washplus Weekly
Supportive Environments for Healthy Communities

Issue 215 | Dec. 18, 2015 | Focus on Water Quality

Recent studies on water quality and household water treatment included in this issue of the Weekly explore the extent to which water contamination contributes to diarrhea, whether a continuous water supply leads to a lower level of waterborne illness, which point-of-use water treatments are most effective, and new technologies to monitor and test water quality.

Microbiological Contamination of Drinking Water Associated with Subsequent Child Diarrhea. *Am Jnl Trop Med Hyg*, Nov 2015. S Luby. Link
Fifty villages across rural Bangladesh were enrolled as part of a program evaluation to assess the relationship between drinking water microbiological quality and child diarrhea. Community monitors visited households monthly and recorded whether children under the age of 5 years had diarrhea in the preceding two days. The authors estimated the population attributable fraction of diarrhea from contaminated water to be 17 percent. The authors point out that the measured association "likely represents a minimal estimate of the contribution of drinking water quality to diarrhea." Data provide further evidence of the health benefits of improved microbiological quality of drinking water.

Does Poor Water Quality Cause Diarrheal Disease? *Am Jnl Trop Med Hyg*, Nov 2015. K Levy. Link
In this editorial the author explains that the Luby study (cited above) is unique in its assessment of water quality prior to diarrheal illness, and with a sufficiently large sample size to observe patterns between household water quality and diarrhea. The data suggest that people are getting diarrhea in many ways in addition to consumption of water in their homes. This study reveals why associations between water quality and diarrheal disease are so hard to find, especially in small studies.

Upgrading a Piped Water Supply from Intermittent to Continuous Delivery and Association with Waterborne Illness: A Matched Cohort Study in Urban India. *PLoS Med*, Oct 2015. A Ercumen. Link
Continuous water supply had no significant overall association with diarrheal disease or growth in children under 5 in the study households in Hubli-Dharwad; this might be due to point-of-use water contamination from continuing household storage and exposure to diarrhea pathogens through non-waterborne routes. Continuous supply was associated with lower prevalence of dysentery in children in low-income households and lower typhoid fever incidence, suggesting that intermittently operated piped water systems are a significant transmission mechanism for Salmonella and dysentery-causing pathogens in this urban

population, despite centralized water treatment.

Microbiological Effectiveness of Household Water Treatment Technologies under Field Use Conditions in Rural Tanzania. *Trop Med Intl Health*, Oct 2015. H Mohamed. Abstract
The objective was to assess the microbiological effectiveness of several household water treatment and safe storage (HWTS) options in situ in Tanzania, before consideration for national scale-up of HWTS. Given that microbiological performance across technologies was comparable, decisions regarding scale up should be based on other factors, including uptake in the target population and correct, consistent, and sustained use over time.

Interventions to Improve Water Quality for Preventing Diarrhoea. *Cochrane Database Syst Rev*, Oct 2015. T Clasen. Link
Interventions that address the microbial contamination of water at the point of use may be important interim measures to improve drinking water quality until homes can be reached with safe, reliable, piped-in water connections. The average estimates of effect for each individual point-of-use intervention generally show important effects. Comparisons between these estimates do not provide evidence of superiority of one intervention over another, as such comparisons are confounded by the study setting, design, and population.

When Are Mobile Phones Useful for Water Quality Data Collection? An Analysis of Data Flows and ICT Applications among Regulated Monitoring Institutions in Sub-Saharan Africa. *Int J Environ Res Public Health*. Sep 2015. E Kumpel. Link
Water quality monitoring is important for identifying public health risks and ensuring water safety. However, even when water sources are tested, many institutions struggle to access data for immediate action or long-term decision making. The authors analyzed water testing structures among 26 regulated water suppliers and public health surveillance agencies across six African countries and identified four water quality data management typologies.

Field Application of the Micro Biological Survey Method for a Simple and Effective Assessment of the Microbiological Quality of Water Sources in Developing Countries. *Int J Environ Res Public Health*, Aug 2015. A Arienzo. Link
Traditional methods of water analysis are usually complex, time consuming, and require an appropriately equipped laboratory, specialized personnel, and expensive instrumentation. The aim of this work was to apply an alternative method, the Micro Biological Survey (MBS), to analyze for contaminants in drinking water. Preliminary experiments were carried out to demonstrate the linearity and accuracy of the MBS method and to verify the possibility of using the evaluation of total coliforms in 1 mL of water as a sufficient parameter to roughly, though accurately, determine water microbiological quality.

Water Quality Monitoring in Developing Countries; Can Microbial Fuel Cells be the Answer? *Biosensors (Basel)*, Sept 2015. J Chouler. Link
The microbial fuel cell (MFC) technology has great potential to rapidly and simply test the quality of water sources. The advantages of MFCs include their simplicity and the possibility for onsite and real-time monitoring. Depending on the choice of manufacturing materials, this technology can also be highly cost effective.

Association of Supply Type with Fecal Contamination of Source Water and Household Stored Drinking Water in Developing Countries: A Bivariate Meta-Analysis. *Env Health Perspec*, May 2015. K Shields. Link

The objective of this study was to assess the extent of fecal contamination at the source and in household stored water (HSW) and explore the relationship between contamination at each of these sampling points and water supply type. Piped water is less likely to be contaminated compared to other water supply types at both the source and in HSW. A focus on upgrading water services to piped supplies may help improve safety, including for those drinking stored water.

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