Access to safe drinking water is one of the greatest barriers to achieving global public health.

Hazards present in drinking water supplies vary greatly depending on the system.

In 2004, the World Health Organization (WHO) introduced Water Safety Plans (WSPs), which are comprehensive risk assessment and management plans developed for systems individually.

Water system management and disinfection are particularly important in developing countries such as Ecuador, where 36% of population is made up of small, rural communities and microbial hazards are a greater risk.

Chemical disinfection, using chlorine, is the most efficient for treating hazards because it both disinfects and remains in the system to protect it.

Visited/studied 19 rural communities in the Chimborazo province of Ecuador, located in the Andean mountain valley.

Community led water systems providing water to 50 – 375 household taps.

Analyse efficacy of the piped, chlorine disinfection and distribution systems in each community based on free residual chlorine concentrations.

Chlorine potency is influenced by a variety of factors including concentration, temperature, contact time, and most significantly pH.

Analyze physicochemical hazards and factors effecting disinfection and palatability.

Assess microbial hazards as well as system management and community feedback.

Perform community taste tests to determine how chlorine concentration impacts palatability of the drinking water.

In country field tests and IC analysis both show that source groundwater is clean (within USGS guideline values and similar to Calvin tap water chemically).

Tests for bacteria reveal variable concentration of combined coliforms and fecal coliforms, depending on community, but consistently above recommended values.

Water is chemically safe and clean, making microbial hazards the primary concern.

Present systems have a good design and are capable of delivering disinfected water.

Optimal system management requires well trained chlorine testers, regular monitoring, and thorough record keeping.

Community feedback and flavor can have strong influence on chlorine dosing in the absence of comprehensive system management techniques.

Community education is vital to the success of a community led water system.

Chlorine tests consistently show that free residual chlorine concentrations are insufficient both at the source and POU.

Observed that stocks for initial dosing are made incorrectly, no form of record keeping present, verbal feedback about flavor from community members influenced dosing.

Conclusions

References


http://www.ezilon.com/maps/south-america/physical-map.shtml
https://www.geology.com/world/south-america/ecuador-physical-maps.html