The Principles of Ethics of Geospatial Analysis in COVID-19 Research

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Highlights (Abstract)

Advanced GIScience methods, geospatial data, and technologies are discussed and utilized to manage the COVID-19 pandemic and track the spread of the virus. Network operators provide phone location data for public health research and COVID-19 mitigation policies. This has helped monitor people in quarantine, improve contact tracing, and give further information about COVID-19 spread. Data is also collected by GPS, Internet mapping technologies like Google Earth, and more. When using digital surveillance technologies like these, **the ethical dilemmas of privacy and security concerns must be addressed.** Geospatial analysis may also result in the discrimination of groups associated with particular regions, such as repressed minorities. **By reading through various codes of ethics and reviewing existing papers on public health research ethics**, several concepts have been concluded to be essential principles to focus on. Individual privacy and civil liberties must be protected when using geospatial analysis. Ethical principles like **data privacy, consent, transparency, universal public data collection**, and continuous monitoring **must be constantly applied.**

References

The following principles and explanations have been drawn from the following codes and articles:

1. APHA Public Health Code of Ethics
2. UNICEF Ethical Considerations When Using Geospatial Technologies for Evidence Generation
3. APA Ethical Principles of Psychologists and Code of Conduct
4. Digital Tools for COVID-19 Contact Tracing: Identifying and Mitigating the Equity, Privacy, and Civil Liberties Concerns

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Data Privacy

- Increase awareness on the limits of confidentiality and uses of information.
  - **De-identify personal data** to greatest extent (while maintaining the use and meaning of data for policy and decision making)
  - Disguise clients & gain consent in writings, lectures, or any other media
  - **Collect only necessary data**
- Reflect on the context data was collected, respective population, data used, likelihood of individual identification, and probability of expectations of privacy being met.

Transparency

- A lack of transparency results in uncertainty in omitted variables, representation, consistency
- **Be clear on how data collected will impact policy & advocacy needs within local context**
- Reflect and plan for data collection within strategic planning processes
- Public health practices rely on the trust of communities (requires transparency)
  - Give reasoning and evidence **so the public can understand** the purpose & decision making
  - **Compliance and consent must be completely voluntary** (participation can't be a condition for access to resources, public services, work, or education)

Future Monitoring

- Consistent ethical reviews of public health
- Benefits are achieved with **minimal repercussions**
- Incorporate discussions involving community representatives and public health leaders
- Consistently reassess system
  - Ensure geospatial tech is truly beneficial
  - Review alternative data collection methods
- Get evidence identifying **benefits** and **appropriateness** of data collection method

Word Clouds

Central Focus

Potential Burdens

Implementation Focus

- The focus should be on utilizing data while performing security practices
- Trends & data are crucial but the biggest burden is providing transparency
- Central focus - maximizing benefits with current data while ensuring transparency

Public Data: Pros & Cons

⊕ Raises awareness of public health efforts while **recognizing unmet needs of vulnerable populations**

⊕ Obtaining data from all members (range of demographics, ethnicities, socioeconomic):
- Results in the ability to adequately find **how to best treat and help everybody**
- Enables consideration of culture, language, and health beliefs of all. **Facilitates inclusion**
- Increase efficacy of public health interventions

⊗ **Data modelling may not take into account** data's limitations and the region's social, political, and environmental context due to a flaw. Thus, **bias**, inaccurate predictions, trends, and decisions **may follow conclusions**

⊗ Geography and relationship between location, poverty, race, gender may result in trends and models **against certain populations in particular locations**

Limitations & Future Work

Limitations to this study include a limited amount of codes of ethics and existing papers regarding this topic. Future work will include updates on what work is being done in government and research institutes to address the issues raised in this study. It is also of interest for further studies to look into what is being done in the private sector to promote data ethics and privacy.

Conclusion

When utilizing geospatial techniques in COVID-19 research, ethics should be analyzed and maintained. Principles of ethics must be considered to uphold the civil liberties of communities being studied and affected. Such principles include data privacy, the benefits and burdens of public data, transparency, and future monitoring.