



With funding from the Conrad N. Hilton Foundation, the Aquaya Institute is coordinating longitudinal water quality monitoring in two target districts in Ghana. In September 2023, Aquaya conducted surveys and water quality testing at households, water points, schools, and healthcare facilities in Asutifi North District. This effort builds upon prior monitoring.

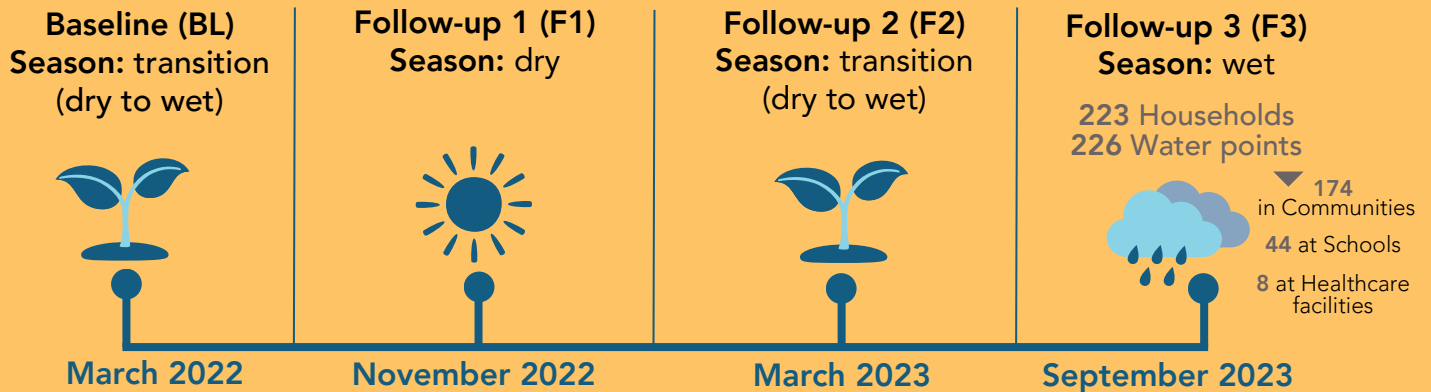
WaterTRACS

(Testing, Research, and Capacity Strengthening) Initiative

WATER QUALITY IN ASUTIFI NORTH DISTRICT, GHANA

September 2023

Drinking Water Samples Tested in Asutifi North



SUMMARY

- Water samples from **improved sources** were **safer** than those from unimproved sources.
- Very **few piped water samples** had **adequate chlorine levels**.
- **Wealthier households** had **safer drinking water** and were more likely to consume sachet water.

KEY RECOMMENDATIONS

- Piped water systems should be treated with **adequate chlorine, particularly in the wet season**.
- Improved water sources should be more **accessible to the poorest households**.
- **Packaged water** remains a **safer option** for households and institutions.



WATER POINTS

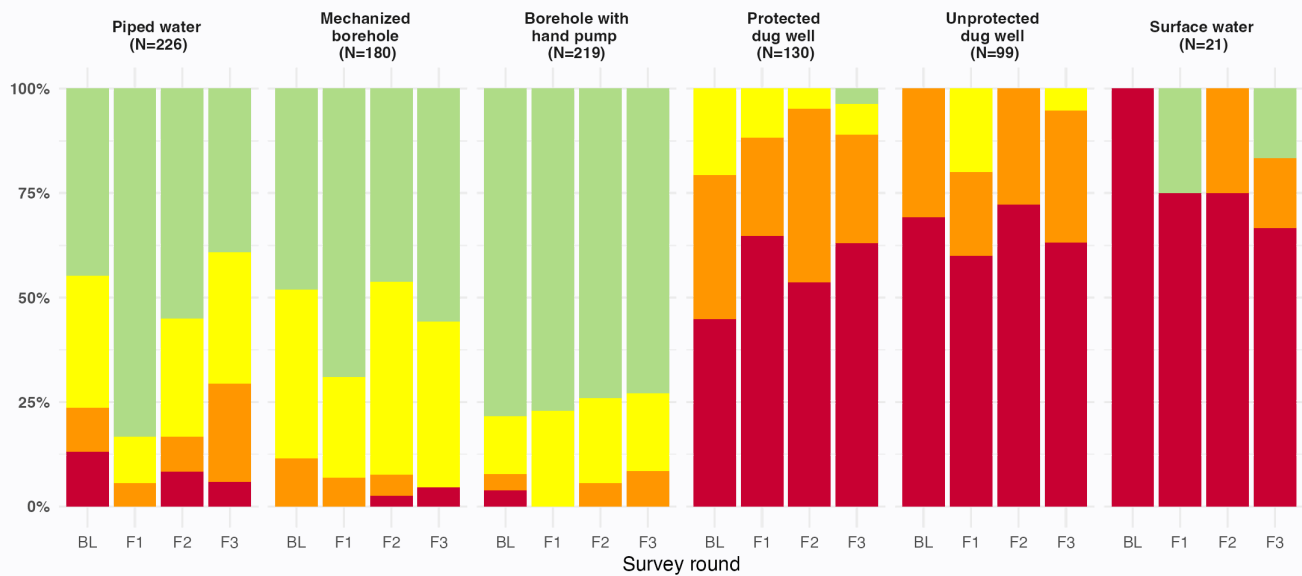
Water samples from piped systems and boreholes with handpumps were safer than water from dug wells and surface water. In the most recent survey, we conducted surveys and tested *E. coli* at 226 water points. Overall, 39% were free from *E. coli*, defined as <1 CFU/100 mL. Water was consistently safest from piped systems and boreholes with hand pumps (57% free from *E. coli*) and less safe from dug wells and surface water (3% free from *E. coli*). Across all survey rounds, piped systems and mechanized boreholes were microbially safest in the dry season (F1) (Figure 1).

