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The DUUC WatSan Insecurity Scale

A Participatory Approach to Exploring Water and Sanitation Needs

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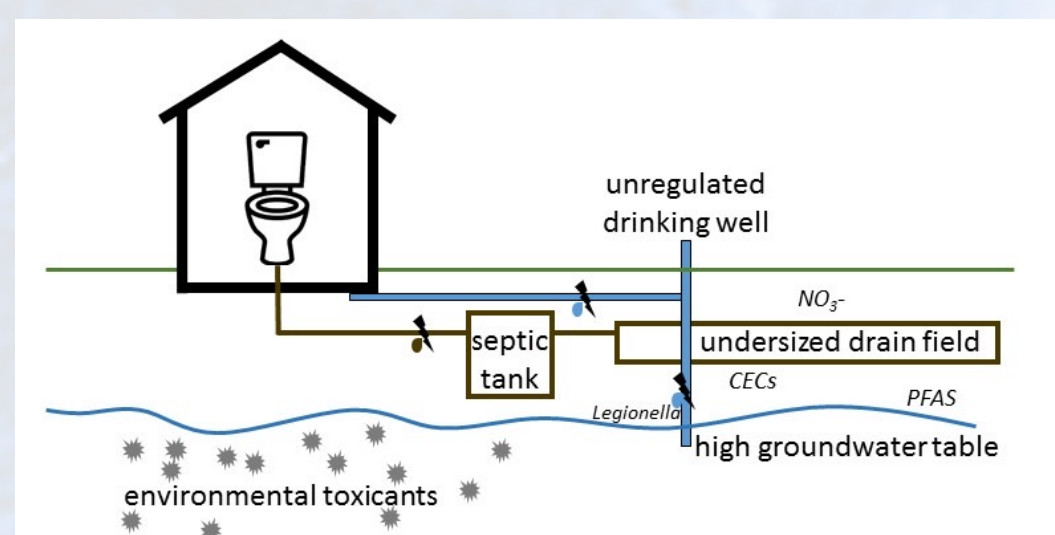
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Overview

Water and sanitation (WatSan) challenges continue to escalate worldwide due to climate change, environmental degradation, and socio-political instability. While interventions are often aimed at low HDI countries, communities in the global north also experience high levels of WatSan insecurity, for example, those in rural and indigenous areas. Recent research in the United States has revealed that many disadvantaged unincorporated urban communities also lack consistent access to clean and safe water and adequate sanitation.

