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ABSTRACT

As urban cities make strides in the development of novel water technologies and infrastructure, there has been a paradoxical rise in the prevalence of water and sewerage unaffordability. Research into social determinants of water accessibility and public health impact in urban households is in early stages.

Purpose: To identify financial and environmental factors and health outcomes associated with water shut-offs in Detroit

Methods: Retrospective cohort design; Standardized follow-up interviews; Qualitative and quantitative analysis for thematic frequency and environmental, economic, and social risk factor associations

Results: Preliminary findings- 47% of households experience continuing water insecurity; poor health status associated with shut-off risk and harms

Conclusion/Next Steps: The results of this ongoing study will guide further studies and evidence-based policies to improve water affordability

INTRODUCTION

Global Context

- 844 million people lack access to clean water
- 432,000 deaths each year are attributed to lack of sanitation
- Accounts for about 10% of the global disease burden
- The Food and Water Watch study highlights that cities with the highest shutoffs have greater poverty and unemployment rates, as compared to cities with the fewest shutoff rates in the country

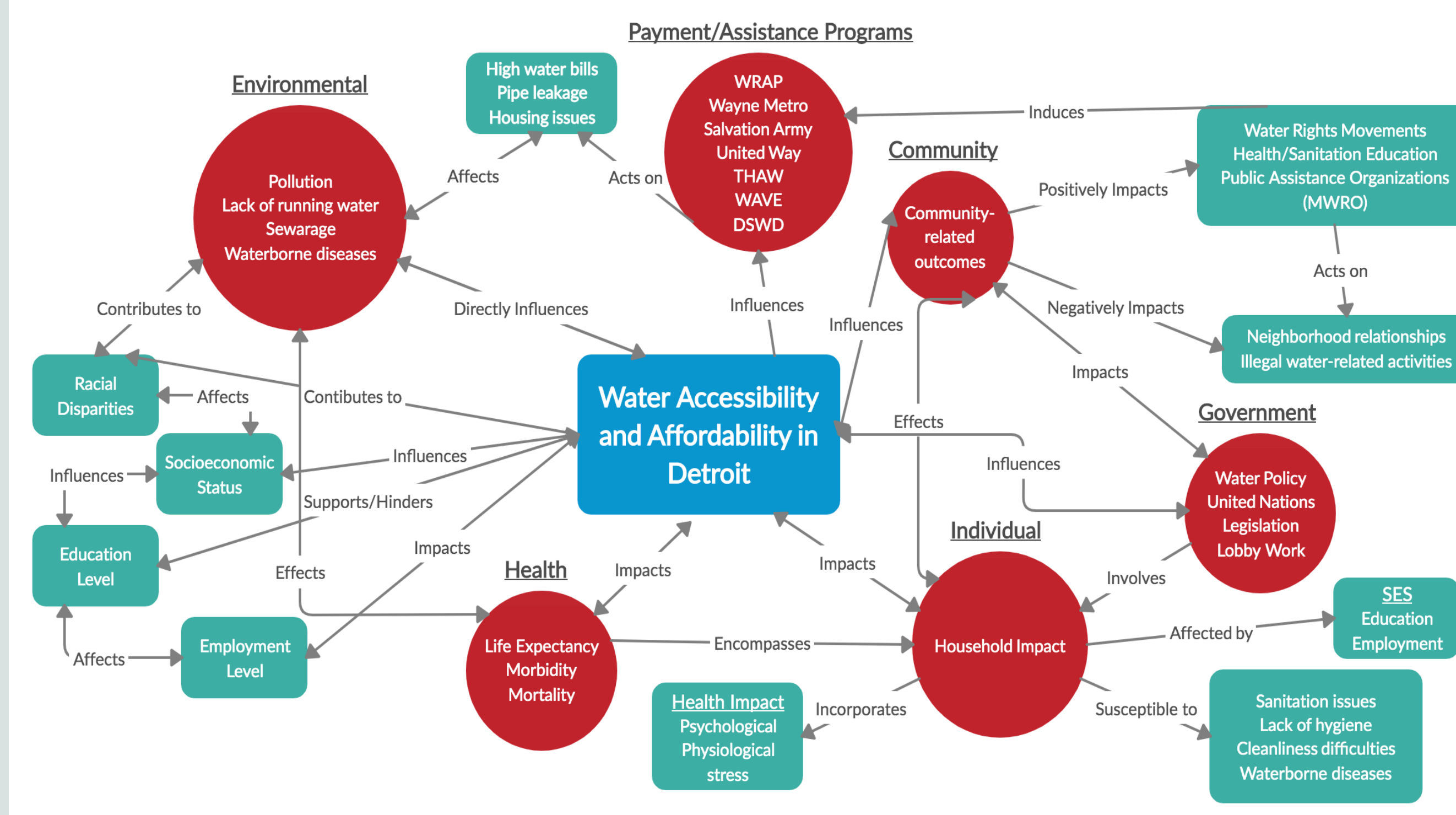
Local Context:

