Leveraging Open Data Sources in Mixed Methods Research

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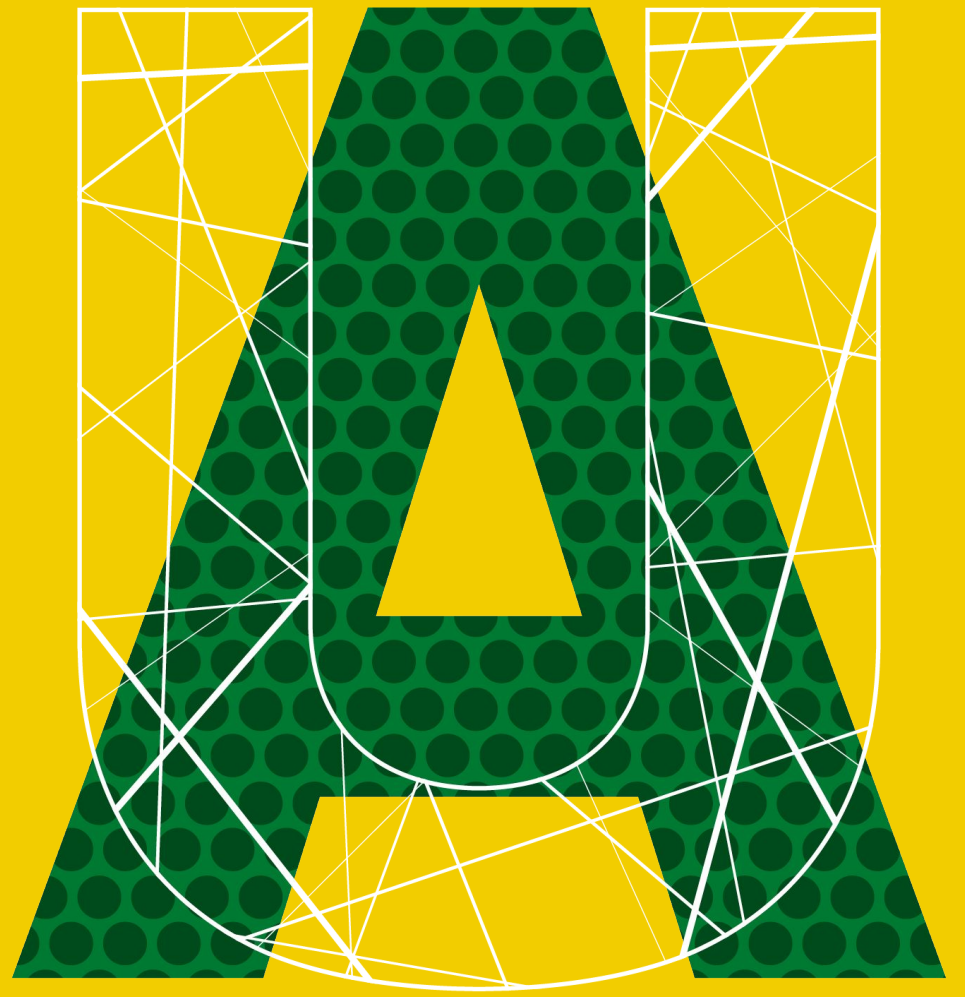
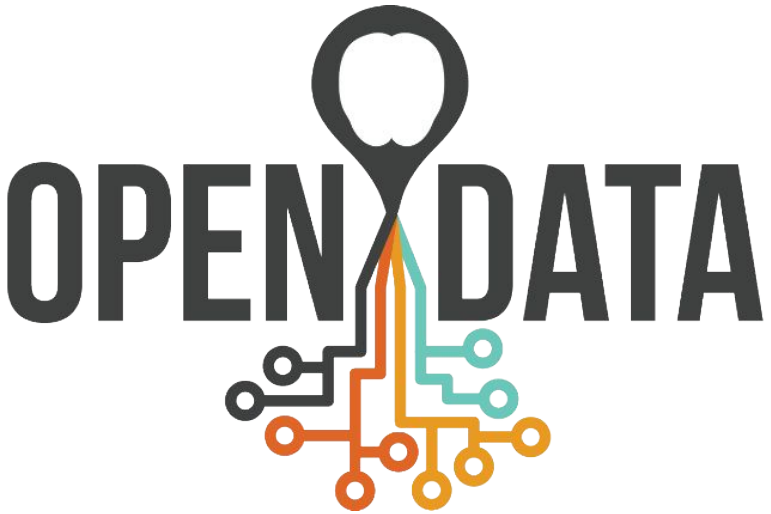
UNIVERSITY OF ALBERTA



Key Messages



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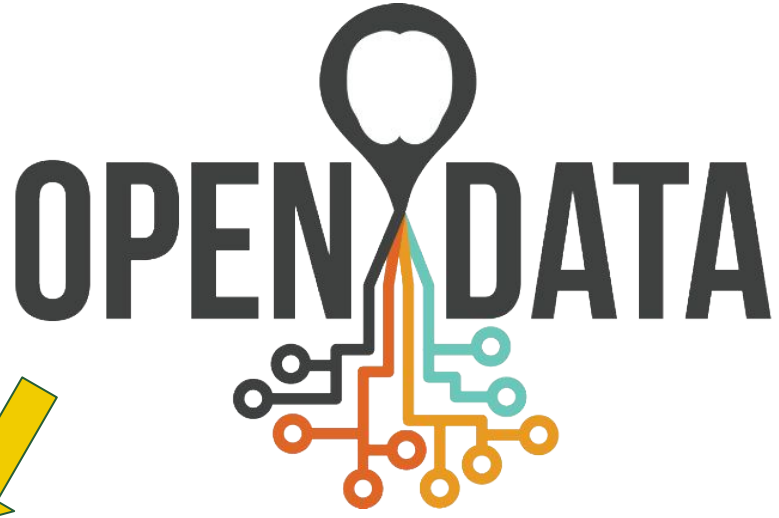
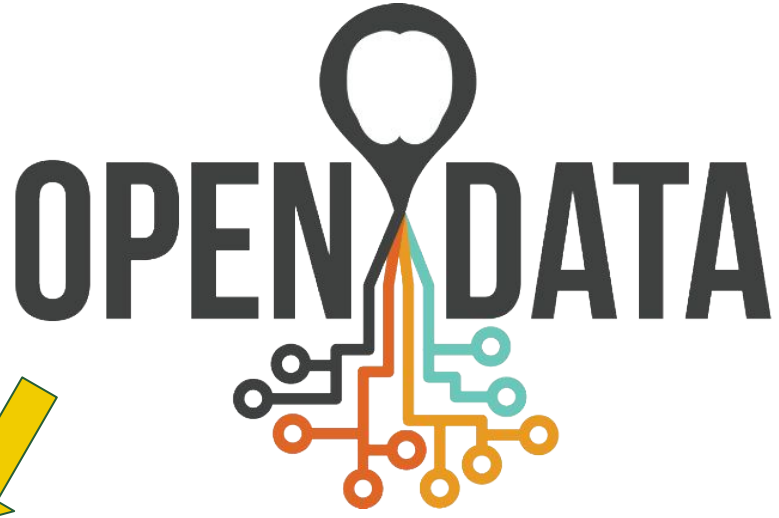


What is it to Mixed Methods Research?

