

Effective COVID Response through Outbreak Investigation: The Provincetown Case Study

PARSA ERFANI • MARGARET BOURDEAUX MD, MPH
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The Provincetown Case Study

The July 2021 COVID-19 outbreak in Provincetown, Massachusetts was rapidly identified through outbreak investigation. Thousands of people were mixing indoors without masks while celebrating the Fourth of July weekend. Shortly after, individuals started falling ill and COVID-19 cases quickly increased. Responding to the uptick in cases, the **Massachusetts Department of Public Health (DPH) and community partners** quickly deployed an “**outbreak investigation**”—a strategy that aims to determine where, when, and how individuals were infected. This robust approach:

- Revealed **important data** about the ability of vaccinated individuals to transmit the virus, prompting the CDC to improve its guidance on indoor masking.
- Determined the outbreak was **caused** by Delta variant.
- Allowed local businesses to improve their COVID prevention strategies.
- Promoted focused and equitable distribution of COVID response resources, including testing, vaccination, and early treatment to infected individuals.

The investigation involved contacting an estimated 1,100 individuals and dozens of businesses—work shared by the MA DPH and the local Provincetown board of health. The versatility of strategies and techniques used in this outbreak investigation can be adapted and deployed across the United States to suppress and prevent COVID-19 outbreaks. Thus far, outbreak investigation has not been widely adopted or standardized in the United States.

The Power of Outbreak Investigation

Outbreak investigations provide **actionable intelligence** about the location and context of COVID-19 outbreaks and empower health authorities to use that intelligence to:

1. Approach **testing and vaccination** efforts in a targeted manner
 - Outbreak investigation provides a **unique window** of opportunity to reach an unvaccinated individual, as they are grappling with a real risk of infection. Immediate referral to **walk-in or mobile vaccination sites** is necessary in the contact tracing process. Vaccine uptake may be most successful if vaccination is offered at the **same time and location** as testing.
2. Connect infected individuals with **life-saving therapeutics**
 - Some exposed individuals who are identified through outbreak investigation may be already infected and symptomatic and may benefit from **antibody therapy**. Antibody infusions are currently approved for treatment of early COVID. Outbreak investigation can help identify high-risk individuals who may be strong candidates for antibody therapy.
3. Guide and help implement **location-based** COVID-19 prevention strategies (e.g., **masking and testing guidance, ventilation practices**)
 - When an outbreak is identified at a specific location, the proprietor (i.e., business owner, faith leader) may be motivated to establish screening guidelines, promote vaccination among their members, or improve their location’s air ventilation.

Contact tracers can connect proprietors with a **small team of local epidemiologists** who can guide them on evidence-based guidelines. Partnering with the community on intervention design and implementation can help establish COVID-19 mitigation standards and address COVID-19 stigma.

4. Provide **social support** to exposed individuals undergoing quarantine or isolation
 - People identified as a close contacts in an outbreak investigation may need **social support to quarantine or isolate** until they are no longer infectious. Contact tracers can ensure that people are connected to available support services.

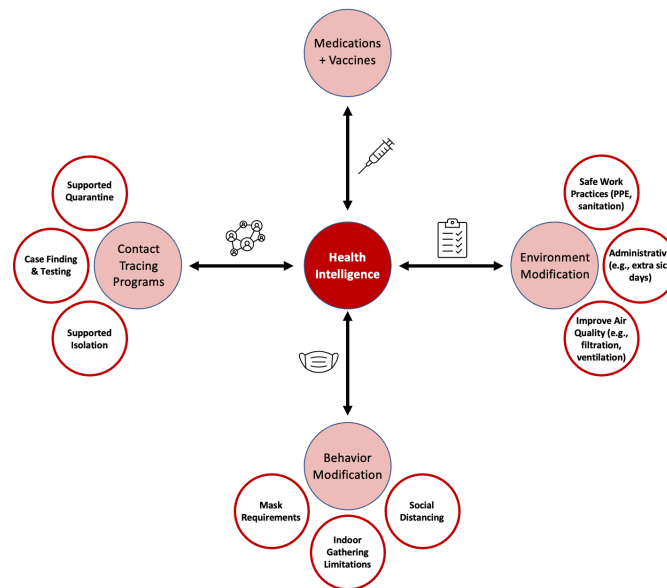


Figure 1. Outbreak investigation provides actionable health intelligence which sits at the center of public health responses to COVID-19 and informs critical elements of the response. *Image adapted from Adam Nagy*

Conclusion

The Provincetown experience underscores the value of outbreak investigation in identifying exposed individuals and determining who is most at risk of infection, **connecting** them to essential services, and producing key data to guide public policy in real time. This **high-touch model** will be vital to quelling COVID-19 outbreaks, reducing COVID-19 morbidity and mortality, and ultimately preventing the emergence of new variants. Health authorities can develop or modify existing public health capabilities to scale outbreak investigations in their respective jurisdictions. In the **upcoming webinar**, state officials and community partners who helped lead the Provincetown outbreak investigation will outline the benefits, operational approach, and challenges to effectively implementing outbreak investigation.

Further Reading and Resources

“Cluster Investigation: How to Obtain Actionable Intelligence.” *The Program in Global Public Policy and Social Change*. Harvard Medical School. Video. Harvard University. May 4, 2020, <https://vimeo.com/548033236>

“COVID-19 Source Investigation.” *Centers for Disease Control and Prevention*. <https://www.cdc.gov/coronavirus/2019-ncov/php/contact-tracing/contact-tracing-plan/source-investigation.html>

“Retrospective Contact Tracing: A Primer for State and Territorial Health Authorities.” *The Berkman Klein Center for Internet and Society*. Harvard University. <https://cyber.harvard.edu/sites/default/files/2020-11/RetrospectiveContactTracingMemo.pdf>

“Organizing, Budgeting, and Implementing Wraparound Services for People in Quarantine and Isolation” *The Berkman Klein Center for Internet and Society*. Harvard University. February 2021. <https://cyber.harvard.edu/events/organizing-budgeting-and-implementing-wraparound-services-people-quarantine-and-isolation>

“This Overlooked Variable Is the Key to the Pandemic.” *The Atlantic*. September 2020. <https://www.theatlantic.com/health/archive/2020/09/k-overlooked-variable-driving-pandemic/616548/>

“Ten scientific reasons in support of airborne transmission of SARS-CoV-2.” *The Lancet*. May 2021. [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(21\)00869-2/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)00869-2/fulltext)

“Indoor Air Changes and Potential Implications for SARS-CoV-2 Transmission.” *JAMA*. April 2021. <https://jamanetwork.com/journals/jama/fullarticle/2779062>

“To vaccinate more Americans, lean into outbreaks.” *STAT News* August 2021 <https://www.statnews.com/2021/08/19/lean-into-outbreaks-to-vaccinate-more-americans/>

Outbreak of SARS-CoV-2 Infections, Including COVID-19 Vaccine Breakthrough Infections, Associated with Large Public Gatherings — Barnstable County, Massachusetts, July 2021,” *MMRW* August 2021 <https://www.cdc.gov/mmwr/volumes/70/wr/mm7031e2.htm>

“Why Provincetown’s Response to Its Covid Outbreak Was So Effective.” *New York Times* August 2021 <https://www.nytimes.com/2021/08/27/opinion/provincetown-covid-contact-tracing.html>

“Principles of Epidemiology in Public Health Practice, Third Edition an Introduction to Applied Epidemiology and Biostatistics.” *Centers for Disease Control and Prevention*. <https://www.cdc.gov/csels/dsepd/ss1978/lesson6/section2.html>