Abstract

Throughout the American South, some communities were excluded from municipal water services as a result of racial segregation, and some of the resulting disparities persist. The quality of well water in such excluded communities and the resulting health implications are not well understood. We tested the microbiological quality of water samples from private wells in 57 households selected at random from neighborhoods previously identified as excluded from nearby water service in Wake County, North Carolina. In addition, we used a population intervention model to estimate the number of acute gastrointestinal illness emergency department visits preventable if water service were extended to all 6,600 residents of such excluded communities. Overall, 29.2% of samples tested positive for total coliform bacteria, compared to 0.566% of samples in the adjacent community water systems. Among the 57 households, 65% tested positive for at least one indicator of microbial contamination. An estimated 3.4 (95% CI: 2.2-5.0) monthly emergency department visits for acute gastrointestinal illness (21% of all such visits) could be avoided by connecting excluded neighborhoods to community water systems. These health disparities should be considered in future cost-benefit analyses of projects to extend water service.

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