstrates how the University utilizes its academic and laboratory expertise and institutional communication platforms to raise awareness about an important global sustainability challenge.

The activity is particularly relevant to **SDG 6 (Clean Water and Sanitation)** because it promotes public understanding of water quality, contamination prevention, safe drinking water, and protection of water resources, while also supporting **SDG 3 through health-focused awareness**.





LIAQUAT UNIVERSITY
OF MEDICAL & HEALTH SCIENCES
JAMSHORO

Awareness Session on Water Quality and water testing for Prevention of Water-Borne Diseases

Activity Overview

An awareness session on **water quality, water monitoring, and prevention of water-borne diseases** was conducted for the cadets of **Cadet College Petaro** by **Dr. Zafar Ali Seenharo, Director, Water Testing Laboratory, Liaquat University of Medical & Health Sciences (LUMHS), Jamshoro**.

The session was attended by the **Principal, teaching staff, and cadets** of Cadet College Petaro. The session focused on the importance of access to safe drinking water and highlighted the role of regular water-quality testing in protecting community health.

Key Areas Covered

The awareness session addressed:

- Importance of **safe and clean drinking water** for health and well-being.
- Role of **regular water-quality monitoring and testing** in identifying contamination.
- Common risks associated with **water-borne diseases**.
- Preventive measures to reduce exposure to contaminated water.
- Importance of **personal hygiene, sanitation, and safe water-handling practices**.
- Community responsibility in maintaining water quality and protecting water resources.

Community and Educational Impact

The session provided students and staff with practical knowledge about the relationship between **water quality, sanitation, hygiene, and public health**. By engaging directly with cadets and educational staff, LUMHS extended its specialized expertise beyond the university and contributed to health education within the wider community.

The activity also strengthened the connection between **higher education, public health education, and community engagement**, demonstrating LUMHS's role in translating scientific and laboratory knowledge into practical awareness for young people.

This activity demonstrates LUMHS's **community outreach and knowledge-transfer efforts** in an area directly connected to sustainable development. It shows how the University's technical expertise in water testing and public health is being shared with educational institutions and young people to promote informed and healthy communities.

Water Quality Awareness Session for Cadets of Cadet College Petaro

The Water Testing Laboratory, Liaquat University of Medical & Health Sciences (LUMHS), Jamshoro, conducted an awareness session on water quality, monitoring and the prevention of

waterborne diseases for the cadets of Cadet College Petaro. The session was delivered by Dr. Zafar Ali Seenharo, Director, Water Testing Laboratory, LUMHS.

Dr. Seenharo highlighted the importance of safe drinking water, regular water testing, hygiene and sanitation in preventing waterborne diseases. The Principal, teaching staff and cadets attended the session.

The activity shows how the University shares its scientific expertise with schools and colleges to build awareness of water safety and public health among young people.



LIAQUAT UNIVERSITY
OF MEDICAL & HEALTH SCIENCES
JAMSHORO





LIAQUAT UNIVERSITY
OF MEDICAL & HEALTH SCIENCES
JAMSHORO



OVERALL REPORT ON SUSTAINABLE DEVELOPMENT GOAL NO:6