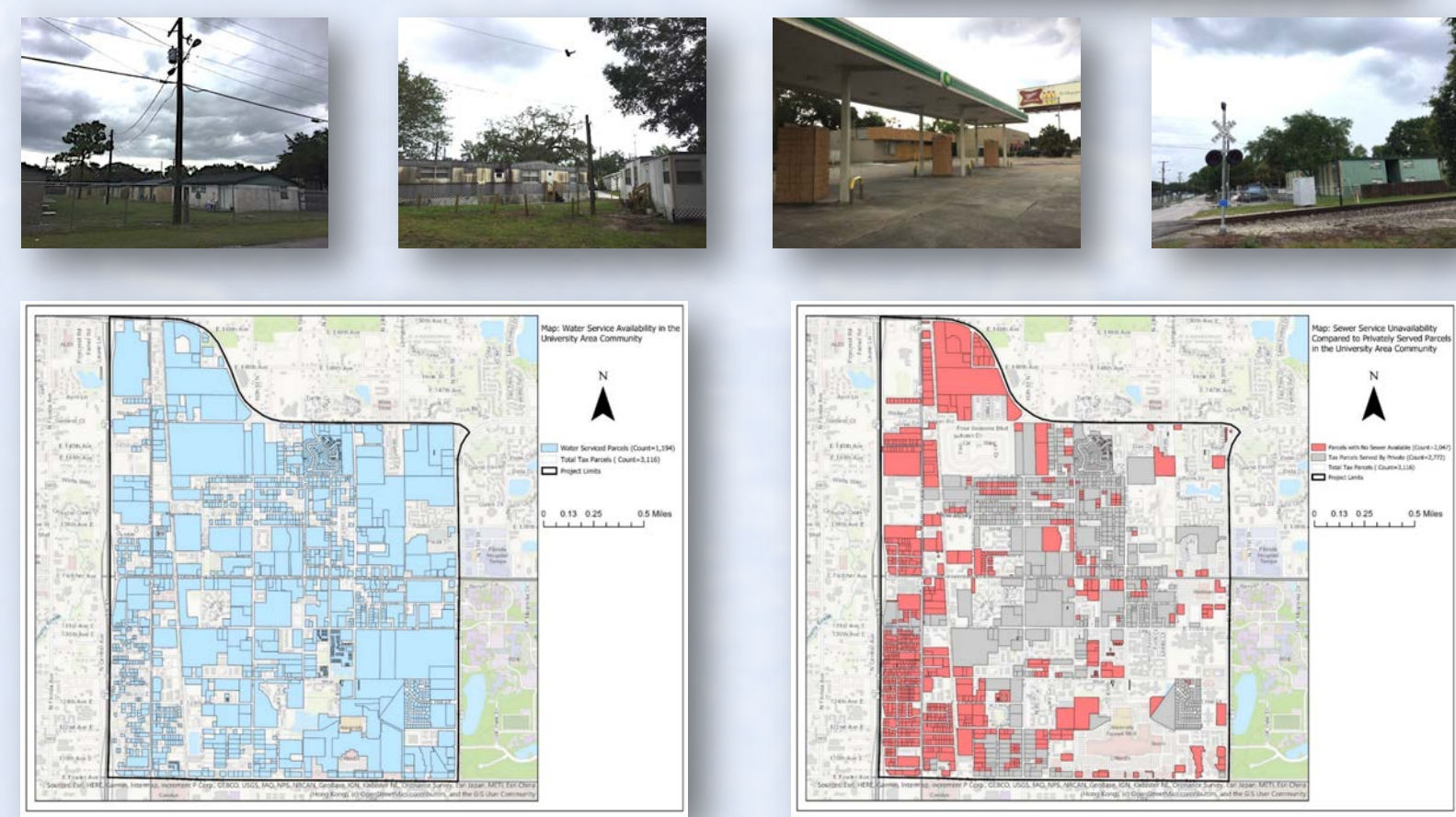


In Florida, these environmental justice communities often originated as unregulated subdivisions of unincorporated land and, as such, lack adequate public investment in WatSan infrastructure. In these settings, some households have access to centralized water treatment and delivery systems, while others rely on private drinking water wells and on-site wastewater treatment such as septic systems. In both cases, water quality and wastewater infrastructure can be insufficient to protect human health.

Research Context

University Area Community

- Urban disadvantaged unincorporated
- History of racial segregation
- High residential densities
- High proportions of renters
- Aging housing stock
- Proximity to hazardous wastes
- Lack of critical infrastructures

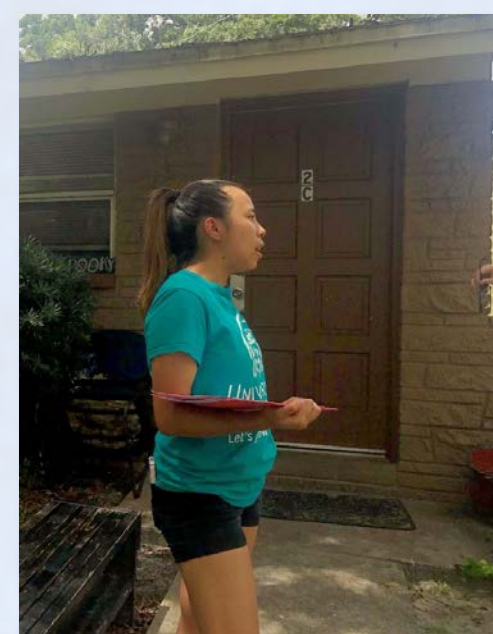


Objectives & Methods

Our research draws on social science methods—including participant observation, rapid field assessments, and in-depth interviews—to examine local residents’ perceptions and experiences with water and sanitation, focusing on the University Area Community located on the northern unincorporated edge of Tampa. We also explore the broader regulatory context of water and wastewater infrastructure at both the municipal (City of Tampa) and county (Hillsborough) levels through interviews with WatSan utilities administrative staff and engineers.



