LIHWAP
Low Income Household Water Assistance Program

Understanding Water Affordability Across Contexts

LIHWAP Water Utility Affordability Survey Report

February 2024

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This report was authored by the Office of Community Services (OCS). OCS would like to thank the utilities that participated in the survey and provided valuable feedback used to compile this report.

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Executive Summary

The Low Income Household Water Assistance Program (LIHWAP) is the first-ever federal emergency program to provide assistance to families struggling to pay their water and wastewater bills. As the LIHWAP program prepares to sunset in March 2024, this report presents findings from an exploratory study conducted to assess the cost of water for households and the financial challenges faced by water and wastewater utilities in the United States. The primary objective of this research is to provide insights to assist grant recipients and utilities in identifying areas for program implementation improvement and future program development, as LIHWAP comes to a close. It is intended to be used by grant recipients and water affordability stakeholders to understand the nuance between differences in water affordability across utilities, improve engagement with utilities, and identify gaps in program design and future directions for water affordability research and program development.

To date, this is the largest survey conducted in the country that documents rates, arrears, disconnections, and fees in one dataset. Responses from the survey were submitted from all but one state, totaling 1,882 responses, and several key findings emerged from the study.

In 2023, the Office of Community Services disseminated a survey to assess rates, customer debt, disconnections, fees, and other information from water and wastewater utilities across the United States. To date, this is the largest survey conducted in the country that documents rates, arrears, disconnections, and fees in one dataset. Responses from the survey were submitted from all but one state, totaling 1,882 responses, and several key findings emerged from the study. First, it became apparent that affordability challenges may present themselves through high customer debt (arrears) or through low arrears and high rates of disconnection. Disconnection policies and arrear amounts vary widely between large urban utilities and smaller rural ones, necessitating tailored approaches to address these disparities. Urban and rural areas also experience distinct affordability challenges, with urban areas having higher arrears and rural areas experiencing higher disconnection rates. Tribal utilities face unique barriers to water access and affordability, with high debt per household and high proportions of households in arrears, underscoring the scope and depth of water affordability challenges in tribal communities. The study also highlights the additional burden that water debt adds to economic instability for families with very low incomes — a target group that LIHWAP seeks to assist.

Furthermore, the research emphasizes the financial strain experienced by utilities of all sizes and locations in covering maintenance and infrastructure costs, particularly for wastewater infrastructure. Many utilities report the need to impose late fees and other charges on customers to bridge funding gaps, further compounding the financial challenges faced by households with low incomes. The report also notes the importance of LIHWAP payments not only for water and wastewater bills but also for fees, as these payments can provide critical support to both households in debt and struggling utilities.

Additional essential takeaways from the report include:

- **On average, 20% of households are in debt to their water utility. For tribal communities, that increases to 32% of households.**
- **The average household debt per utility is $285, but among tribally owned utilities, the average household debt is $502.**
- **Nearly all participating utilities charge late fees and disconnection or reconnection fees (88% each).**
- **For households at 75% of the federal poverty level, up to 40% of their monthly income is spent on water and sewer bills.**
- **States with the highest average debt per household have significantly lower rates of disconnection than states with the lowest average household debt for their water utility.**
- **An average of nearly $15 million is owed to each very large utility (serving populations over 100,000).**
- **Most utilities rely on small numbers of administrative staff (55% had fewer than three administrative staff members).**
- **Utilities experience financial challenges and note significant benefits from water assistance programs for both their own organizations and their customers.**

In conclusion, this study underscores the widespread issue of water affordability in the U.S., affecting various geographies, utilities, and households, worsening inequality for families and communities already experiencing poverty. It also acknowledges the limitations of the research and identifies the need for broader data collection and continued efforts to address water affordability across the nation. Lastly, the report notes that as the first-ever federally funded water assistance program, LIHWAP has played a crucial role in addressing these challenges by providing assistance to reconnect services, prevent disconnections, and reduce rates for vulnerable populations.

Background

The Low Income Household Water Assistance Program (LIHWAP) is the first federal program dedicated to providing water and wastewater bill payment assistance to households with low incomes. Funds were provided to states, the District of Columbia, U.S. territories, and federally and state-recognized Indian tribes and tribal organizations that received Fiscal Year (FY) 2021 Low Income Home Energy Assistance Program (LIHEAP) grants by the Office of Community Services (OCS; the federal agency that administers LIHWAP). LIHWAP was authorized and funded by the Consolidated Appropriations Act of 2021 and the American Rescue Plan Act of 2021 during the COVID-19 pandemic.[1]

LIHWAP was authorized as a temporary emergency program to meet the emergent needs of households with low incomes and water utilities during the pandemic. LIHWAP funds needed to be obligated by September 30, 2023 for some grant recipients and March 31, 2023 for grant recipients that requested a no-cost extension.[2] As one way to help grant recipients identify ways in which they could best conduct outreach and focus their resources, OCS wanted to understand the specific areas in the states, tribes, or territories that are experiencing the greatest burden from water poverty. Although data exists for some cities and utilities, there is no comprehensive national database of water and wastewater rates, disconnections, arrears, and other fees. With the LIHWAP Water Utility Affordability Survey, OCS sought to provide grant recipients with information about the financial burdens that utilities and households in their areas are experiencing, what benefit thresholds might be useful, and specific challenges experienced by different types of utilities. Key findings and takeaways from this survey were shared with LIHWAP grant recipients through the 2023 OCS World Water Week: Addressing Water Affordability and Accessibility webinar, a survey findings one-pager, and information shared directly with the federal program specialists working with LIHWAP grant recipients.[3] OCS identified specific points of interest for individual grant recipients based on responses to the survey and key points based on characteristics reaching across grant recipients (for example, by utility size, rural versus urban contexts, etc.). This report is a deeper dive into the initial findings shared with grant recipients and provides a more comprehensive landscape of water affordability in the United States.

With the LIHWAP Water Utility Affordability Survey, OCS sought to provide grant recipients with information about the financial burdens that utilities and households in their areas are experiencing, what benefit thresholds might be useful, and specific challenges experienced by different types of utilities.

[1] Low Income Household Water Assistance Program. Low Income Household Water Assistance Program (LIHWAP) | The Administration for Children and Families (hhs.gov) Office of Community Services Office of Community Services (OCS) | The Administration for Children and Families (hhs.gov).

[2] In July 2023, eligible grant recipients were offered the opportunity to apply for a six-month no-cost extension (NCE). The NCE did not include any additional funding, but it adjusted the liquidation deadline from December 31, 2023 to June 30, 2024. The NCE was offered to help grant recipients fully expend their funding and reach more eligible households. Some grant recipients decided not to apply for an NCE for various reasons, including a lack of need for increased time to spend funds and challenges with adjusting administrative budgets to cover the NCE time period.

[3] OCS World Water Week: Addressing Water Affordability and Accessibility OCS Celebrates World Water Week 2023 | The Administration for Children and Families (hhs.gov) (https://www.youtube.com/watch?v=jJ7XsNglauU). Survey Reveals Impact of Water Poverty on Americans (https://www.acf.hhs.gov/sites/default/files/documents/ocs/water-survey.pdf)

Methods

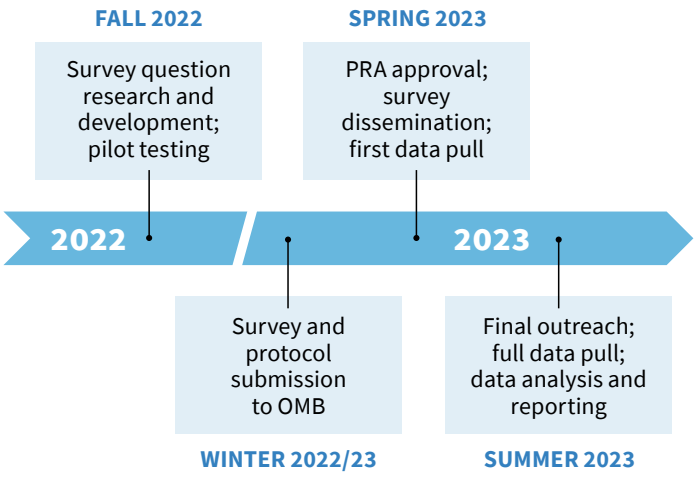
Through conducting the 2022 LIHWAP Water Utility Affordability Survey, OCS sought to provide state-specific data that would assist grant recipient programs in determining program implementation. All data in the survey represent the 2022 calendar year. An initial analysis was conducted of the national poverty landscape and intersections of poverty with other indicators of financial stress. The initial document shared during the 2023 OCS World Water Week, highlighted poverty rates by state, stratifying by demographic variables including age, sex, race, ethnicity, and housing status, and including existing research assessing the impacts of natural disasters on high-poverty areas. The second phase of this work looked more closely at indicators of poverty alongside state-level water and wastewater rate data. Water and wastewater rate information for large and very large utilities in each state was provided for internal analysis by the Nicholas Institute for Energy, Environment, and Sustainability at Duke University.[4] These analyses gave a high-level view of water and wastewater costs at different usage levels in states with varying levels of poverty, and importantly, indicated that poverty was not a significant predictor of water and wastewater rates — meaning that variation in poverty was not significantly related to variation in rates. The analysis indicated that across the nation, regardless of the economic status of a community, water and wastewater rates are set at levels needed to support the utilities' functions, and these rates may be unsustainable for low-income households.

From this preliminary work, a list of topics and questions was developed for survey inclusion. A final draft was sent to a small number of water utilities for piloting. Pilot respondents provided feedback on the survey. OCS received approval from the Office of Management and Budget (OMB) for data collection on February 27, 2023, under OMB control number 0970-0531.[5] A PDF

The analysis indicated that across the nation, regardless of the economic status of a community, water and wastewater rates are set at levels needed to support the utilities' functions, and these rates may be unsustainable for low-income households.

of the survey is appended to this report. Survey participation, as well as all questions on the survey, were optional. The survey included multiple publicly available data sources linked to the survey data to provide additional context around census demographic data and other geographic characteristics. This information reduced burden on survey respondents, as they did not need to answer questions about income, poverty rates, and more for their utilities' locations. **Figure 1** shows a timeline of survey development, dissemination, and analysis.

Figure 1. Survey Development and Analysis Timeline



[4] Patterson, Lauren, Martin Doyle, Aislinn McLaughlin, and Sophia Bryson. 2021. Water Affordability Data Repository. Nicholas Institute Energy, Environment, and Sustainability at Duke University. https://github.com/NIEPS-Water-Program/water-affordability

[5] Formative Data Collections for ACF Program Support. https://omb.report/omb/0970-0531.

Immediately following OMB approval, outreach began for survey responses. This survey used convenience sampling in the initial phase of outreach, followed by stratified convenience sampling.[6] Subgroups included rural water organizations and systems, specific states, tribes, and territories. While the research design was not seeking equal representation across all subgroups, it sought to make sure each subgroup had a high enough number of responses for statistical analyses. The initial phase involved outreach to several broad groups of people and organizations with the goal that they would share the survey with utilities: researchers and academics, training and technical assistance organizations, and water service providers. OCS staff identified existing relationships with groups and individually reached out regarding the survey. If no relationship existed, then the primary survey contact conducted the outreach. Several outreach templates were developed that could be used based on the person or type of organization being contacted. Furthermore, these templates included additional outreach materials and language that the contacted person or organization could then use to reach out directly to water and wastewater utilities. Outreach progress, including the person or organization contacted, contact information and title, date, response status, and notes were tracked in a shared spreadsheet.

