

Citizen-Administered Water Quality Tests: Case Study from Ahmedabad



Jonars B. Spielberg¹, Reecha Das², Ashish Ranjan², and Ankur Sarin²
¹Sociotechnical Systems Research Center, Massachusetts Institute of Technology, Cambridge, MA
²Public Systems Group, India Institute of Management–Ahmedabad, Vastrapur, Ahmedabad, India



Background

Ahmedabad is the sixth largest city in India and, with more than 6 million people, the largest in the western state of Gujarat. Anchored by Ahmedabad, Gujarat is a prospering hub of business and industry: the state accounts for 5% of India's population but generates 16% of industrial output and 22% of exports [5].

However, Ahmedabad also has a history of social unrest, exemplified by sectarian violence that led to 2,000 deaths, largely Muslims, in one month in 2002. More recently, the \$200 million Sabarmati Riverfront project reclaimed 11 km of land for public promenades and plazas, triggering the eviction and relocation of 12,000 riparian slum residents to government housing blocks. Such experiences undermine many residents' faith in the social contract with the state.

The body responsible for water supply, the Ahmedabad Municipal Corporation (AMC), has provided 85%-90% of households with on-plot piped water connections [4]. Yet, specific areas are systematically neglected [3]. Poor infrastructure and increasing demand, and seasonal weather events inflate contamination risk between distribution and collection points. Intermittent supply necessitates water storage, causing further contamination [2,4]. Thus, water quality at the household remains highly variable and largely unknown.



Objectives

As households are generally unaware of their water quality, what role might citizen monitoring—via low-cost, decentralized water testing—play for enhancing individual agency and government accountability? Two objectives follow:

- To determine the acceptability and usability of H₂S tests—a cheap, simple presence/absence test—among lower-income households; and
- To assess the degree to which a simple technical intervention engenders action.

Methods

Structured household survey: perception of H₂S test (completed, March 2015)

- Purposive sample of 234 households in 6 low-income neighborhoods

Semi-structured interviews (in process)