135 hours of volunteer-based participant observation



12 in-depth, semi-structured interviews with residents

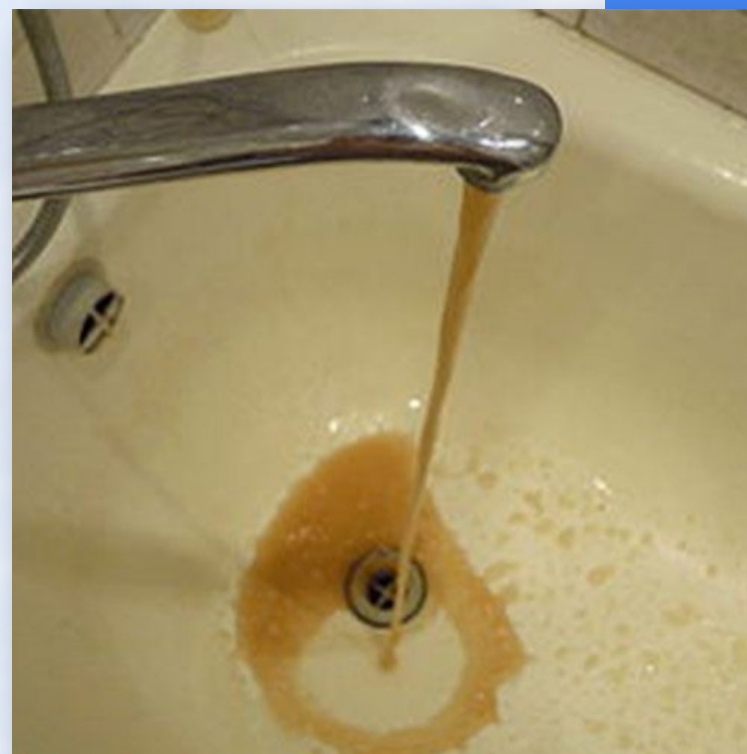


28 rapid field assessments



10 in-depth, semi-structured interviews with city/county utilities administrators