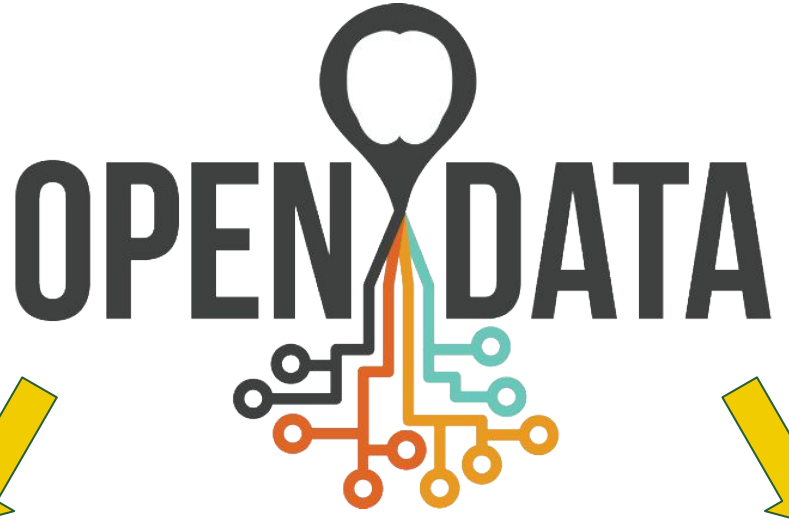
Key Messages



What is it to Mixed Methods Research?

Illustrated Example in the Mixed Methods Research framework

Key Messages



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Illustrated Example in the Mixed Methods Research framework

Benefits and Challenges to Mixed Methods Research

Introducing Open Data in Mixed Methods Research

- Our interdisciplinary team has been exploring the possibilities (and limitations) of open data to generate novel insights within the mixed methods research framework
  - **Tarid Wongvorachan**: doctoral student in Measurement, Evaluation, and Data Science (MEDS)
  - **Cheryl Poth**: Lead researcher of the project. Professor in the MEDS program
  - **Okan Bulut**: Associate Professor in the MEDS program
  - **Simon Otto**: Assistant Professor of the Human-Environment-Animal Transdisciplinary Antimicrobial Resistance Research Group (HEAT-AMR) in the School of Public Health

- **Open data** is publicly accessible source of anonymized information whose potential has not yet been realized in mixed methods research

Situating our COVID Study in the Context of Public Health Communications

- The global COVID-19 pandemic offers new opportunities for open data in research integrating qualitative and quantitative data:
  - Quantitative: case counts, hospitalization/ICU/vaccination rate
  - Qualitative: transcripts of public health briefing, Twitter postings

- Such data was communicated through various channels such as live public health briefings by the provincial public health authority (https://www.alberta.ca/covid) and Twitter's post by public health authority.

Government of Alberta - July 13th 2022

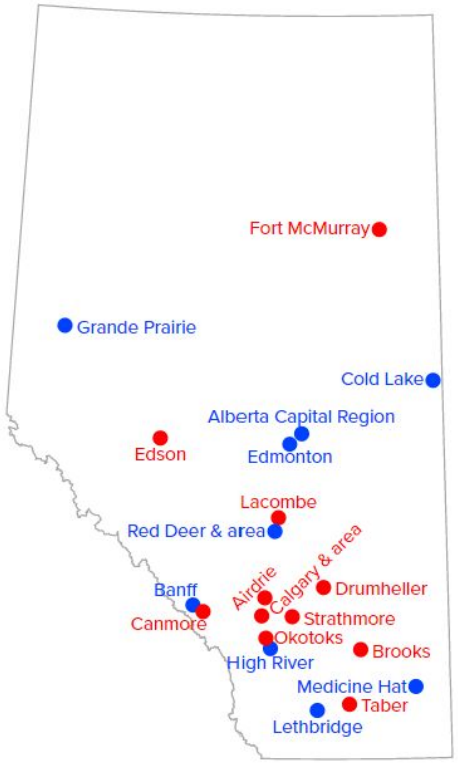
Public Health Communications During a Pandemic as a Complex Phenomena

- Publicly available public health communications became a key source of information about a range of topics such as virus information, risk factors to the public, and preventive measures to the spread of COVID-19.

- Given the rapid evolution of information, individuals who are responsible for public health communication during the pandemic are required to ‘think on their feet’ and make ‘risk assessments on the go.’

- Public health communication is a component in this complex adaptive phenomena as it is interdependent with factors such as public behavior, case statistics, and public health restriction (Angeli & Montefusco, 2020).

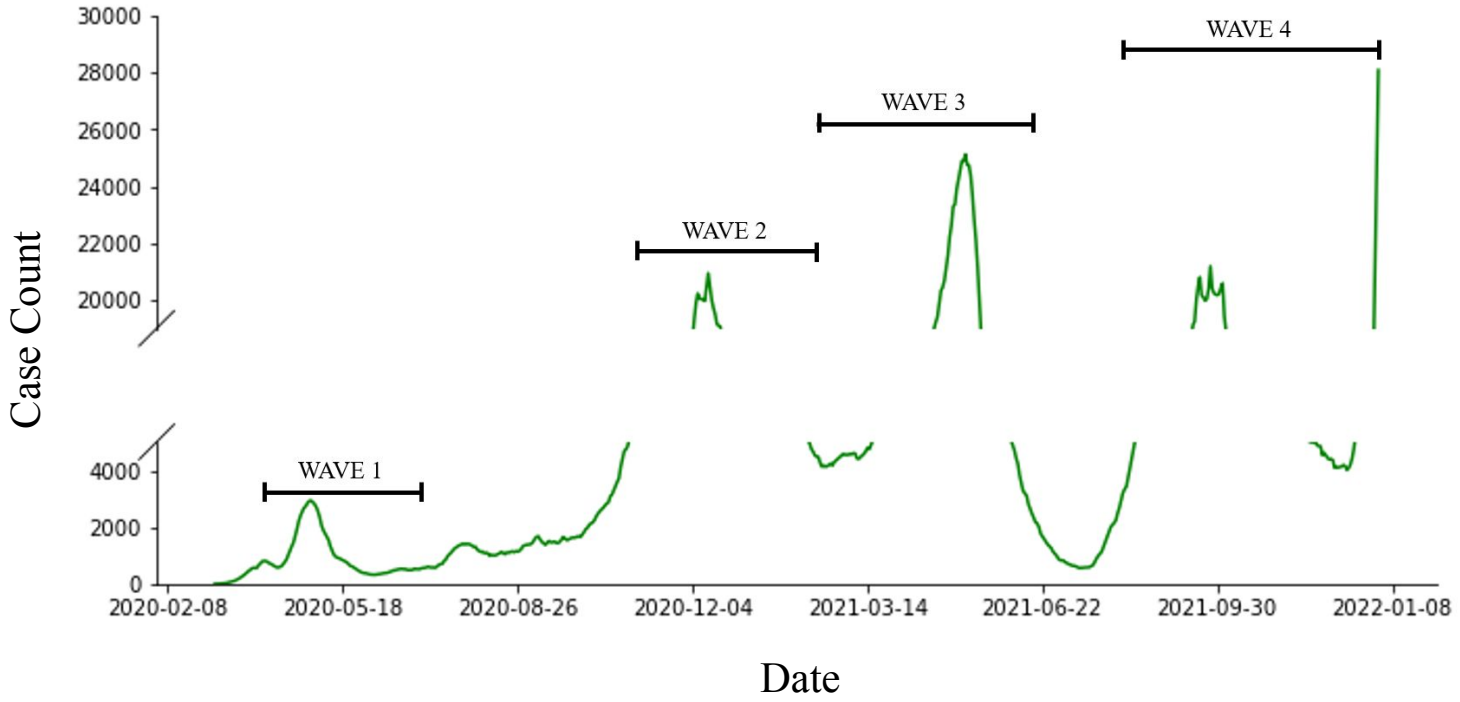
- Open data reflects the dynamic nature of the pandemic as it involves several aspects of the phenomenon of such as local waste water data or province-wide transmission level (Marjanovic & Cecez-Kecmanovic, 2017).