Convenience sampling and outreach continued until the first full data pull, which took place on April 22, 2023. Initial descriptive analyses indicated the need for targeted outreach to several states (Delaware, Hawaii, Indiana, Rhode Island, South Dakota, and West Virginia), D.C., U.S. territories, and U.S. tribes. Additionally, the team wanted the distribution of utility sizes to reflect the Environmental Protection Agency's (EPA) reported water utility size distribution as closely as possible. These sizes are based on the population served by the utility (very small: 500 or less; small: 501 to 3,300; medium: 3,301 to 10,000; large: 10,001 to 100,000; very large: greater than 100,000).[7] Thus, after the initial data pull in April 2023, stratified convenience sampling and purposive sampling approaches were used. OCS staff followed up with grant recipients who had no or low survey participation and emphasized that responses from small and very small utilities were the priority. Training and technical assistance providers and water associations serving rural areas were contacted by email, phone, or both. Staff members who had personal connections to rural water vendors contacted them directly to request survey participation.

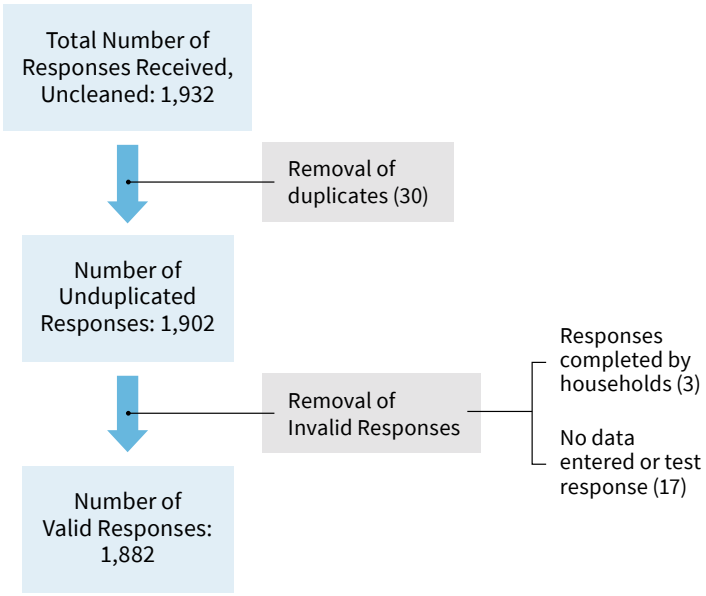
Challenges with outreach to small and very small utilities and rural systems included incomplete online contact information, lack of existing relationships, lack of utility staff capacity, and geographic spread. Although the size categories did not exactly reflect the EPA's utility size distributions, the survey responses ultimately included a much greater proportion of medium, small, and very small utilities than most publicly available data sources related to water and wastewater costs. The breakdown of utility sizes among those responding to the survey was: very small (19.3%), small (37.3%), medium (18.5%), large (17.4%), and very large (7.5%) versus the EPA's distribution (very small = 54.4%, small = 26.6%, medium = 10%, large = 8%, and very large = 1%).

The final deadline for survey completion was June 30, 2023. At this date, there were 1,932 responses. **Figure 2** shows initial responses numbers and the numbers remaining following each round of data cleaning. The final sample included 1,882 responses after accounting for duplicate and invalid responses.

[6] Convenience sampling is a method of sample selection for data collection that is not-probabilistic; the sample is selected based on accessibility and ability to contact and enroll. Stratified convenience sampling is a type of convenience sampling that focuses on specific subgroups and convenience samples within those groups.

[7] Environmental Protection Agency Enforcement and Compliance History Online. Drinking Water Dashboard Help | ECHO | US EPA.

Figure 2. Survey Responses and Cleaning Flowchart



To gain context about the geographic areas surrounding each utility that responded, survey data were merged with data from three other sources: the Water Utility Service Area Boundaries (SAB) project at the Environmental Policy Innovation Center, demographic and geographic data from the American Community Survey, and Rural-Urban Commuting Area (RUCA) Codes from the Rural-Urban Commuting Area Codes files with the U.S. Department of Agriculture Economic Research Service.[8] Utility addresses from survey responses were geocoded and then spatially joined to SABs. RUCA codes and American Community Survey variables were joined to survey data by zip code of the utility. Survey questions were not mandatory; and therefore, address data was incomplete. There was address information for 1,420 responses. All analyses that used external data sources were conducted using this sample; analyses not using the merged datasets were conducted using the full sample of 1,882. A random sample of 200 was used for rate data; rate data was the least complete and most complex out of all data collected. To report on findings in a timely fashion (by August 2023, during World Water Week) and to allow grant recipients to use this information while expending the remainder of their LIHWAP funding, a random sample[9] of 200 based on the national size distribution of utilities was taken. Only utilities that provided both drinking water and wastewater services were sampled.[10] Rates were cleaned for this sample. This cleaning often involved looking up individual utilities online or contacting them directly to verify rate information. Additional survey data were cleaned via the following processes:

- **Duplicates determined by address; key information compared and duplicates removed**
- **Invalid responses (for example, blank or test entries, responses from individual households) removed**
- **Data type coding**
  - Text data recoded as numeric
  - Categorical data verified
- **Rate data cleaned and calculated**
  - Rates at 5,000 gallons and 10,000 gallons of water, wastewater, or both calculated, based on base rate, flow rate, and variation in rates depending on usage tier

[8] Environmental Policy Innovation Center. Water Utility Service Area Boundaries. https://www.policyinnovation.org/technology/water-utility-service-area-boundaries; demographic and geographic data from the American Community Survey (https://data.census.gov/); rural and urban designation codes from the Rural-Urban Commuting Area (RUCA) Codes files hosted by the United States Department of Agriculture Economic Research Service (https://www.ers.usda.gov/data-products/rural-urban-commuting-area-codes.aspx). Software used for merging and analyses: Esri. ArcGIS Pro. 2D, 3D & 4D GIS Mapping Software | ArcGIS Pro (esri.com); R-Project. (R: The R Project for Statistical Computing (r-project.org).

[9] A random sample is a probability sampling method that randomly selects individuals or units for data collection from the source population.

[10] The approach of including rate data only for utilities providing both drinking water and wastewater services has also been used in Duke University's rate studies and Water Affordability Dashboard. See their methodology here: https://nicholasinstitute.duke.edu/water-affordability/affordability/about_dashboard.html.

- **Fee data cleaned**
  - Fee types separated (e.g., late fees, disconnection or reconnection fees, administrative fees)
  - For example, if a late fee was listed as 10% of the arrearage, then this was estimated using the average arrearage per household in arrears.
- **Ownership structures listed as "other" were sorted into public, private, public-private, or tribal, based on descriptive information provided.**
- **Records missing whole sections were searched online or contacted for additional information if they provided an email address and consented to be contacted about their survey response.**
- **New variables calculated based on existing survey and external data:**
  - Percent of residential connections in arrears
  - Percent of residential connections that received notice of disconnection
  - Percent of residential connections that were disconnected from services
  - Two water burden measures (cost of water plus wastewater per month at 10,000 gallons of usage, divided by the zip code-level median monthly household income or divided by monthly household income at 75% of the federal poverty level)[11]

Because individuals above the federal poverty level may be eligible for LIHWAP, we merged several income-related variables from the American Community Survey with our dataset. In addition to poverty rates by zip code of each utility's primary address, we added median household income, the percent of the population at multiple income thresholds, and the percent of the population below 150% of the federal poverty level.

Following data merging and cleaning, analyses were conducted to identify relationships between utility characteristics and key outcomes, including rates, arrears, disconnections, and fees. A variety of statistical tests were used to understand these associations, including t-tests, chi-squared tests, analyses of variance, and linear and logistic regression models.

[11] The federal poverty level is determined annually by the U.S. Department of Health and Human Services and is used to determine eligibility for Medicaid and the Children's Health Insurance Program. Federal Poverty Level (FPL) - Glossary | HealthCare.gov

Results

Descriptive Statistics

Table 1 shows descriptive statistics[12] for participants. The "N (%)" column reflects actual numbers (complete cases only), and the percentages are percentages of the complete data count (N varies by variable), not necessarily of the entire sample of 1,882.

Table 1. Survey Participant Information

Variable	N (%)
EPA Size Categories (population size served by utility)	
Very Small (<500)	298 (19.3)
Small (501-3,300)	575 (37.3)
Medium (3,301-10,000)	286 (18.5)
Large (10,001-100,000)	269 (17.4)
Very Large (>100,000)	115 (7.5)
Utility Ownership Structure	
Privately Owned	138 (7.5)
Publicly Owned	1681 (91.1)
Combination Public and Private	13 (0.7)
Tribally Owned	13 (0.7)
Responding Utility Location Type	
States Respondents	1868 (99.3)
Tribal Respondents	13 (0.7)
Territory Respondents	1 (<0.1)
Services Provided	
Water Only	501 (26.8)
Wastewater Only	180 (9.6)
Both	1189 (63.6)
Water Source	
Groundwater	1014 (59.4)
Surface Water	422 (24.7)
Groundwater and Surface Water	270 (15.8)
Number of Residential Connections as of December 1st, 2022	14046 (70705) *mean (SD)
Administrative Staff Size	
< 3 people	1020 (54.5)
3-5 people	512 (27.4)
> 5 people	339 (18.1)
Service Area Size	
< 5 sq miles	534 (29.8)
5-50 sq miles	842 (46.9)
51-100 sq miles	155 (8.6)
> 100 sq miles	263 (14.7)

Survey respondents commonly listed job titles of clerk; accountant, bookkeeper, or treasurer; administrator; or manager. Other respondents included board members, presidents, CEOs, mayors, and secretaries.

[12] Descriptive statistics include summaries of the data; here, distributions of variables are shown.

Figure 3 shows a map of responses by state. Only one state, South Dakota, did not have any utilities submit a survey response. Additionally, responses were received from 12 tribally-owned utilities and from one U.S. territory.

