

# THE ADMINISTRATION AND MANAGEMENT OF COVID-19 CONTACT TRACING PROGRAMS

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A Descriptive Study of the Experiences  
of US State & Local Health Departments



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*Advancing  
public health  
performance*

January 2021

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**Conflict of Interest and Source of Funding:** This research was funded by the Public Health Accreditation Board (PHAB), with support from the Robert Wood Johnson Foundation. The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the funding agency. The authors declare no conflict of interest.

**Acknowledgments:** Special thanks go to all state and local health departments who participated in this study, during this exceptionally busy time for public health, and to PHAB for their support in recruiting study participants.

# CONTENT

<b>Content</b>	3
<b>Executive Summary</b>	4
<b>Introduction</b>	8
<b>Methods</b>	12
<b>Results</b>	14
Contact Tracing Program Planning	14
Workforce Recruitment	19
Workforce Training	25
Workforce Retention	30
Infrastructure	32
Contact Tracing Process and Best Practices	35
Contact Tracing Challenges	43
Identifying and Addressing Health Equity Issues	51
Developing and Implementing Robust Contact Tracing Programs: Opportunities and Recommendations	56
<b>Summary and Conclusion</b>	59
<b>References</b>	61

# EXECUTIVE SUMMARY

## Introduction

During the early months of the COVID-19 pandemic, it became abundantly clear to both state and local health departments that in order to slow the spread of the virus, a large public health workforce, including thousands of contact tracers, was going to be needed. Despite many of these health departments already having trained disease investigation teams including epidemiologists, disease intervention specialists (DIS), and communicable disease specialists (CDS), a COVID-19 specific contact tracing program was often needed in order to increase workforce capacity for an effective pandemic response. This pandemic created a great deal of strain on the current public health infrastructure and state and local health departments were met with challenges in implementing and scaling up their contact tracing programs.

## Methodology

To articulate the current challenges and opportunities met by state and local health departments while developing and implementing their COVID-19 contact tracing programs, the Jiann-Ping Hsu College of Public Health (JPHCOPH) at Georgia Southern University was contracted by the Public Health Accreditation Board (PHAB) to conduct a qualitative study to document their experiences. Data were collected using 18 qualitative interviews with health departments including 6 state health departments, 5 city health departments, and 7 county or district health departments. The project sought to document the lessons learned and best practices in order to inform planning and preparedness for contact tracing and disease investigation concerning future pandemics.

## Findings

Highlighted below are the key findings grouped by theme and spanning the qualitative analyses.

### Contact Tracing Program Planning

- While some health departments developed new contact tracing plans and programs, others modified existing plans and programs in order to respond to the pandemic.
- State health departments often took the lead in program development and provided broad plans that local health departments modified to suit their specific needs.
- Plans and processes had to be flexible and dynamic in order to adapt to the changing disease guidance, varied caseloads, staffing, and data management improvements.
- Challenges experienced during planning included challenges associated with the unknown aspects of the virus, complex communication plans, urgency in which plans had to be developed or adapted, and barriers to improving staffing and IT/data management infrastructure.

## **Workforce Recruitment**

- Health departments depended on a variety of sources to fill their contact tracing staffing needs including existing staff, governmental agency redirects, students, and volunteers.
- Recruitment efforts were shaped by considerations for surge capacity, existing administrative capacity, diversity of the population served, specialized staff skill mix, and desirable employee attributes.
- Challenges experienced during recruitment included lack of existing capacity and ability to hire/train staff, shortages of specialized public health professionals, inability to accurately estimate staffing needs, and challenges associated with adapting to a remote work environment.

## **Workforce Training**

- State and local health departments relied on a variety of sources, such as academic partners, Johns Hopkins, Association of State and Territorial Health Officials, the CDC, and their own experiences to curate training content.
- Training development efforts were a collaborative process involving both internal and external stakeholders to ensure that the training efforts were comprehensive, culturally appropriate, and responsive.
- Training efforts were constrained by the large number of staff that needed to be trained, the need to tailor content for employees with no public health background, and issues related to technology and data management systems.

## **Workforce Retention**

- Contact tracing program staff turnover was, in part, driven by the reliance on temporary, transitioning or volunteer staff, the inability of some staff to adapt to technology and work expectations, and staff burnout.
- Promising practices for contact tracing workforce development shared by participants included providing contact tracers with multiple resources, tailoring training to the diverse staff, leveraging existing partnerships to support workforce development, enhancing team communication and collaboration, providing psychosocial support for the contact tracing team, and valuing stakeholder feedback.

## **Infrastructure**

- A robust data management system is essential to a successful case management and contact tracing program.
- Partnerships and trust were essential to communicating with typically hard to reach populations, while stakeholders and community partners paved the way by communicating with those in their community about contact tracing and the importance of answering calls from the health department.
- Infrastructure challenges that were experienced included lack of existing IT resources, difficulty in learning new data management systems, providing phones and laptops for remote workers, and space for on-site workers.

## **Best Practices for Developing and Implementing Contact Tracing Programs**

- Superior training and coordination of contact tracers; and leveraging local-state agency collaborations.
- Identifying and using nationally reputed sources of training on contact tracing, including those available virtually from the Association of States and Territorial Health Officials (ASTHO), Johns Hopkins, and Centers for Disease Control and Prevention (CDC); and having a well-organized contact tracing team with the right skills and organizational support.
- Knowing the population and matching cultural competency.
- Dedicating a part of the team as essential to communicate with special needs populations such as homeless community members and migrant farm workers.
- Alerting contacts through text or email that they will be contacted by phone and providing proof of identity to address issues with contact tracer identity.
- Using jargon-free language and providing explanations of the terms appropriate for the population.
- Embracing technology and superior information technology and data systems.
- Stakeholder engagement and utility of their feedback plays a crucial role in the success of the contact tracing program.
- Willingness to evolve with changing guidelines, evolving terminology, changing workforce availability, and fluctuations in COVID-19 cases is essential.
- Internal and external stakeholder engagement and valuing stakeholder feedback.
- Focus on building trust and rapport with the cases, contacts, and community;
- Providing or assuring wrap-around services.

## **Contact Tracing Challenges**

- Public trust, misconception, and misinformation coupled with a reluctance to be interviewed for a variety of reasons.
- Fatigue from call frequency and/or lengthy questionnaires was a significant barrier to compliance among the contacts.
- Contacts were non-compliant due to the fatigue of reporting, the time commitment needed for testing, non-availability of social and wrap-around services, or simply because of the lack of belief in the seriousness of COVID-19.
- Steep learning curve among contact tracers not trained in public health.
- Constantly changing guidelines, protocols, and definitions of COVID-19.

## **Identifying and Addressing Health Equity Issues**

- Existence of health equity issues was acknowledged by health departments. Addressing sources of health inequities was recommended as a best practice.
- Health equity issues arose from some subgroup characteristics such as lack of health literacy, inability to understand the science behind contact tracing, belief in conspiracy theories, political alignments promoting distrust in science and government, inaccurate identifying information due to change in residence (nonpayment of rent), loss of phone service due to