Some Residents Can’t Drink the Water



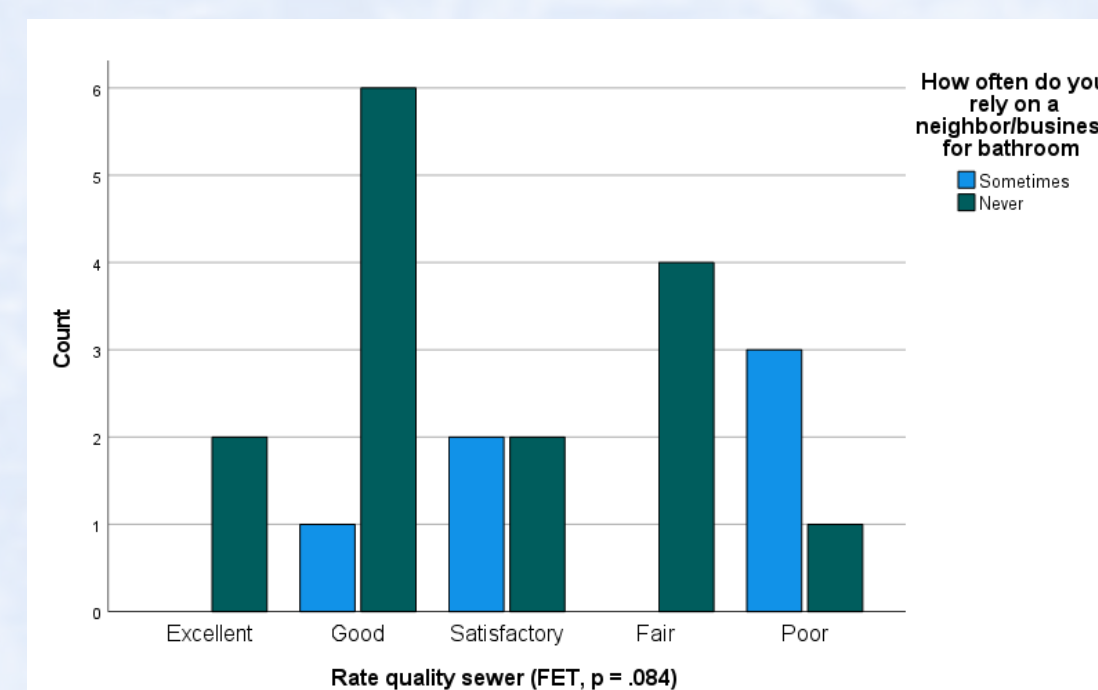
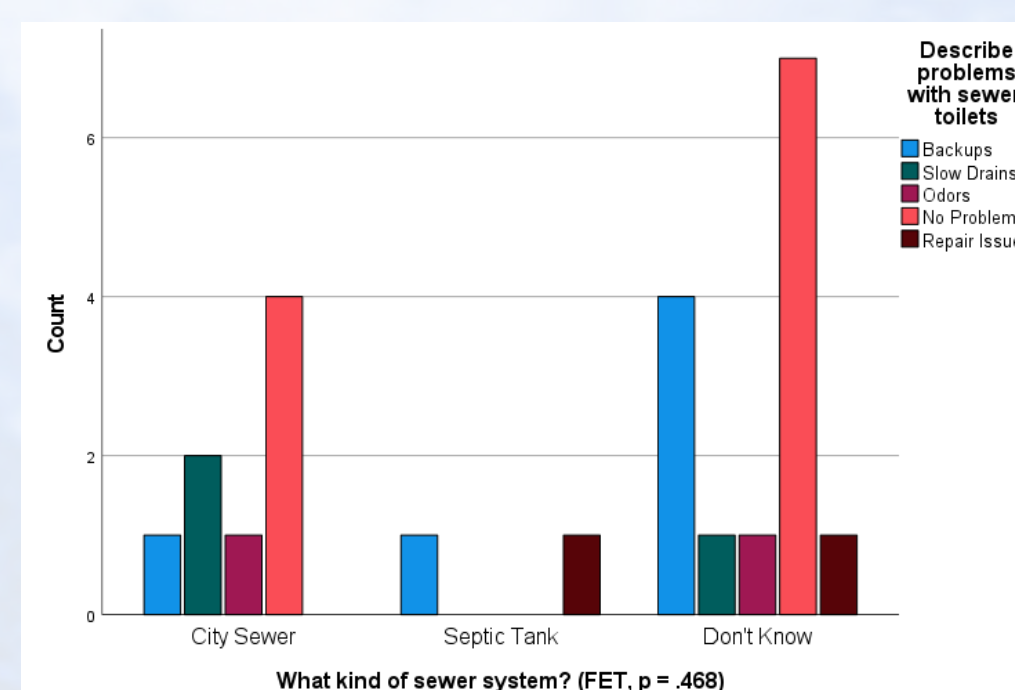
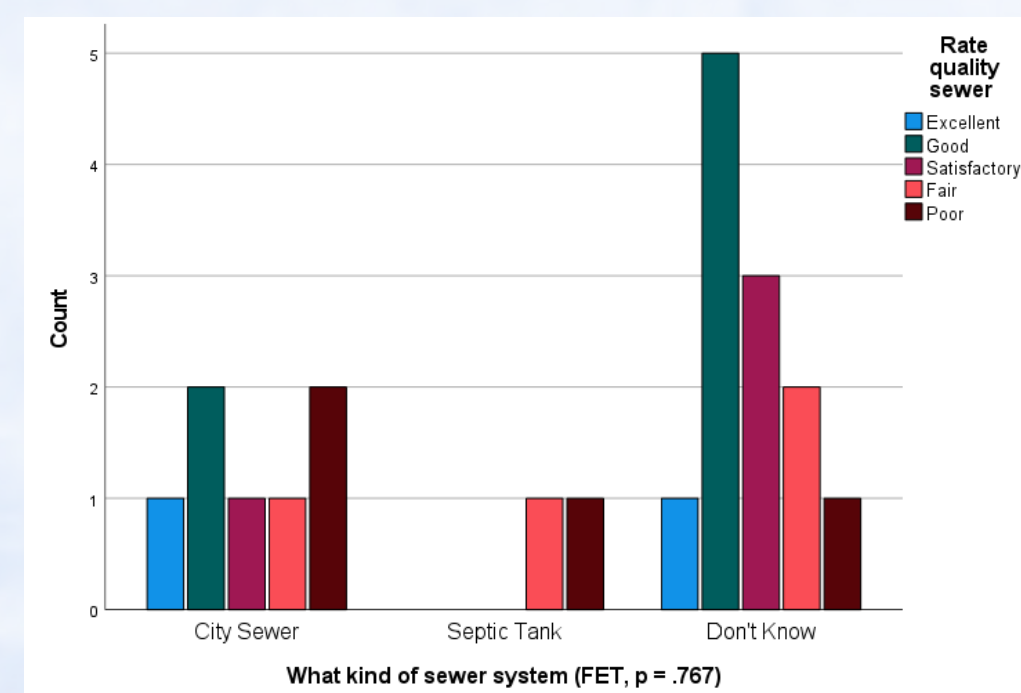
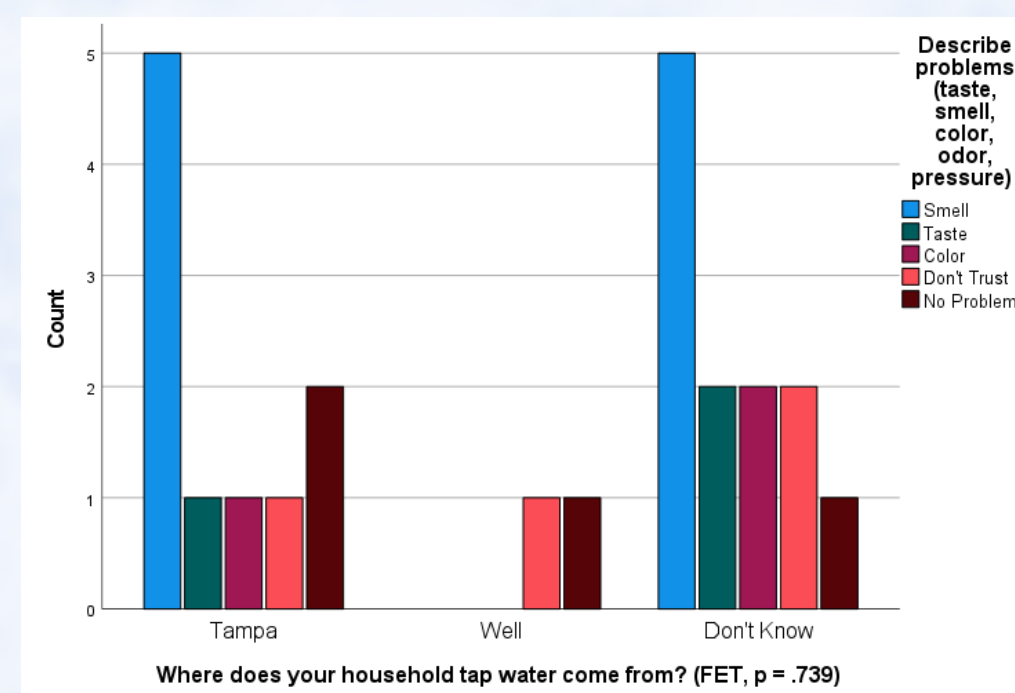