Figure 3. Number of Survey Responses Per State

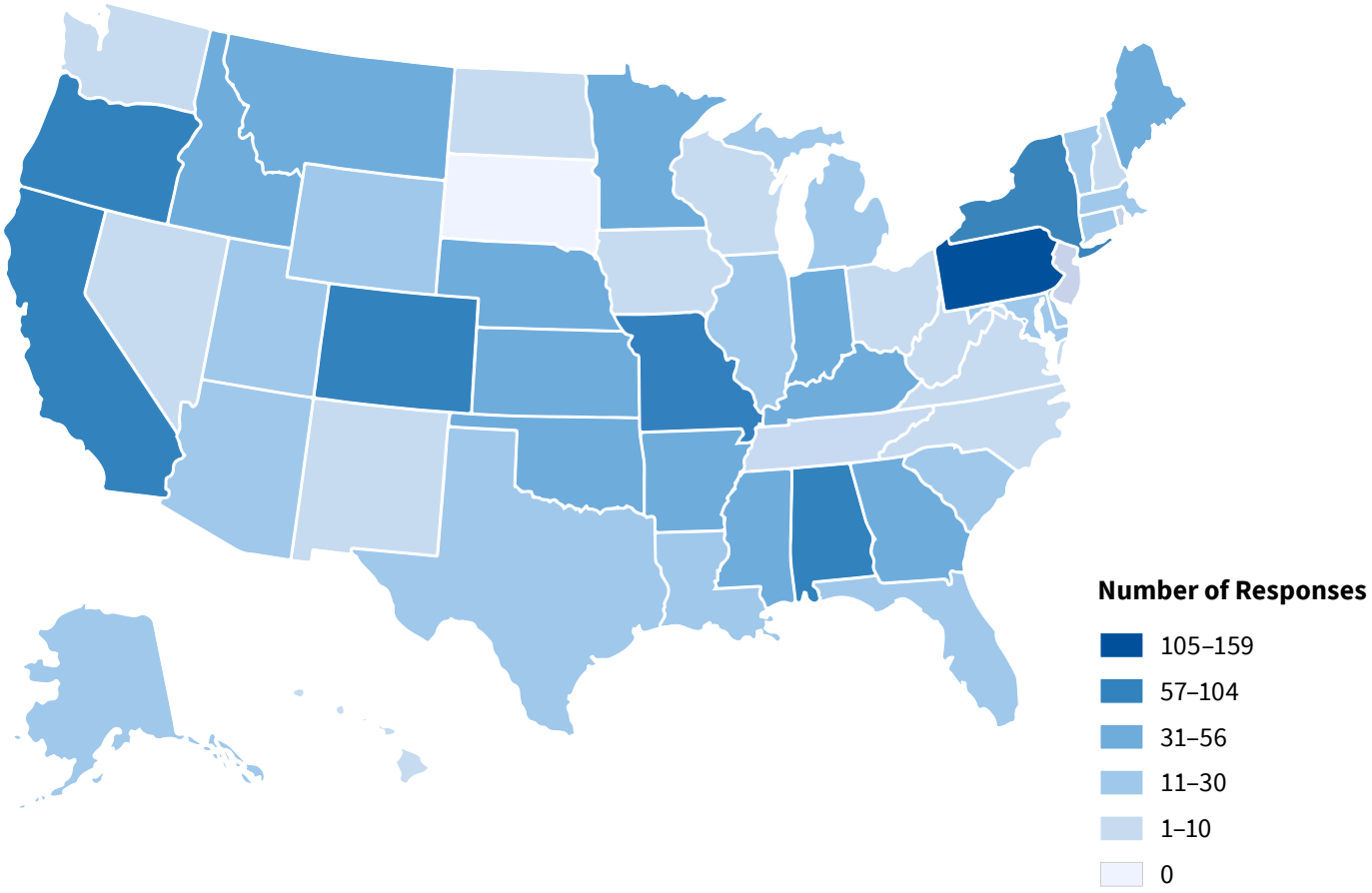


Table 2 shows water and wastewater rates, disconnections, arrears, and fees across participants, and **Table 3** shows the same variables based on EPA size category. As with Table 1, the N (%) column reflects actual numbers (complete cases only), and the percentages are percentages of the complete data count, not necessarily of the entire sample of 1,882. The water and wastewater rates data reflect the subsample of N = 200.

*Table 2. Rates, Disconnections, Arrears, and Fees among Responding Utilities**

Variable	N (%) or Mean (SD)
Moratorium on Disconnections in 2022 (N utilities)	343 (18.6%)
Disconnections	
Number of households that received notice of disconnection	2907 (33471)
Number of households that were disconnected	344 (1457)
Arrears	
Number of households in arrears	2965 (13782)
Average arrears per household in arrears	$285 ($406)
Total dollar amount of arrears per utility	$1,195,873 ($14,780,540)
Fees charged	
Disconnection or Reconnection fee charged (N utilities)	1321 (88.2%)
Average disconnection or reconnection fee amount	$67.17 ($261.34)
Late fee charged (N utilities)	1317 (88.3%)
Average late fee amount	$17.97 ($31.39)
Other fees charged (N utilities)	573 (38.8%)
Monthly Water and Wastewater Rates	
Average Water and Wastewater, 5,000 gallons monthly usage	$91.02 ($78.65)
Average Water and Wastewater, 10,000 gallons monthly usage	$126.20 ($87.71)

*All questions referred to the 2022 calendar year. Details about how specific questions were asked are included in the appendix.

Table 3. Rates, Disconnections, Arrears, and Fees among Responding Utilities by EPA Size Category*

Variable	Very Small	Small	Medium	Large	Very Large
Moratorium on Disconnections in 2022	16.27%	15.53%	13.73%	18.80%	43.75%
Disconnections					
Average percent of households that received notice of disconnection	11.98%	16.79%	16.20%	18.72%	19.72%
Average percent of households that were disconnected	3.22%	5.28%	4.82%	4.73%	4.61%
Percent households disconnected out of percent notified of disconnection	26.88%	31.45%	29.75%	25.27%	23.38%
Arrears					
Average number of households in arrears per utility	17.37%	19.18%	20.57%	21.91%	21.43%
Average arrears per household in arrears	$339.81	$251.32	$263.99	$221.23	$508.79
Average total dollar amount of arrears per utility	$12,616.43	$31,763.18	$101,033.68	$472,697.09	$14,948,643.79
Fees charged (% represents % responding “yes”, fee charged; $ is average fee amount)					
Disconnection or reconnection fee charged	82.81%	87.95%	89.53%	91.15%	92.73%
Average disconnection or reconnection fee amount	$61.59	$62.84	$85.19	$71.61	$48.33
Late fee charged	83.74%	92.07%	89.98%	84.17%	85.59%
Average late fee amount	$20.62	$16.41	$18.37	$13.96	$27.02
Other fees charged	26.79%	32.43%	48.73%	46.27%	58.33%
Monthly Water and Wastewater Rates					
Water and Wastewater, 5,000 gallons monthly usage	$98.95	$67.46	$114.79	$67.46	$78.45
Water and Wastewater, 10,000 gallons monthly usage	$135.44	$104.98	$139.93	$104.96	$112.12

*All questions referred to the 2022 calendar year. Details about how specific questions were asked are available in the appendix.

**N for each cell may vary, depending on the completeness of each observation.

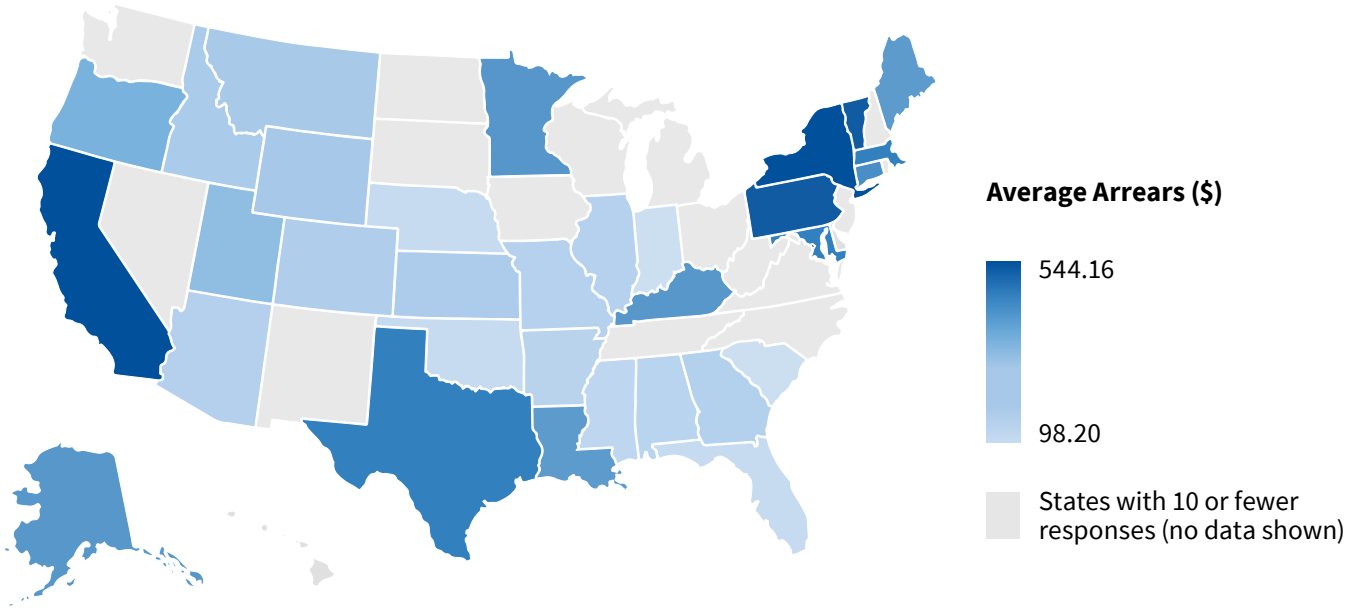
Table 4 below lists average arrears per household by state. Only states with at least 10 responses are shown in this table. New York, California, Vermont, Pennsylvania, and Maryland had the highest average arrears per customer, while South Carolina, Florida, Mississippi, Nebraska, and Alabama had the lowest average arrears.

Table 4. Average arrears per household, states with 10 or more responses

State	Average Arrears	State	Average Arrears	State	Average Arrears
Alabama	$141.90	Indiana	$142.26	Nebraska	$139.97
Alaska	$335.42	Kansas	$163.23	New York	$544.16
Arizona	$164.11	Kentucky	$308.84	Oklahoma	$142.92
Arkansas	$162.16	Louisiana	$283.97	Oregon	$287.31
California	$537.81	Maine	$233.05	Pennsylvania	$473.92
Colorado	$208.32	Maryland	$410.10	South Carolina	$98.20
Connecticut	$320.91	Massachusetts	$378.48	Texas	$395.16
Florida	$130.65	Minnesota	$282.57	Utah	$252.29
Georgia	$163.32	Mississippi	$133.25	Vermont	$491.37
Idaho	$209.75	Missouri	$157.66	Wyoming	$228.79
Illinois	$156.22	Montana	$204.73		

Figure 4 shows a map of the data table above. States with darker blue shading had higher average arrears per household, and lighter blue shading indicated lower average arrears per household. States in gray had fewer than 10 responses, and no data is shown below.

Figure 4. Map of average arrears by state with 10 or more responses



Further analysis was done to determine if the likelihood of lower arrears per household could be attributed to higher rates of disconnection. In other words, in states with aggressive disconnection policies, arrears rates could be lower because households would be quickly disconnected and not build up arrears. **Table 5** summarizes disconnection rates in the five states with the highest average arrears per household and the five states with the lowest average arrears and found statistically significant differences in disconnection rates between these states. In contrast to the map shown in figure 4, the table below looks only at utilities that did not have a moratorium on disconnections at any point in 2022.

