Introduction

- Challenges often exist in accessing safe drinking water in remote, Northern Canadian communities.1
- These challenges have important human health implications, particularly in terms of waterborne diseases.
- Specifically, acute gastrointestinal illness including diarrhea and/or vomiting, can be acquired via environmental sources such as food and water.2
- One of the highest rates of self-reported acute gastrointestinal illness was in Iqaluit, Nunavut.3
- The People, Animals, Water, and Sustenance (PAWS) Project was developed to create a participatory, community-based monitoring system to identify potential sources of pathogens that may cause acute gastrointestinal illness in Iqaluit.

Research Goals

- The water portion of this project explored potential waterborne disease transmission in Iqaluit by:
  I. Estimating the prevalence and concentrations of Giardia and Cryptosporidium parasites in untreated surface water that community members often collect for drinking;
  II. Examining relationships between indicator bacteria and parasite presence in these surface waters; and
  III. Identifying potential associations of parasites in surface water with weather conditions and water quality parameters.

Methods

- Water samples (n=55) were collected from June to September 2016, from two rivers commonly used as sources of untreated drinking water.
- Samples were filtered in Iqaluit to concentrate sample material, and tested by Hyperion Research Ltd. for parasite presence using microscopy and polymerase chain reaction (PCR).
- Statistical associations were examined between parasite presence and environmental conditions.

Results

- Using microscopy, 20.0% of samples tested positive for Giardia and 1.8% of samples tested positive for Cryptosporidium.
- Using PCR, parasites were not detected in any of the water samples, so we could not determine the species or sources of parasites.

Discussion

- Surface water contamination with Giardia and Cryptosporidium may be lower in Iqaluit compared to other regions of Canada,4 particularly with lower temperatures, but the human health risk is unclear.
- E. coli and total coliforms may not be appropriate indicators for Giardia and Cryptosporidium in Iqaluit’s surface waters.
- Future research should examine the molecular characterization of these waterborne parasites to evaluate the potential human health implications in Iqaluit.

References


Acknowledgements

Special thanks to the Nunavut Research Institute for their partnership and interest in the development of this project. This research was supported and funded by ArcticNet, the Province of Ontario, and Arthur D. Latornell. Many thanks to D. Julien-Wright, A. Manore, E. Sudlovienick, A. Bychok, C. Wright, K. Bishop-Williams, J. Middleton, V. Watson, and J. Petrasek-MacDonald for their invaluable support.

*For more information, please contact Stephanie Masina, MSc Candidate at the University of Guelph, smasina@uoguelph.ca.