

Data-Driven Monitoring and Control of Water Sanitation and Hygiene for Improved Maternal Health in Rural Communities

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Abstract : Governments and development partners in low-income countries often prioritize building Water Sanitation and Hygiene (WaSH) infrastructure of healthcare facilities to improve maternal healthcare outcomes. However, the operation, maintenance, and utilization of this infrastructure is almost never considered. Many healthcare facilities in these countries use untreated water that is not monitored for quality or quantity. Consequently, it is common to run out of water with a patient is on their way to, or in, the operating theater. Further, the handwashing stations in healthcare facilities regularly run out of water or soap for months, and the latrines are typically not clean, in part due to the lack of water. In this chapter, we present a system that uses Internet of Things (IoT), big data, cloud computing and AI to initiate WaSH security in healthcare facilities, with a specific focus on maternal health. We have implemented smart sensors and actuators to monitor and control WaSH systems from afar to ensure their objectives are achieved. We have also developed a cloud-based system to analyze WaSH data in real time and communicate relevant information back to the healthcare facilities and their stakeholders (e.g., medical personnel, NGOs, ministry of health officials, facilities managers, community leaders, pregnant women, and new mothers and their families) to avert or mitigate problems before they occur.

Keywords : WaSH, internet of things, artificial intelligence, maternal health, rural communities, healthcare facilities

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