

## Abstract

The aim of this study was to investigate the microbiological quality of drinking water at the source (taps at eThekweni laboratories, standpipes and mobile community tankers) and corresponding point-of-use (storage containers and ground tanks) supplied to peri-urban areas in Durban by eThekweni Municipality. It also aimed to identify factors associated with deterioration in water quality such as storage of water, household demographics, hygiene and sanitation practices. In order to determine the microbial quality of drinking water, the pour plate method (for enumeration of heterotrophic organisms) and the membrane filtration technique (for total coliforms and *E. coli* enumeration) were used. Conductivity, turbidity, pH and total and residual chlorine levels of drinking water were measured. Microbial and physico-chemical data was collated and statistically analysed with epidemiological data from an associated study to determine the link between microbial quality of drinking water, household demographics, health outcomes, socio-economic status, hygiene and sanitation practices. Findings showed that all point-of-use water was unsafe for human consumption as a result of either poor source water quality, in the case of standpipes, and microbial contamination at the point-of-use, in the case of ground tanks and community tankers. The latter could be attributed to unsanitary environments, poor hygiene practices or poor water-use behaviour. Households which included children aged 0-5 years and in which open-top containers were used for water storage had the highest rates of diarrhoea and vomiting. Water from ground tanks had the best microbial quality but people in households using this water presented with the highest rate of diarrhoea. Therefore provision of microbially safe drinking water will not reduce the rate of health outcomes if addressed in isolation. In order to reduce water-associated illness, provision of safe and adequate amounts of water, hygiene and sanitation education and education on water-use behaviour should be provided as a package. The provision of improved water delivery systems does not ensure that drinking water is safe for human consumption. Measures, such as point-of-use water treatment should be considered to ensure that drinking water provided at the source and point-of-use is microbially safe for human consumption.