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*Perspective*

# Evaluation of Public Health Microbiological Safety and Quality

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## INTRODUCTION

Worldwide, drinking water contamination by microorganisms has resulted in fatalities and severe illnesses. It acts as a conduit for the spread of infectious illnesses like cholera, dysentery, diarrhea, typhoid and guinea worm infections. Diseases linked to inadequate water and sanitation in developing nations continues to impede economic growth and constitute a threat to millions of lives. According to estimates from the World Health Organization (WHO), diarrheal illness killed 2.5 million people in 2008. Nearly 1.8 million people died in 2013 from cholera and diarrhea, which were primarily brought on by contaminated water supplies combined with poor sanitation and hygiene.

About 40% of people in Africa lack access to better sanitation and water supplies. Worldwide contamination of drinking water supplies by both natural and artificial sources poses a threat to public health. The drinking water's safety and quality remain a major public health concern. It is the cornerstone of the primary defense against and management of harmful microorganisms, including viruses, bacteria, protozoa and helminthes. As a result, one of the specific criteria used to establish the quality of drinking water that is free of bacteria that indicate excreta contamination and free of any pathogenic microorganisms is the microbiological aspect.

## DESCRIPTION

The sample is deemed inadequate for use as drinking water. The presence of coliform bacteria in the faeces suggests that the water source has been contaminated by faeces. Similar investigations carried out in 2010 in Assam, India; 2013 in Peshawar, Pakistan; and 2012 in Bo, Sierra Leone by Stenger, et al., revealed that 78.1%, 70% and 61% of drinking water samples were contaminated with faecal coliforms and Escherichia coli, respectively.

There are various sources of drinking water in developing nations, especially in Ethiopia. The results of this investigation showed that over the study period, microorganisms have contaminated samples taken from the municipal drinking water sources in this study location. In light of this, bacterial groups were found in 6% of drinking water samples that were taken from public taps and 6% of drinking water samples that were taken from service reservoirs.

Previous research of a similar nature revealed that while most samples taken from reservoirs were positive for both total and faecal coliforms, certain reservoirs had contamination from similar bacterial groups. Additionally, this investigation showed that every sample gathered for the evaluation of the parasitological quality and safety tested negative for parasite species. A related study conducted in 2013 in Tabuk, Saudi Arabia by El Badawy, et al., demonstrated that giardia cysts were found in 25% of water samples and C. parvi oocysts were found in 16.6% of water samples through parasitological analysis using both microscopy and ELISA methods.

### Statement of the problem

Providing everyone with access to clean, safe drinking water is one of the biggest problems facing municipal authorities around the globe. While clean and treated water supplies to every home may be standard in North America and Europe, waterborne diseases are widespread in underdeveloped nations where access to sanitation facilities and clean water is scarce. High morbidity and mortality rates from diseases related to excreta are linked to the absence of safe drinking water.

### Quality assurance

All sample collection locations received distilled water, which was then brought back to the lab for testing with the water sample. Under the full supervision of culture media, reagents and samples, tests were conducted with positive

and negative controls for the entire study's quality. Environmentalists, the AAWSA's water quality case team and biologists also oversaw this process.

**Bacteria quality testing:** Principle of the Presence-Absence (P-A) coliform test: The multiple-tube method is simply modified to perform the Presence-Absence (P-A) test for the entire coliform group. Based on the idea that there shouldn't be any coliforms in a 100 ml sample of drinking water, using one large test portion (100 ml) in a single culture bottle to gather qualitative data on the presence or absence of coliforms is warranted.

# CONCLUSION

Constructing secure spaces that shield drinking water sources' springs and wells from animals, people, intense rain and flooding. Since drinking water quality is a significant component that directly affects human health, it must be regularly monitored. To assess the trends in safety procedures and water quality, operational research is required.