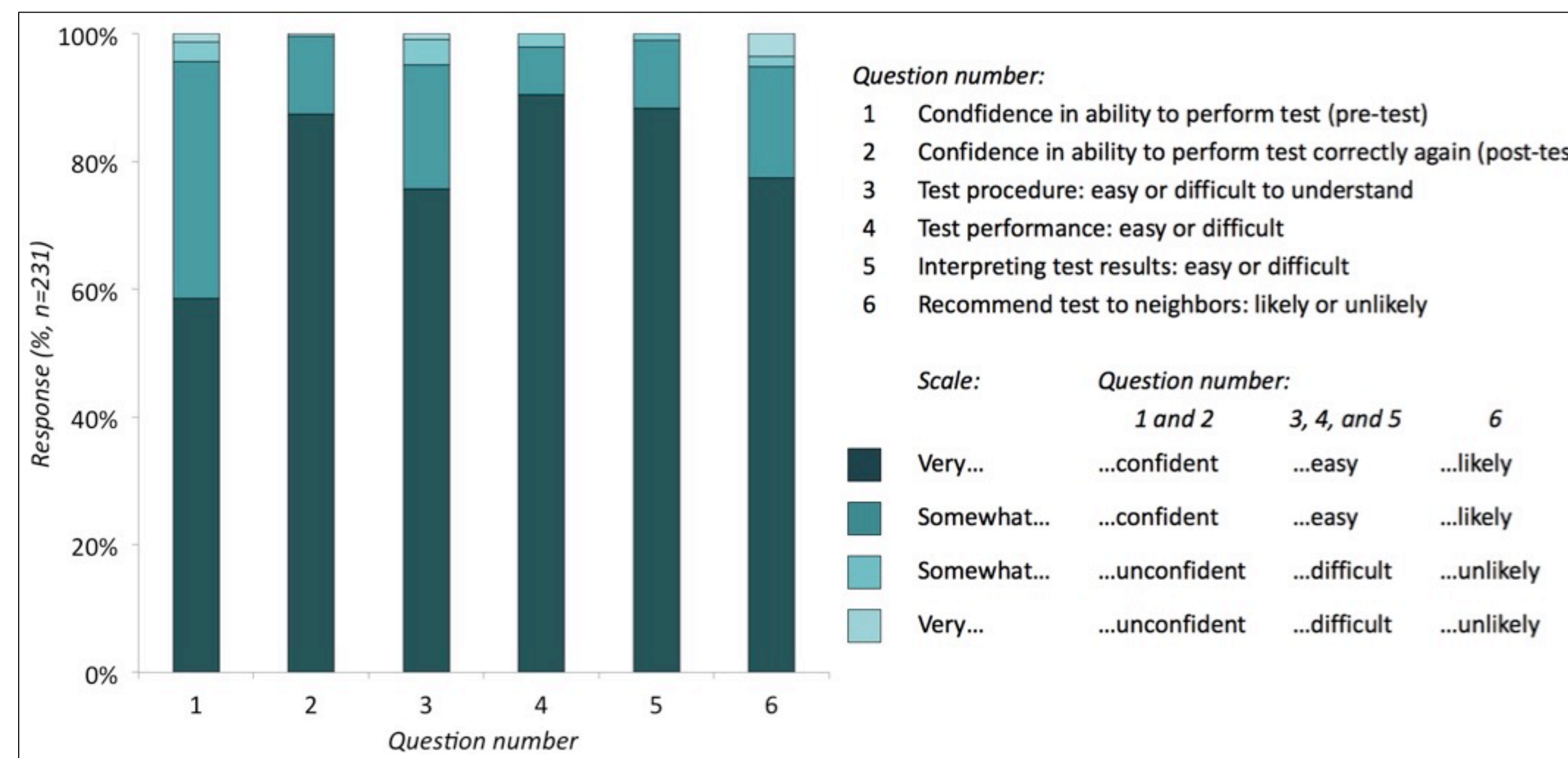
- Ward officers at various offices throughout Ahmedabad
- Subset of households whose water samples yielded positive results