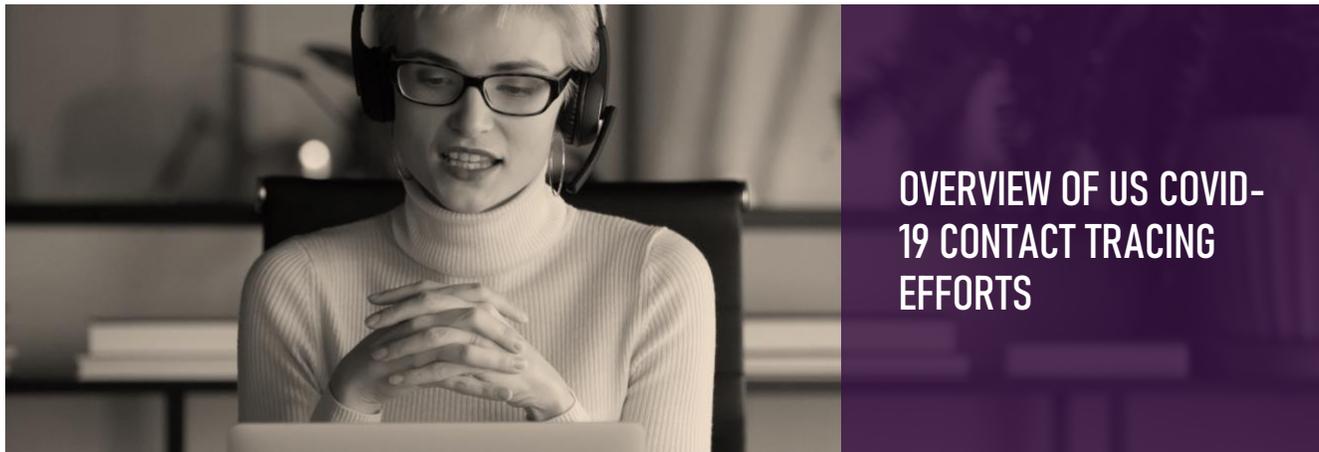
affordability, and the fear of losing employment if the workplace was identified as a source of infection.

- Additional health equity issues were associated with the shortage of culturally competent public health workforce and non-availability of wrap-around services such as transportation, non-availability of work from home, lack of social support including childcare, adequate housing, food security, laundry assistance, and garbage disposal.
- Strong community support and robust wraparound services are essential to keeping those exposed at home.
- Addressing health equities necessitated activities such as the provision of wraparound services or assuring availability of these services through the community.

### **Opportunities and Additional Recommendations**

- Public health has an opportunity to increase its visibility and demonstrate its value to the public.
- Public health needs to look closer at all levels of its infrastructure and build capacity for a more coordinated response in the future.
- There is a need for better coordinated and more robust public health messaging.
- Public health must continue to apply evidence-based approaches to contact tracing planning and implementation efforts, while expanding workforce training and development efforts targeted at contact tracing and disease investigation.

# INTRODUCTION



Contact tracing is an essential component of infectious disease control and has proven to be an incredibly important tool for curbing the spread of COVID-19 (Eames & Keeling, 2003; MacIntyre, 2020; CDC, 2020). The idea behind contact tracing efforts is to keep the reproduction rate ( $R_t$ ) below one, by limiting the number each case infects ( $R_0$ ) (Inglesby, 2020). This can be achieved by quickly identifying new cases and their closest contacts and isolating them from the general population. As such, contact tracing is especially effective during the early onset disease outbreaks, when the number of cases is few (Keeling, Hollingsworth & Read, 2020).

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## The Contact Tracing Process

For COVID-19, the CDC defines a contact as anyone who for a 24-hour period, was within 6ft of a case for at least 15 minutes (CDC, 2020). In the contact tracing process, the CDC recommends informing all individuals fitting this description of their potential exposure to a case within 24 hours of getting information regarding exposure. This notification can be done electronically through text messaging or through a phone call. Individual cases can directly inform their contacts, as well. Contact tracers are, however, not allowed to disclose the names of the cases to contacts.

During contact tracing calls, contacts are informed about their potential contact with cases and educated about the disease and the next steps to take. In most cases, the next step will involve testing (symptomatic) or a self-quarantine (asymptomatic) period during which signs and symptoms are actively monitored. Contacts can self-quarantine in their homes while staying away from other members of their households. Self-monitoring includes daily real-time communication about their symptoms. After 14 days of no symptoms, the quarantine period ends for contacts (CDC 2020). While the federal government, through the Centers for Disease Control and Prevention (CDC), has provided a framework for conducting contact tracing, it is up to the individual states and local governments to determine how to implement these guidelines (NASHP, 2020).

## Technological Tools for Facilitating Contact Tracing

Technology has proven useful in augmenting the traditional contact tracing process during the COVID-19 pandemic. States and local health departments, nationwide, have leveraged health information technology systems and applications for the collection, storage, tracking and retrieval of information to facilitate the contact tracing process. However, while the use of digital contact tracing tools may help with contact tracing activities, such as speeding up the process of identification of the individuals, it is unlikely to replace the need for a large public health workforce (CDC 2020b). This is because technology use is associated with inherent challenges, including issues with merging with traditional contact tracing, privacy, correct identification of infected individuals, limitations of the technology (Dar et al, 2020), as well as efficacy and ethical issues (Lucivero et al., 2020). For public health interventions such as digital contact tracing to be effective, public trust must be gained. The human-to-human interaction in manual contact tracing supersedes the effect of technology on contact tracing. Manual contact tracing entails communication of empathy which is vital to adhering to rules of quarantine and isolation as well as a contribution to the healing process. Further, certain communities such as rural areas may lack the necessary technological infrastructure.

## The Contact Tracing Workforce

While the contact tracing process has received significant attention as a critical tool for blunting the COVID-19 curve, less attention has been given to the contact tracing workforce. Three waves of a survey of public health departments conducted by the National Public Radio (NPR) in April, June and July of 2020 remain, perhaps, the only attempt to assess the contact tracing workforce capacity on a national scale. The findings of these surveys indicated that despite a quadrupling of the contact tracing workforce between April and July of 2020, most states did not have sufficient contact tracers to meet the demand. In June 2020, estimates of contact tracers were approximately 37,000, up from 11,000 in April, and tapering off to 41,000 in July (NPR 2020a; 2020b), falling short of the estimated over 100,000 contact tracers the nation needed to effectively respond to the pandemic (Watson et al., 2020). George Washington University (GWU), in partnership with ASTHO and NACCHO, has developed a dynamic contact tracing workforce estimator for states, counties and tribal nations that factors in outbreak size and individual contact tracer workload capacity. Estimates from this tool point to significant shortages of contact tracers across the nation, especially in states hit with late summer surges like Georgia and Texas (GWHWI, 2020).

## Recruitment and Retention Challenges

Across the nation, several states have struggled to shore up their workforce capacity in response to surges in COVID-19 cases (Clark et al., 2020). Many states have had to scale up their contact tracing workforce quickly, through partnerships with non-governmental public health organizations like the Partners in Health (PIH) (Ross et al. , 2020; Burns et al., 2020), academic partnerships (Koetter et al. 2020), federal support (for example, over 600 CDC employees have been deployed to assist states and local governments with the pandemic response, including contact tracing) (CDC, 2020), the national guard, and volunteers, through partnerships with service groups and other philanthropic organizations (NPR, 2020a). Many states (about two-thirds in June 2020) have created a reserve of contact tracers to enable them to scale up (or down) contact tracing capacity efficiently, in response to dynamics of COVID-19 infection rates (NPR 2020a).

While data on the retention of contact tracers are currently limited, the existing evidence suggests that contact tracers may encounter challenges in performing their jobs effectively, which may lead to added work-related stress and potentially, higher turnover. These challenges are primarily driven by a general lack of public cooperation, fueled in part by public distrust, and beliefs in conspiracy theories (Stephenson, 2020). Conversely, given the pandemic-induced increase in unemployment rates, it is also possible the contact tracers may be motivated to remain employed, thereby increasing retention. Thus, additional research is needed to characterize the challenges and opportunities related to the recruitment and retention of this workforce that has proven to be an essential component of our nation's response to the pandemic.

### **Efforts to Address Workforce Challenges**

For a public health system with an already stretched workforce capacity prior to the pandemic, the pandemic has undoubtedly increased the workload of public health professionals nationwide. While states have expanded their existing contact tracing programs with new hires, a considerable number of existing public health professionals have remained extensively engaged in the contact tracing process. To maximize the productivity of their existing public health workforce, some states like Montana have assessed and reassigned excess workforce capacity to contact tracing. However, in several other states, including Wyoming, contact tracing was an addition to the existing workload of local health departments employees (NPR 2020a).

