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Implementing Open Source Solutions Within Local Public Health Systems

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Implementing Open-Source Solutions in Local Public Health Systems

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INTRODUCTION

- The COVID-19 pandemic has highlighted the importance of open source in public health, as researchers and public health officials around the world have shared data, research findings, and software tools to help combat the spread of the virus.
- Research shows that open-source solutions can improve the efficiency of public health responses to the pandemic and help reduce resource needs, including staffing.
- There is currently little to no research, however, regarding the impact of the COVID-19 pandemic on the open-source community. Identifying the open-source solutions that were developed and implemented during this pandemic period would allow public health agencies and local communities to determine unmet needs that have not been addressed, so that future open-source solutions can target those challenges.

KEY TERMS

- Open source - source code that is made publicly available so that anyone can view, modify, and redistribute the contents of a product
- But in more general terms, the concept of open source refers to any creative work or product (e.g. data, designs, educational resources, scientific research, hardware) that is developed and shared with few or no restrictions on access or use.
- This study considers any data, hardware or software, or information that is "open" as an open-source solution. Although open data, open hardware, and open-source solutions are not exactly the same things, they share the same values of transparency and collaboration.

Photo 330841604 by Fatmawati Achmad Zaenuri. Retrieved from Shutterstock.com.

RESEARCH QUESTIONS

- What challenges during the COVID-19 pandemic were addressed by developing and implementing open-source solutions?
- What are some open-source solutions and practices that were utilized during the COVID-19 pandemic? How can they help communities better respond to future public health issues?
- Did the COVID-19 pandemic cause a surge in open-source developments in the public health sector?

METHODS

This study primarily involves literature review of sources gathered from the Binghamton Library Database, Google Scholar, and other credited databases. Keywords like "open source" and "COVID-19" were used to identify relevant open-source solutions that were developed and/or implemented during the pandemic. The qualitative analysis mainly focused on studies that examined the development and application of specific open-source solutions and their impacts on the communities that utilized them. Additionally, video media discussing the growth of the open-source community during the pandemic was reviewed to gain insight from experts and individuals at the forefront of the open-source movement.

RESULTS

It was found that there were a range of unmet needs during the COVID-19 pandemic and as a result, many communities and public health agencies utilized open-source solutions to respond to these challenges.

- In March 2020, a virtual hackathon was organized by the MedTech Foundation to generate open-source solutions to tackle unmet needs during the pandemic, such as epidemiological data collection, shortage of personal protective equipment (PPE), and management of mental health issues exacerbated by isolation.
- On May 14, 2020, Maine CDC began enrolling patients and contacts of COVID-19 into Sara Alert, an automated open-source symptom monitoring tool.
- In July 2020, the Ohio State University Library launched an open-source web-application that records real-time building capacity at multiple entrances and exits throughout the library.

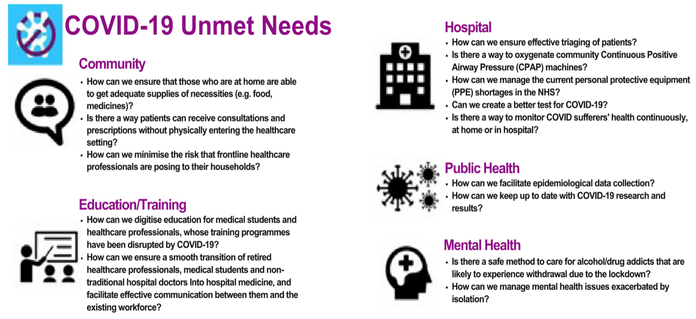

Figure 1. Themes of the COVID-19 unmet needs tackled in the MedTech Foundation virtual hackathon. Retrieved from https://europepmc.org/backend/ptpmcrender.fcgi?accid=PMC7780418&blobtype=pdf.

AUTOMATED SYSTEM MONITORING

Krueger and co-authors (2020) found that automated symptom monitoring was an effective tool for monitoring health of people exposed to COVID-19, so that those with symptoms can be identified and isolated more quickly, slowing the spread of the virus. Those who were monitored using open-source tools like Sara Alert were more likely to report the symptoms they experienced and seek medical help than those who were directly monitored (contacted directly).

CONTACT TRACING

A study conducted by Surio et al. (2022) on open-source data gathered by the Association of State and Territorial Health Officials (ASTHO) regarding the use of digital tools and technologies for the COVID-19 pandemic indicates which digital tools were used by public health agencies across 59 represented areas (including the 50 states, 5 US territories, 3 freely associated states, and the District of Columbia) and what they planned to use it for in their COVID-19 response. In New York, for example, most public health agencies utilized CommCare, an open-source software that allows users to create and deploy custom mobile forms, to collect information for contact tracing, symptom monitoring, contact tracing, and case investigation. They validated the data about each digital tool by confirming with state health agencies and comparing information with CDC partners through email and formal convenings. By analyzing this data, they were able to evaluate the effectiveness of each digital tool that was used and as a result, better inform future decision making on public health practices.

CONCLUSION

The growth of the open-source community during the pandemic can be attributed to the numerous needs that were unmet during the crises, along with the worldwide urgency to join forces and share solutions. Open-source solutions are cost-effective and can easily be customized to suit the specific needs of different public health systems. Moreover, the use of open-source solutions can encourage collaboration and sharing of knowledge among communities. The analysis of numerous articles in this study has demonstrated the positive impact of open-source solutions on the COVID-19 pandemic and the continued need for further development of additional solutions in the future.

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