

**PREVALENCE OF DIARRHEA CAUSING BACTERIA,  
VIRUSES AND PARASITES IN WATER SOURCES IN  
THE RURAL COMMUNITIES IN THE VHEMBE  
DISTRICT**

**By**

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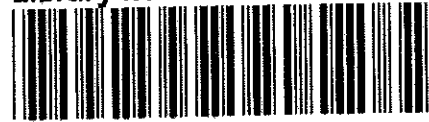
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## Abstract

Globally, several waterborne diseases and outbreaks have been linked to contaminated water. The objective of this study was to determine the prevalence of diarrhea causing bacteria, viruses and parasites in ten river water sources used by rural communities in the Vhembe District. Water quality was determined using indicator organisms (Total coliforms, *Escherichia coli* and *Clostridium perfringens*) and physical parameters (pH, Temperature, Total dissolved solids, Dissolved oxygen, Electrical conductivity and Salinity). In addition, this study determined the prevalence of pathogenic organisms such as *Salmonella*, *Shigella*, *Vibrio cholerae*, *Cryptosporidium*, *Entamoeba*, *Giardia*, Rotaviruses, Noroviruses and Adenoviruses. Water was sampled once during the winter months (June-August 2016) and once during the summer months (October-December 2016) over a 12 months period. The Colilert Quanti-Tray®/2000 technique (IDEXX) was used for isolation of Total coliforms and *Escherichia coli*. Isolation of target bacteria was done using m-CP agar, Salmonella-Shigella agar and Thiosulfate-citrate bile salts sucrose agar. Presumptive isolates were confirmed by oxidase test, API 20E test, Gram staining and standardized published multiplex PCR protocols. Analysis of enteric viruses was done according to the South African National Standards for drinking water. The USEPA Method 1623.1 was employed for parasites. The results indicated that all the ten rivers were contaminated with Total coliforms and *Escherichia coli*; *Clostridium perfringens* bacteria were more prevalent in summer (90%) than winter (70%); *Vibrio cholerae* bacteria were more prevalent in summer (90%) than winter (50%); *Shigella* bacteria were not detected in any of the samples and *Salmonella* bacteria prevalence were similar for winter (90%) and summer (100%) months. Most of the viruses were detected in winter. Enteroviruses and Rotavirus were the most detected viruses. *Giardia* and *Cryptosporidium* were only detected in 20% and 10% of winter samples respectively. The results clearly indicate that raw surface water could be a potential health hazard if consumed without any treatment.

**Key words:** diarrhea, rural areas, Vhembe District, Water quality