# Water for healthcare is for more than drinking

## Rethinking the water service indicators for healthcare facilities

Li Ann Ong, Zahid Hayat Mahmud, Md. Sakib Hossain, Mohammed Monirul Alam, Jiwon Park, Maya Vandenent & Katrina Charles

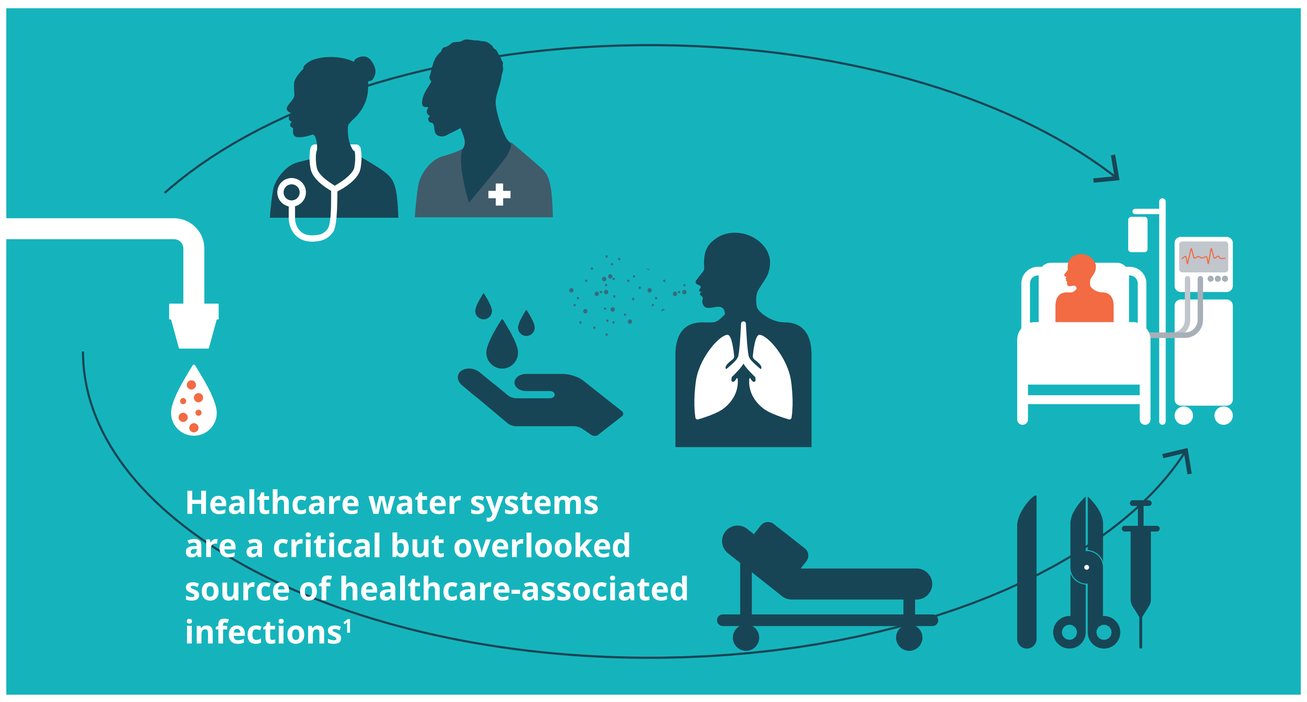
## Introduction

***"The first requirement of a hospital is that it should do the sick no harm"***
***Florence Nightingale***

The Joint Monitoring Programme (JMP) for WASH in healthcare facilities prioritises water service by availability from an improved source on premise and monitoring of drinking water quality. Microbiological safety of water for broader usage is not considered.[2]

We conducted a cross-sectional study to examine:

1. The quality of water services in Bangladesh public hospitals, as assessed by the JMP WASH in healthcare facilities indicator;
2. The utility of *E. coli* as an indicator of safe water for healthcare use.




## Methods

**Study sites**: 21 hospitals in Bangladesh with access to JMP-defined basic water services and provided in-patient care, surgical, maternal, and newborn services:

**Data collection**:

**1. Sanitary inspection** for infrastructure risks and environmental hazards.

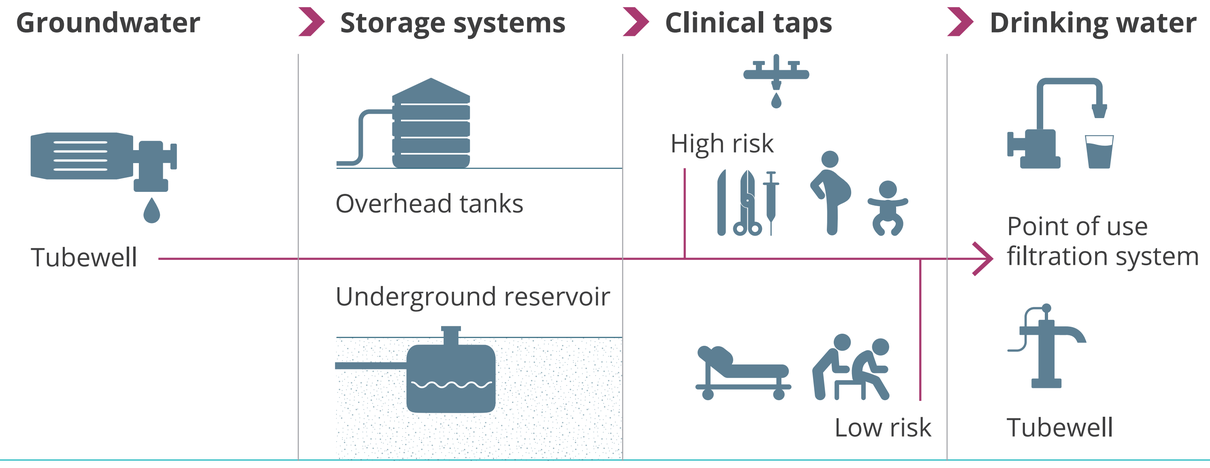
**2. Systematic water system sampling** and drinking water points (Figure 1).