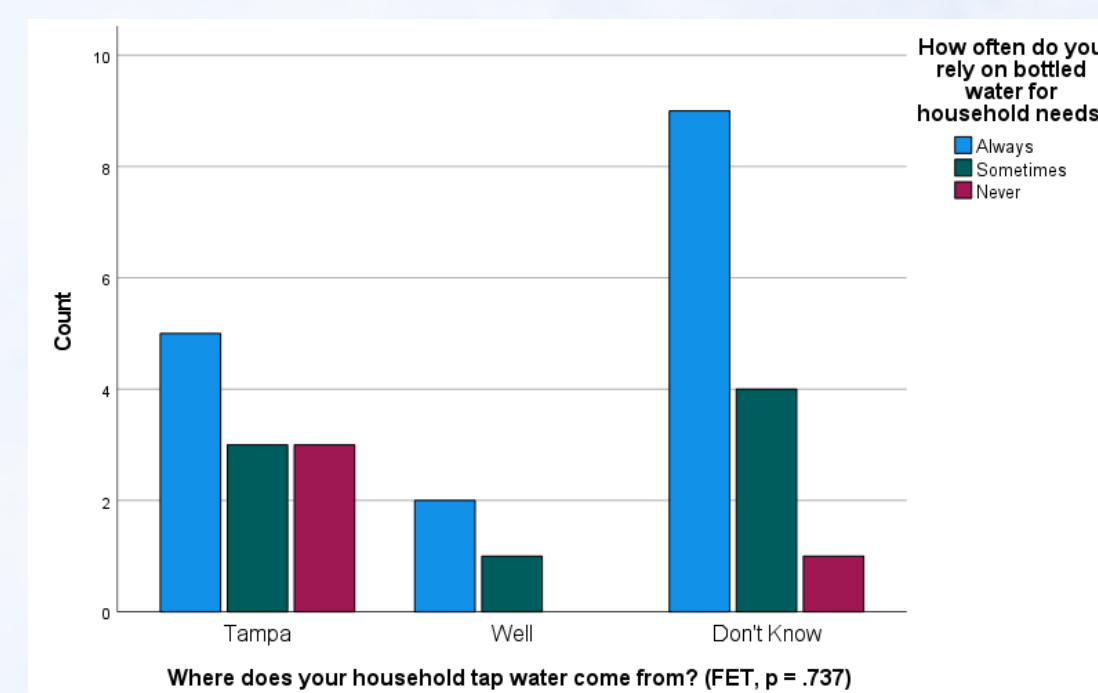
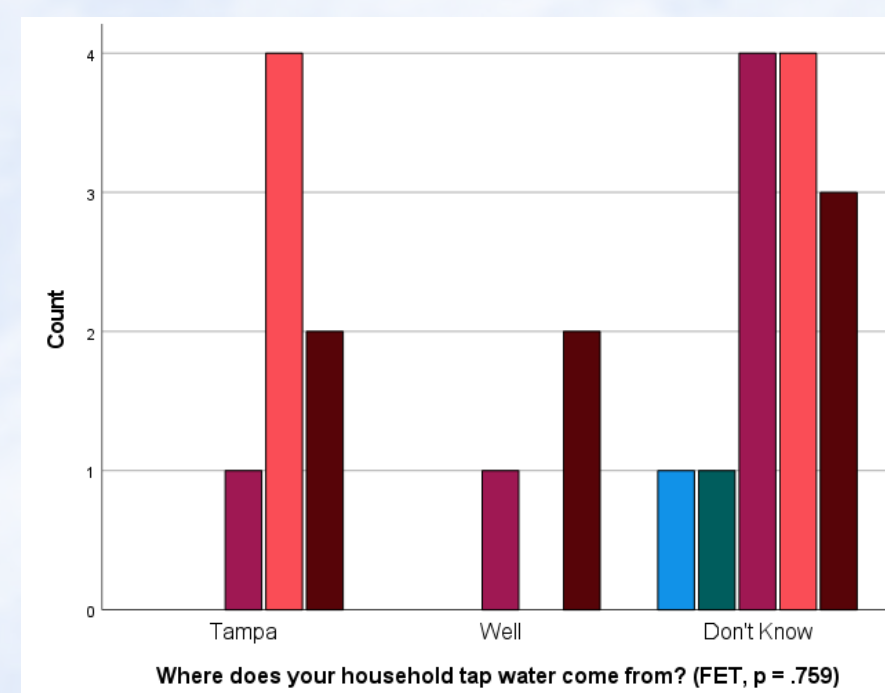
“The property we live at, I feel like it’s contaminated. We can’t drink our water there, you end up going to the hospital. The water is a brown color. You have big rust stains in your tub. You wouldn’t live in a place like that, so why would you subject someone else to live like that?”

