

Quantitative analysis of water access factors in two unpiped remote Alaska community areas

SUMMARY OF RESULTS

What were we trying to find out? Past studies have shown that households that have easy and convenient access to water have better health. Our goal was to see if we could find factors that helped improve the ability for households to easily get water into homes and if those factors helped increase a household's water use.

How we looked at it. Using data collected as part of the Portable Alternative Sanitation System Health and Wellbeing Study, we looked to see if certain factors affected how much water was hauled by household in gallons per person per day (GPD). GPD is the measure used to evaluate basic access to water by the World Health Organization (WHO).

Due to significant differences in community water infrastructure, study communities in the Interior were analyzed separately from the study community in the Northwest. The combined data was also analyzed.

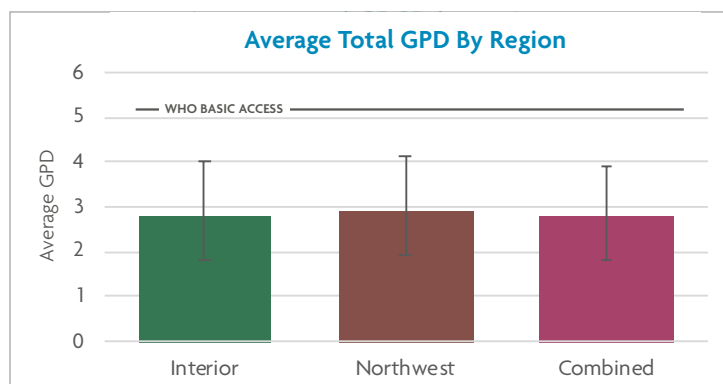


Figure 1. Average of total GPD by region.

Factors we examined

- Watering point distance (meters)
- Round-trip time to get water (minutes)
- Household size (number of residents)
- Who hauled water (male, female or both)
- Number of water sources used (count)
- Seasons (fall, winter, spring, summer)
- Haul method (vehicle or by foot)
- Household composition (ratio: adults/total residents)
- Location of laundry and bathing (home or off-plot)
- How much water storage in the household (gallons)

Outcome

- Volume of water hauled (GPD)

What did the data show? The households who participated in the study, regardless of community or region, averaged less than basic water access as defined by the WHO (5.3 GPD). Due to limits of the data and methods, most factors analyzed did not show evidence of an impact on GPD. However, in the Interior community, collection time and household size had strong evidence that the greater the time it took to collect water and household size, the smaller the GPD. Additionally, strong evidence suggests seasonal differences in the amount of water hauled by households, with less water hauled during spring than during the fall.

In the Northwest community, the location of laundry and bathing was a key factor. Strong evidence supported that households who did laundry and bathed entirely at their home hauled more water than those who had to do their laundry elsewhere. In both the Northwest and Interior communities who participated, the greater the number of sources, the more water was collected, reflecting strong evidence of an effect of number of sources on GPD.

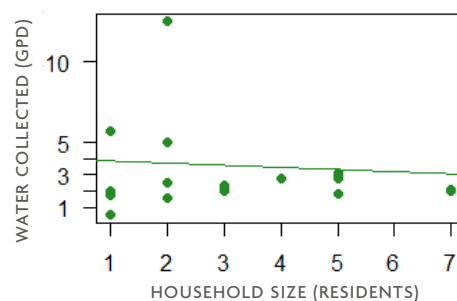


Figure 2. Volume collected by household size. Interior only.

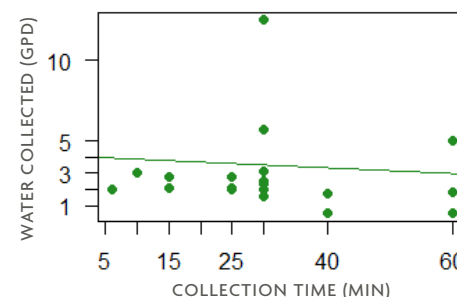


Figure 3. Volume collected by collection time. Interior only.

