Title: Development and Validation of an Instrument to Measure Household Water Insecurity Across Cultures: The Household Water InSecurity Experiences (HWISE) Scale

Water insecurity, the inability to access and benefit from affordable, adequate, reliable, and safe water for wellbeing, has manifold adverse effects on physical and mental health, and is a major contributor to the global burden of disease. Although the need for water is universal and its safe access is considered a critical Sustainable Development Goal (SDG 6.1), there is no metric for assessing household water insecurity in a cross-culturally valid way. Indeed, the ability to measure household food insecurity across settings has transformed policy, allowed for more rigorous examination of its social, political, and health consequences, and provided more accurate tracking of the Sustainable Development Goals. An analogous measure of water insecurity should be similarly informative and useful across many disciplines. Therefore, we developed a consortium of multi-disciplinary scientists to facilitate the implementation of a household water insecurity survey across 28 ecologically and culturally diverse field sites to inform the development and validation of a short, easy-to-use scale. Both Classical Test Theory and Item Response Theory are being applied to determine which survey items are most strongly associated with water insecurity, and related with health, economic, and nutrition consequences. Our current findings suggest that although water insecurity has many different manifestations, there are universal experiences that can be tracked over time. The implementation of this instrument in large-scale surveys will permit the determination of the prevalence of water insecurity, the adverse outcomes associated with water insecurity (e.g. increased depression, disease), and to evaluate the impact of interventions and programs that seek to improve access to safe water in sufficient quantities. More generally, this scale will provide new insights into the causes and consequences of water insecurity and progress towards the Sustainable Development Goals.