INTEGRATED ENVIRONMENT AND HEALTH SURVEILLANCE: A systematic realist review

Alexandra Sawatzky¹, Ashlee Cunsolo², Andria Jones-Bitton¹, Jacqueline Middleton¹, and Sherilee L. Harper¹

1) Department of Population Medicine, University of Guelph; 2) Labrador Institute of Memorial University

References

Introduction

Arctic and Subarctic regions across the Circumpolar North are experiencing some of the most drastic and rapid environmental changes in the world, resulting from stresses such as climate change and resource development.¹⁻³

However, few studies have synthesized information from peer-reviewed literature about integrated surveillance strategies for Arctic and Subarctic regions.

First Objective

Provide an overview of the range, extent, and distribution of integrated surveillance strategies in the Arctic and Subarctic outlined in the peer-reviewed literature.

Second Objective

Compare, contrast, and characterize the key components of integrated surveillance development, implementation, and uses that are described in the peer-reviewed literature.

Characteristics of Included Articles

Number of Articles

- 4040 hits from database searches; 621 duplicates removed
- 3419 titles and abstracts screened; of which 476 were deemed relevant
- 476 full texts reviewed; of which 73 met all of the inclusion criteria
- 12 additional relevant articles retrieved from hand searches
- 85 total articles included for data extraction, analysis, and synthesis

Topics

65% of articles were primary or secondary studies that served to inform and/or recommend integrated surveillance strategies (n=55). These studies contributed to a variety of different areas of environment and health research, including:

- Health and/or environmental impact assessments (n=15)
- Identifying indicators and threshold levels of risk (n=18)
- Climate change adaptation strategies (n=19)
- Climate change impacts on health outcomes (n=6)
- Wildlife health and harvesting (n=0)
- Environmental contaminants (n=6)
- Food and water security (n=3)

Components of Integrated Surveillance

The components of integrated surveillance discussed in included articles fell into three main categories:

1) Structural components described the logistical, organizational, and operational components of integrated surveillance strategies.

2) Processual components described the approaches and methods used within integrated surveillance strategies.

3) Relational components described the interpersonal elements and connections that exist in integrated surveillance strategies that help to build and sustain connections between stakeholders.

Integrated surveillance strategies operated at local, regional, national, and international levels and used various types and combinations of structural, processual, and relational components to work towards certain priorities.

Studies that described a greater total number of components of integrated surveillance were more likely to describe components from across all three categories.

Methods

This modified systematic realist review (SRR) applied the transparent, replicable methods of a systematic review to search for and identify relevant peer-reviewed literature,⁴⁻⁶ and drew upon realist review methods to synthesize and analyze the included studies.⁷⁻¹⁰

Searching the Literature

- Used a search string to conduct searches in MEDLINE® and Web of Science™ aggregator databases
- Hand-searched three key journals: Arctic; Environmental Health Perspectives; and International Journal of Circumpolar Health

Selecting Studies and Assessing Relevance

- Established inclusion and exclusion criteria
- Uploaded articles to DistillerSR® online software to remove duplicates and facilitate screening
- Two independent reviewers screened titles and abstracts, and subsequently conducted full text reviews to select relevant articles based on inclusion and exclusion criteria

Data Extraction, Analysis, and Synthesis

- Created data extraction forms to gather descriptive information from included articles
- Uploaded articles into Nvivo®, a qualitative data management software, to facilitate thematic analysis, consisting of a comprehensive process of deductive and inductive coding.¹¹⁻¹²

Discussion

The literature indicated that environmental change cannot be adequately responded to in the North without involving numerous sources of information, focusing on multiple stressors and geographic coverage, and incorporating different knowledge systems, to produce real-time, usable environment and health surveillance data that can inform public health research, policy, programming, and decision-making.¹³⁻¹⁴

Based on the literature, one type of strategy does not fit all types of problems: examining the components of integrated surveillance strategies can help to understand how and why certain strategies can be structured to be more responsive to public health concerns within rapidly changing Northern environments.¹⁵⁻¹⁶

Acknowledgements

We would like to acknowledge Sahar Fazel for her contributions to developing the research questions as well as her role in early discussions and searches. A sincere thanks to the following reviewers for their comments, feedback, and guidance on this review: Alana Papadopoulos and Jonathan McWhirter, University of Guelph.

Contact Information

Alex Sawatzky, PhD Candidate, Public Health, University of Guelph
Email: alex.sawatzk@uoguelph.ca
Twitter: @a_sawatzk