USE OF COMMUNITY–DRIVEN RESEARCH TO ASSESS BUILT ENVIRONMENT DISPARITIES AND THE VULNERABILITY OF WATER AND SEWER SERVICES IN UNDERSERVED ENVIRONMENTAL JUSTICE COMMUNITIES

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Background and Aims. Some low-income, communities of-color in the United States rely on a complex mixture of unregulated private wells and septic systems and inadequate public drinking water and sewer services. The West End Revitalization Association (WERA) developed and used the community-owned and -managed research (COMR) to assess disparities in the built environment with a focus on the quality of publicly regulated sewer and water infrastructure.
Methods. Community monitor (CM) training workshops and drinking water and surface water tests of fecal pollution were completed at private (target) and regulated public (referent) service households in three low-income African-American communities in Mebane, North Carolina. ArcGIS was used to map sewer and water infrastructure by race/ethnicity to assess disparities in infrastructure. We performed a cross-sectional household drinking water and sewer service survey and measured fecal pollution levels in drinking water and surface water supplies in the communities. Differences in turbidity (NTU) and fecal microbial indicator concentrations at target and referent sites in WERA neighborhoods (MPN/100ml) were evaluated using SAS version 9.
Results. Maps of sewer and water infrastructure showed disparities in access to this infrastructure by race/ethnicity in Mebane, North Carolina. CMs collected survey data showing a mixture of failing private wells and septic systems and regulated public drinking water and sewer infrastructure. Septic system failure ranged from 11-18%. Higher turbidity levels were observed in private wells compared to regulated public drinking water ($p<0.0001$). There was little statistical evidence of differences in surface water fecal pollution at target and referent sites. Drinking water and surface water fecal pollution levels exceeded maximum contaminant levels at several target and referent sites.
Conclusions. Drinking and surface water fecal contamination levels suggest a need for provision of improved water and sewer services to protect health in these underserved and marginalized EJ communities and more enforcement of regulations.