Table 1. Summary of Significant Results

FACTOR	EVIDENCE OF EFFECT ON GALLONS PER PERSON PER DAY (GPD)	
	Interior	Northwest
Study communities' region		
Distance to watering point		
Collection time	Yes	
Location of laundry and bathing		Yes (Mixed location for laundry and bathing)
Household size	Yes	
Season	Yes (Spring)	
Number of sources	Yes	Yes

What does this information mean?

Access in unserved communities is less than WHO standards for basic access. Households that used multiple sources had more water access. This supports the use of alternate sources of water in addition to the watering point, such as in-home filtration or treatment, to improve the quality of these additional water sources. Evidence supports centralized laundry and bathing facilities, such as a washeteria, as a means to increase water access.

How can this information be used?

- Document the level of water access for un piped communities.
- Support use of centralized facilities for laundry and bathing to decrease haul requirements.
- Support in-home systems for water purification of traditional sources.
- Support efforts to improve or maintain good environmental water quality for traditional water sources.
- Prompt further direction for future research such as, “What would it take to collect five gallons per person per day for members of your household?”

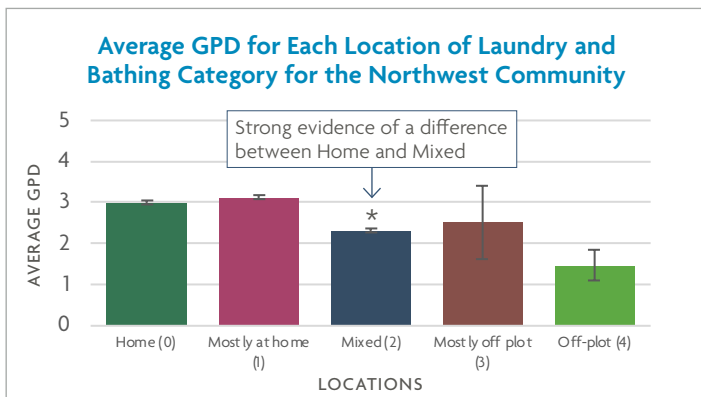


Figure 4. Volume collected by location of laundry and bathing, Northwest only.

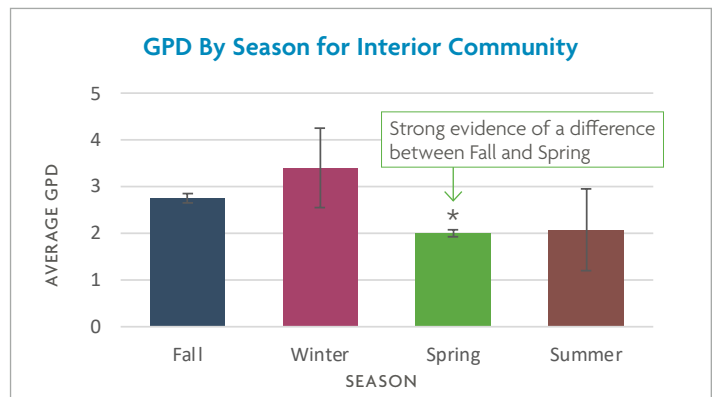


Figure 5. Volume collected by season, Interior only.

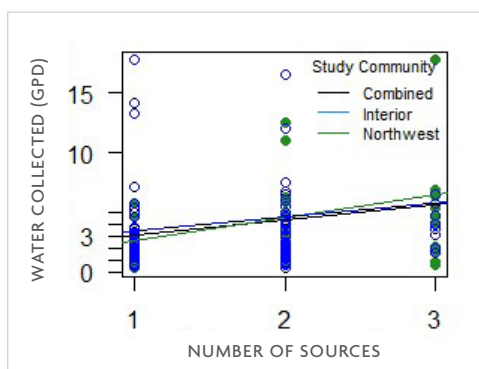


Figure 6. Volume collected by number of sources used, all data.

Acknowledgments

This research would not have been possible without the generous support and participation of the residents of the Interior and Northwest study communities. This research was financially supported by Alaska Native Tribal Health Consortium, National Science Foundation and the Robert Wood Johnson Foundation.

Want to know more? For a complete explanation of the study and findings, please contact Tricia Howe at tshowe@anthc.org or Laura Eichelberger leichelberger@anthc.org. This study was approved by the AAIRB (#2018-03-009). Published March 2022.