Table 5. Variation in Disconnection Rates Between States with the Highest and Lowest Average Arrears per Household, Controlling for Moratoria

State	Average Arrears per Household	Average Disconnection Rate
Highest Average Arrears		
New York	$535.48	<1%
Pennsylvania	$463.74	1%
California	$444.87	2%
Massachusetts	$422.08	<1%
Maryland	$406.59	3%
Lowest Average Arrears		
South Carolina	$98.20	13%
Florida	$106.54	14%
Alabama	$110.53	12%
Nebraska	$133.85	3%
Arkansas	$133.94	7%

Overall, states with the highest average arrears per household had significantly lower rates of disconnection than states with the lowest average arrears per household (with the exception of Nebraska). This might be because when households get disconnected from services earlier, they do not build up high arrears.

Tiered rates were calculated if that information was provided. If rates did not seem reasonable for a utility, submitted rates were compared to that utility's online rate information when available, and if not, the utility was contacted directly. Because of incomplete rate information in survey responses and challenges with data cleaning, 200 responses were randomly selected to reflect the national utility size distribution as documented by the EPA. Cleaned rate data was documented for these utilities, reflecting combined water and wastewater rates at 5,000 gallons of use per month and 10,000 gallons of use per month. All responses in this subsample included both water and wastewater data. For larger sample sizes from select states assessing water rates and affordability, readers should refer to resources such as Duke University's Water Affordability Dashboard and the University of North Carolina's Utility Rates Dashboards.[3,13]

Arrears

The number of households in arrears and the average arrears per residential connection (only of households who owed money to the utility, as opposed to households that were up to date on their bills) were collected in the survey. From these questions, the average number of residential connections (households) in arrears was calculated by dividing the number in arrears by the number of residential connections.

[13] University of North Carolina School of Government Environmental Finance Center Utility Rates Dashboards. Dashboards | UNC Environmental Finance Center

Median arrear balances are higher among very large utilities than other utility sizes. Additionally, the distribution of average arrears is much more condensed among median and large utilities than other sizes. Among very large utilities, a higher proportion of residential connections experience high average arrears, This may be because smaller utilities are not able to accommodate large arrears because of limited disposable income in comparison to larger utilities.

Figure 5 shows another visualization of the distribution of average arrears by utility size. This figure illustrates that very large utilities had the fewest survey responses but had a flatter distribution of arrears than other utility sizes. Average arrears among very large utilities were significantly higher than those of other utility sizes. On average, across all utilities, 20% of residential customers fell behind on their bills at some point during 2022. There were no significant differences by utility size.

The highest average arrears per household at a utility was $5,000, and the minimum was $1.22. Both values support the removal or flexibility of minimum and maximum benefit thresholds for LIHWAP, as some customers may have a very small amount of debt they need to pay off in order to regain access to water, and some have much higher debts.

Subgroup analysis of services provided (water, wastewater, or both) and of water source, both using chi-squared tests, revealed additional differences in average arrears.

Figure 5. Distribution of Average Household Arrears by Utility Size

Distribution of Average Arrears ($) in 2022 by Utility Size

Values above $2,500 removed

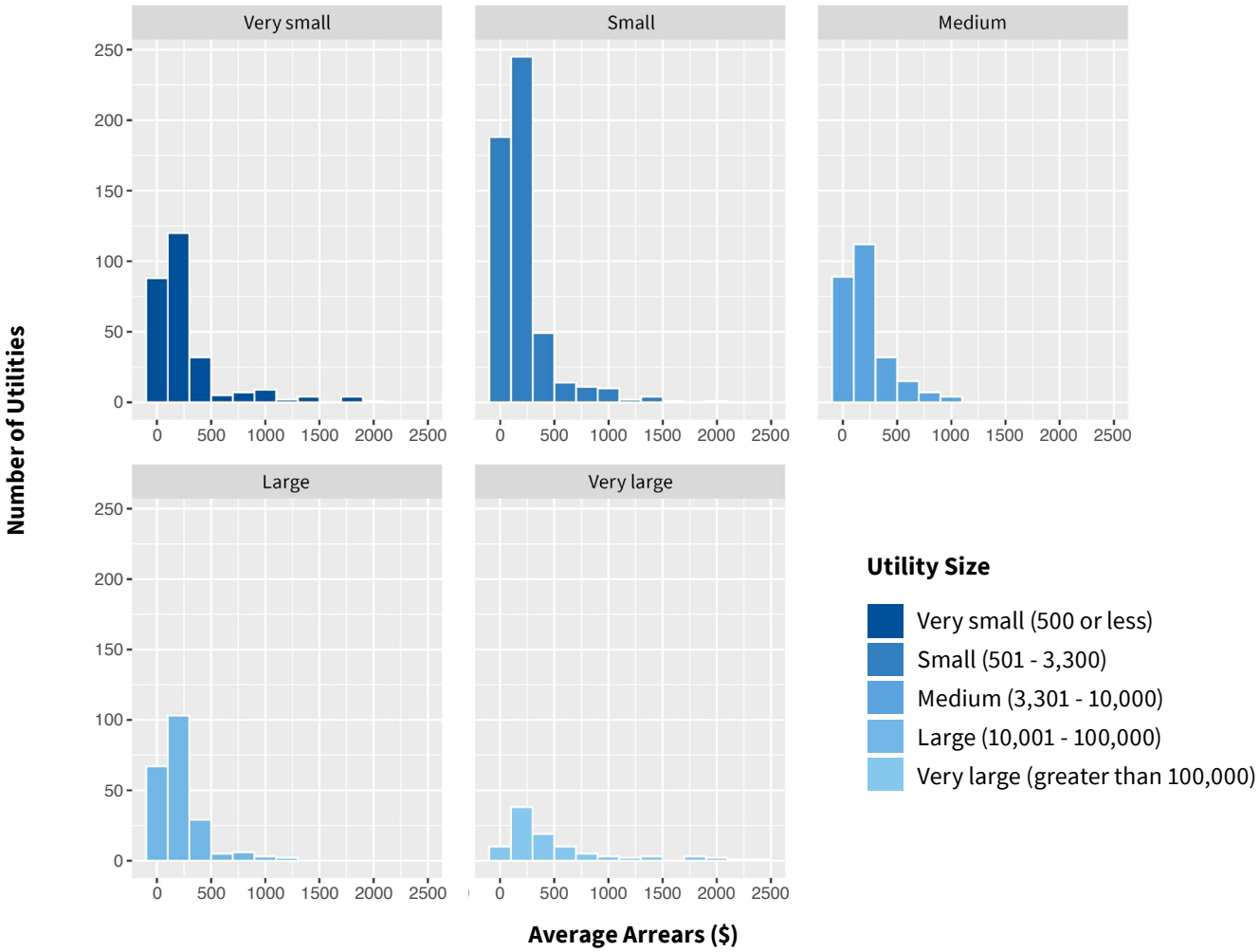


Table 6 breaks down these differences and shows that utilities providing only wastewater services had residential connections with significantly higher average arrears than utilities providing only water or both water and wastewater. Wastewater-only utilities were also significantly more likely to be in urban areas, which may indicate larger populations and higher volumes of treatment needed at wastewater facilities. Average arrears also differed by water source for utilities that provided drinking water services. Those that provided a combination of groundwater and surface water had significantly higher average household arrears than those providing only one or the other. It is noteworthy that across both of these subgroups, the average percent of households in arrears was not significantly different.

Table 6. Variations in Average Arrears by Service Provided and Water Source

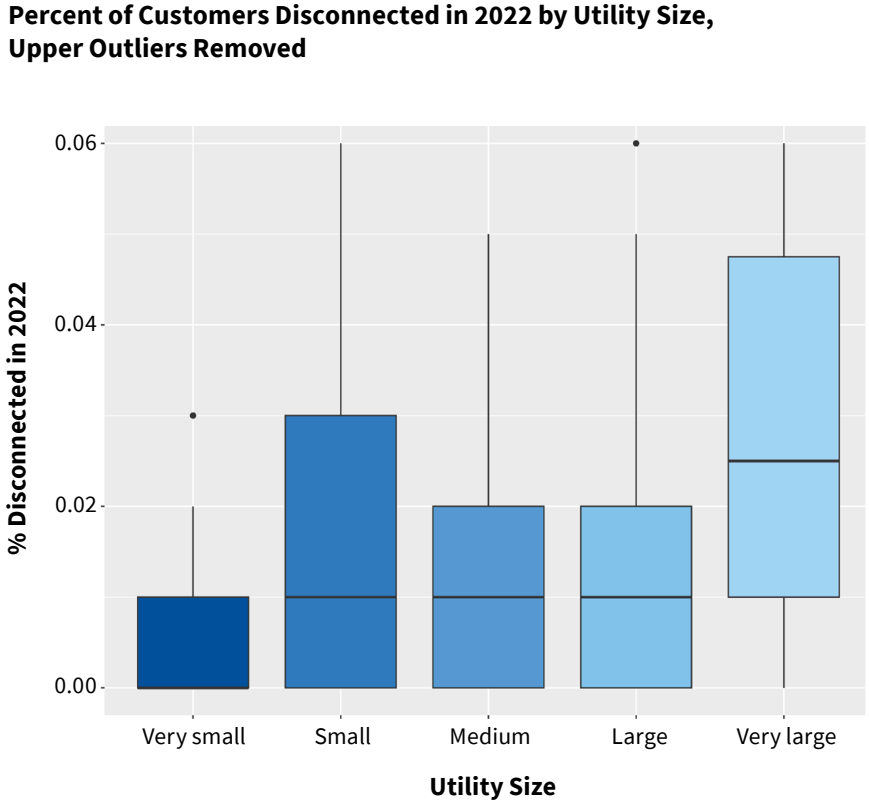
Service Provided	Average Arrears	Average % of Households in Arrears
Water Only	$251.57	20.3%
Wastewater Only	$446.98	17.0%
Both	$273.87	19.8%
Water Source		
Surface Water	$285.16	20.6%
Ground Water	$259.77	19.4%
Combination	$339.02	20.7%

Disconnections

On average, 16.2% of residential connections received a notice of disconnection due to nonpayment from their utility in 2022. This percentage varied significantly across utilities, with 20% of customers at very large utilities receiving such notices versus 12% at very small utilities. However, the percent of households disconnected did not significantly vary by utility size, with an average of 5% of residential connections disconnected at any point in 2022 due to nonpayment.

Figure 6 shows the percent of customers disconnected due to nonpayment by utility size. The percent of the population that fell below an income of $50,000 per year was significantly correlated with the percent of households disconnected (positive correlation) and was higher among rural versus urban utilities. The second chart in Figure 7 shows the same visualization, but with the upper outliers (utilities whose responses were above 75% of the other data values) removed.

Figure 6. Percent of Customers Disconnected in 2022 Due to Nonpayment, by Utility Size



The percentage of those who received notice of disconnection that were disconnected from services varied by utility size, though differences were not statistically significant. At very small utilities, 25% of customers who received notice of disconnection were disconnected. For small utilities, this was 29%; 31% at medium utilities; 26% at large utilities; and 25% at very large utilities.

In addition, 19% of utilities had a moratorium on disconnections at some point during 2022. Very large utilities were significantly more likely to have had a disconnection moratorium than other utility sizes (43.75% of very large utilities had a moratorium, compared to 18.80% of large, 13.73% of medium, 15.53% of small, and 16.27% of very small utilities).

