Our research group studies the ways in which social and environmental conditions - from climate change to agricultural practices to urbanization - impact the emergence and transmission of water-borne diseases. We use multi-disciplinary approaches including field-based surveillance, next generation genomic sequencing and biostatistical analysis to identify vulnerable populations and improve disease surveillance methods.

Estimating the potential impacts of climate change on water-borne disease transmission

Climate change has the potential to impact the distribution of water-borne diseases but the causal pathways are complex, and health impacts likely depend not only on meteorological exposures but other underlying vulnerabilities. We are interested in estimating relationships between predicted changes in climate (such as increased ambient temperature and heavy rainfall events) and water-borne diseases, developing models that explore the extent to which climate-health relationships to vary across factors such as population density, access to safe water and pathogen distribution.

Climate change, urbanization and emerging infectious diseases

Outbreaks of mosquito-borne viral diseases have increased in frequency and magnitude over the last 20 years as a result of multiple factors including climate change, globalization, and urbanization. The viruses, Zika, Dengue, Yellow Fever, and Chikungunya, are transmitted by Aedes mosquitoes, which thrive in urban areas. Aedes mosquitoes and Yellow Fever have long been present in West Africa and rapid urbanization may be increasing available habitat for Aedes mosquitoes. We are studying the association between social and environmental conditions, and the distribution of Aedes mosquitoes in order to identify vulnerable populations and inform surveillance and control measures.
What is driving the reemergence of Schistosomiasis in China?

Despite aggressive disease control efforts and remarkable progress in the control of schistosomiasis in China, it has reemerged and persisted in some areas. We are working with collaborators at the Sichuan Center for Disease Control and Prevention in order to understand why these pockets of transmission persist. Current efforts are underway to understand sources of infections in residual transmission hotspots.

Research opportunities

- Work with the schistosomiasis team to design and carry out surveys on mammalian populations and their contact with snail habitat in our study villages in China
- Statistical analysis of recently collected data including on transmission pathways of schistosomiasis and opisthorchiasis
- Other projects depending on skills and interests of the group

Requirements

- Great problem-solving skills, work well with others, creative thinking, positive attitude

Additional skills that may be useful (but are not required)

- Mandarin language skills
- Epidemiological and/or biostatistical skills
- Experience working with genomic data
- Prior experience carrying out field-based public health or ecological studies

For more information, visit our research group website:

http://www.ucdenver.edu/academics/colleges/PublicHealth/resourcesfor/Faculty/carlton/Pages/default.aspx

If you are interested in joining our Research Group, contact Dr. Elizabeth Carlton: Elizabeth.Carlton@ucdenver.edu