—Rachel (UAC resident), interview June 16, 2021

Water & Sewer Challenges

- Reliance on bottled water for drinking/bathing; concerns about tap water quality
- Skin rashes/itching skin from shower water
- Concerns about septic system leach fields being close to drinking water wells
- Constant sewage backups in properties connected to city sewer

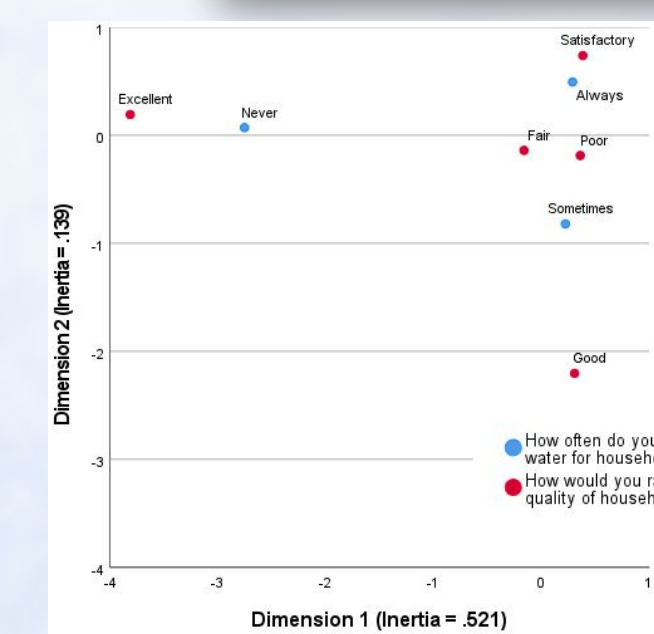
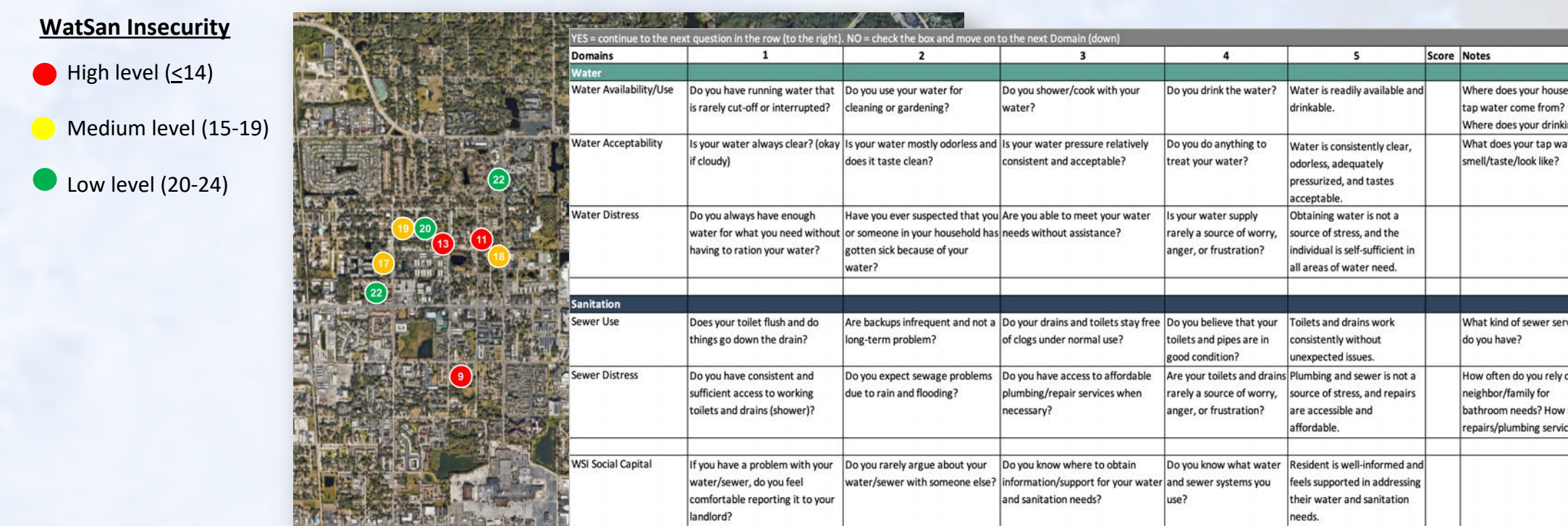
- “My tap water is always brown and smells.”
- “Sometimes the water will be brown, sometimes it will smell like the sewage.”
- “It smells. It was really bad. You can’t drink it, so you’re forced to buy bottled water.”
- “I never drink the water. It is always bottled purchase.”
- “You don’t want to bathe in it, but you have no other choice.”
- “Our babies get UTIs from bathing in contaminated water in the bathroom.”