The ability for state and local public health systems to expand workforce capacity is often constrained by resource scarcity. With many states experiencing constrictions in revenue, following the pandemic, the scaling up of an already costly contact tracing program becomes challenging (NASHP, 2020). Early reports suggested that several states relied on volunteers to expand the capacity of their contact tracing programs (NPR 2020a). As of July 2020, volunteers were a key part of the contact tracing workforce in at least 11 states, including Michigan and Massachusetts (NPR 2020a & b; NASHP, 2020).

### **Workforce Training**

The work of contact tracers involves interacting, educating, and obtaining information needed to help isolate potential cases from the public and provide the needed assistance for those isolated. The basic understanding of the steps associated with contact tracing is barely a starting point for contact tracers (Beech & Woodard, 2020). As such, contact tracers need to have the skills and knowledge in communicating, listening, identifying cases that need to be referred, and an ability to understand and respond to culturally sensitive issues and topics (CDC, 2020). Contact tracers, therefore, need training on how to provide medical information in simple terms to the population. They also need training on professional ethics and confidentiality, active listening, emotional intelligence, and cultural competency (CDC 2020), which brings to the forefront, the need for uniform training standards and methods as we move forward (Beech & Woodward, 2020).

With the surge in the number of COVID-19 cases, contact tracing training programs, aimed at training as many people as possible and effectively in a short time, have become essential. These programs, which have primarily been virtual, have needed to be abridged because of the severe need of contact tracers to handle the COVID-19 pandemic (CDC, 2020). While the CDC has provided a

general framework for contact tracing training, most state health departments have either provided these training directly or contracted with academic institutions to provide the training (NASHP,2020).

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## Study Purpose

Undoubtedly, the COVID-19 pandemic has challenged the existing public health infrastructure. There is evidence to suggest that state and local health departments have experienced challenges in implementing and scaling up their respective contact tracing programs in response to the pandemic. There are lessons to be learned. Thus, the purpose of this study is to document the experiences of health departments in developing and implementing their COVID-19 contact tracing programs. Specifically, the study examines challenges and opportunities related to contact tracing program development and implementation, infrastructure, and workforce development. The findings may provide lessons learned as well as best practices to inform both current and future pandemic preparedness and response efforts.

# METHODS



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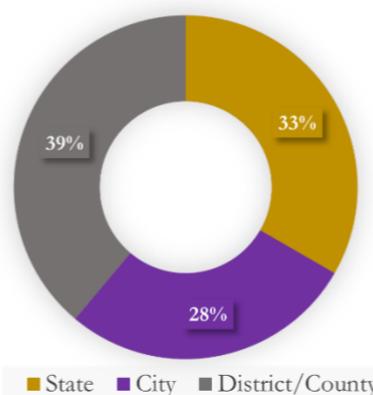
## Study Population

This study used a qualitative research methodology. The sample of health departments for this study was selected using a purposive variation sampling approach to assure sufficient representation of state and local health departments. The sampling frame for the study was obtained from the Public Health Accreditation Board (PHAB). From the list, the project team identified and invited 35 health departments in consultation with PHAB to participate in the study. Of these 20 agreed to participate in the study. Out of the 20 health departments who initially agreed to participate, 18 completed the interviews.

Of these 18, one-third (i.e., 6) were from state health agencies. Of the remaining 12 local health departments, 5 were city health departments and the remaining 7 were county or district health departments. Participants were geographically diverse, including 8 from the West, 3 from the Northeast, 5 from the South, and 2 from the Midwestern regions of the US. The average population served by the local health departments is 1.6 million citizens and the average population served by the state health departments is 11.1 million citizens.

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Participating Health Departments



All participating health departments had been accredited by PHAB. The health department accreditation contact persons helped the JPHCOPH project team to connect with their contact tracing lead person or a designee. In a few cases, multiple team members participated in the same interview to make sure the most relevant person answered relevant questions.

Participants had a variety of roles within their health departments including health commissioner, public health nurse, epidemiologist, disease investigation specialist (DIS), communicable disease investigator (CDI), division director, chief or senior chief, program lead, and infectious disease physician. Typical roles and responsibilities included overseeing case investigation and contact tracing, training, conducting case investigation and contact tracing, program development and evaluation, disease surveillance, data management and analysis, and care resource coordination.

### **Instrument**

The project team from JPHCOPH, in collaboration with the PHAB team developed a semi-structured interview guide to serve as the study's qualitative interview instrument. The instrument was refined based on an extensive review of the academic and grey literature on contact tracing and case investigation and pretested before its use.

### **Data Collection and Transcription**

The project team completed 18 in-depth hour-long interviews with health departments' staff. The interviews were conducted over the telephone by the Principal Investigator (Shah) and Co-Investigators (Peden, and Opoku). All interviews were recorded and stored on a secure server. The audio recordings were transcribed, assuring that any identifiers inadvertently included in the conversation were deleted.

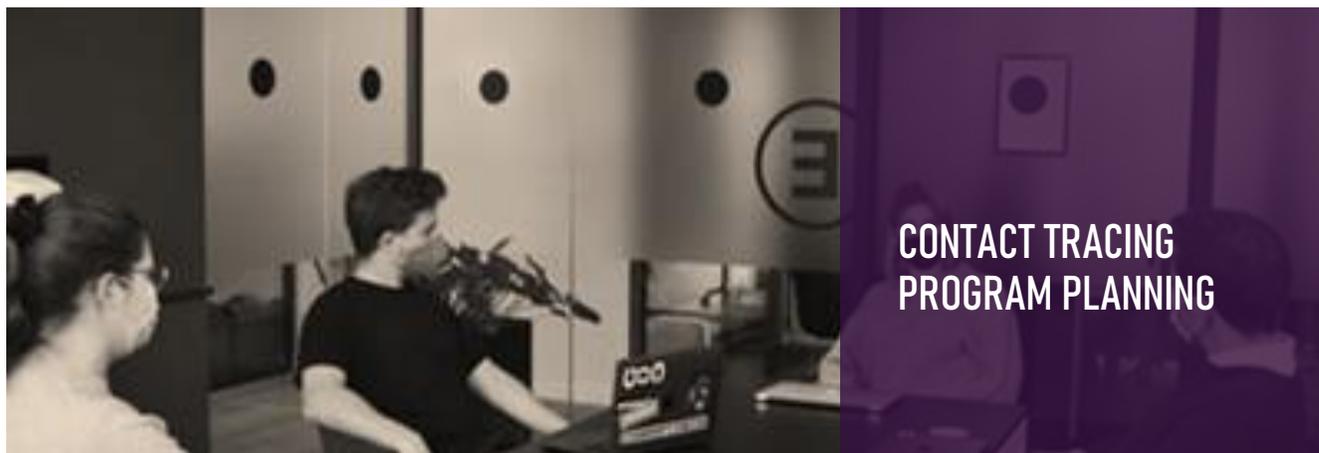
### **Thematic Analysis**

The transcripts were verified for completeness and quality before coding, then imported into QSR International's NVivo 12 qualitative data analysis software. Data were analyzed following Braun and Clarke's (2006) thematic analysis methodology. Three researchers coded the qualitative data independently. Interviews were iteratively coded and recoded to maximize intercoder consistency. After the codes were completed, intercoder consistency was analyzed, and coding inconsistencies were addressed through discussion and consensus. Codes were subsequently collated into emerging themes and subthemes.

### **Ethical Approval**

Ethical Approval for this study was received from the Georgia Southern University Institutional Review Board (IRB), under the protocol numbered H21018.