Fees

Overall, 88% of utilities charged a disconnection or reconnection fee or both. Disconnection or reconnection fees are charged for the administrative and service costs of shutting off or turning back on water services. Most disconnection fees were flat rates, with an average fee of $68. A total of 88% of utilities charged late fees, which are fees associated with delinquent account balances. Late fees were typically based on a percentage of money owed to the utility. The average estimated late fee was $18, based on flat rates, tiered rates, and percentage-based fees that were calculated based on the average arrearage per household, if available. Very small utilities were the least likely to charge a disconnection or reconnection fee (83%), and very large utilities were the most likely (93%). Very small utilities were also the least likely to charge a late fee (83%), and small utilities were the most likely (92%).

38% of utilities charged other fees, including things like lien fees, legal fees, or notice fees. Respondents noted that these fees are often used to help cover infrastructure and maintenance needs of the utility. **Figure 7** shows a diagram of types of fees charged and ways in which they were estimated.

Figure 7. Fee Structures and Types Charged by Utilities Participating in the Survey

Disconnection Fee Structures Flowchart

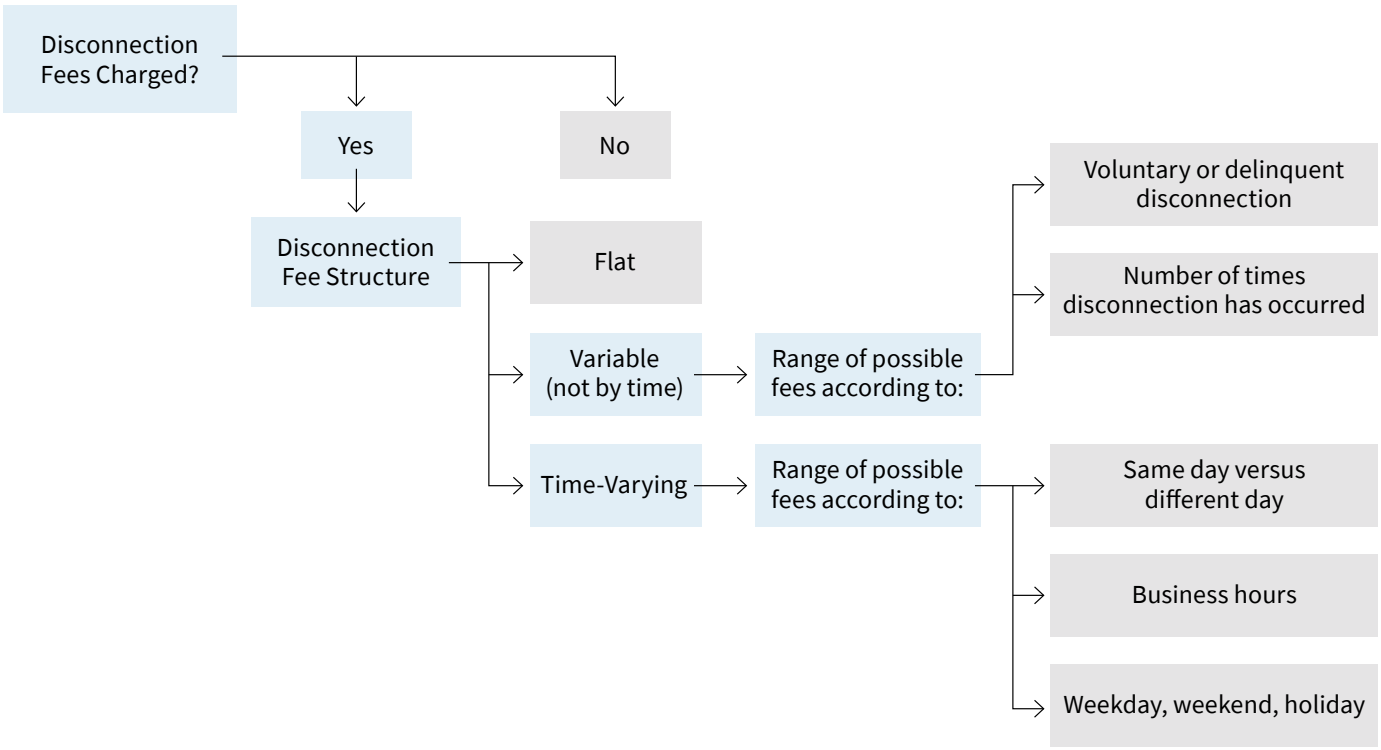


Figure 7. Fee Structures and Types Charged by Utilities Participating in the Survey (continued)

Disconnection Fee Structures Flowchart

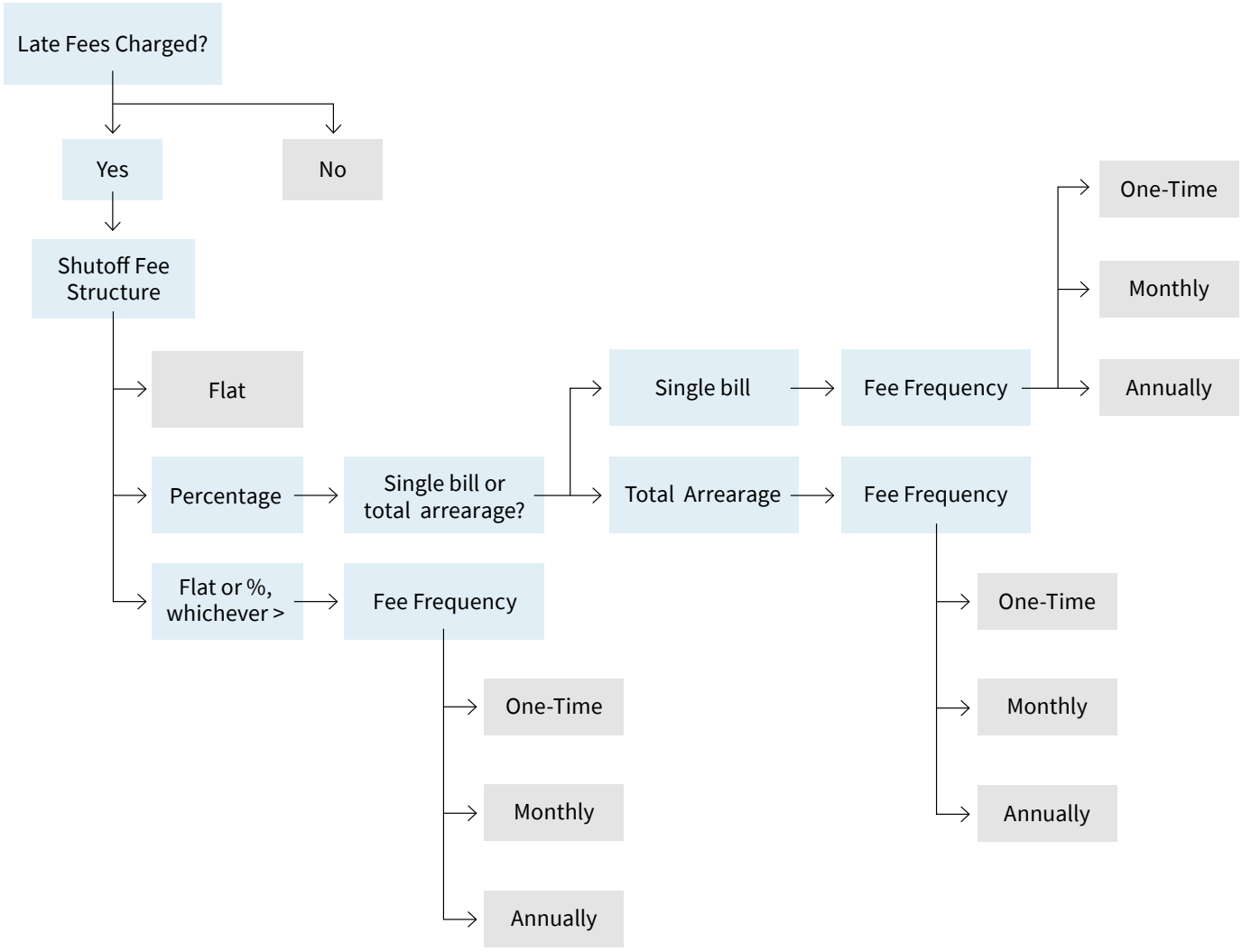


Table 7 shows descriptions of other fees charged by utilities, besides disconnection or late fees. These fees ranged from customer-driven fees, like damage or tampering, to fixed fees that could not be changed by the customer, like public safety or infrastructure improvement fees.

Table 7. Other Possible Fees Charged by Utilities

Fee Category	Examples from Survey Respondents
Notice Fees	Automated delinquent call Document preparation fee Mailing costs: postage, printing, envelope, time Initial, reminder, last-chance, and pre-shutoff notice
Lien Fees	Manual or electronic lien search fee Lien filing or recording fee Lien certification fee
Legal Fees	Marshall fee Attorney and court costs Bankruptcy filing fee Escrow or transfer fee Forfeiture reinstatement fee Re-levy fee
Account Fees	New account connection fee Account or title transfer fee Account closing fee New tenant or owner fee Abandonment application fee Rental fee Non-resident fee Name change fee Address change fee Well user fee
Damage and Tampering Fees	Meter neglect repair Pressure gauge damage or theft Tampering fee Theft of service, illegal turn-on, unauthorized use of water Meter damage Hydrant tampering Curb stop damage Node damage
Service, Inspection, and Quality Testing Fees	Wastewater connection Water reliability Well inspection or testing Water quality Monitoring fee Emergency work fee Primacy fee (lab services) Service call
Service, Inspection, and Quality Testing Fees (continued)	Pumping charge Backflow device installation Fish screen installation Grease trap fee Garden hose connection Sewer lateral inspection Backflow prevention
Payment-Related Fees	Returned check or declined card Payment plan fee Online billing fee Banking fee Incorrect bank account information fee Transaction fee Bill request fee Administrative fees
Flat Fees, Non-Payment Related	State water fee Public safety fee Infrastructure fee, capital improvement, system development charges Utility tax Health department fee Environmental restoration fee Flat city fees (e.g., street lights, roads) State testing fee Protection fee Seasonal shutoff
Non-Damage Meter Fees	Meter testing or retesting fee Meter reinstallation or relocation Metered connection to hydrant Meter removal Meter lock Unreadable meter fee
Delinquent Account (not including standard late fees)	Collection fees Non-compliance fees Denial of access surcharge Sump pump penalties Bad debt certification fee to property taxes
Construction Fees	New construction capacity fee Water feasibility study Permit fee Irrigation wells

Rates

The sample size used to calculate rates was smaller than the overall survey sample and included a random selection of 200 observations that matches the EPA's national distribution of utility sizes. Out of these utilities, the average monthly combined water and wastewater cost at 10,000 gallons of monthly usage was $126.20, with a median of $113.58, a minimum of $31.00, and a maximum of $696.39. Rates were significantly associated with average arrears per household and with estimated late fees ($p < 0.05$) and significantly associated at $p<0.10$ with estimated disconnection fees. Again, for information on rates based on larger sample sizes, readers should refer to work from Duke University and the University of North Carolina.[3,11]