Centre for Health Informatics, 2022

Background to our Mixed Methods Study

- Our larger program of research has sought to assess the extent to which and how local public health communications were consistent or changeable through data mining techniques.
  - Poth, C. N., Bulut, O., Aquilina, A. M., & Otto, S. J. G. (2021). Using data mining for rapid complex case study descriptions: Example of public health briefings during the onset of the Covid-19 pandemic. *Journal of Mixed Methods Research*, 1–26. https://doi.org/10.1177/15586898211013925



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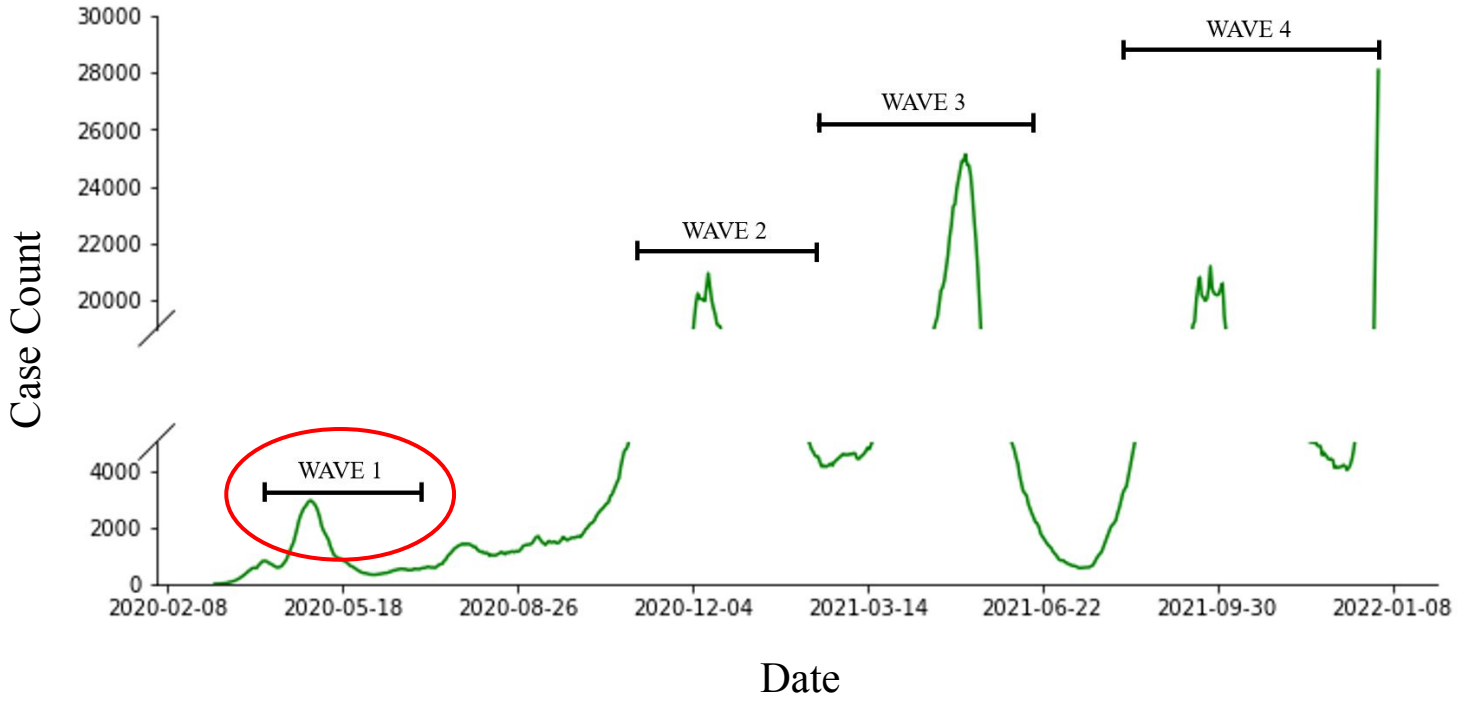

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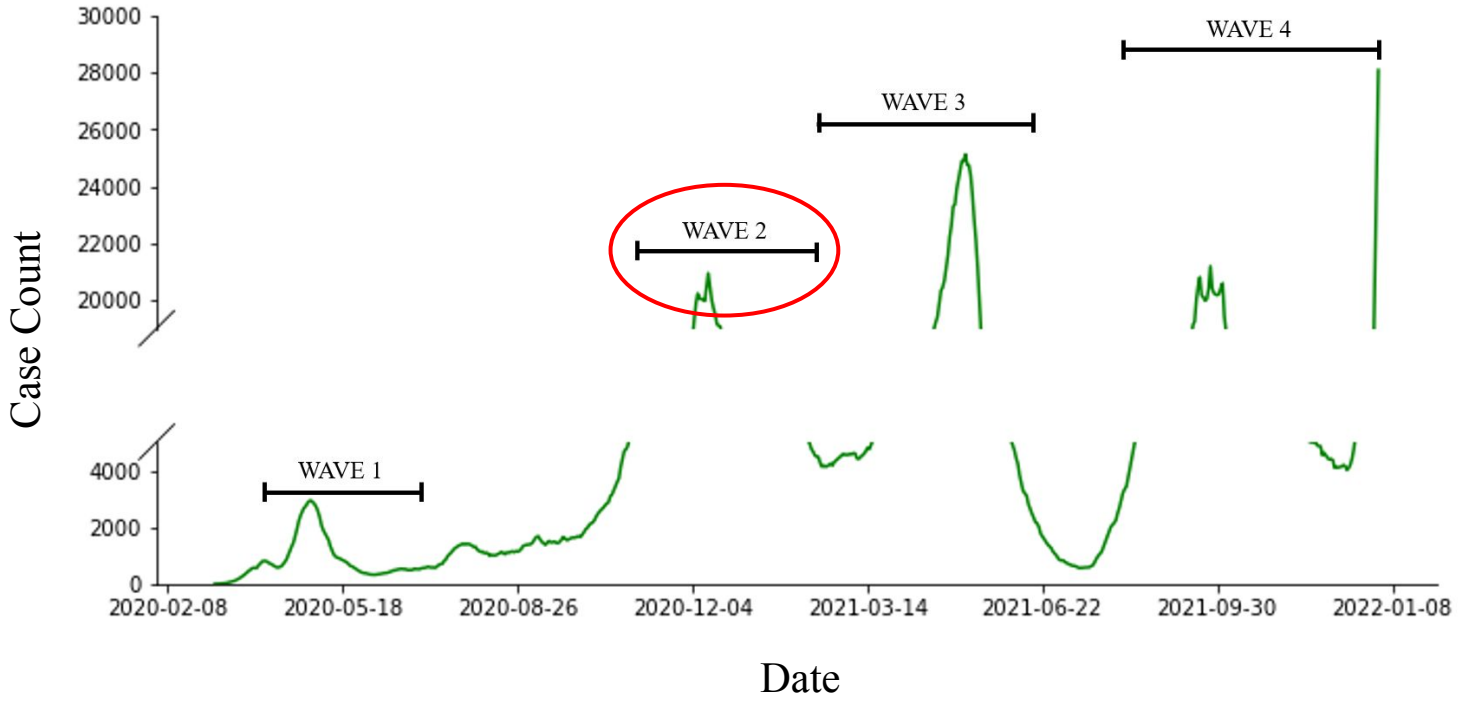