# RESULTS



## Plan Development

All the health departments included in this sample discussed the importance of developing a contact tracing and case investigation program plan in response to the coronavirus pandemic. About half of the health departments developed new contact tracing plans and programs to respond to the pandemic, but many of these were based on prior plans within disease investigation and epidemiology branches/divisions. Others used existing disease investigation or emergency operations plans and scaled up or made policy changes as needed. Participants also reported that they started the response with an existing local plan and then pivoted to a state-based plan once one was developed.

Originally when COVID started we were using staff and a system that was utilized previously for all investigations and now statewide we use the same process for contact tracing, which is a separate system and a separate staffing plan than our regular investigations. – *District Health Department Participant*

The partnership between state and local public health was also highlighted during the discussion of plan development. States often took the lead in plan development but produced dynamic plans that could be customized by local health departments. Processes varied by state, but most participants described the case investigation and contact tracing at the local level with data management and disease surveillance ultimately occurring at the state level.

Plan development included collaboration and engagement at multiple levels across the state and within local public health. Engagement included local health officials, epidemiologists, CDIs, information technology (IT) specialists, human resources (HR) directors, and public health nurses.

So ultimately the plan for us obviously was agreed upon by the state department. But we wanted to engage all our county health department officials, the health directors, the boots on the ground folks, the epidemiologists and CDIs. – *State Health Department Participant*

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## Considerations for Plan Development

Participants spoke frequently about the need to adapt to a changing pandemic environment. Plans and processes had to be **flexible and dynamic** to stay in tune with changing disease guidance, varied caseloads, staffing, and data management improvements as the pandemic progressed.

I think one of the most important things we have found is close collaboration between epidemiologists and IT support, and a flexible system, I think. A flexible system that can rapidly iterate is one of the most important aspects because as things are changing, we need the process to be able to quickly change along with the things that are changing. So, we need leadership that is flexible, and we need systems that are flexible. – *State Health Department Participant*

I'll say, May 15th, is not the exact same plan that was used June 15th or July or now. It's constantly evolving. So, for us to just create a plan once and stick to it, we would have failed a long time ago. So, we're constantly altering and adjusting this plan to fit the needs of the response. – *County Health Department Participant*

## Essential Program Plan Elements



**Communication.** *External:* An essential tenet of contact tracing is communicating effectively with the public. This public communication is three-fold:

1. **Prior to contact tracing.** The public needs to understand what contact tracing is and why it is so important that they answer their phones and share their close contact information with the case investigator or contact tracer. This communication needs to be continuous throughout the duration of the pandemic.
2. **Direct communication with the case and contacts.** Proper training, which will be discussed later, allows both the case investigators and the contact tracers to build rapport

with those affected in order to share important isolation and quarantine guidance as well as gain access to information for close contacts.

3. **Results.** What is happening with cases in my community? Is contact tracing working? What should I expect to happen next?

*Internal:* Internal communication is difficult during a pandemic especially one that involves a novel virus where national guidance changes frequently. Participants stressed the need for timely communication through all levels of public health in order to effectively contact trace.

**Collaboration.** The importance of collaborating on multiple levels was stressed throughout many of the interviews. Collaboration between state and local health departments in plan development as well as communicating with community partners to assist with testing and wraparound services that allow cases and contacts to isolate and quarantine.

**Staffing.** Staffing will be discussed at length later in this report but for the contact tracing plan, adaptability is important. Participants reported cases coming in waves and varying from week to week and month to month. The plan needs to account for this. Additionally, simply hiring large numbers of case managers and contact tracers is not effective. Supervisors are vital to the success of contact tracing programs.

We brought on the investigators and the front-line staff first, but now we're struggling because we've got so many new staff that we have brought on, we don't have enough trained supervisors to manage. Some of them right now have a span of control of 11 staff, which is too high for this kind of work. So, we are now trying to focus on bringing in some more middle managers and more management staff to help assist and even out that workflow. – *City Health Department Participant*

**Information Technology and Data Management.** All participants discussed the need for robust information technology and data management systems. Even agencies that described using existing contact tracing plans, stressed the fact that the daily number of cases and contacts was much larger than anything they have dealt with in the past. New systems were developed quickly and rolled out to local health departments often while still being finalized and perfected.

The state converted over to a brand-new system in early August. So, not only are we having to stand up new disease investigators, and get training, and get the actual cases investigated, we're having to learn a brand-new system as well that's not fully developed. It's a good system and it's helping us to get information out fairly quickly, which is different from the system that they had previously. That has been very beneficial. But there are still pieces of that electronic system that are not yet fully designed. – *City Health Department Participant*

**Evaluation and Quality Improvement.** The importance of collecting and evaluating metrics on contact tracing was discussed by many of the participants. For example, percent of calls answered, and percent of cases called within 24 hours.

**Adaptability.** Flexibility is at the core of an effective contact tracing plan. Participants stressed the need for adaptability in all aspects of the plan to account for changing guidance, case fluctuation, and staffing needs.

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## Planning Challenges

Participants discussed numerous plan development challenges and common themes are listed below:

**Novelty of the virus.** Many participants discussed the challenges associated with unknown aspects of the virus. Scope and scale were very difficult as well as transmission unknowns at the beginning of the pandemic. Most LHDs had experience dealing with other public health emergencies such as Ebola or H1N1 but nothing on the same scale as Covid-19.

**Communication.** Communication challenges were complex during plan development and included communication between state and local health departments, communication with the public, and communication with multiple levels of government.

**Urgency.** Health departments had to move very quickly to put together a plan for robust contact tracing. Even though public health is accustomed to responding quickly, one interviewee described this response as a *“pivot at light speed.”*

**“ I THINK ONE OF THE BIGGEST CHALLENGES THAT WE FACED WAS JUST OUR INABILITY TO PREDICT WHERE THE PANDEMIC WOULD GO. I THINK [IN] MOST OF OUR PLANNING, WE THOUGHT WE WERE BEING VERY GENEROUS IN MAKING OUR PROJECTIONS AND ESTIMATIONS BASED ON THE RATE GOING UP THREE TIMES AS MUCH AS THEY WERE IN SHELTER-IN-PLACE. SO THAT ENDED UP BEING A PRETTY BIG UNDERESTIMATION. SO, FEELING LIKE WHEN WE LAUNCHED OUR PROGRAM, WE STARTED OFF BEHIND IN SOME SENSE. ”**



STATE HEALTH DEPARTMENT PARTICIPANT

**Staffing.** Staffing plans had to be robust, adaptable, and also broad. Participants shared that just hiring large numbers of tracers was not going to be enough. Budgets had to account for supervisors, data managers, and additional epidemiologists.

**Infrastructure.** Many participants listed infrastructure, specifically IT and data management, as a large planning challenge. Specifically, state health departments discussed the urgent need for new state-wide case and contact management systems.

**“ WE UNDERESTIMATED HOW CHALLENGING IT WOULD BE TO BRING ALL OF THE DIVERSE STATE AND LOCAL HEALTH JURISDICTIONS ONTO A DATA MANAGEMENT PLATFORM OR TO PROVIDE THEM STAFF. IT'S NOT AS EASY AS JUST FLIPPING A SWITCH AND NOW THEY'RE USING THIS NEW DATA MANAGEMENT PLATFORM OR JUST GIVING THEM STAFF AND NOW THEY'RE READY TO GO OR JUST TRAINING STAFF AND THEY'RE READY OUT OF THE GATE. THERE IS A LOT MORE INVOLVED IN THAT CHANGE PROCESS AND IN THE SKILLS-BUILDING AND SO MUCH MORE NEEDED TO BE INVESTED IN ALL OF THAT WRAPAROUND, THAT I DON'T THINK WE PUBLICLY FORESAW THAT OUT OF THE GATE. ”**



STATE HEALTH DEPARTMENT PARTICIPANT



Responding health departments shared their experiences with recruiting, training, and retaining the contact tracing and case investigation workforce during the COVID-19 pandemic. The emerging themes are summarized in the ensuing paragraphs. Participants described a generally adaptive approach to staffing, noting that such flexibility was necessary given the evolving nature of the pandemic response. Health departments depended on a **variety of sources** to fill their contact tracing staffing needs, including:

- Federal government staffing extenders, including staff from the CDC
- Redirected staff from other state and local government agencies
- National Guard
- Redirecting staff within their own health department
- Paid contractors
- Students
- Volunteers



Most depended on existing workforce, redirects from other governmental agencies, interns, and other volunteer workforce at the beginning of the pandemic and expanded their workforce capacity through hired positions as the virus surged across communities and as additional funding became available.

