

# WATER QUALITY IN NORTH MECHA WOREDA, ETHIOPIA

(AUGUST-SEPTEMBER 2022)



With funding from the Conrad N. Hilton Foundation, the Aquaya Institute is coordinating longitudinal water quality monitoring in three target woredas (districts) in Ethiopia. **In August - September 2022, Aquaya conducted surveys and water quality testing at households, water points, schools, and healthcare facilities in North Mecha woreda, in collaboration with Stanford University and Performance Monitoring for Action Ethiopia (PMA).**

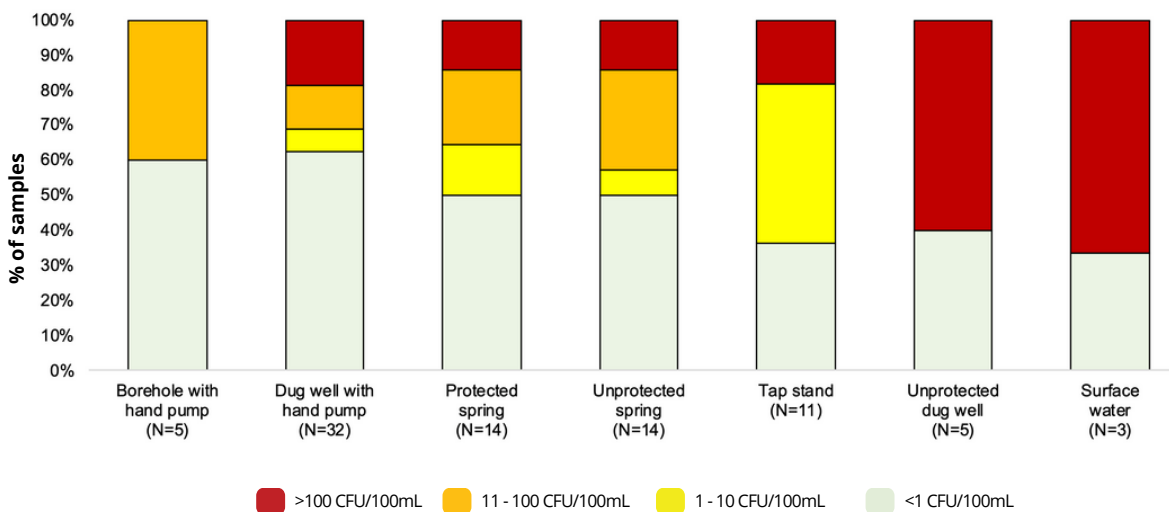
## DRINKING WATER SAMPLES TESTED IN NORTH MECHA



## WATER POINTS

We conducted surveys and tested *E. coli* at 85 water points, including improved and unimproved types. About half of the water points (53%) were free from *E. coli* contamination (<1 CFU/100 mL). **Water was microbially safest from boreholes and dug wells with hand pumps (62% free from *E. coli*), and least safe from unprotected dug wells and surface water (38% free from *E. coli*) (Figure 1).**

### Water Point Samples



*E. coli* is an indicator of fecal contamination in drinking water. Increased *E. coli* concentrations suggest an increased risk of diarrheal disease – particularly for children under 5 and immunocompromised people.

**Figure 1.** *E. coli* levels in North Mecha woreda, displayed by water point type (N=85).

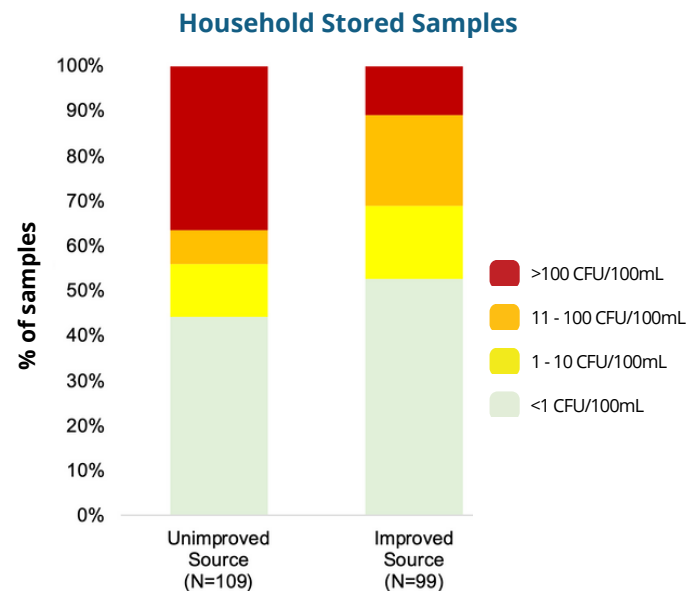
Analyzing **physical-chemical parameters** in water point samples showed that:

- All samples met the Ethiopia Drinking Water Standard for electrical conductivity (<2000 µS/cm). The taste of water is affected if electrical conductivity is too high.
- 52% of samples met the Ethiopia Drinking Water Standard for turbidity (<5 NTU). If turbidity is too high, water is aesthetically less acceptable to people, and chlorine treatment is less effective.
- 22% met the Ethiopia Drinking Water Standard for pH (6.5-8.5). Many groundwater samples were below the range, which indicates potential for water point corrosion but is not dangerous to health.
- 9% of piped system taps (N=11) met the Ethiopia Drinking Water Standard for free chlorine residual (0.2-0.5 mg/L). Free chlorine protects against re-contamination during transport and storage.

## HOUSEHOLDS

We detected *E. coli* in 52% of stored household water samples, and one-quarter were in the very high-risk category (>100 CFU/100mL). **Household samples from an improved source like a hand pump or protected spring had safer water (53% free from *E. coli*) than those collected from unimproved sources (44% free from *E. coli*)** (Figure 2); however, the majority of households had water from an unimproved source.

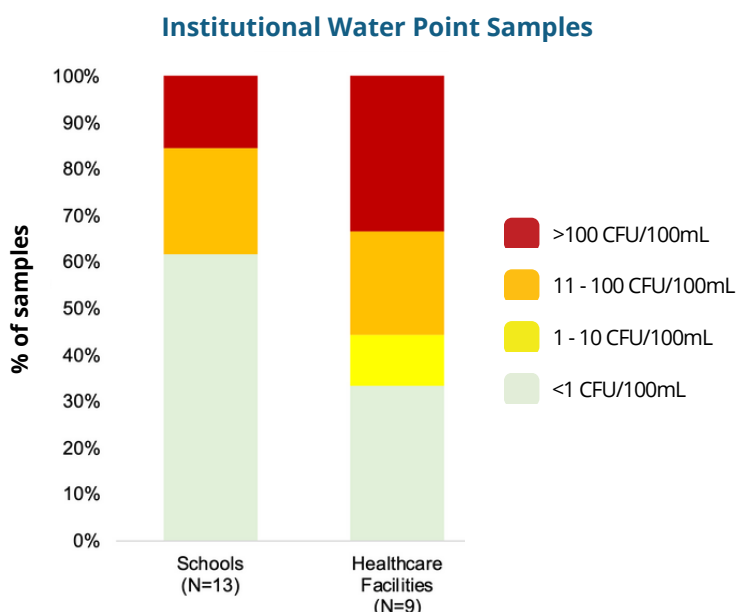
There was no significant association between *E. coli* concentration and safe storage or household treatment habits. While most households (81%) stored water safely in covered containers with a narrow opening, very few (3%) treated water in the home.



**Figure 2.** *E. coli* levels in household samples in North Mecha woreda. Samples are sorted by the reported source type they were collected from.

## SCHOOLS AND HEALTHCARE FACILITIES

We conducted surveys at 50 schools and 20 healthcare facilities and tested *E. coli* from water points where water was available: at 13 schools and 9 healthcare facilities. Water points at **62% of schools and one-third of healthcare facilities were free from *E. coli*** (Figure 3).



**Figure 3.** *E. coli* levels at schools (N=13) and healthcare facilities (N=9) in North Mecha woreda

About three-quarters of schools and healthcare facilities had improved water points like tap stands and dug wells with hand pumps, though some were located off-site or had no water available.

Overall, 32% of schools (n=50) and 25% of healthcare facilities (n=20) had a basic water service: an improved water point on premises with water available.