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A Methodology for Assessing Point-of-Use Water Quality Improvements Following Communal Chlorine Dispenser Interventions in Rural Oromia, Ethiopia

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Abstract

In rural Ethiopia, reliance on communal water sources increases the risk of waterborne diseases. Chlorine dispensers at these sources are a common intervention, but robust methods for assessing their effect on the quality of water actually consumed in households are lacking. This article details a methodology for evaluating the impact of communal chlorine dispenser interventions on point-of-use water quality. Its primary objective is to provide a standardised, field-tested protocol for measuring changes in faecal contamination of household drinking water. The methodology employs a longitudinal, quasi-experimental design with baseline and follow-up surveys in intervention and control villages. It specifies procedures for collecting water samples from communal sources and from stored household drinking water. The protocol outlines the use of portable incubators and Colilert® reagents for Escherichia coli analysis, survey tools for recording water handling practices, and analytical plans for comparing log-reductions in contamination. As a methodology article, it presents no empirical research findings. It details the protocol's development, noting that pilot testing demonstrated high field feasibility, with over 95% of sampled households complying with the water sampling procedure. The proposed methodology offers a practical and scientifically rigorous framework for assessing the effectiveness of chlorine dispenser programmes on household water quality, addressing a critical evidence

gap in water, sanitation and hygiene monitoring. Researchers and public health practitioners implementing similar interventions in rural African settings are encouraged to adopt or adapt this protocol. Rigorous training of field staff and proactive community engagement are emphasised to ensure high participation and data quality. water quality, methodology, point-of-use, chlorine dispenser, Ethiopia, WASH This work provides a standardised methodological tool for generating comparable evidence on the point-of-use water quality impact of a widely used public health intervention in low-resource settings.