

WATER, WATER EVERYWHERE, NOR ANY DROP TO DRINK? OCEAN SALINITY, EARLY-LIFE HEALTH, AND ADAPTATION

Amanda Guimbeau¹, Xinde James Ji², Nidhiya Menon³ and Zi Long³

¹Université de Sherbrooke, Sherbrooke, QC, Canada

²University of Florida, Gainesville, FL, USA

³Brandeis University, Waltham, MA USA

Sea level rise poses serious threats to vulnerable coastal communities in developing nations, with children especially vulnerable. In this study, we examine the health and social impacts of salination caused by seawater intrusion. Specifically, we examine whether these early life health impacts result from in-utero salinity exposure in the spirit of the fetal origin hypothesis.

We focus on the coastal belt of Bangladesh, an area with more than 10 million poor people and one of the most severely impacted by salt intrusion in the world. We construct a panel dataset on the birth history and health outcomes of children under the age of 5 from the Bangladesh Demographic and Health Surveys (DHS) spanning 1993-2018. We then link that with geospatial data on ocean salinity levels, ocean chemistry, and local weather and climate. To examine the impact of salinity exposure, we use a saturated panel fixed-effects regression model that includes location-specific seasonality and regional trends while also controlling for child, mother, and household characteristics.

Results show that increased in-utero salinity exposure significantly raises the chances of a child experiencing nutritional deficiencies. A one-standard-deviation increase in such exposure reduces a child's height-for-age z-score by 0.114 standard deviations. Salinity exposure also increases the chances of wasting and underweight conditions. The impact is likely driven by the income channel: salinity exposure prompts agriculture to shift from irrigated to rainfed rice, which is salt-tolerant but has less yield. Families with higher salinity exposure also tend to neglect formal prenatal care, neonatal care, and vaccinations.

Our work complements the growing literature quantifying the unequal social impact of climate change. Few studies have investigated the social impact of coastal salination in a developing country context, a problem that will exacerbate in the next century due to climate change. We also complement public health and economics literature on the link between prenatal environment shocks and later-life outcomes, and on the public health impacts of salt intake.

PRESENTER BIO: Dr. James Ji is an assistant professor at the Food and Resource Economics Department, University of Florida. An environmental economist, his work seeks to understand the economic, social, and public health impact of environmental and climate change domestically and globally.