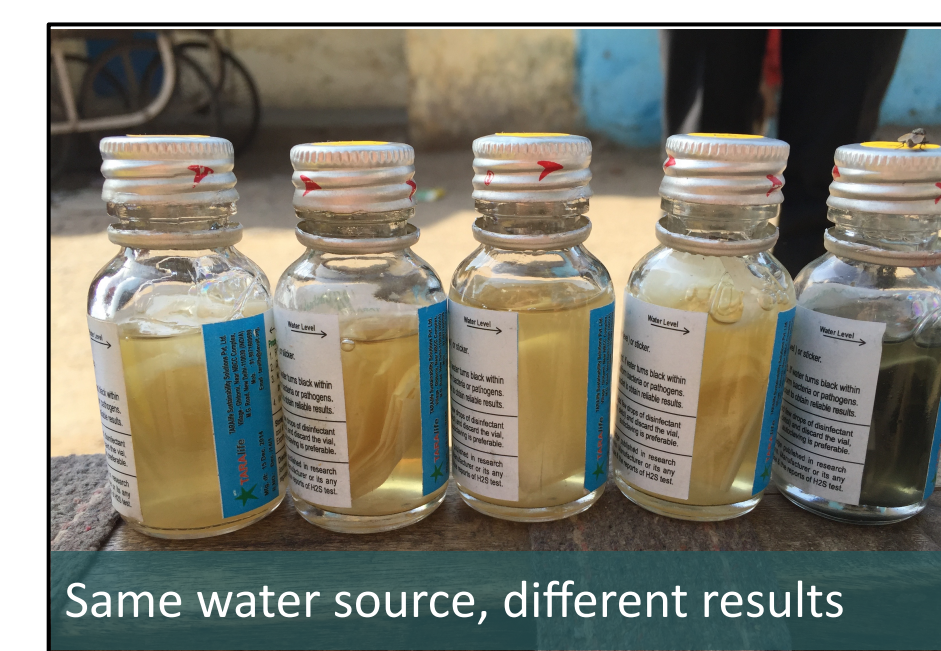
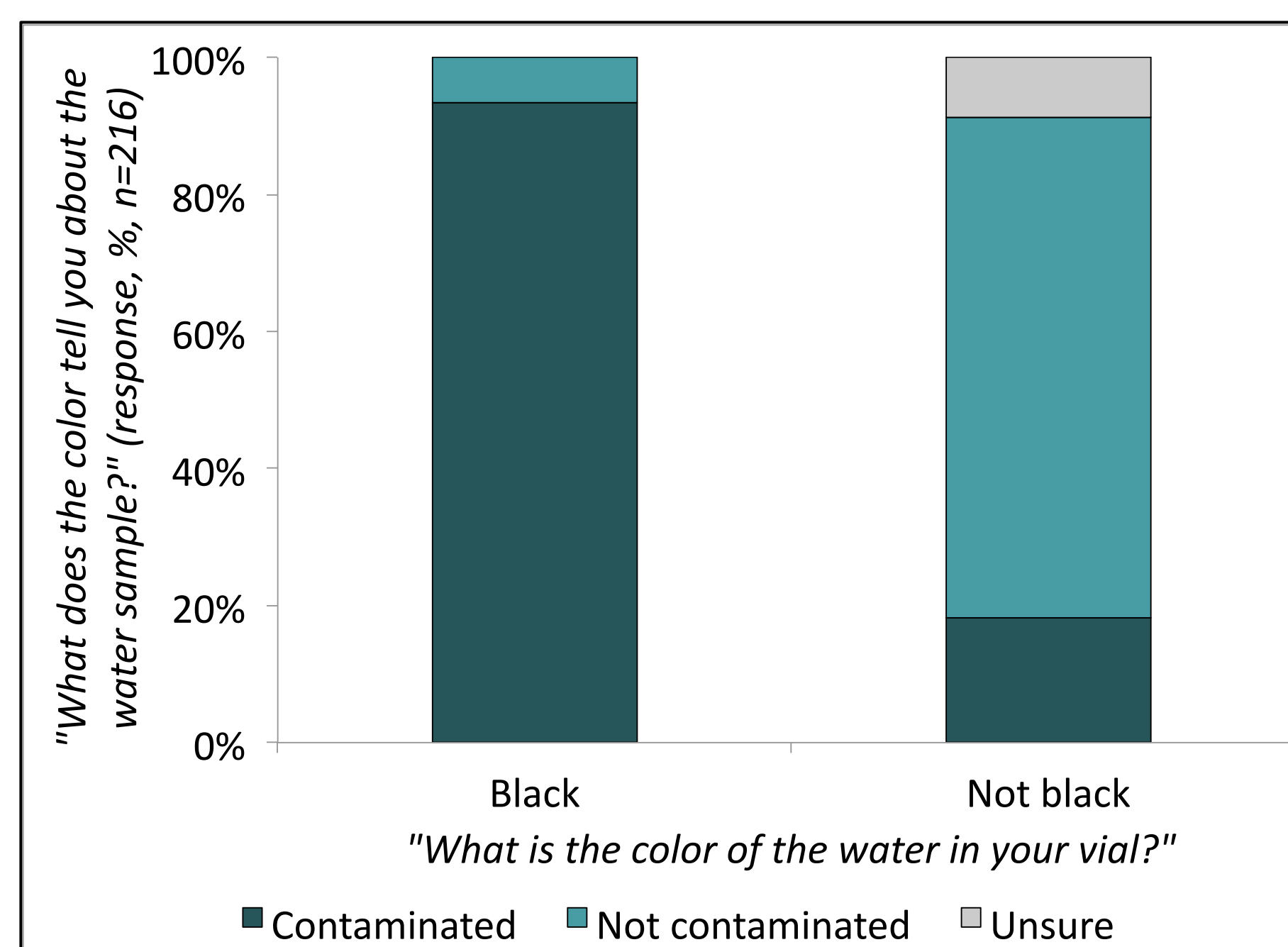
Results and Findings

H₂S tests were deemed appropriate and desirable by households, and the knowledge they provided proved valuable.