So, at the very beginning of the response, we were trying to leverage our community members, leverage our MPH student organizations, utilizing both to do case investigation and contact tracing and things like that knowing that or unknowing that we were going to be receiving some additional funds. But we started off kind of down our normal route of using what we have available to us. And at the time, it was unpaid volunteer workforce. Obviously, with the passing of the Cares Act and getting some additional funding from the federal government, that is when we reassessed and figured that we could start hiring some contractors to do this work. – *State Health Department Participant*

So, our process has changed several times since April. First, it started where we were utilizing staff that were not able to work in their normal job duties because things were shut down...Once the end

of April start happened, we worked with the state office and the governor had approved funding for contact tracers, and they also had approved funding for additional epidemiology staff. – *Local Health Department Participant*

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## Recruitment Considerations

Recruitment efforts were shaped by considerations for surge capacity, existing administrative capacity, diversity, as well as desired skill mix and employee attributes.

**Surge Capacity.** Participants discussed the need for an adaptive staffing plan that allowed the expansion (or contraction) of staffing in response to disease dynamics.

It feels like we're on a rollercoaster about, okay, we don't have enough staff, let's recruit, let's get enough staff. Okay, let us get them through training. Okay, great. Wait, we only have contact tracers because we split apart that role as case investigation and contact tracing. Wait, we have a ton of contact tracers, but we cannot do the work because we do not have enough case investigators – *State Health Department Participant*

**Existing Administrative Capacity.** For several health departments (especially local health departments), the volume of hiring they had to complete for their respective contact tracing programs was significantly greater than they were used to. Thus, they stressed the need to remain cognizant of the administrative challenges that were associated with managing a large workforce.

You just need to be prepared to handle the type of issues that you would have with any large staff. With all the support staff included, we have over 350 people dealing with contact tracing, and you are going to have issues where individuals do not get along, where somebody is going to want a certain day off or doesn't want to work at a particular location. I would not expect there to be anything different just because you are doing contact tracing as opposed to any other job with those types of issues. – *County Health Department Participant*

**Diversity.** Participants expressed the importance of recruiting a diverse contact tracing and case investigation staff that matched the diversity of the population they served.

I think as time moved on and we realized that there was opportunity to bring in new staff, we really felt like it was critical to have representation and diversity on our contact tracing teams, so folks from the communities that are most proportionately impacted because we knew we could accomplish more if we had people that understood the people they were reaching out to – whether it was speaking in their languages or understanding their cultural reservations or kind of understanding what the impact of a diagnosis might mean on a particular person in a particular line of work. – *State Health Department Participant*

**Staff Skill Mix.** The contact training and case investigation efforts required a diverse group of professionals with complementary technical skills, including epidemiologists, disease investigators, health educators, nursing and clinical staff, information technology (IT) and information systems professionals, health services managers and administrators, and administrative support staff. Several participants also noted the need for care coordinators or care resource coordinators to lead efforts in addressing the social needs of cases and contacts:

Then kind of another position that we have been working on promoting and creating are the care resource coordinators who support wraparound services and social services to individuals that are in isolation and quarantine – *State Health Department Participant*

There was also a need to find staff with supervisory and management experience to oversee and coordinate the contact tracing efforts.

Because of the structure of contact tracing, there's multiple levels, multiple layers—one section that sometimes gets forgotten is the supporting cast of contact tracing. And what I am talking about are the administrators, the supervisors, right, the team leads. The team lead role is actually quite unique in that, you know, initially, we had a bunch of, I guess you could say they're epis who were put into those roles. Unfortunately, some of them, many of them did not have the supervisor experience to be able to be a lead and to be able to communicate and give clear directions—how to manage HR issues, how to manage conflict within teams, right? Because we are talking about a very large sized group of individuals working together. So, then, we decided to maybe bring in some that have supervisor experience. But then the challenge there is that they do not necessarily have the epi background. So, it is a fine balance between the epi knowledge as well as the supervisor experience for those in the lead positions. – *County Health Department Participant*

Participants also noted the **need for more specialized staff for case investigation**, compared to contact tracing.

If we look at a case investigator, I think it really helps to either have somebody that has a public health background or has a medical background. Those are really two important pieces but also that is not enough either. We must have people who understand empathy and understand that you're having a conversation with somebody and that you're not just collecting data... And as far as contact tracing staff goes it is not really necessary to have somebody that has worked in public health or that even has a medical background. I think looking at somebody that has customer service experience and again can have a conversation with somebody, those are really important pieces that I think are valuable when you're a contact tracer. Because again, you are calling somebody to educate them on their exposure and what are the next steps of the recommendations and you're not really just trying to collect information from them, so I think those are really important qualities. – *County Health Department Participant*

**Desirable Employee Attributes.** Participants detailed a comprehensive list of employee attributes required to successfully implement contact tracing programs. The ideal contact tracer and/or case investigator was:

- One with a Public Health background and/or experience
- A good communicator
- An analytical thinker
- Culturally competent
- Bilingual, ideally
- Cross-trained, ideally
- Exhibited good judgement
- A team player
- Able to multitask and work well under pressure

- One with a good knowledge about the community
- Experienced in technology use, data management and interpretation

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## Recruitment Challenges

Interview participants identified several recruitment challenges, including a “bumpy” experience with recruitment, especially during the early phases of the pandemic response. One participant described the recruitment challenges metaphorically: “*we’re trying to put out a fire with a garden hose*”.

**Resource Constraints.** The challenges with recruitment were driven in part by the historical lack of resources committed to public health, which resulted in a general lack of slack in existing capacity to tap into, and placed constraints on the ability to hire, train and retain staff as part of the current pandemic response.

For recruitment, it was unfortunately a little bumpy as I’m sure everyone else had experienced as well. At the very beginning of the pandemic, we, and I’m sure I am in fact preaching to the choir, but as public health is routinely underfunded and understaffed the pandemic showed that even more.  
– *State Health Department Participant*

Obviously, we are trying to put out a fire with a garden hose, as how we say it, with the staffing. At this point, we have fulfilled about 43 percent of the positions through recruiting and hiring on. Most of those positions, unfortunately, are what we call limited term: it's all contingent upon available funding. – *City Health Department Participant*

**Pandemic-Amplified Shortages.** As public health agencies nationwide started recruiting aggressively to build their contact tracing capacities, health departments noted that they struggled to find sufficient workforce to fill up their contact tracing and case investigation positions.

For our response here, it seemed to go from 0 to 100,000 overnight and all of [a sudden] just started exploding everywhere. And so, we then ran into the issue where all of the county health departments as well as ADHS were tapping into the same resources. We were all calling the same universities; trying to partner with the same student groups and things like that. And so, we realized quickly that we were all tapping into the same resources and those resources were drying up very quickly. So that was another barrier. – *State Health Department Participant*

We have seen a lot of people vying for the same types of positions. It is like a competition between local public health agencies because everybody is using that same pool of people that are applying all over. Obviously, they are going to want to get the best offer that they can. So, they apply at four different health departments. So, we are really feeding off of that same pool of candidates, so that's been somewhat challenging. – *City Health Department Participant*

**Finding the Right Professionals.** Participants also shared struggles finding the right professionals for functions requiring specialized skillsets.