- Detroit ranks 9th in the nation for highest water shutoff rates (2016)
- Minorities and low-income families are disproportionately affected
- Annual average use of 60,000 gallons of water creates a cost burden of 10.6% of Median Household Income for low-income families in Detroit (2.5% recommended)
- Detroit Water and Sewerage Dept. disconnected water service to 1 in 9 homes for nonpayment in 2019

METHODS

- Community based participatory research collaboration with the Michigan Welfare Rights Organization (MWRO) and families served
- Standardized, follow-up telephone/in-person survey
- Retrospective data on health status along with social, financial, and physical barriers experienced
- Created a series of spreadsheets of cases linked to follow-up data with the intent to generate a comprehensive database of Detroit's water insecurity
- Collaborated with Detroit People's Water Board to support advocacy efforts to advance evidence-based policies for increasing water security at a local and statewide level

Concept Map: Factors Contributing to Water Access & Quality



Average Sample Characteristics

- 36 households surveyed
- Household Size: 3.35 people
- Minors Living in Home: 44.4%
- Monthly Income: \$1236.56
- Water Bill Amount: \$115.25
- Payment Plan: 38.8% of households
- Experiencing Health Problems: 66.67% of households

Acknowledgements

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RESULTS

Figure 1: Map documenting reported water shut offs

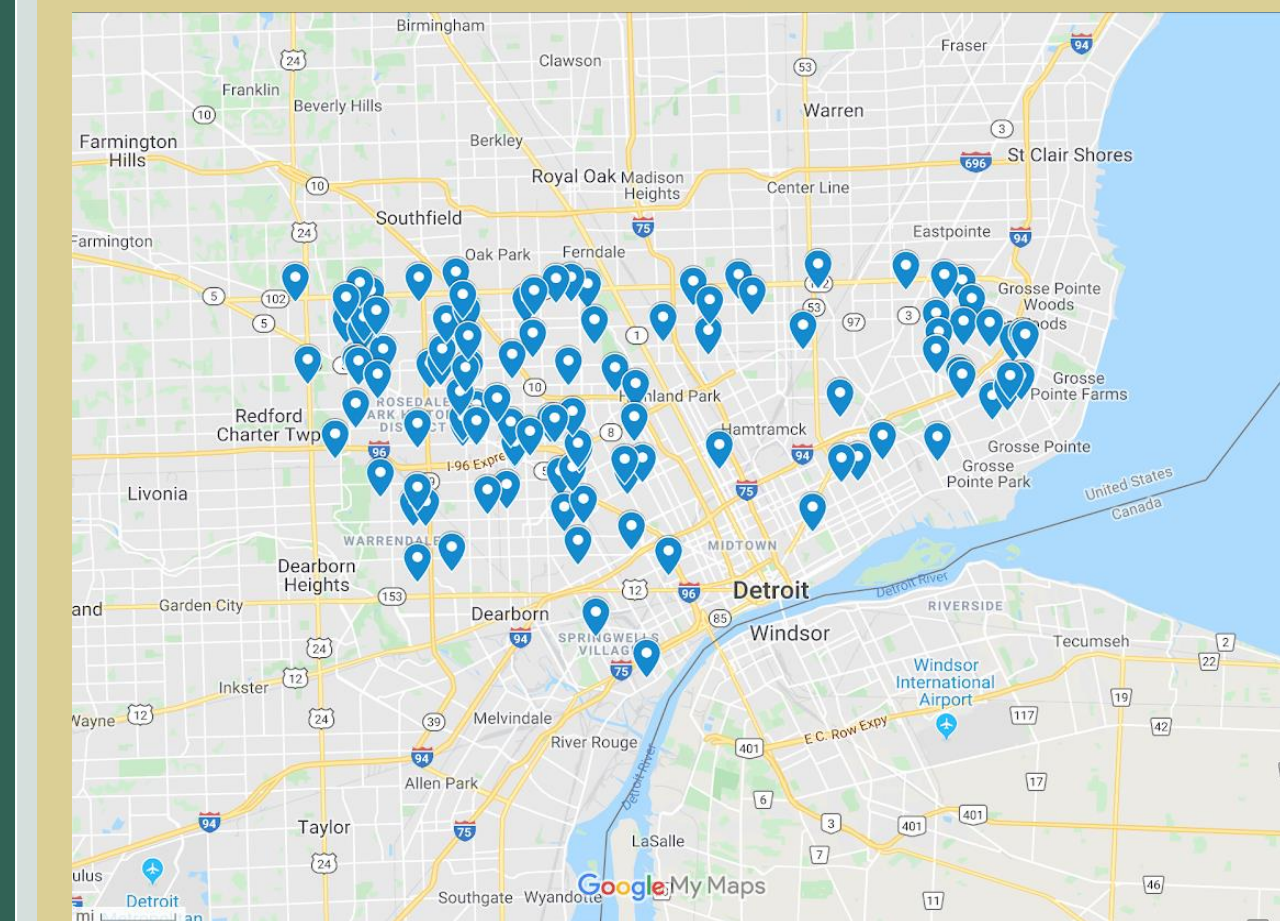


Figure 2: Negative health outcomes during and after water shutoffs

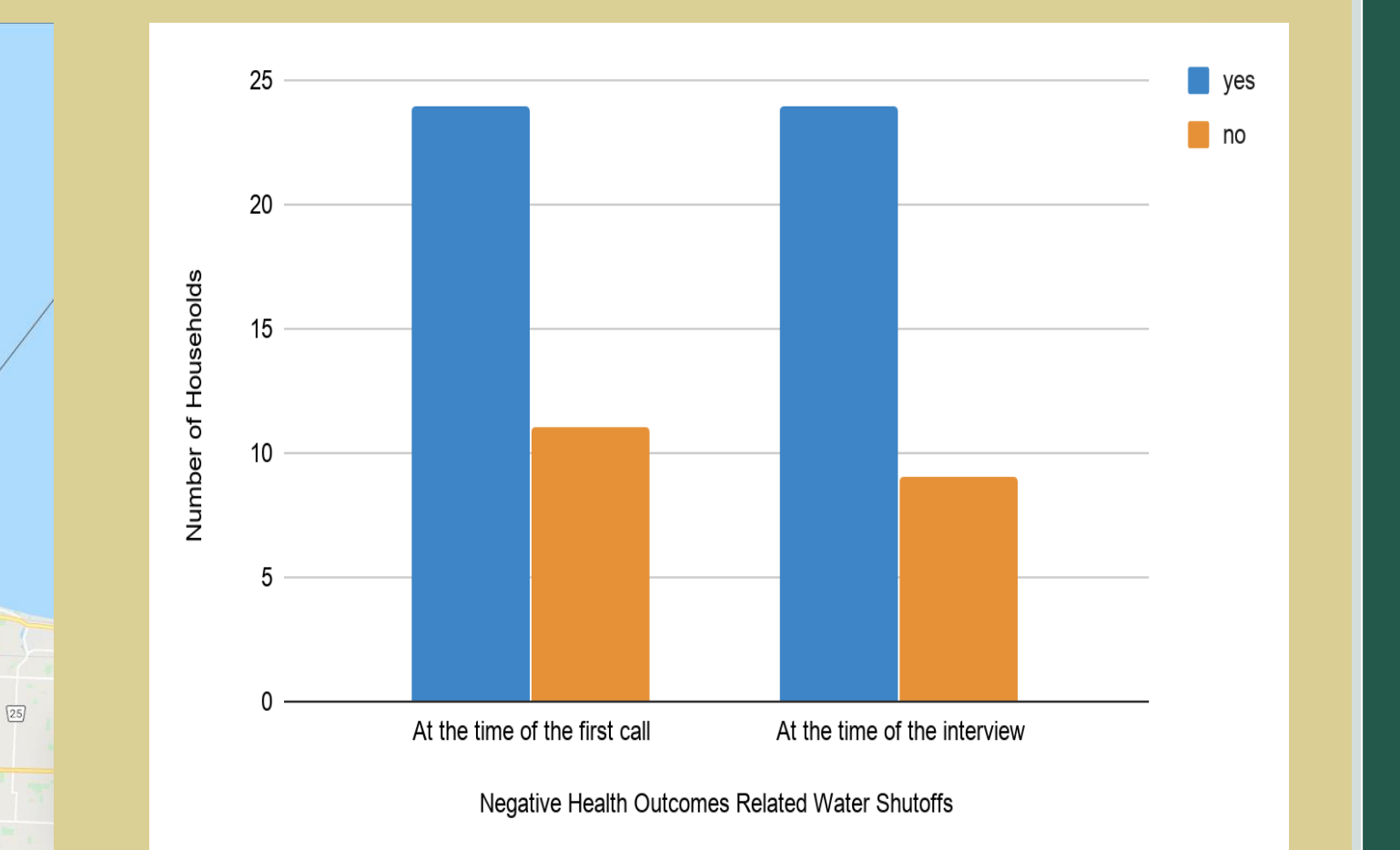
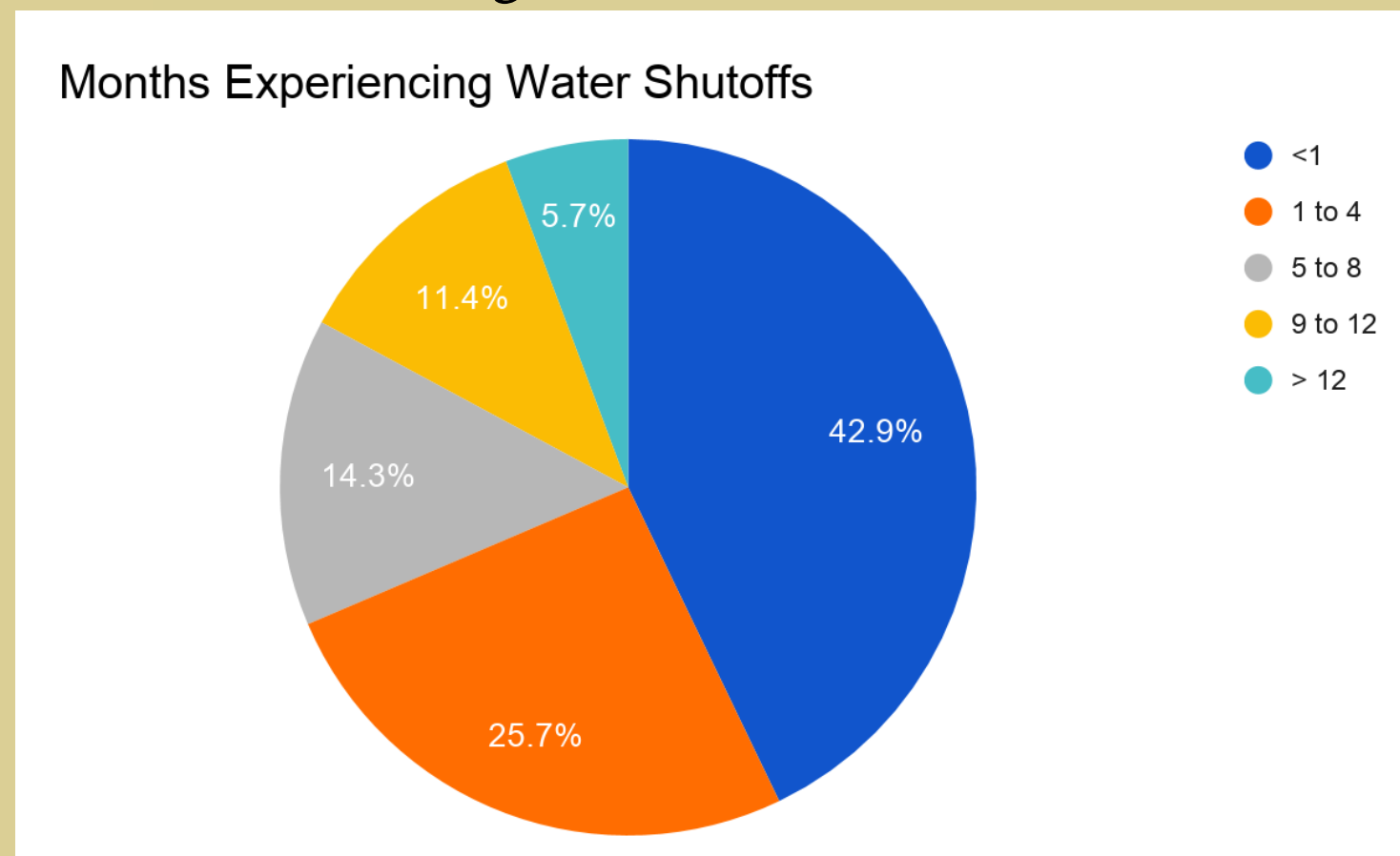


Figure 3: Amount of time interviewees lacked access to running water



- Economic and health challenges were the major factors influencing water insecurity as they impacted low-income family's ability to pay their water bills
- 20 of 27 individuals responded that the payment plans are unaffordable and unsustainable with their current income
- 32 individuals responded that they believe the government should help ensure water affordability, while 4 individuals chose not to respond

CONCLUSIONS & PUBLIC HEALTH IMPLICATIONS

High water and sewerage costs relative to income is the most common factor contributing to water insecurity. Water access impacts participation in the workforce, educational systems, and common public spaces. Lack of water access increases the risk of waterborne disease and corrosion in water/wastewater infrastructure systems, due to stagnant water in the pipes. It appears that water shutoffs for 1-4 months increase the risk of dehydration and poor sanitation. Residents pay bills based on what is needed to preserve the quality of life. Many had to choose between paying the water bill, buying groceries, or paying for heat/electricity. Water policy must equitably assess the economic burden of water costs and ensure access for economically disadvantaged communities.