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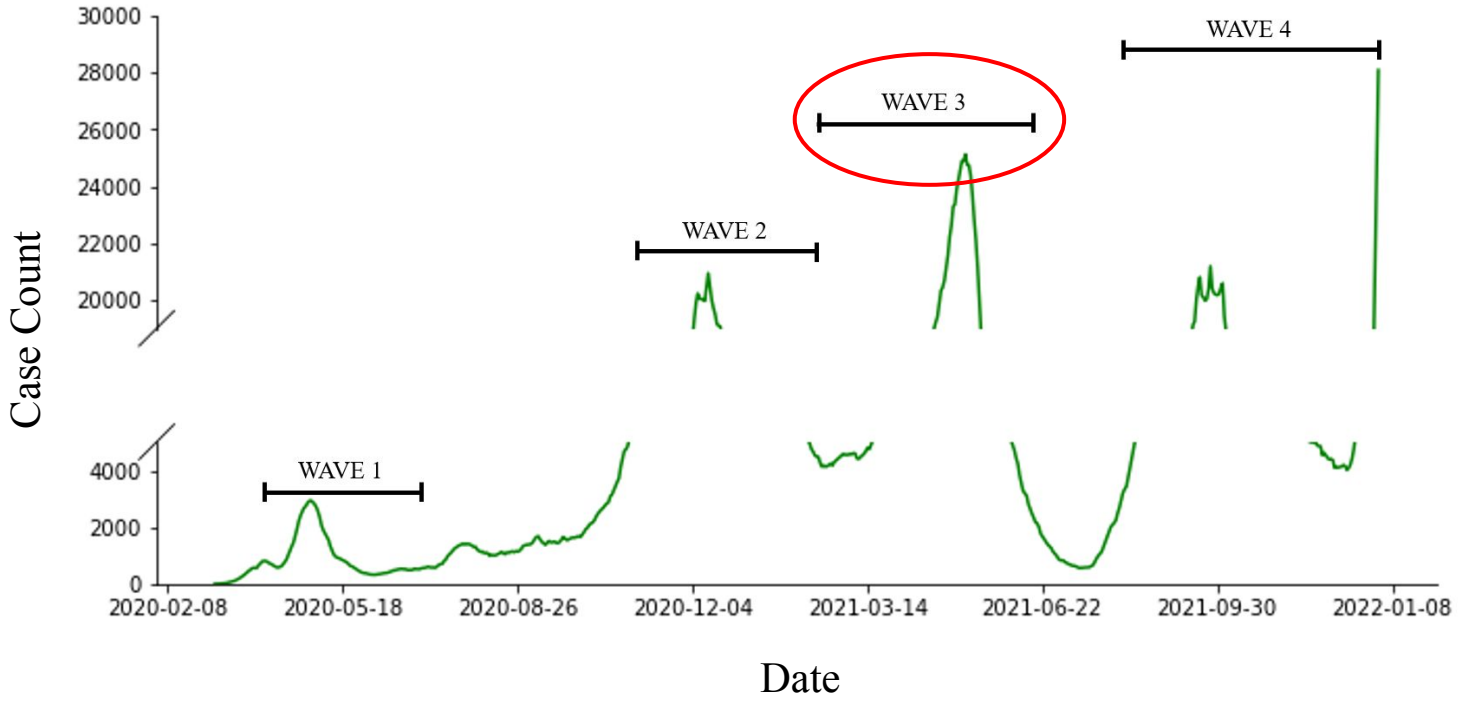

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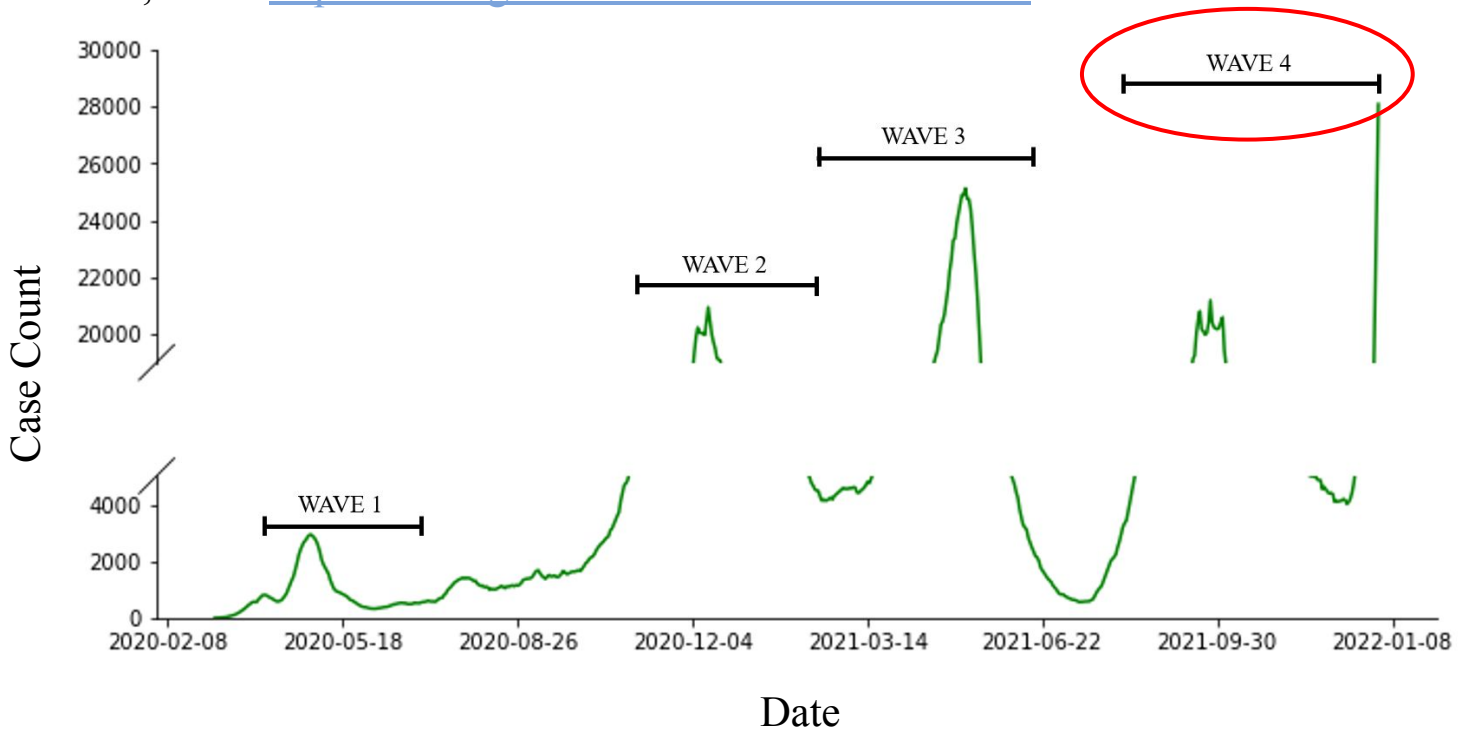


Rationale for our Mixed Methods Case Study Design

- Also, in this expanded study, we conceptualize the COVID-19 pandemic as a complex phenomenon that rapidly evolves across time. Mixed methods case study is a useful approach to study such phenomenon
  - *Exploring the relevance of complexity theory for mixed methods research* (Kallemeyn et al., 2020).
  - *Innovation in mixed methods research: A practical guide to integrative thinking with complexity* (Poth, 2018).