In the most recent survey, **only 4% of taps from piped systems met the Ghana National Drinking Water Standard for free chlorine residual (0.2-5.0 mg/L).** Free chlorine residual protects water from recontamination during transport and storage. Chlorination levels were highest during the dry season (F1), when 15% of piped system samples met the standard. This coincides with the lowest *E. coli* counts.



Image 1. Enumerators are on their way to collect water quality samples at water points in Asutifi North, Ghana.

Water Point Samples



Excludes springs and rainwater collection (N<5). Sample sizes shown are totals across all survey rounds.

E. coli risk categories

- Low <1 CFU/100mL
- Medium 1 - 10 CFU/100mL
- High 11 - 100 CFU/100mL
- Very high >100 CFU/100mL

Figure 1. *E. coli* risk levels from water point samples collected at BL (N=204), F1 (N=114), F2 (N=219), and F3 (N=226) survey rounds.



HOUSEHOLDS

In the most recent survey, 32% of households provided packaged water (sachet or bottled) as a drinking water sample, 65% provided water from improved water points like piped systems and boreholes, and 3% provided water from unimproved water points like unprotected wells. Overall, 25% of the 223 household water samples were free from *E. coli*, and microbial water quality depended on the source of water.

Packaged water was safer than other household water sources.

About 92% of packaged water samples – mostly sachet samples – were free from *E. coli*, but only 3% of samples from improved water points and none from unimproved water points were free from *E. coli* (Figure 2).

Household Samples

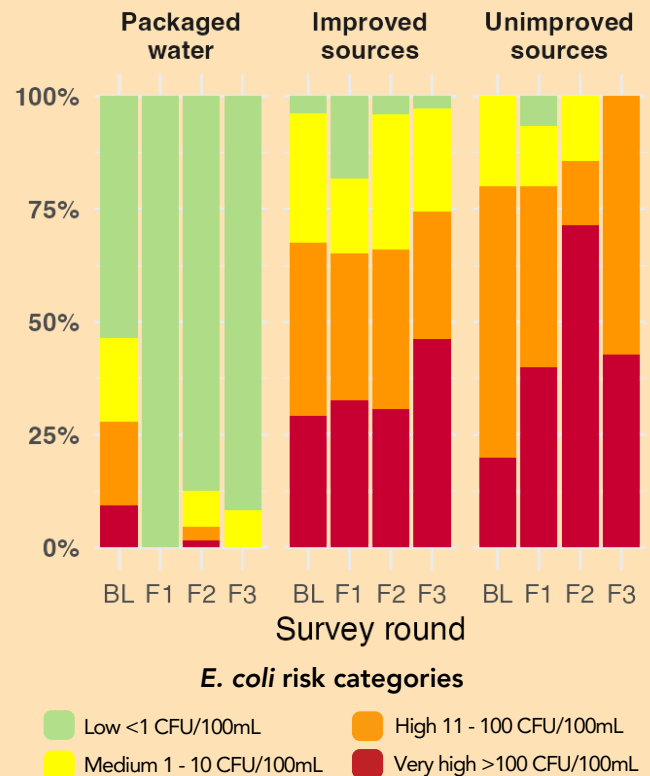


Figure 2. *E. coli* risk levels in household water samples collected at BL (N=236), F1 (N=160), F2 (N=228), and F3 (N=223) survey rounds. Results are displayed by water source type.