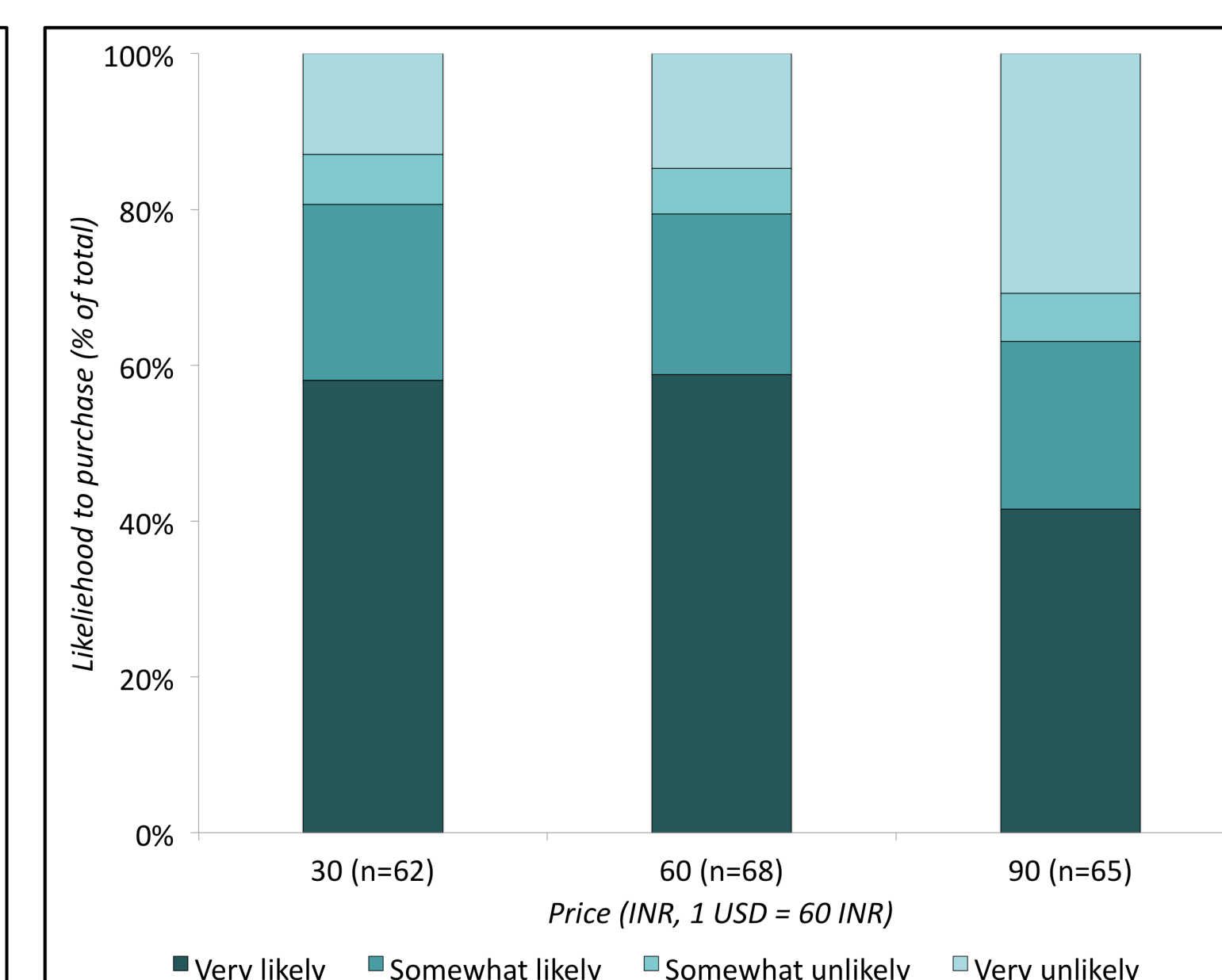
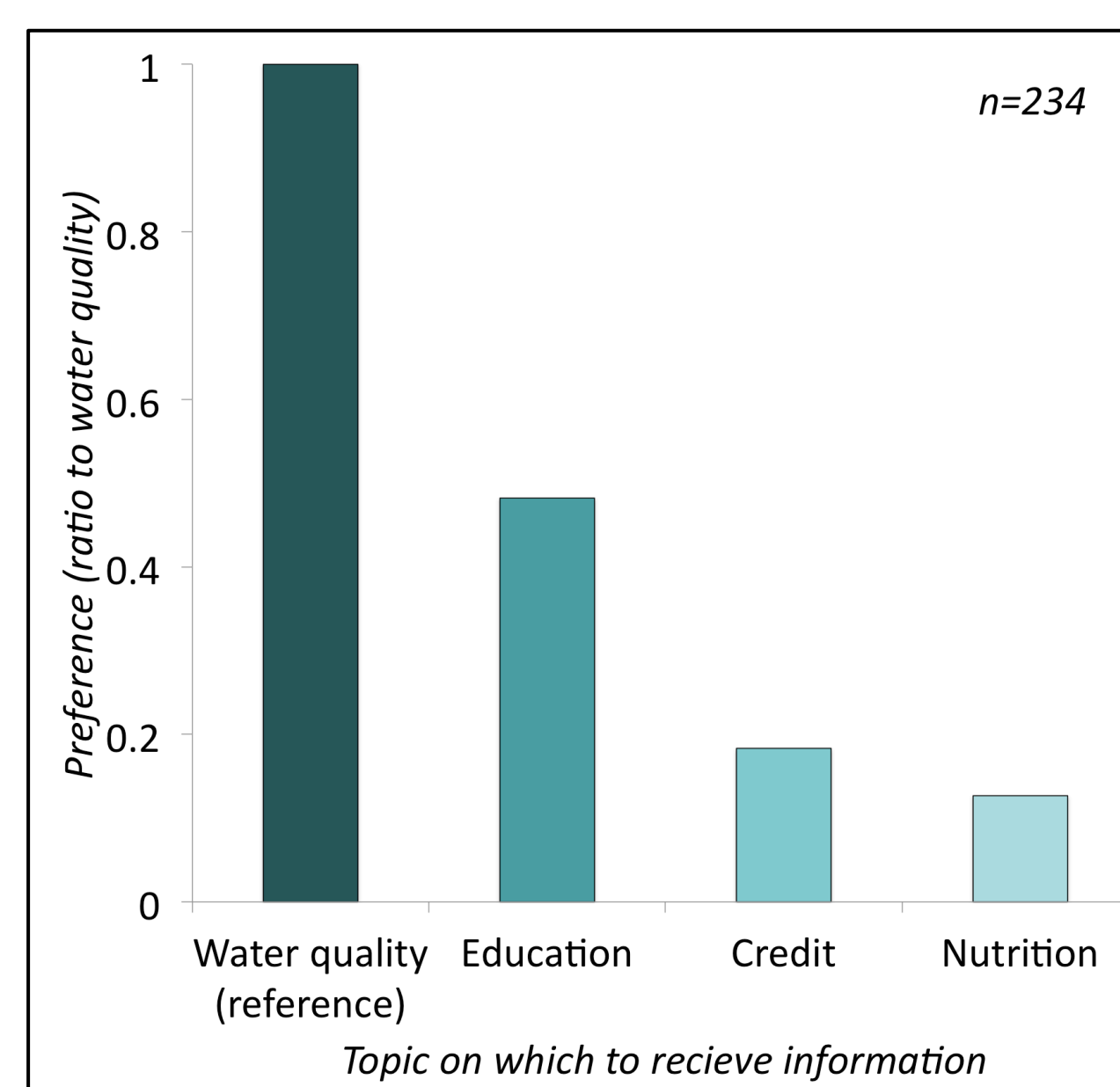
Confidence in performing the test correctly was high, the test procedure was simple, results interpretation was straightforward, and people were likely to recommend the test to neighbors.