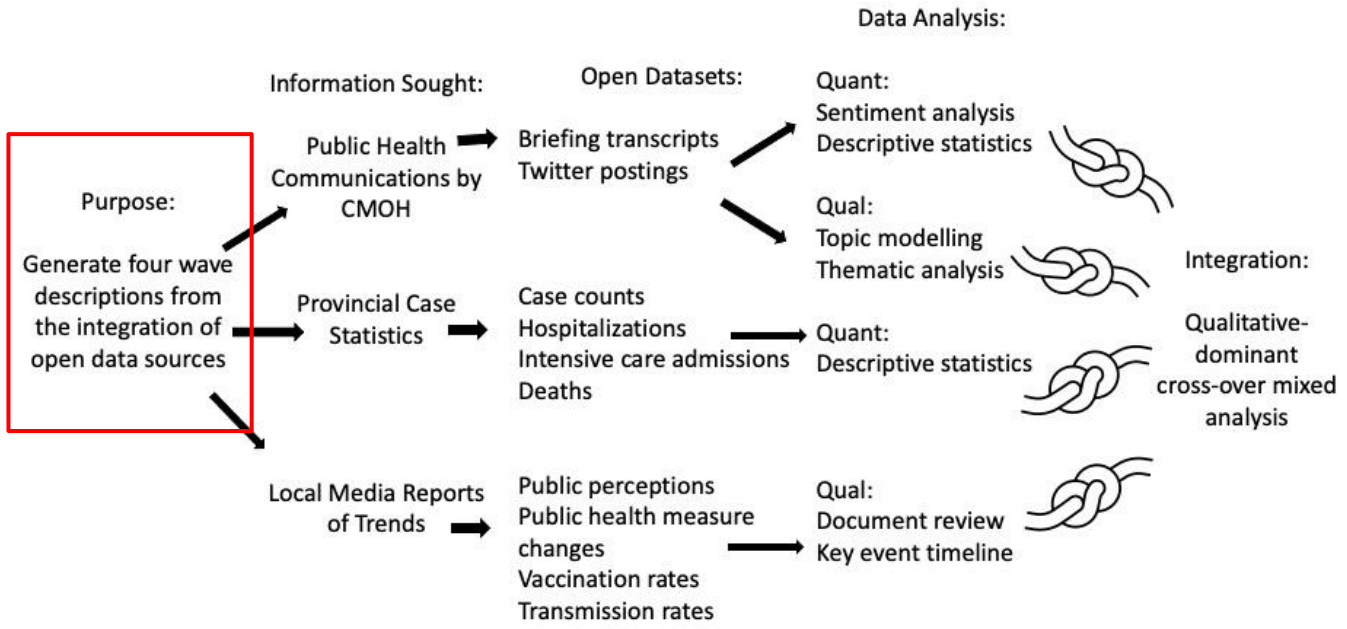
- Our use of open data in mixed methods case study was based on its efficiency, availability, and timeliness

- The current work in progress will describe our efforts using a cross-case examination of four distinct waves during the COVID 19 global pandemic to track how Alberta public health communications evolved over time.

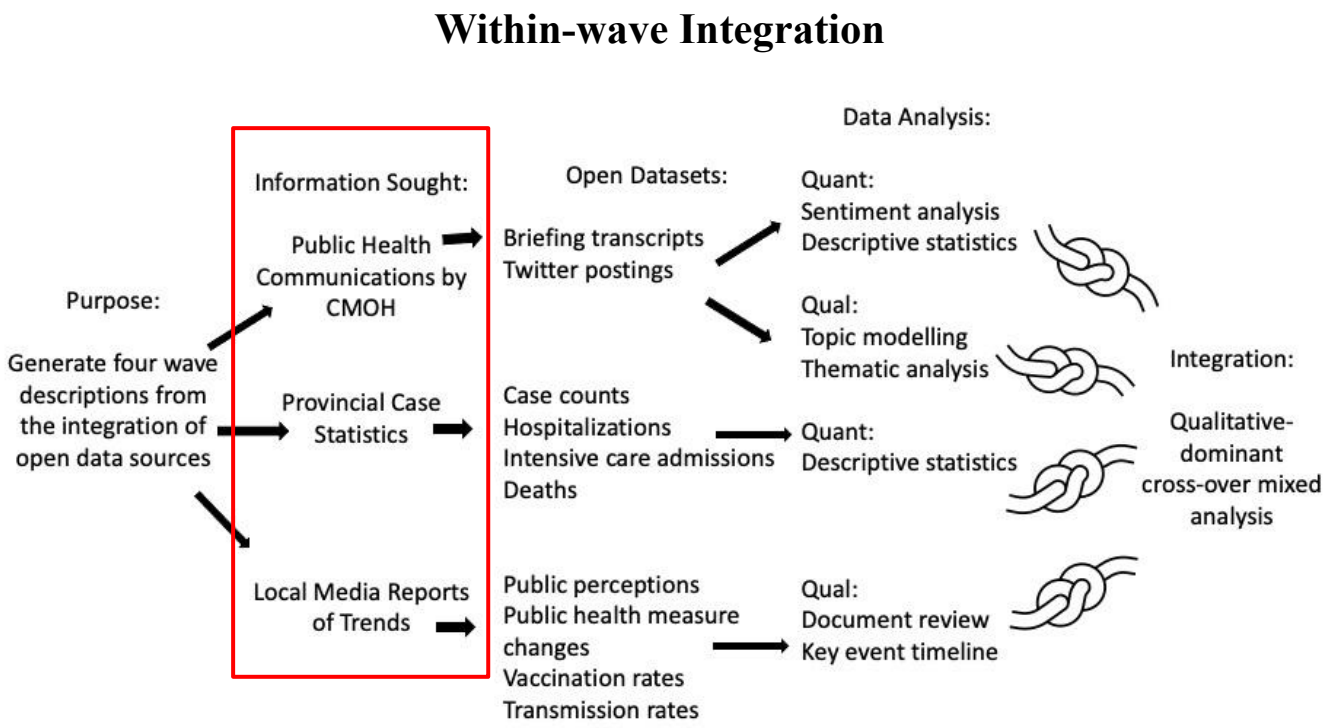
Complex Cross-Case Mixed Methods Purpose

- Both qualitative and quantitative findings were integrated to form case descriptions of each wave via the qualitative-dominant mixed methods design.