Water burden was calculated two ways: first, by dividing the monthly water and wastewater costs at 10,000 gallons of usage by median monthly household income (based on the zip code of the utility's primary address, which typically correlates to service area), and second, by estimating the burden for those at 75% of the federal poverty level (also by zip code). Based on median household income, the average water burden was 2.7%, with a minimum of less than 1% and a maximum of 15.2%. For those at 75% of the federal poverty level, average water burden was 7.3%, with a minimum of 1.8% and a maximum of 40.2%. Water burden was significantly associated with the percent of the population under 150% of the federal poverty level; LIHWAP grant recipients were required to utilize 150% of the federal poverty level, 60% state median income, or another lower poverty threshold for determining a household's income eligibility.[14]

Tribes and Tribal Communities[15]

We received responses from 12 tribally-owned and operated utilities.[16] On average, 3% of residential connections were disconnected in 2022. The average percent of households in arrears in tribal communities was 32%, with average arrears of $501.56; conversely, among all survey respondents, an average of 20% of residential connections were in arrears, with average arrears of $285. All but one respondent in a tribal community represented a small or very small utility. The high proportion of households in arrears and average money owed points to the unique challenges experienced in tribal communities — one respondent noted that their community uses a shared location for accessing water, and recently it has been unavailable:

> **"We are having electricity issues in our community so our washeteria[17] has been closed on and off for many months. This means we have no safe water source for our community. It is affecting our community in a terrible way. People are getting drinking water from creeks and rivers. Also, the washeteria being closed means we have no way to keep clean."**

[14] LIHWAP Information Memorandum-2021-01 Benefit Policy and Matrix Resources FY2021. LIHWAP IM-2021-01 Benefit Policy and Matrix Resources FY2021 | The Administration for Children and Families (hhs.gov)

[15] There are approximately 1,046 drinking water utilities on tribal land, as of January 4, 2023, based on the EPA's Enforcement and Compliance History Online (ECHO) data.

[16] To help ensure that tribes and tribal communities received adequate LIHWAP benefits, a floor benefit amount (in the LIHWAP allotment formula when determining award amounts to states, territories, and tribes) was set at $10,000 for the 97 tribes and tribal organizations participating in LIHWAP.

[17] A washeteria is a building that provides water services including drinking water, laundry, showers, and toilets.

Predictive Models

Several linear and logistic regression models[18] were developed to see if variation in key outcomes could be predicted by utility and demographic characteristics. Predictive variables (independent variables) were selected based on review of water affordability literature and indicators of financial hardship.[19] **Table 8** describes the results of these regressions. Note that models including rates as predictors or outcomes had a smaller sample size than other models and included fewer covariates.

Table 8. Multiple Linear Regression Models Predicting Key Outcomes

Model	*Estimate (Standard Error)*
Model 1: Predicting Average Arrears	
Constant	128.62 (66.47)*
Combined Water and Wastewater Rates, 10k gal/month	-0.21 (0.29)
Estimated Late Fee	9.66 (0.37)***
Poverty Rate	-0.73 (2.67)
Adjusted R-Squared	0.92
P-Value	<0.001***
Model 2: Predicting Rates	
Constant	220.98 (52.18)
Poverty Rate	-1.37 (1.15)
Moratorium (Yes)	-62.10 (23.71)**
Utility Size (Compared to Large)	
Very Small	37.83 (22.35)*
Small	4.70 (27.22)
Medium	28.88 (34.17)
Very Large	30.07 (38.30)
ACF Region (Compared to Region 1)	
Region 2	126.74 (60.21)*
Region 3	-55.52 (52.29)
Region 4	-116.85 (52.59)**
Region 5	-69.73 (56.43)
Region 6	-82.55 (56.31)
Region 7	-113.10 (52.37)**
Region 8	-116.12 (48.62)**
Region 9	-85.26 (53.12)
Region 10	-127.65 (50.74)**
Adjusted R-Squared	**0.24**
P-Value	**<0.001****

Significance levels are indicated by * (90%), ** (95%), and *** (99%)

[18] Regression models are equations that attempt to predict an outcome variable by one or more independent variables. Components of the regression model describe its quality and the strength of the relationship between independent variable(s) and the outcome variable.

[19] Conceptual frameworks of three key outcomes (arrears, rates, and percent disconnected) were initially developed based on existing literature; from there, backwards stepwise selection was used in R to select final variables to include in models.

Table 8. Multiple Linear Regression Models Predicting Key Outcomes (continued)

Model	*Estimate (Standard Error)*
Model 3: Predicting Percent Disconnected	
Constant	-1.12e-02 (1.01e-01)
Average Arrears	-4.27e-05 (1.72e-05)**
Percent of the Population Below 150% FPL	1.34e-01 (2.93e-02)***
Administrative Staff Size (Compared to 3-5)	
Less than 3	-1.89e-02 (8.02e-03)**
More than 5	-7.35e-03 (1.37e-02)
Service Area Size	
<5 square miles	-3.38e-02 (2.47e-02)
5-50 square miles	-2.01e-02 (2.55e-02)
51-100 square miles	-1.25e-02 (2.41e-02)
>100 square miles	-2.50e-02 (2.61e-02)
Water Source	
Groundwater	3.06e-02 (1.73e-02)*
Surface Water	2.33e-02 (1.80e-02)
Combination	3.82e-02 (1.86e-02)**
Utility Size	
Very Small	4.98e-02 (8.88e-02)
Small	7.76e-02 (8.85e-02)
Medium	6.28e-02 (8.83e-02)
Large	6.63e-02 (8.84e-02)
Very Large	3.20e-02 (8.98e-02)
Estimated Late Fee	3.03e-04 (1.83e-04)*
Estimated Disconnection Fee	-9.14e-06 (1.47e-05)
Ownership	
Private	-2.25e-02 (4.13e-02)
Public	-1.61e-02 (4.00e-02)
Public-Private	1.17e-01 (5.38e-02)**
Tribal	1.48e-02 (7.40e-02)
Adjusted R-Squared	**0.09**
P-Value	**<0.001*** **

Significance levels are indicated by * (90%), ** (95%), and *** (99%)

The models above have varying degrees of quality, with the first model (predicting average arrears) performing much more strongly than the others, though all models are statistically significant. The first two models use fewer predictors because the sample size was much smaller for responses with complete rate data. Model 1 shows that **92% of the variation in average arrears** per household can be explained by water and wastewater rates (at 10,000 gallons per month), average estimated late fees, and poverty rate. In particular, late fee estimates were significantly positively associated with arrears.

Model 2 predicts rates at 10,000 gallons per month by poverty rate, utility size, whether or not the utility had a moratorium in 2022, and ACF (Administration for Children and

Families) region;[20] these variables predicted approximately **24% of the variation in rates**. ACF regions reflect broader geographic units than states; regions include multiple states or states and territories. It was useful to include ACF region as a variable because of the variation in number of responses from individual states and territories. Having a disconnection moratorium and being located in regions 4, 7, 8, and 10 were significantly *negatively* associated with rates, and very small utility size and being located in region 2 were significantly *positively* associated with rates.

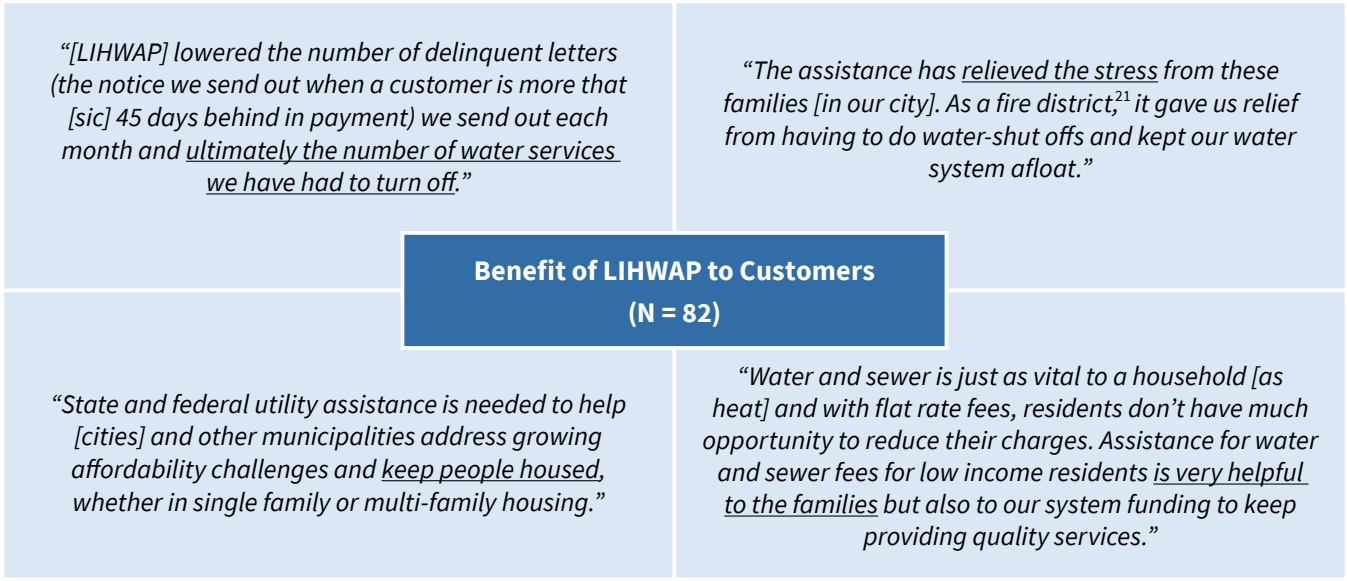
Lastly, Model 3 examined the percent of residential connections disconnected in 2022 by the following predictors: average arrears, percent of the population below 150% of the federal poverty level, administrative staff size, service area size, water source, utility size, estimated late and disconnection fees, and ownership structure. These variables accounted for **only 9% of the variation in percent disconnected**; this model used a much larger sample size than the previous two models because it did not include the rate variables, which were available only for a smaller sample size. Of these variables, percent below 150% of the federal poverty level, groundwater or combination water sourcing, estimated late fees, and combination public-private ownership were significantly associated with higher rates of disconnection. Higher average arrears and smaller administrative staff size were significantly associated with lower disconnection rates.

For grant recipients and utilities, these findings, particularly from Model 1, have practical implications. Grant recipients may want to ensure that their programs cover fees and that they are ensuring adequate outreach and services in high poverty areas. Model 2 highlights the importance of outreach and partnership agreements with very small utilities. Model 3 had the weakest coefficient of determinants (R^2) but further supports outreach to high poverty areas, inclusion of fee coverage, and ensuring that all utility ownership types are being reached by LIHWAP outreach. These lessons were shared directly with program specialists and grant recipients in August 2023.

Qualitative Information

Many survey respondents shared information in comment sections throughout the survey. **Figure 8** describes the major themes that emerged from these qualitative sections and provides examples of each.

Figure 8. Qualitative Themes Emerging from LIHWAP Water Utility Affordability Survey (total N providing qualitative content: 222)



[20] There are 10 ACF regions, which are geographically grouped; each region and their offices' headquarters can be found here: https://www.acf.hhs.gov/oro/regional-offices.

[21] Fire districts typically serve multiple small communities or unincorporated areas, as opposed to fire departments, which are typically associated with one city or town.