I would say another challenge was that this work has a specific subject matter expertise and there's just a very small number of people with that expertise in the state. So it was a lot of work for a small number of people. – *State Health Department Participant*

I think what was hard for us to identify were program managers, people who had the skillset to help develop a program and run a program, evaluate a program, manage staff, hire staff, etc. Everyone was so focused on the number of contact tracers. – *City Health Department Participant*

**Adequately Assessing Staffing Needs.** The struggles with staff recruitment for contact tracing programs were further compounded by the difficulty in accurately estimating staffing needs, while striving for a balance between adequate surge capacity and efficiency.

You have case fluctuations. And so, if you have a nice strong team and your cases drop, what do you do with this group of trained people? You cannot just decommission them all because if the cases rise again, you need them at the ready. So how to maintain that workforce with the rise and the fall of cases. So, I think that the staff training, and support has probably been one of the biggest challenges of this program. – *State Health Department Participant*

I think also predicting staffing. At the beginning, we were having difficulty keeping up with cases. Then, there was a lag as we came down one side of the wave, and then another surge as we started going up the other. So, predicting staffing levels has been difficult. Much of the time, we've either had people sitting around doing nothing or we have had too many cases to handle. It has been difficult to maintain the right number of people. – *State Health Department Participant*

**Navigating Technology and the Remote Workplace.** Like many organizations across the nations, public health agencies had to alter their work processes to accommodate pandemic-associated social distancing guidelines and lockdowns. In some cases, this resulted in the need to implement and coordinate contact tracing activities in remote workspaces. In addition, health departments also had to navigate challenges associated with training their contact tracing staff, many of whom were new to public health, on the technology needed to facilitate remote work.

There were just several human resource and unions and just logistical things around working from home that I think all presented various ongoing challenges to make sure that we had a workforce that we could deploy virtually. – *State Health Department Participant*

We use Microsoft Teams as our primary mode of communication, and there were a lot of folks who actually didn't know how to turn on a laptop, didn't know how to start a Word document, didn't know how to sign into Teams and log in. – *County Health Department Participant*

I think our supervisors are having a little harder time with the ones that are remote and making sure that we're getting what we need out of those that are maybe 100 percent remote versus those that are here in the office, which you can just walk by and see that they're on the phone and listen and see how things are going. The remote aspect does pose some challenges, I will say that. – *City Health Department Participant*

**Administrative and Logistic Human Resource Management Challenges.** The pandemic resulted in a need scale up the contact tracing workforce rapidly, resulting in administrative and logistic human resource management challenges for health departments who were not used to such large volume hires.

I will say we had to kind of recruit many people simultaneously at the beginning of the pandemic. So from an administrative perspective that is a very challenging process, and as mentioned it was focused on centrally, so the coordination between central office and the local health department, the process

of the districts of hiring, recruitment, onboarding, creation of email accounts and access to our network, shipping out equipment – it's just a very large task logistically to conduct that without some pitfalls and there definitely have been some challenges with coordination and communication when you're attempting to hire 800 contact investigators as quickly as possible and that doesn't account for the 400 or so case investigators that were also recruited at the same time and a whole host of other positions. I think there are over 2,000 positions that have been recruited since the beginning of the pandemic. – *State Health Department Participant*

I think, just the scale. So, I mean we were essentially, before this started, we were a communicable disease program of around 500 people. Then we redirected just at the state level alone, over 3000 employees...And I know at the local level they are experiencing the same thing. You know, just building up a workforce that is just so huge in a small period of time and making sure that there's appropriate supervision and making sure that there's some kind of way to evaluate how they're performing their job. It is something that I think has been probably the biggest challenge – *State Health Department Participant*



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## Training Development

While some health departments created their contact tracing and case investigation training programs internally, others curated training content created by academic and practice partners. Commonly cited external contact tracing training content included the Johns Hopkins Contact Tracing Training curriculum, as well as training content developed by Association of State and Territorial Health Officials (ASTHO) and the CDC. Some states also developed training materials to be used by all health departments within their state.

We would onboard [contact tracing staff] through a curriculum set up by us internally for contact tracing. The first course was fortunately done through Johns Hopkins University, the Coursera course on contact tracing. That was everybody's crash course on contact tracing that had not done it before. Then, the other course was the Association of State and Territorial Health Officials contact tracing course. Then, [our state] Department of Health has a specific training on the disease surveillance system, so these individuals could input the case data directly into our system so we could see it. – *City Health Department Participant*

In developing internal training programs, several health departments noted that they relied on their experience in developing contact tracing programs for HIV and sexually transmitted diseases.

I perform syphilis and congenital syphilis interviews as part of my work. So, we knew we wanted to follow a similar interview format but of course, with confidentiality, it's always something we want to uphold. – *State Health Department Participant*

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## Stakeholder Engagement in Training Development

Health departments, generally, described their training development efforts as a collaborative process involving both internal and external stakeholders, including government and academic partners. Such stakeholders were necessary to ensure that the training efforts were comprehensive, culturally appropriate, and responsive.

So, one of the very first things that we did when we came together is, we did a survey of the local health department to ask them and to kind of identify what their existing contact tracing efforts look like, where they needed support... We asked them a lot about the needs for training new staff because

we knew that they had to bring on and their redirecting and hiring to build up that contact tracing local capacity. – *State Health Department Participant*

On the training piece, we collaborated really early on. We launched our Virtual Training Academy back in early May, and that's a collaboration between [three academic partners]. So, we had some training subject matter experts who developed about a 20-hour course where contact tracers and investigators, there's two separate tracks and they are taught the basics of COVID, et cetera. – *State Health Department Participant*

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## Training Content

In addition to training staff on the technical aspects of contact tracing and case investigation, participants stressed the importance of using their onboarding and training efforts to improve customer service skills, improve knowledge concerning privacy regulations, such as HIPAA, and to stress the importance of “soft skills” such as empathy and active listening and other desirable interpersonal skills.

Our contact tracers are customer service representatives as well as contact tracers, so I think training our staff on listening skills, you know, skills to help alleviate people's fears, kind of those soft skills that maybe you cannot give to someone in a paper document that they read or a process and procedure manual. So, I think that training people to have empathy and to listen to these folks is helpful. – *State Health Department Participant*

I think providing like a thorough HIPAA training and making sure that all case and contact investigators are trained, understand, and follow HIPAA guidelines is a huge priority, and having a process for tracking any HIPAA breaches you have is essential to a contact tracing program. – *City Health Department Participant*

Health departments also worked to tailor their training content to the diverse contact tracing staff, especially since a significant proportion of this new workforce did not have prior public health experience.

In our training, we wanted to make sure that we included verbiage that wasn't difficult for the National Guard especially to be able to explain to contacts on the phone, especially because none of them really had public health experience or any type of medical experience. The same with our class actors, we had some with nursing degrees and things like that but many of them did not have public health backgrounds. So we wanted to make sure that we were using simple words, kind of fifth grade reading level for them to be able to explain to the contacts and the contacts would be able to comprehend. So, we really kept that in mind when building our survey and all of our training materials. We also created an FAQ document so that way all the National Guard soldiers could have that on their computers while they were conducting the interviews. We also printed them for the ones that were in office. – *State Health Department Participant*

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## Training Delivery

Participants generally adopted a multi-modal approach to training, with most training programs including both a didactic and “on-the-job” skills development or shadowing/mentoring component. The didactic components were delivered via virtual platforms or in-person. Several health

departments adopted a hybrid approach to training, delivering content through a hybrid of both online and in-person interactions. Others, tailored their delivery approach to the needs of their employees, offering online training for some and in-person training for others.