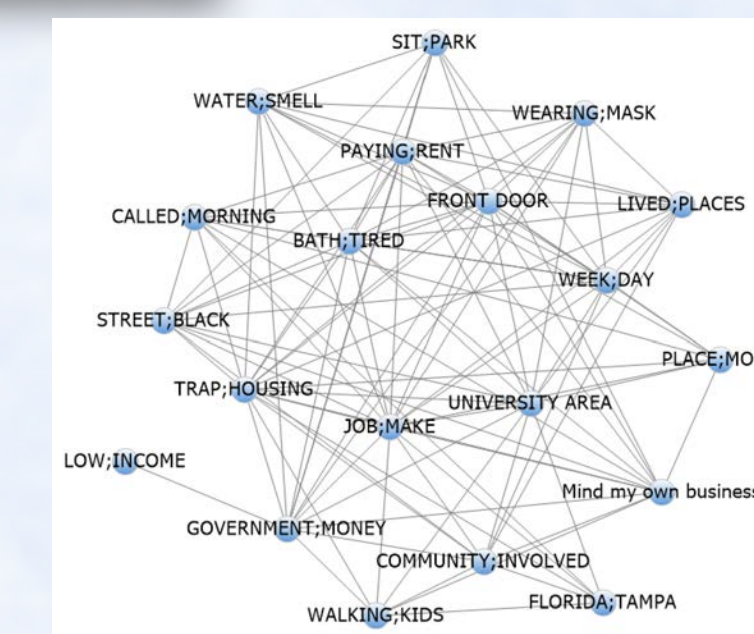
Results

We find contrasting perceptions of WatSan problems and notions of risk between stakeholder groups, which have contributed to misunderstandings and miscommunications about problems and potential solutions to WatSan challenges. Our research reveals potential interventions to WatSan challenges in how interlocal agreements are negotiated between cities and counties regarding water and wastewater service provision. Finally, our research allowed us to develop DWISe — a community-based, participatory rapid assessment tool for evaluating household WatSan insecurity that helps identify households in the community at greater risk for WatSan insecurity.

DUUC WatSan Insecurity Scale (DWISe)



Correspondence analysis plot (n=23). Total inertia = .66; Fisher's Exact Test, p = .04



Network visualization of a text link analysis using the tf-idf statistic to extract key topics from interviews based on their weighted frequencies of occurrence

“Studying Up”: Interviews with City/County Utilities Staff

“The reality is that the city’s first obligation is to its residents, inside the city limits. If money is tight and resources are limited, the city is going to choose to serve its citizenry first. So people outside the city limits, even though they’re in [the city’s water and sewer service area], even though they’re their customers, they’re going to take the backseat. And that’s just a reality.”

—Jim (City of Tampa), interview July 6, 2021

“We don’t put in pipes for free. So if there’s a bunch of septic tanks out there and they want to hook up to us, they have to pay the fees, and if we have to extend the pipe, then they have to pay for that too.”

—Mark (Hillsborough County), interview July 13, 2021

“There’s a difference between contaminated and just, ‘I don’t like the water.’ That’s what we call aesthetics. That’s not a public health issue... You can drink, crappy tasting groundwater all day long and it’s not necessarily a health consequence to you... What you smell in the water doesn’t necessarily mean it’s bad for you.”

—Dan (Hillsborough County), interview June 28, 2021

Key Findings

- Residents report a wide range of water quality problems, identified mostly by taste, color, and odor. Some respondents also connect poor health outcomes with poor water quality. This leads to a high dependence on bottled water, neighbors, and area businesses. This includes water for drinking, cooking, and bathing.
- These problems have led to tap water mistrust, where: (1) water may be perceived as dangerous but is not necessarily unsafe per existing regulations; (2) treated (city) water, while safe to drink, may not be seen as drinkable water.
- Sewer backups characterize most sanitation problems.
- Water and sewer infrastructures are managed independently and differently between the city and county. Thus, there are managerial and policy disconnects in being able to address joint water-sanitation challenges.
- Water utilities apply a techno-scientific approach to risk (e.g., “experts” assess, measure, and calculate risk as a probability that can be used to inform decision making).
- Residents’ understanding of risk is a manifestation of broader social and historical processes (e.g., notions of risk are embedded in different understandings of “contamination” as expressed and experienced by people differently).