The themes described are the benefits of LIHWAP for households; financial stress experienced by utilities; challenges faced with LIHWAP implementation; and hopes for the future of water assistance. There are four examples from different states provided for each. States with fewer than 10 responses were not included in any of the examples.

Figure 8. Qualitative Themes Emerging from LIHWAP Water Utility Affordability Survey (total N providing qualitative content: 222) (continued)

"We know that it's inevitable that we will need to raise utility rates to pay for critical infrastructure, like our water filtration plant or our wastewater treatment plant expansion — both of which are necessary to fulfill our regulatory obligations."

"The delinquent accounts remain a part of my records. Some of this delinquency is more than 12 years old. Some of the account holders are deceased."

Utilities Experience Financial Stress (N = 31)

"We are a small sewer system that needs all our customers to pay their sewer fees in order to keep our sewer plant running. Any help that our residents receive is greatly appreciated by them and our municipality."

"Existing rates do not support existing approved capital project and operating costs. Rates will need to be raised substantially 10% to 20% to support approved projects and required borrowing for said projects."

"The LIHWAP program design did not allow payments to other municipal services like solid waste services. Most municipal governments offer all services and cannot separate one service from another for payments."

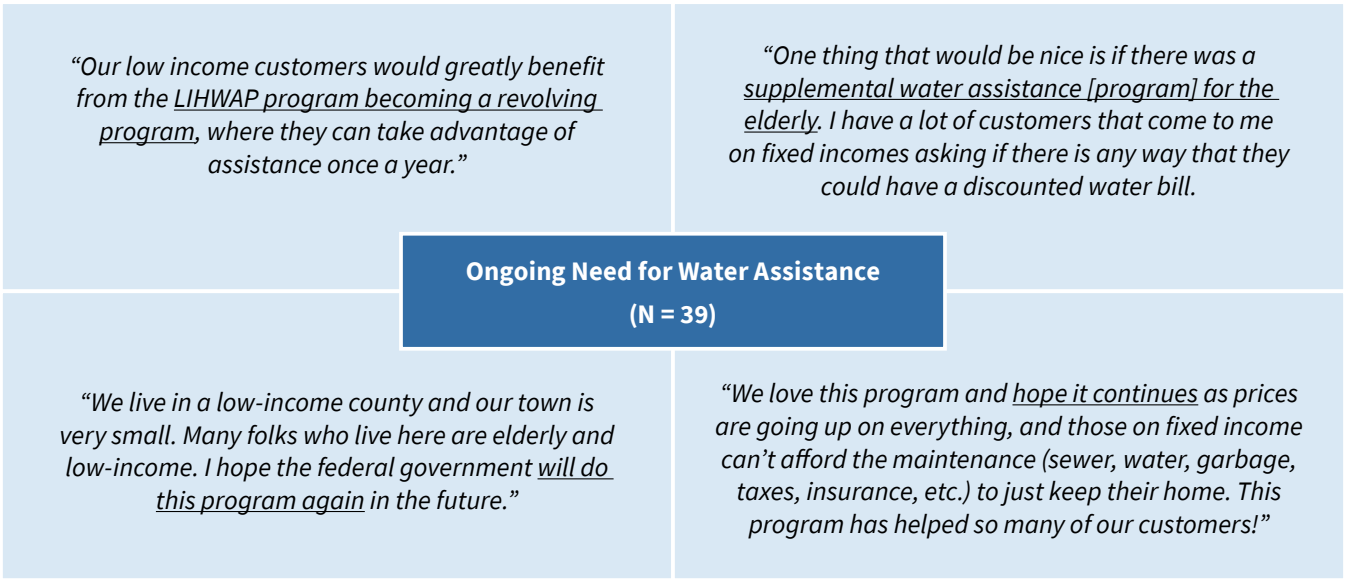
"Please re-evaluate the assistance qualifications — the 150% [below] poverty is very low, and there are many who do not qualify but still struggle to pay their water bill."

Challenges Faced with LIHWAP Implementation (N = 28)

"We even communicated [information about] the [housing and water] programs again when mailing late notices to customers. We are saddened more people have not taken advantage, as we do believe many would qualify."

"It would be helpful to extend the assistance directly to the landlords, similar to the [other assistance program]. There are many residents that don't qualify or don't follow through with completing an application, and I have no recourse to collect other then eviction for non-payment."

Figure 8. Qualitative Themes Emerging from LIHWAP Water Utility Affordability Survey (total N providing qualitative content: 222) (continued)



These broad themes represent concepts that emerged repeatedly in respondents' comments; from these broad themes, several subthemes emerged that unpack the nuance in each. The subthemes fall under a given theme but illustrate a specific element or example of the theme that was described by respondents. Sub-themes of each broad theme are described below.

Theme 1: Benefit of LIHWAP for Customers

Theme 1 Subthemes:

I. **Essential Nature of Water:** Connection to clean drinking water along with wastewater services are essential for health and well-being. There is assistance available to households with low incomes for other utilities but not for water and wastewater.

II. **Prevention of Downstream Consequences:** Bill assistance helps prevent a cascade of adverse effects that come from overdue bills, including foreclosure, eviction, and inability to pay for other essential needs like food and medicine.

III. **Vulnerable Populations:** LIHWAP and other assistance programs are essential for vulnerable populations, especially older adults, who may live on fixed incomes and struggle to meet their monthly bills.

Theme 2: Utilities Experience Financial Stress

Theme 2 Subthemes:

I. **Infrastructure and Public Health:** When too many accounts fall behind, rates and fees are inadequate to cover utilities' infrastructure needs and treatment costs that ensure essential sanitation required to maintain clean water systems.

II. **Long-Term Account Delinquency:** Many accounts in arrears have owed money for months or years, preventing the utility from bringing in consistent funding.

III. **Rising Costs to Utilities:** Costs for utilities are rising, with causes ranging from supply chain disruptions to system maintenance to climate-driven water shortages.[22] With these increases in costs to utilities, consumer rates also increase.

[22] Cost of Water. Bluefield Research. https://www.bluefieldresearch.com/our-coverage/macro-trends/cost-of-water/; Water Bills Are Rising. Here's What to Do About It. The New York Times. https://www.nytimes.com/2023/07/14/your-money/water-bills-tips.html.

Theme 3: Challenges Faced with LIHWAP Implementation

Theme 3 Subthemes:

I. **Delayed Rollout:** In some circumstances, initial implementation of LIHWAP was delayed or slow, as it was a new program for both the federal government and the state, tribe, or territory grant recipients.

II. **Outreach and Enrollment:** Some utilities and grant recipients faced or continue to face difficulties with getting qualified households to apply for benefits. Other times, households did not qualify, and the utilities did not have other assistance options for them.[23]

III. **Qualifications:** Income eligibility thresholds meant that many individuals who earned income over the eligibility threshold were not qualified to participate, even if they were having trouble paying their bills.

Theme 4: Ongoing Need for Water Assistance

Theme 4 Subthemes:

I. **LIHWAP Extension:** Dozens of survey respondents reported that the program has been very beneficial to their customers and to their utility and that they want to see it renewed or extended in the future.

II. **Broader Income Eligibility:** Related to the "Qualifications" subtheme of theme 3, respondents wanted to see water assistance programs with higher income eligibility thresholds, or income eligibility that was varied depending on other factors (for example, higher thresholds for households with older adults).

Together, these themes and subthemes describe a landscape in which households with low incomes experience significant challenges in paying for their water and wastewater, often with severe consequences if left unpaid, and the utilities that serve them struggle to maintain enough revenue to meet their operating costs. While survey respondents noted some shared challenges experienced in LIHWAP implementation, they broadly agreed that both customers and utilities need the support offered by LIHWAP to minimize gaps in water services and operating costs. For more information on the success, challenges, and lessons learned from implementing LIHWAP, please review the LIHWAP Impact and Implementation Report.

[23] One utility noted that many of their customers earned slightly too much to receive LIHWAP benefits, "Unfortunately, there are plenty of families here that are just over the threshold to apply. It would be nice if the program could help those folks out as well. They really have no where [sic] to turn." Another noted that they were not able to track the success of their outreach efforts to households because of a lack of communication from partnering organizations, "We participated fully in the LIHWAP program often using flyers or social media to promote residents to take advantage of LIHWAP. We couldn't get any reports or feedback from our local Capacity Reservation Tariff or Decision Support System about the applications. How many [city] residents qualified for the program, how many applications were disqualified, etc."

Discussion of Key Findings

This report used information collected directly from water and wastewater utilities to understand the costs of water to households and the financial pressures utilities face. As stated earlier, the primary purpose of this work was to allow the federal LIHWAP team to assist LIHWAP grant recipients with identifying the types of utilities and geographies in greatest need of assistance and to support potential program adjustments to best meet the needs of households and utilities. The results of this work shed light on several key focal points for the future:

1. Affordability challenges may still be present even when average arrears are low.

The average amount of money owed to utilities varied significantly, ranging from $1.22 to $5,000, and average arrears were significantly higher among very large utilities than other sizes. When looking at average arrears by state, some states had significantly higher average debt per customer than others (for example, $544.16 in New York compared to $98.20 in South Carolina). Rates of disconnection were also significantly different between these states, with New York having an average disconnection rate of less than 1% in 2022, compared to 13% in South Carolina. This points to a phenomenon that has been documented to federal program specialists by LIHWAP grant recipients in Illinois and Indiana where disconnection policies may vary between large, urban utilities and smaller, rural utilities, resulting in lower average arrears but higher disconnection rates in rural areas. It is essential for LIHWAP grant recipients to account for this variation when developing benefit structures. Minimum benefit amounts for arrears may preclude customers at small utilities from receiving payments if they were disconnected with a small amount of debt. For households with low incomes served by these smaller utilities, rate reduction payments that place credits on the accounts of eligible households would help prevent future disconnection. Additionally, rate reduction payments allow for more eligible households to be served, even if they are unable to accumulate arrears above the grant recipient's minimum payment. Likewise, grant recipients may want to ensure that rate reduction payments are included if overall disconnection rates are lower but debts are high.

2. Urban and rural areas face distinct affordability challenges.

Expanding on the point above, urban and rural utilities showed significant differences in arrear amounts, percent of customers in debt, and disconnection moratoria. Small, rural utilities may not have the capacity to maintain connections for accounts that have past due balances versus urban utilities with a larger customer base. In addition, there were no significant differences in water burden (defined as percent of income spent on water and wastewater) between rural and urban utilities, indicating that affordability challenges presented themselves differently across these contexts with higher arrears in urban areas and higher disconnection rates in rural ones.

3. Tribal utilities experience unique barriers to water access and affordability.

Tribal utilities participating in the survey did not have higher rates of disconnection compared to other publicly or privately owned utilities, but they had very high amounts of debt per household (out of households that owed money — over $500, on par with very large utilities across the sample) and proportions of households in arrears (32%). Many of these utilities are financially strained and may experience other challenges with water access; for example, the U.S. Supreme Court recently ruled that the United States does not have an obligation to Navajo Nation to measure and plan for the tribe's water needs; this ruling reversed a prior decision.[24]

4. Utilities across the U.S. are experiencing financial strain and struggle to fund needed maintenance and infrastructure.