Household Samples

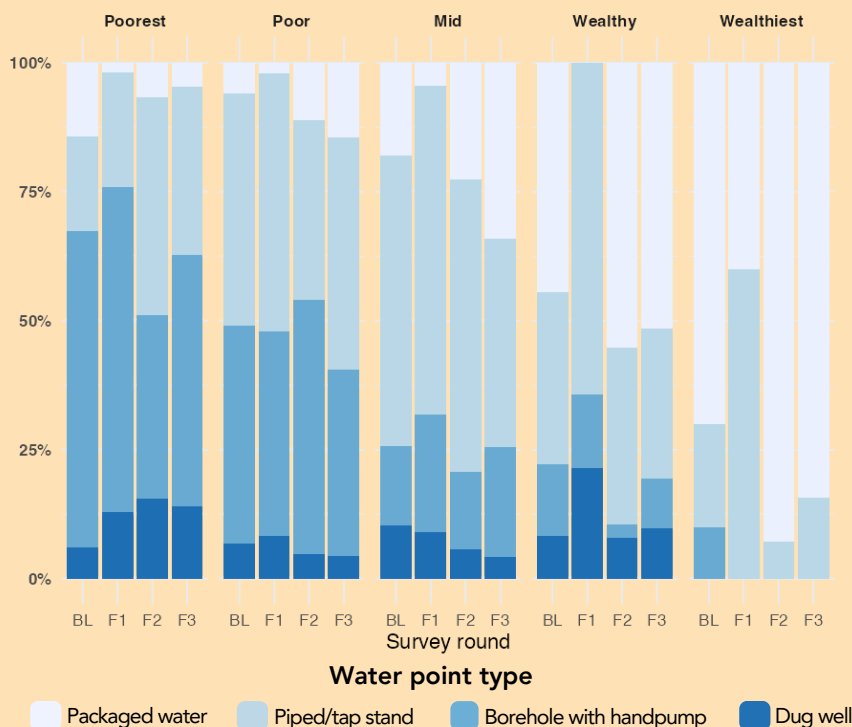


Figure 3. Household drinking water sources by household wealth quintile. Samples were collected at BL (N=236), F1 (N=160), F2 (N=228), and F3 (N=223) survey rounds.

Wealthier households had safer drinking water and were more likely to consume sachet water than poorer households.

Overall, 81% of households in the wealthiest quintile had water free from *E. coli*, while no households in the poorest did. This is largely attributable to bottled and sachet water use being more prevalent among wealthy households, particularly during wet and transitional seasons (Figure 3).



INSTITUTIONS

In the most recent survey, we tested *E. coli* from water points at 44 schools and 8 healthcare facilities. All schools and healthcare facilities used improved water points, and 85% had basic water service (an improved water point on premises with water available).

The types of primary drinking water points used by healthcare facilities have started to shift from piped water and mechanized boreholes to packaged water (Figure 4).

Microbial water quality has remained consistent across survey rounds. Among primary water points available on the premises – excluding packaged water – 62% were free from *E. coli*, consistent with previous survey rounds. Among sampled packaged water (sachet water), 100% were free from *E. coli*. Institutions' secondary water points had higher levels of *E. coli* in two-thirds of those cases (67% >1 CFU/100mL).

Institutional Drinking Water Sources

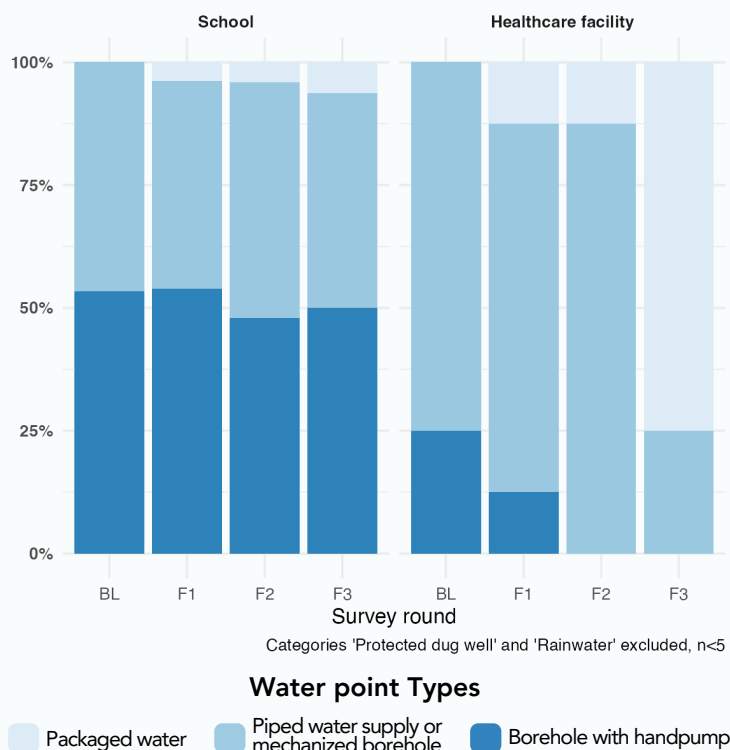


Figure 4. Primary drinking water sources reportedly used by schools at BL (N=46), F1 (N=27), F2 (N=49), and F3 (N=49) and healthcare facilities at BL (N=8), F1 (N=8), F2 (N=8), and F3 (N=8) survey rounds.

RECOMMENDATIONS

- 1 Piped water systems should be treated with adequate chlorine** to maintain a residual of >0.2 mg/L at all tap stands in the water distribution system, particularly in wet seasons. This could improve water quality at both the point of collection and the point of use.
- 2 Water sources with lower levels of microbial contamination, such as boreholes and piped water systems with adequate treatment, should be made more accessible** to households with the lowest socioeconomic status. This may include the provision of reduced tariffs.
- 3 For households and institutions that can afford it, packaged water remains a safer option to minimize risk of infection** until water quality improves in other water sources.
- 4 Continued monitoring should be performed with seasonality in mind** to better assess different water quality conditions and needs in wet, dry, and transitional seasons.

