Analyzing the State of Geospatial Analysis in COVID-19 Research

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Highlights

- The COVID-19 pandemic has created a **massive need for geospatial analysis of information related to the pandemic** across multiple fields.
- This project aims to **determine the utility of and barriers to geospatial methodologies** used in the COVID-19 research community through literature review and text analysis.
- Geospatial analysis has enormous potential to provide many useful insights into the pandemic, but **it is important to address the limitations of existing approaches to geospatial analysis** such as the modifiable areal unit problem and the modifiable temporal unit problem.
- Many of the studies we reviewed used country-level or regional-level data; although studies at this level provide many important insights, we hope to have **finer-level higher-resolution geospatial data** to fully understand the impact of COVID-19.

Study Area

Our literature review encompasses studies from **all over the world including both first and second order impact studies**.

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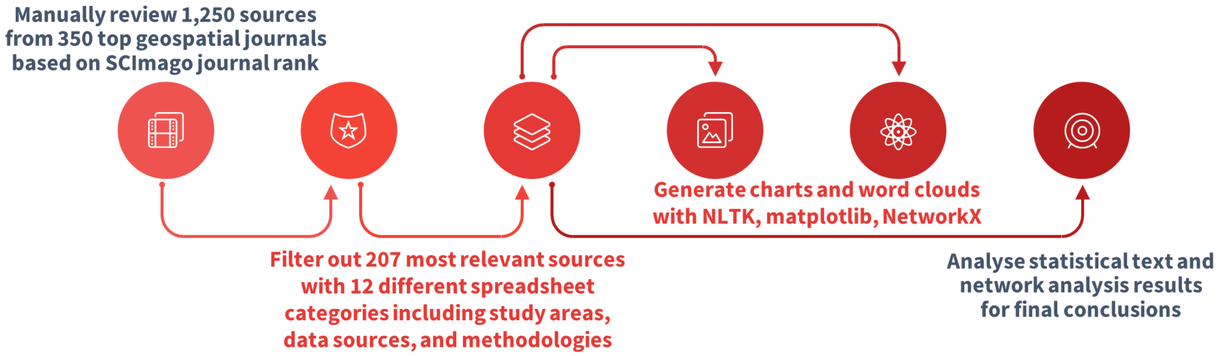
MAP GIVE
Cities' COVID-19 Mitigation Mapping (C2M2)

Methodology



Results

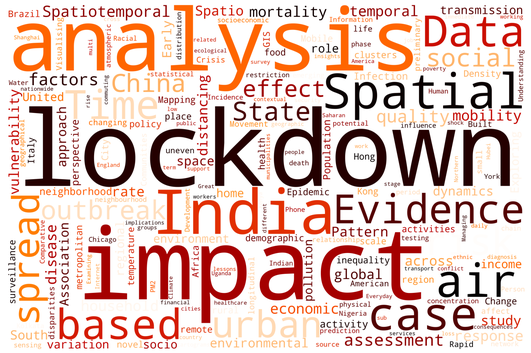
- Most COVID-19 studies using geospatial methods **used country-level or regional-level data**.
- Geospatial analysis methodologies were **most prevalent in studies of the impact of COVID-19 on the environment** as well as studies on the impact of COVID-19 on mobility, disease spread, and economies.

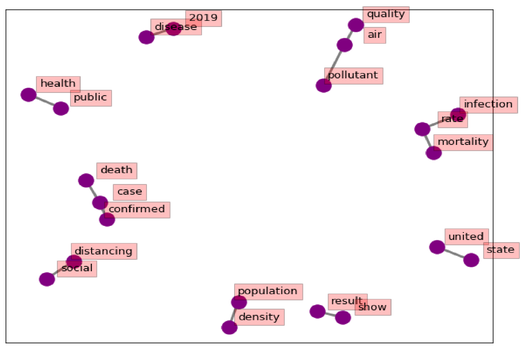
Bigram and TF-IDF analysis

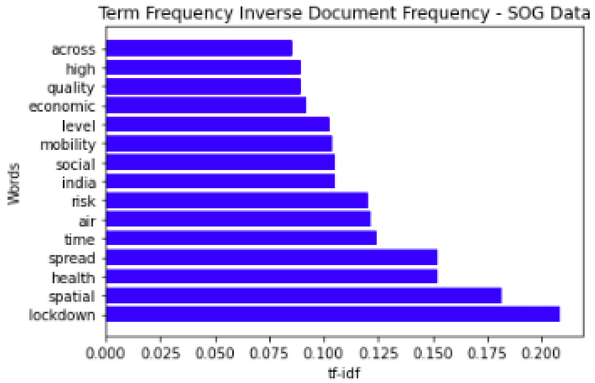
- Many geospatial studies were conducted in the **environmental field** including effects of the pandemic on air quality and pollution.
- **'Lockdown' was the most used word** across all 207 papers followed by terms including **spread, air, mobility, and economic**.
- The only country to appear on the TF-IDF analysis was India (12% of sources).

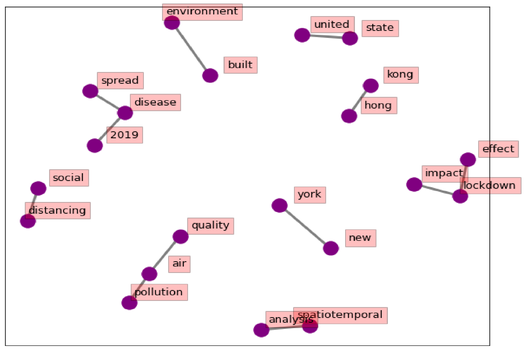
Network analysis

- Connections include those **between infection rate and mortality** as well as **confirmed death cases and population density**.









Future Plans

- Explore more literature with geospatial elements **focusing on both second-order impacts and low- and middle-income countries** (LMICs).
- Further explore geospatial applications and **analyze specific methodologies** (MORAN I, LISA, etc.)

Conclusion

- **Researchers must consider and address geospatial limitations** including the modifiable areal unit problem and the modifiable temporal unit problem.
- **Higher-quality datasets focusing on more specific regions** would allow for better understanding of the impact of COVID-19.