We do three levels of training. We use the ASTHO training for contact tracing. That is something that someone needs to complete online before they ever come here in person. And then we have an in-person trainer. People are socially distanced in a group and we go through a PowerPoint and there are some activities they complete, and that's a chance to ask a lot of questions that are coming up as they're learning the process. And then the third and final part of the training is one-on-one with an investigator where they shadow for the first day and then the second day, they begin making some calls and participating in the interview, and then eventually they get checked out by a lead, actually listens in before they make calls by themselves. So, I think providing the training in different ways for different types of learners [is helpful] – like some people will read something and get it, some people will listen and get it, and some people have to try it to understand it. – *City Health Department Participant*

So, they have about a week length of training that combines the elements of online modules, web-based modules that they can conduct themselves, and then there are some lecturing-type sessions where they would have live instruction from subject matter experts, and then there would be some shadowing opportunities to shadow experienced contact tracers and watch the process with someone that was experienced before they conducted the process themselves. And then we also provided training on one of our monitoring systems tools that's utilized for monitoring, so contact tracers would be trained in that system as well. – *State Health Department Participant*

As with other aspects of developing and implementing COVID-19 contact tracing programs, many had to adapt their training plans and make modifications over time.

Many of them [contact tracers] went to National Guard right after high school and they are not utilizing things like Zoom, Google Meet, Microboxing as often as we are. So, we set that up and we didn't have very many people join and the people who did join, they weren't really actively participating... So the second time around we did an in-person training with the National Guard and that worked really well because they were forced to show up at one of our state universities and they all sat in an auditorium. We were socially distant. Everybody was masked. We conducted our presentation extensively. We went through the survey and they were able to ask questions in person, which I think went really well for them. And then we had our IT on staff as well as [our academic partner's] IT on staff and they were able to kind of assist them during that session. – *State Health Department Participant*

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## Training Challenges

Participants identified training challenges including those related to the volume of trainees, the complexity and urgency of the pandemic response, and adapting trainees to technology and public health.

**Volume of Trainees.** Participants mentioned that the volume of staff they had to train and onboard for contact tracing was at times overwhelming.

So, in terms of training, it was a bit of a challenge at the beginning as well, right? Because we had a very short window to onboard hundreds of contact tracers. So, we had to tweak our training... Then

we slowly refined the process where it became, we on boarded them a group at a time, a small group at a time on a weekly basis, which allowed us, the trainers, to spend a very dedicated amount of time with these trainees as they come on board. So, we have special training paths for a basic contact tracer. We have a special training track for a case investigator. – *County Health Department Participant*

I think what has been hard because we have primarily used deployed staff to date is that we continue to have a revolving door of people in and out because they're deployed for short time periods. And so, while it keeps the workforce motivated, you always have some fresh people, it is exhausting from a training perspective. – *City Health Department Participant*

**Adapting Trainees to Public Health.** Because several contact tracers did not have a public health background, most health departments had to tailor their training programs to provide some foundational training in public health for such staff, in addition to all the other complex COVID-19 contact tracing-related training.

I have close to 97 contact tracers and case investigators working for me right now that are these temporary part-time positions, and maybe 10 of them are individuals with public health degrees or any kind of health experience at all. So that is a huge training problem when you are trying to explain isolation periods to people that don't know what you're talking about. – *District Health Department Participant*

One participant described the complexity of the training concisely:

The staff training is really complex. They need to be trained to understand coronavirus and COVID-19 and contact tracing as a subject matter skill or knowledgebase. They need to develop their skills in case interviewing. That's a whole different piece of it, that skill development bit. Because they're all remote, they need to understand how to utilize all of their technology remotely. Oftentimes they're at home so they have to figure out ways to have private space. And then they need to learn the data management system. – *State Health Department Participant*

**Adapting Trainees to Technology.** A consistent theme expressed by participants was the need to assist several new hires with navigating technology and data management systems used as part of the contact tracing and case investigation process.

Some people just cannot figure out how to get into their email, or get into Teams, or the tech issues. And that has been challenging. So, we have had to let some people go just because they can't figure out the tech stuff. – *State Health Department Participant*

The CRP database that we were referring to, it's homemade, it is home built. It did not exist before March 15th...This was not some of the normal epidemiological software that others might be familiar with. it actually took quite a bit of training to get individuals on that. It is a very powerful tool, but in a way, you can't explain all of it in one training session. We have had multiple training sessions. – *County Health Department Participant*

**Complexity and Urgency of the Pandemic Response.** Participants noted that the novelty of the virus, the complexity of the pandemic response, the need for urgency and the rapidly changing guidelines complicated and made training efforts challenging.

I think one of the biggest barriers is that we've only known about the virus since January. So, one of the biggest barriers is staying on top of the ever-evolving guidance and making sure people understand that as a government employee for the state, if the CDC guidance differs than the [state] guidance we can only go off of what the [state] guidance says...So just that changing guidance and making sure people understand what the process is and what the guidance means is one of the biggest barriers. – *District Health Department Participant*

The response is evolving every day and our guidance is changing and new testing platforms are coming out that we're always analyzing and making sure that we are providing the best public health that we can to protect [citizens] and so one of the challenges has been having this large workforce, we have over 100 contact tracers at this point and so we have this large workforce and when we need to change guidance, having this ability to be able to quickly communicate the changes, make sure that everybody understands the changes and then are able to implement them . – *State Health Department Participant*



Some health departments reported turnover of the contact tracing and case investigation workforce, driven primarily by the heavy reliance (at least in the beginning of the pandemic response) on temporary, transitioning or volunteer staff. Other factors identified as influencing turnover included staff burnout and the inability of some staff to adapt to technology and work expectations.

I think one of the biggest challenges we have had it just transitioning our folk that need to go back to their regular work and getting this program up and running and getting new people on board. –  
*State Health Department Participant*



“ THIS IS A 9 MONTH CONTRACT POSITION FOR CONTACT TRACING OR CASE INVESTIGATION, AND IT'S 40 HOURS A WEEK, BUT NO BENEFITS. SO PEOPLE HAVE LEFT BECAUSE THEY'VE GOTTEN BETTER OPPORTUNITIES THAT ARE FULL-TIME OR HAVE BENEFITS. [IT HAS BEEN] EXHAUSTING TO ONBOARD PEOPLE, AND THEN THE TURNOVER, AND BRING MORE PEOPLE ON. ”



DISTRICT HEALTH DEPARTMENT PARTICIPANT

“ WE HAVE HAD TO LET SOME PEOPLE GO BASED ON PERFORMANCE. BECAUSE WE ARE 100 PERCENT REMOTE, THE ABILITY TO FIGURE OUT THE TECHNOLOGY AND USE IT EFFECTIVELY AND COMMUNICATE, THAT HAS BEEN PROBABLY THE NUMBER ONE REASON FOR TERMINATION FOR THE PERFORMANCE ISSUE. PEOPLE ARE NOT RESPONDING TO OUR EMAILS. WE HAVE WEEKLY MEETINGS, AND WE RECORD THEM SO PEOPLE WHO AREN'T SCHEDULED TO WORK CAN WATCH IT, BUT THEY'RE NOT WATCHING IT. ”

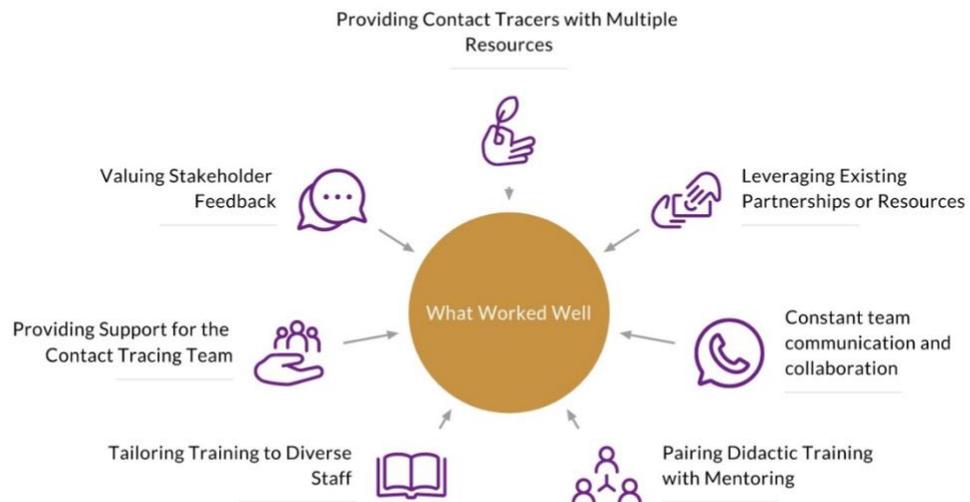


DISTRICT HEALTH DEPARTMENT PARTICIPANT

Participating health departments were asked to share what worked well in their contact tracing workforce development efforts, as well as lessons learned. Promising practices are highlighted in the figure below.