**3. Structured survey** of hospital water system operations and maintenance practice.

Clinical areas caring for vulnerable patients, e.g. maternity and newborn units and operating theatres, were designated high-risk.

**Water analysis**: *E. coli*, and opportunistic pathogens (*Pseudomonas aeruginosa*, *Klebsiella pneumonia*, *Acinetobacter spp*., and *Legionella spp*.) by membrane filtration, culture and molecular confirmation.

**Figure 1: Systematic sampling across hospital water system from groundwater source to tap for use in clinical areas and drinking water points**




## Results

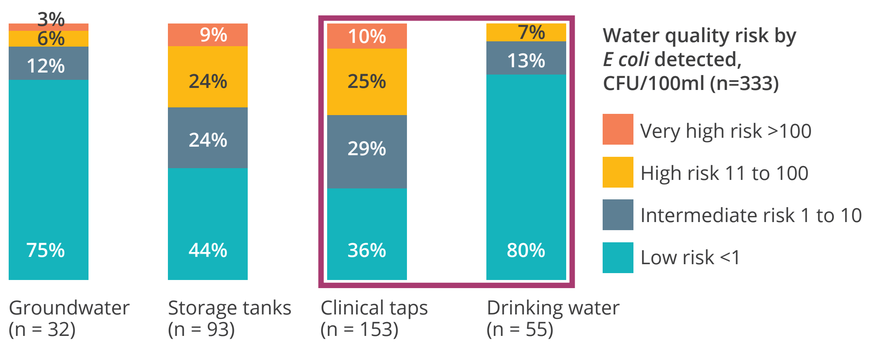
**Water system set-up and management:**

All hospitals sourced water from on-site deep tubewells while drinking water was predominantly from separate improved sources, e.g. handpumps. No hospital had a water safety plan or routine maintenance.

**Utility of drinking water monitoring in assessing healthcare water system safety:**

Drinking water quality was significantly better than water for healthcare use. Water quality deteriorated within the system as it transitioned from source to tap.

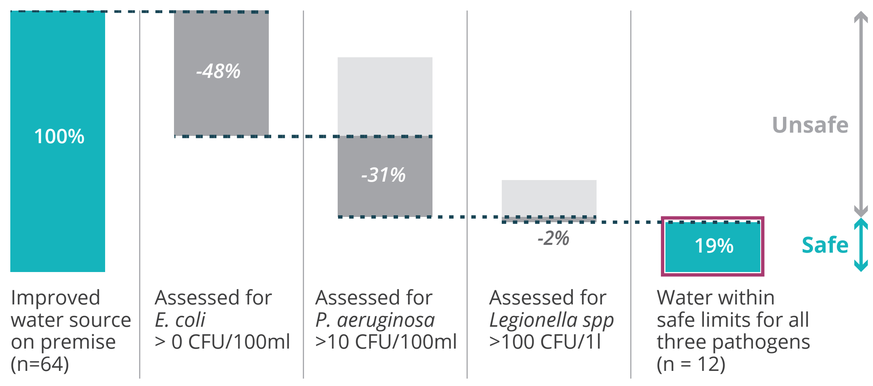
**Figure 2: Change in water quality across the water systems and compared to drinking water.**




**Adequacy of water services by JMP WASH in healthcare facilities indicator:**

Only 19% of water samples in high-risk clinical areas met the safety threshold for use when further assessed for *E. coli*, *Pseudomonas aeruginosa*[3], and *Legionella spp*[4].

**Figure 3: Water services assessed by infrastructure access and detection of opportunistic pathogens for high-risk clinical areas**




## Conclusion

1. **Drinking water quality did not adequately represent the health risks to patients.** Monitoring drinking water only with *E. coli* overlooks risks from other opportunistic pathogens in the water system and transmission pathways besides drinking.
2. **Access to improved infrastructure is not an adequate indication of safe water for healthcare services.** Water quality deteriorated between source and tap, underscoring the importance of water system management.
3. **Investments in WASH infrastructures must be matched with operations and maintenance** to deliver on infection prevention and control objectives.


## Authors

**Li Ann Ong (Corresponding author: li.ong@ouce.ox.ac.uk) & Katrina Charles** | School of Geography and the Environment, University of Oxford. **Zahid Hayat Mahmud & Md. Sakib Hossain** | International Centre for Diarrhoeal Disease Research, Bangladesh. **Mohammed Monirul Alam, Jiwon Park & Maya Vandenent** | United Nations Children's Fund (UNICEF), Bangladesh.



## References

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