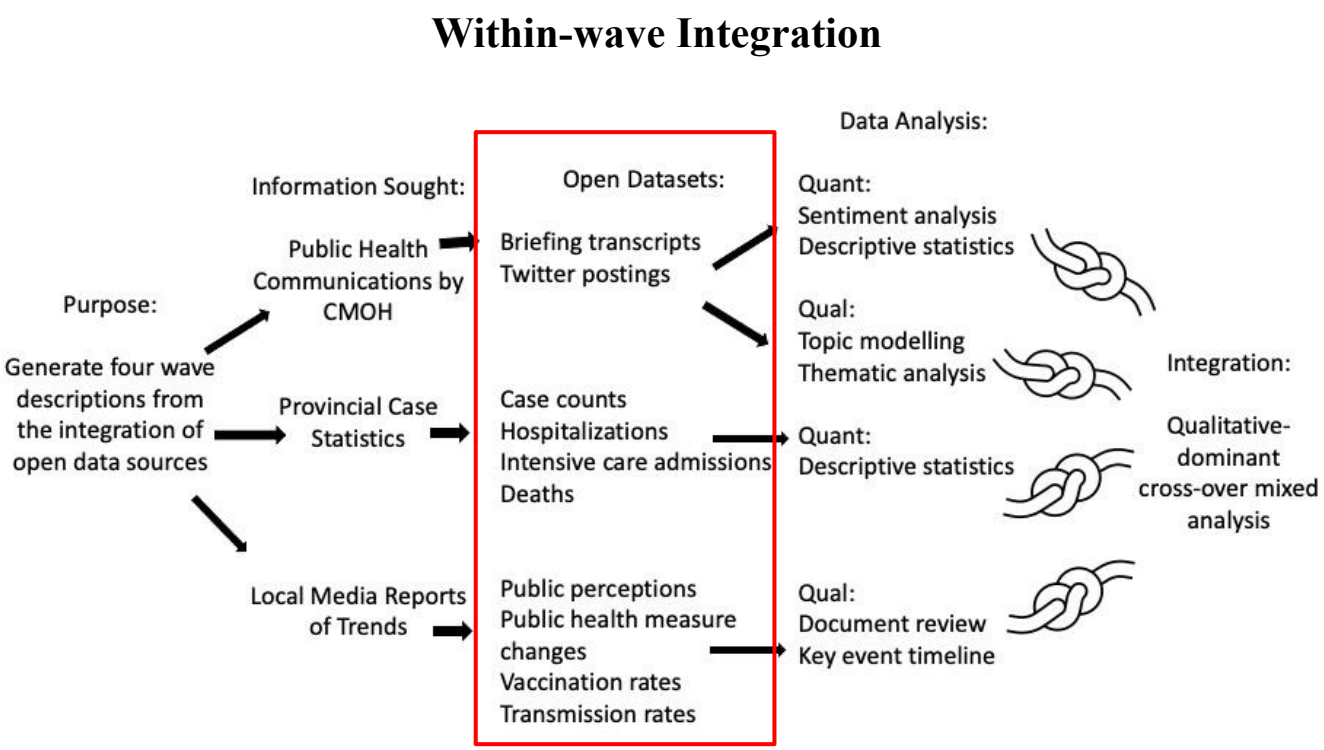
Within-wave Integration



Complex Cross-Case Mixed Methods Information Sought

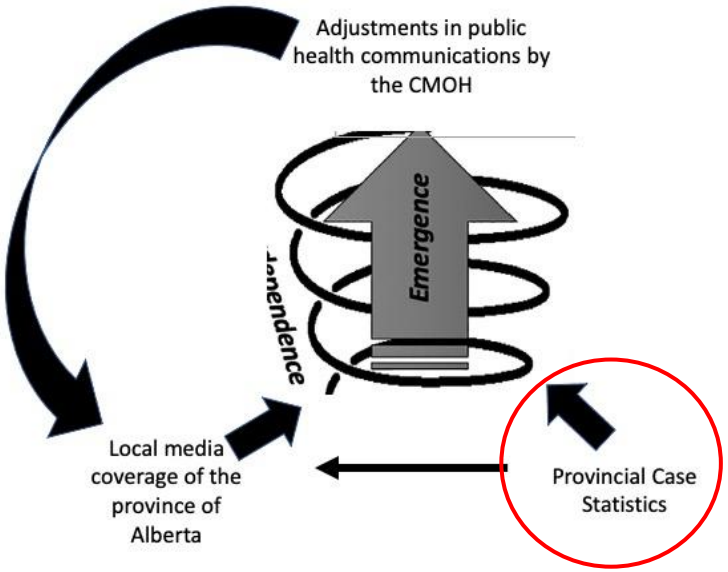


Complex Cross-Case Mixed Methods Open Datasets



Weaving the Data Sources with Complex Adaptive System

- Provincial case statistics was used to inform local media coverage of Alberta.
- Both media coverage and case statistics were adapted to the emergence of COVID-19 key-events to inform public health communication by the CMOH.
- Public health communication informs local media coverage in the next iteration.



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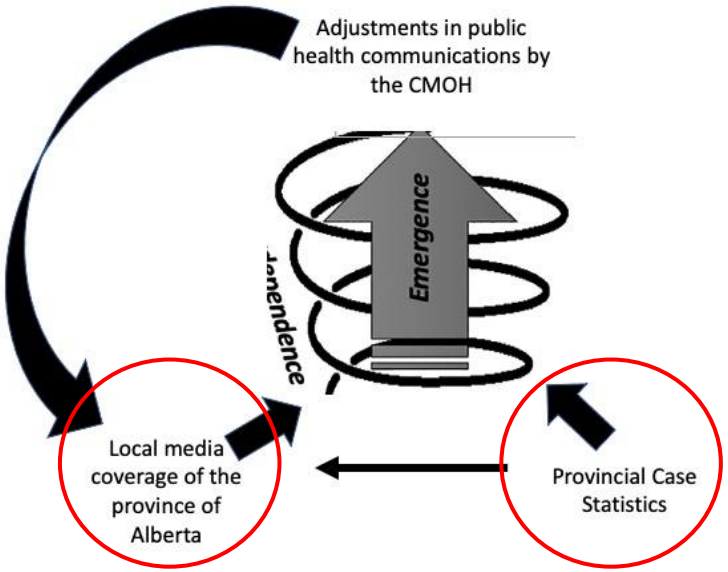

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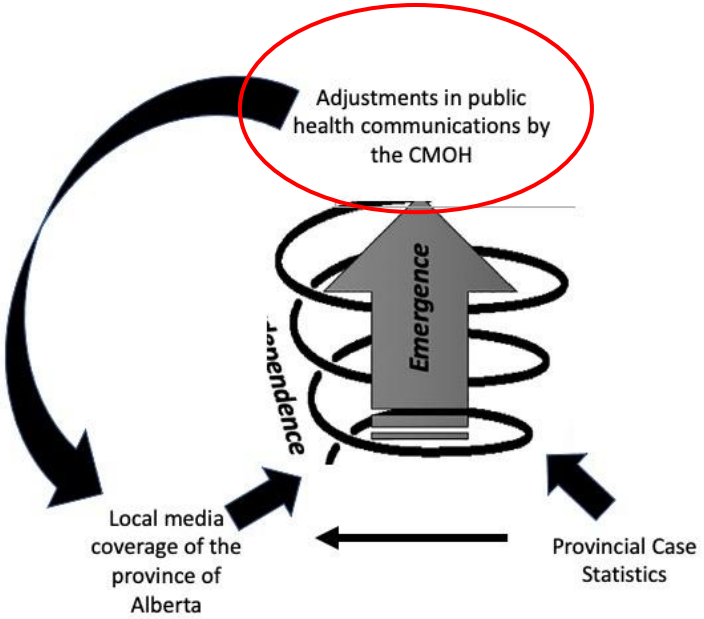