Individuals interpreted test results correctly for the most part, though misinterpretation did occur, often due to difficulties assessing changes in color.



Information on water quality was preferred over other types of information by a factor of between 2 and 8, and the likelihood of purchase was high, even at triple the current price of 30 INR (\$0.50).



Results and Findings (continued)

Few people took action upon observing a positive test result.

Of the few who did take steps to improve their water quality, the most common action was to boil water more often, followed by finding alternate water sources in nearby communities they believed to be cleaner. Of the 53 individuals (out of 196, or 23%) whose vials yielded a positive result, only 4 said they planned to approach government authorities. Available short-term alternatives, which required less effort, were therefore favored over approaching local authorities.

Lack of community cohesion, especially in government-relocated housing blocks, made efforts in collective action largely untenable. A general perception that little can be achieved through formal complaint mechanisms pervades, coupled with scant awareness of administrative and political avenues for redress.

Conclusions and Future Work

Overall, knowledge of water quality was valued but, in and of itself, did not ameliorate individuals' ability to hold the state accountable for lapses in service and quality, nor did it significantly impact individual behavioral outcomes.

Though individuals reacted positively to the H₂S test, its ability to foster change in the absence of substantive structural and institutional changes—at the community and/or municipal level—remains dubious. While the test partly helps overcome the information asymmetry that is at the core of citizens' inability to monitor authorities and demand accountability, it may also be inimical to the citizen-state social contract by increasing the disillusionment of citizens with their government [1]. Indeed, despite its vibrant civil society, India's poor, disadvantaged urban communities are often excluded from socio-political processes that would otherwise help them secure basic needs.

To understand the governance challenge from the provider's perspective, we plan to take test results to local officials responsible for water quality and document their perceptions and responses to the use of such self-administered technology. We also intend to return to communities to oversee focus group discussions aimed at bringing households together as a means of empowering them to devise and execute solutions to their persistent water quality problems.

References

1. Bauhr M and Grimes M. April 2014. "Indignation or Resignation: The Implications of Transparency for Societal Accountability." *Governance* 27(2): 291-320.
2. CITE. October 2015. "Experimentation in Product Evaluation: Household Water Filter Evaluation in Ahmedabad, India." Product Evaluation Report, Massachusetts Institute of Technology.
3. Patel S, Sliuzas R, and Mathur N. April 2015. "The Risk of Impoverishment in Urban Development-Induced Displacement and Resettlement in Ahmedabad." *Environment and Urbanization* 27(1): 231-256.
4. Yadav SM, Singh NP, Shah KA, and Gamit JH. 2014. "Performance Evaluation of Water Supply Services in Developing Country: A Case Study of Ahmedabad City." *KSCE Journal of Civil Engineering* 18(7): 1984-1990.
5. —. 7 July 2015. "India's Guangdong: Gujarat's Economy." *The Economist*. Available online: <http://www.economist.com/node/18929279>

Acknowledgements

This research was funded by the United States Agency for International Development, and completed as part of the Comprehensive initiative on Technology Evaluation (CITE). The research was approved by the MIT Committee on the Use of Human Subjects as Experimental Subjects (COUHES), Protocol # 1412006824, in January 2015.