Respondents from all utility sizes and geographies shared stories of revenue challenges. Regardless of location, setting rates that were affordable and could also cover necessary costs was challenging. When customers fell into arrears or accumulated large amounts of debt, these challenges became more prominent.

[24] Arizona et al. v. Navajo Nation et al. 21-1484. US 1 (2023). 21-1484 Arizona v. Navajo Nation (06/22/2023) (supremecourt.gov).

Many utilities talked specifically about more difficult challenges funding the costs of wastewater infrastructure and treatment. This is also evidenced through the significantly higher average arrears among wastewater-only utilities compared to water-only or water and wastewater utilities (utilities that provide water and wastewater may be better able to subsidize the high costs of wastewater treatment through their drinking water service revenue). These stories and data indicate the need for immediate financial relief and longer-term affordability plans.

5. Importance of LIHWAP payments for fees in addition to water and wastewater bills

Because rates were often insufficient to meet infrastructure needs (for example, see the quote in **Figure 9** – *"Existing rates do not support existing approved capital project and operating costs […]"*), utilities often included late fees, disconnection fees, or other fees to help bridge these gaps and to encourage timely payments. For customers, these fees can compound and make it more challenging to climb out of debt. This highlights the necessity of LIHWAP payments for fees (which is an allowable use of LIHWAP funds) in addition to water and wastewater usage bills. Such payments will support both households in debt as well as the utilities that need to meet the revenue necessary to sustain operations.

How is LIHWAP working to address these challenges?

LIHWAP's basic goals are to provide payments to utilities on behalf of households to reconnect disconnected services, prevent disconnection of services, and reduce rates for existing services. As of August 2023, over 1,000,000 households have been served by the program. These benefit payments directly support both households and utilities across the country. The program targets specific populations that may experience elevated issues with water access or face greater threats if water access is lost, including households with older adults, people with disabilities, and children aged five and under. Additionally, annual reporting data from LIHWAP grant recipients tracks income categories of households served. The largest income category served is households that fall under 75% of the federal poverty level.[25] These households have extremely low income, and this program works to ensure that they can maintain continuous water and wastewater services.

Limitations

There are limitations to this work. First, as described in the methodology of this report, this was a convenience sample and not a randomized sample. With LIHWAP ending, there was a short timeline and turnaround from survey development to Paperwork Reduction Act submission and outreach, and we heavily targeted rural and small water utilities and associations. In order to recruit a large enough sample of small water utilities, a convenience sample was appropriate to ensure geographic representation. Our primary purpose was to rapidly provide information and assistance to LIHWAP grant recipients, not to produce a nationally representative sample. We hope that this work serves as a starting point for a broader conversation around water affordability and more comprehensive data collection. This survey was cross-sectional, meaning that data was collected from a single point in time, and more detailed studies of water affordability should consider longitudinal designs to track how water costs change over time.

Dissemination

For additional sharable information, interested parties should seek out our LIHWAP Water Utility Survey Factsheet[26] and the LIHWAP Data Dashboard.[27] These resources may be useful for examining summative results from this survey. The LIHWAP Data Dashboard also contains data and graphics of quarterly and annual reports from LIHWAP grant recipients.

[25] LIHWAP Data Dashboard Annual Report Snapshot, Number of Assisted Households by Poverty Interval. Annual Snapshot | LIHWAP Data Dashboard (arcgis.com)

[26] LIHWAP Utility Survey Fact Sheet. Office of Community Services, Administration for Children and Families. https://www.acf.hhs.gov/sites/default/files/documents/ocs/water-survey.pdf

[27] LIHWAP Data Dashboard. Office of Community Services, Administration for Children and Families. https://lihwap-hhs-acf.opendata.arcgis.com/

Conclusions

Water affordability is a ubiquitous challenge across U.S. geographies, utilities, and households. Findings from this survey highlighted several key points for understanding water access and utility sustainability:

- **High infrastructure and maintenance costs create financial burdens for water and wastewater utilities, and households across the country experience water debt or disconnection.**
- **There is wide geographic variation in consumer water debt and disconnect rates across places, community sizes, and utility sizes. In particular, rural water customers are at increased risk of disconnection, while urban water customers experience lower rates of disconnection but higher arrears balances.**
- **There were also meaningful state-level differences, highlighting the role that state policies play in consumer water affordability.**

Overall, water affordability impacts many Americans:

20% of residential customers fell behind on their bills in 2022. Programs like LIHWAP can help meet immediate water access needs and alleviate cost burdens on utilities.

Appendix: Water Utility Survey

This appendix contains the Water Utility Affordability Survey as it appeared to participating water and wastewater utilities. The survey was disseminated using online software and therefore certain survey questions may have been shown or not shown, depending on survey branching logic based on prior question responses from participants.

Introduction

Thank you for your interest in our water utility survey. Our agency, the Office of Community Services, administers the Low Income Household Water Assistance Program (LIHWAP), the first-ever low-income federal water assistance program.

> LIHWAP provides funding to states, tribes, and territories across the United States to help households with low incomes with their water and wastewater bills. With this survey, we are trying to better understand the scope of water and wastewater debt so that we can help ensure that both households and utilities get the money and support they need. This program directly benefits utilities by providing payments on behalf of customers who are behind on their water or wastewater bills. This survey will take 30 minutes or less to complete and is broken into six sections. Please note that the time needed to complete the survey may be longer than this estimate, depending on your utility's data management system. Your information will be kept private.

PAPERWORK REDUCTION ACT OF 1995 (Pub. L. 104-13) STATEMENT OF PUBLIC

BURDEN: The purpose of this information collection is to gather data related to water and sewer costs so we can better assist LIHWAP grantees. Public reporting burden for this collection of information is estimated to average 30 minutes per respondent, including the time for reviewing instructions, gathering and maintaining the data needed, and reviewing the collection of information. This is a voluntary collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information subject to the requirements of the Paperwork Reduction Act of 1995, unless it displays a currently valid OMB control number. The OMB # is 0970-0531 and the expiration date is 09/30/2025. If you have any comments on this collection of information, please contact Gwen Donley at gwendolyn.donley@acf.hhs.gov.

Utility Information

The following questions will ask you some basic information about your water utility.

1. Approximately how many residential connections do you have (as of December 1, 2022)?

2. What is the size of your administrative staff? (Administrative staff includes staff who are responsible for customer service, billing, support, etc.)

- ◯ Less than 3
- ◯ 3-5
- ◯ More than 5

3. Which of the following services do you provide? (Check all that apply)

- ◯ Water
- ◯ Wastewater

4. What is your water source? (Check all that apply)

- ◯ Groundwater
- ◯ Surface water

5. What is the ownership structure of your utility? (Check all that apply)

- ◯ Publicly owned (i.e., owned by commissions, municipalities, etc.)
- ◯ Privately owned (i.e., owned by a corporation, Homeowners Association, etc.)
- ◯ Tribally owned
- ◯ Other (please specify)

6. What is the approximate square mileage covering residences you bill for water or wastewater?

- ◯ <5
- ◯ 5-50
- ◯ 51-100
- ◯ >100

7. How is your service area defined? (Check all that apply)

- ◯ Neighborhood/Community
- ◯ Municipality
- ◯ Zip Code(s)
- ◯ Public Service Area
- ◯ HOA
- ◯ County
- ◯ Other (please specify)

8. Please expand on your answer to question

7. What is your service area?

EPA Size Category

9. At any point during the 2022 calendar year, was there a moratorium that disallowed residential water or sewer service shut-offs?

- ○ Yes
- ○ No

The following questions refer to residential accounts to whom you provide water or wastewater services.

10. Please estimate how many residential accounts *received notice* that their water and/or wastewater services would be shut off or disconnected due to *nonpayment* at any point during the 2022 calendar year:

11. Please estimate how many residential accounts had their water/wastewater services *shut off or disconnected* due to *nonpayment* at any point during the 2022 calendar year:

The following questions refer to residential accounts to whom you provide water or wastewater services. Please answer to the best of your ability.

12. Please estimate how many residential accounts fell behind (arrearages) on their water and/or wastewater bills at any point during the 2022 calendar year:

13. What was the average amount of money owed (arrearages) per residential account (out of those that owed an arrearage at any point in 2022)?

14. What is the total amount of money owed (arrearages) as of December 1, 2022 that your utility is owed for water and/or wastewater bills?

15. What is the population size served by your utility?

- ◯ Very small (<500 people)
- ◯ Small (501-3,300 people)
- ◯ Medium (3,301-10,000 people)
- ◯ Large (10,001-100,000 people)
- ◯ Very Large (>100,000 people)

Rates

The following questions refer to residential accounts to whom you provide water or wastewater services.

16. What is your billing frequency?

- ◯ Monthly
- ◯ 60 Days
- ◯ Quarterly
- ◯ Twice Annually
- ◯ Annually

17. What is your base rate for water services per billing period ($)?

18. How many gallons or cubic feet are included in your base rate per billing period?

19. Is your flow rate/volume charge measured using gallons or cubic feet?

- ◯ Gallons
- ◯ Cubic feet

20. What is your flow rate/volume charge for water services per billing period?

____$

per____gallon/cubic foot

21. Is your wastewater charged by a flat fee?

- Yes
- No

22. Wastewater flat fee amount ($):

23. Is your wastewater fee charged based on water usage?

- Yes
- No

24. If no, please explain:

Other Fees, Shut-Off Fee

Our federal program, LIHWAP, is able to cover costs related to unpaid or late bills, disconnections, and other fees, so we are interested in learning about the types of fees charged by utilities. In collecting this information, we are not evaluating or critiquing your utility's policies.

25. Does your utility charge a shut-off fee (disconnection or reconnection of water/wastewater)?

- Yes
- No

Other Fees, Shut-Off Amount

26. Shut-off fee amount ($):

Other Fees, Late Fee

27. Does your utility charge late fee(s) on bills owed?

- Yes
- No

Other Fees, Late Fee Amount

28. Late fee amount ($):

Other Fees, Additional

29. Does your utility charge other fees (ex: interest on unpaid balances, collection fees)?

- Yes
- No

Other Fees, Describe

30. Please describe other fees:

31. If there are any other details related to rates, disconnections, arrearages, or fees that you would like to add, please do so here:

Contact Information

All of your information will be kept private. We will use this to make sure we don't collect duplicate responses and for data quality verification.

32. Your name(s):

***33. Name of the utility you work for:**

***34. Primary address of the utility:**

Address

Address 2

City/Town State/Province

ZIP/Postal Code

35. Your job title(s) or role(s):

36. Phone (including area code):

37. Email address:

38. May we contact you if we have any questions about your survey responses?

- Yes
- No

Closing

Thank you for completing this survey. Your responses are helping us understand the water and wastewater needs of communities across the country, and how programs like the Low Income Household Water Assistance Program can help both households and utilities. We appreciate your time. If you have any questions or concerns, please reach out to Gwendolyn Donley at gwendolyn.donley@acf.hhs.gov.

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39. If you would like to add any comments or additional details, please do so here:

Low Income Household Water Assistance Program | LIHWAP

February 2024

ADMINISTRATION FOR CHILDREN & FAMILIES
Office of Community Services