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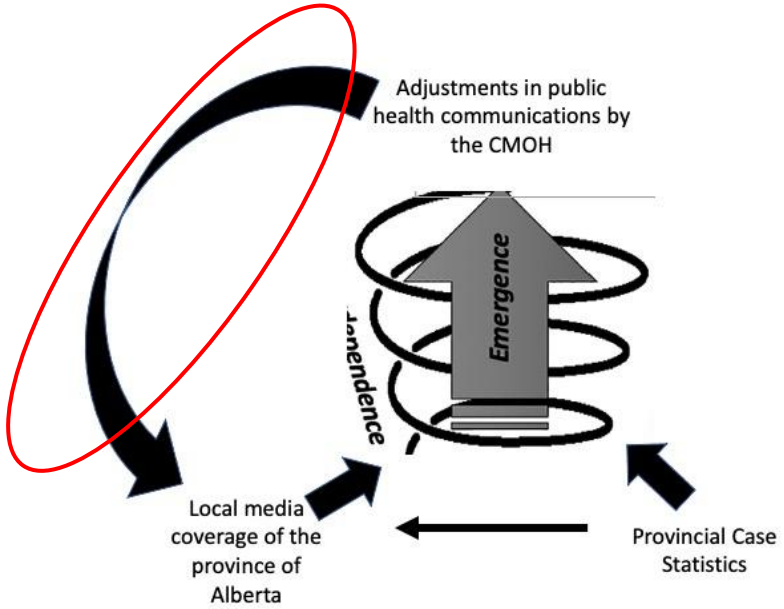
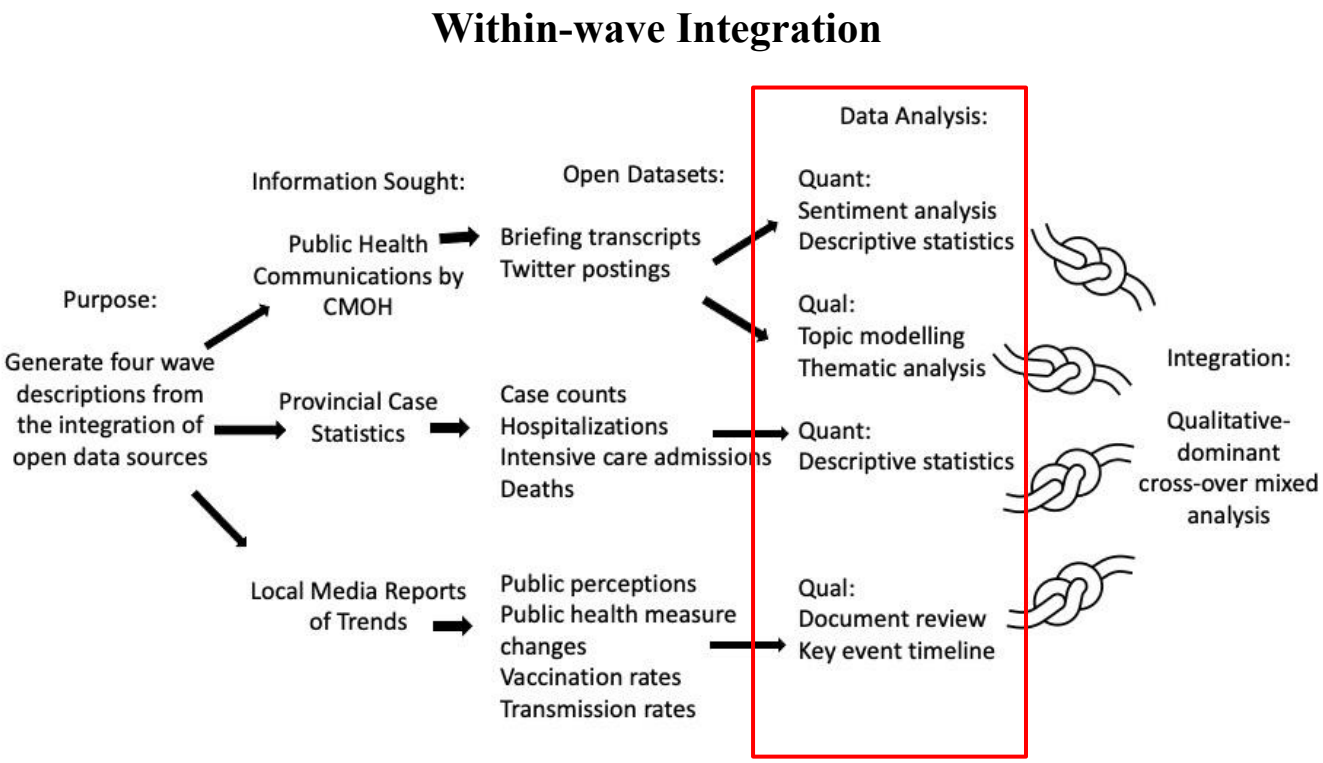
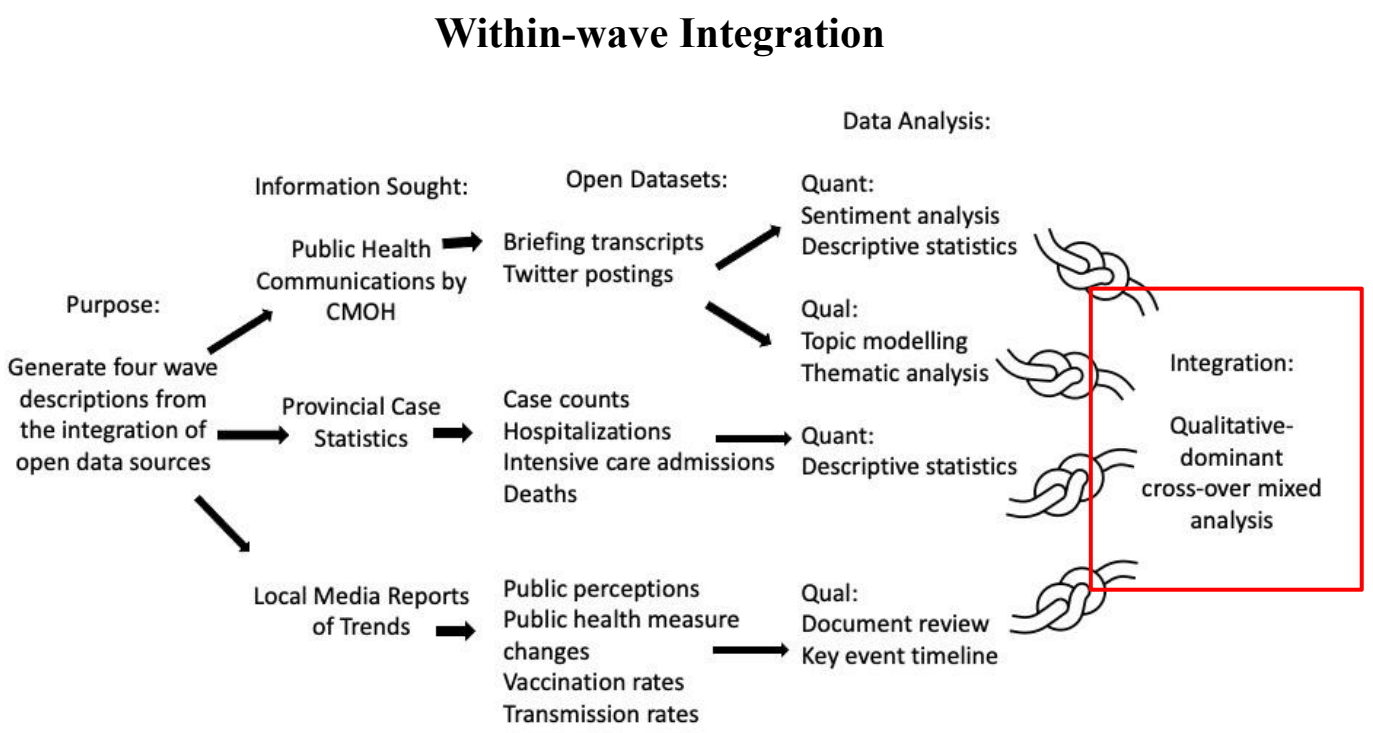


Complex Cross-Case Mixed Methods Procedure



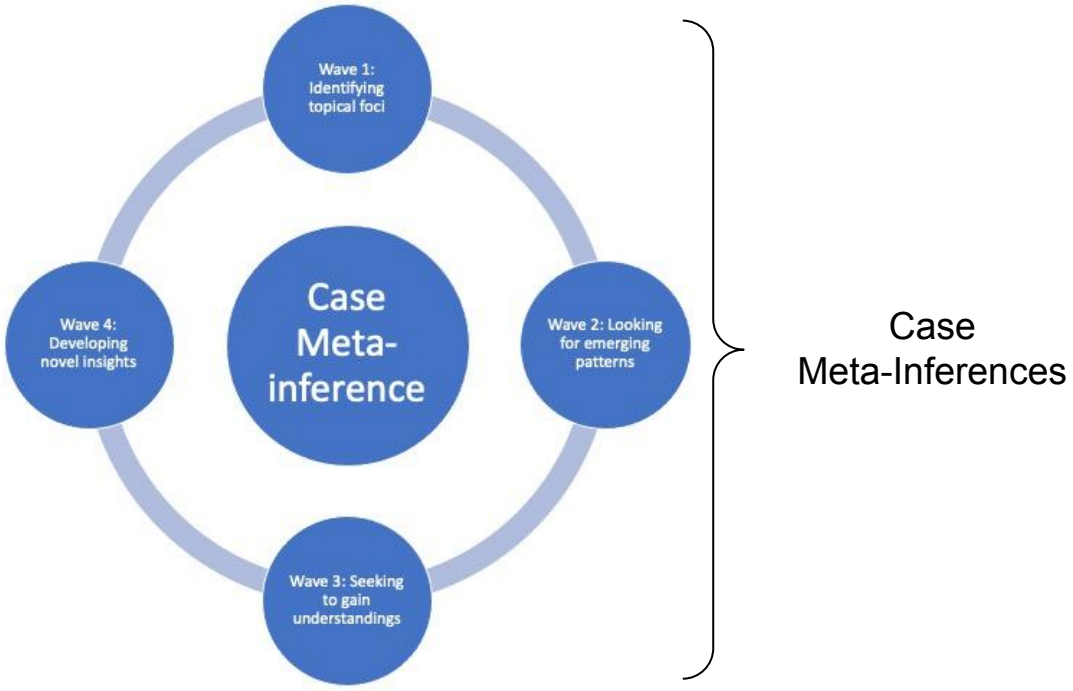
Complex Cross-Case Mixed Methods Integration

- The four integrated wave description will be cross-analyzed altogether to generate case meta-inferences



Cross-case Analysis of Four Waves

- We used cross-wave pattern detection to generate novel insights and key case meta-inferences for informing effective public health communications
- We first examined wave 1 integrated description for identifying the topical focus
- We looked at wave 2 looking for emerging patterns
- We looked at wave 3 seeking to gain understandings
- We looked at wave 4 for developing novel insights



Initial findings and Contributions

Benefits: Novel Case Meta-Inferences

- Risk assessments and public health measures of the communication modulated by vaccinations and health system demands
- Positive outlook and demonstrations of empathy in the message eventually changes by high hospitalizations of unvaccinated
- Continual fluctuations in measures met with public frustration and concern for vulnerable populations

Limitations and Challenges

- Change in open source data credibility (e.g., case count)
- Limited availability
- Lack of control in terms of data collection

Contribution

- Theoretical advancement of effective public health communication among complex adaptive system phenomenon
- Practical advancement for public health officials during a pandemic
- Methodological advancement for the integration of open data in the study of complex adaptive system and mixed methods research

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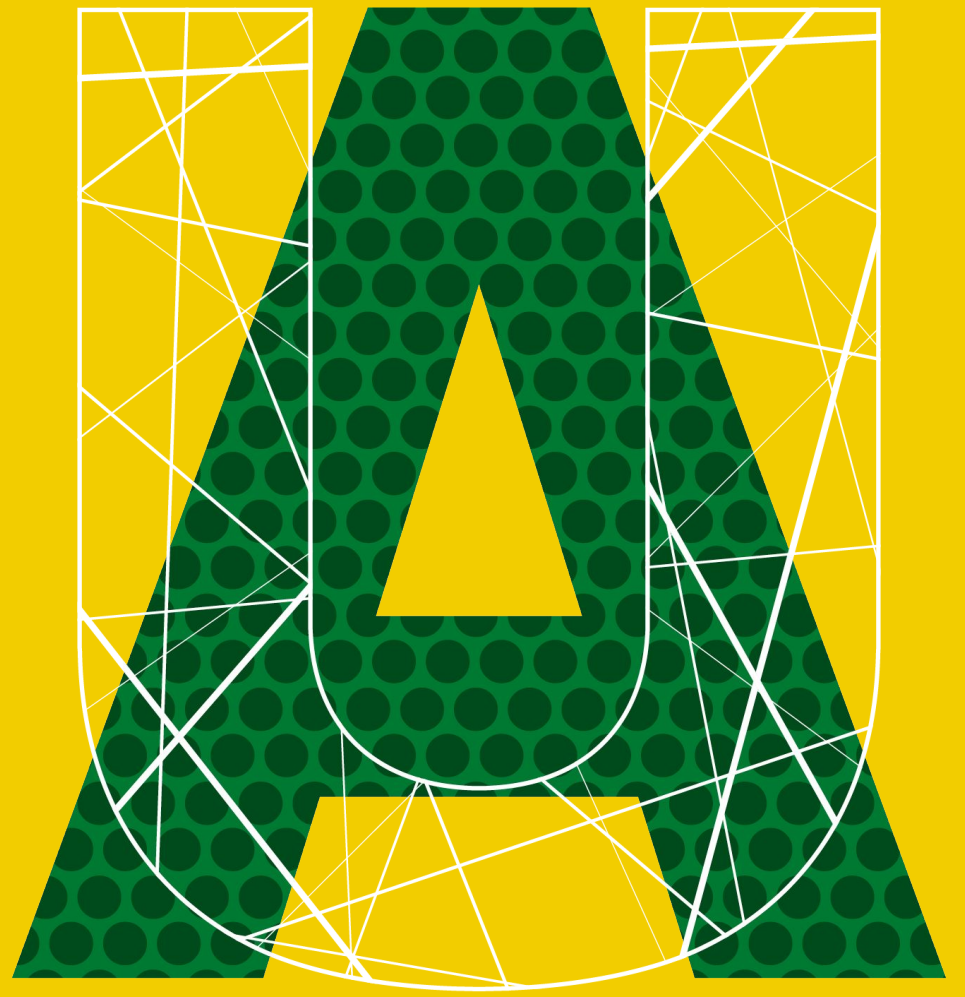
Thank you for your attention!

For questions, please feel free to contact wongvora@ualberta.ca

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