## WORKFORCE DEVELOPMENT: WHAT WORKED WELL AND LESSONS LEARNED

### PROMISING PRACTICES





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## Information Technology

As noted by all participants, a robust data management system is essential to a successful case management and contact tracing program. Each state has its own system and some smaller health departments are still paper based due to lack of access to data management software or server size issues. Because each state manages their data separately, this does pose some challenges to national reporting. This will be discussed further in the recommendations section. Some important characteristics of effective data management systems as shared by participants are outlined below:

1. **Robust, capable system:** Participants shared that one of the common limitations they experienced with their current disease investigation software was lack of power to continuously monitor cases and contacts throughout the disease cycle. Follow-up is essential to contact tracing and many systems could not keep up with the large amounts of data entry and that come with a respiratory illness like Covid-19.
2. **User friendly/intuitive:** Many contact tracers hired during the pandemic have little to no public health or contact tracing experience. Additionally, they often lack higher level computer skills and can struggle with complicated spreadsheets and software functions. Participants shared that data management systems need to be robust with complex data reporting capabilities but also very user friendly and intuitive to novice contact tracers.
3. **Adaptable:** Adaptability is a strong theme throughout the pandemic response and data management is no different. State health departments shared that there is a strong need for state-wide data systems to be flexible and modifiable for their local health departments:

We have a very robust surveillance system that we were able to quickly expand and customize to fit our needs for COVID. We have an informatics team that is just incredible and built us systems that we could develop in house, like I said, we could customize it, we could expand it and it grew as we grew and as the needs for contact tracing changed, we were able to quickly and easily make those changes in our surveillance systems and that I don't think – if we didn't have that, I don't think we would have been nearly as successful in our contact tracing. – *State Health Department Participant*

4. **Data analytics capability:** Administrators and supervisors shared the need for high level data analytics in order to evaluate the effectiveness of their contact tracing programs. Key indicators, process measures, and dashboards are necessary for health departments to better understand their contact tracing programs and where improvements are needed.

Additionally, participants discussed the need for laptops, phones, and Virtual Private Network (VPN) systems to allow their contact tracers to work remotely. For those health departments that required an in-person workforce, private space was needed for contact tracers to do complete their sensitive work.

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## Community Infrastructure

Community support was discussed throughout the interviews as essential to contact tracing everywhere from testing to wraparound services. Partnerships and trust were essential to communicating with typically hard to reach populations such as migrant farmworkers and homeless community members. Stakeholders and community partners paved the way for contact tracing by communicating with people about contact tracing and the importance of answering calls from the health department and sharing relevant contact information:

There are models that we're looking at, also, across the nation that used community leaders—so, faith leaders, elected leaders, and lay leaders within the community to promote the contact tracing process. And so, that's an alternate perspective in terms of engaging the community in contact tracing versus hiring from the community where we may or may not get the staff that, you know, the qualified staff that we need, necessarily, but we can engage the community in promoting contact tracing generally and helping to facilitate the process for our staff. – *County Health Department Participant*

Health departments also partnered with community groups to try and ease the fear of the public – the fear of the disease and also the fear or stigma attached to Covid-19 itself and sharing private contact information of friends and family. Academic institutions were consulted for training options and staff recruitment. Additionally, health departments collaborated with community-based organizations, other government agencies such as CMS, local churches, FQHCs, hospitals, and schools.

Community wraparound services (discussed in greater detail later in this report) were also discussed as essential to successful isolation for cases and quarantine for contacts. Health departments reported connecting community members with food pantries, mental health support, shelters and hotels for the homeless, access to medication, thermometers, and other social support.

We're asking about whether folks have food at home, whether they have a primary care provider, if they would need some healthcare, whether they'll have access to their medications during this time, will they have transportation if they need it to get to a medical appointment, do they need any financial assistance whether that's with rent or mortgages or phone services or utilities. We've also just recently begun asking some more about behavioral health and trying to assess if folks have concerns about being alone or being isolated during this period. Again, assessing whether they're particularly stressed or feeling that they might want to connect with our behavioral health services. We are also asking if people have just the very basics: masks and hand sanitizer and gloves. – *County Health Department Participant*

Successful contact tracing must include support for quarantine. Without support for quarantine, many close contacts are unable to successfully stay away from others. According to one interviewee, *“If we're asking people to stay home, especially if they were exposed and they're not sick, it's a big ask so we need to make sure that if we're going to do that we try to address some of those equity issues at the same time.”*

Health equity issues and possible solutions will be discussed later in this report, but strong community support and robust wraparound services are essential to keeping those exposed at home. Participants also discussed the importance of providing wraparound services as a way of staying client-centered and building trust so cases would ultimately provide names and contact information for their close contacts. Many of these wraparound services came from community partners but health departments also used the CARES Act money to provide things such as grocery delivery and rental assistance.

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## Challenges

Participants discussed numerous infrastructure challenges and common themes are listed below:

**Lack of existing IT resources.** Frequently, participants described the progression of data management through the pandemic. LHDs often started with current disease surveillance data management systems and then transitioned to state developed systems. While the state developed systems were superior, the transition was right in the middle of the pandemic and the systems were often still being developed.

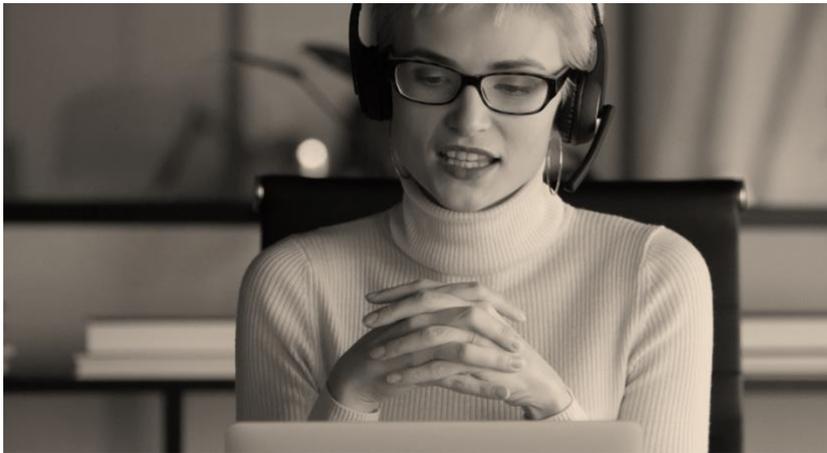
Definitely I think the technology infrastructure was critical. When we first started we were doing this on paper, and so the interview was paper and we would have to scan it in and it was just a nightmare because somebody then had to collect the data, send it back to somewhere else, had to analyze data, so it was horrific, especially when we were getting 2,000 cases a day. – *County Health Department Participant*

**Difficulty in learning new data management systems.** LHDs had to learn the new systems as well as train their case managers and contact tracers. This was often done with little to no formal training protocols since the new data management systems were developed so quickly.

**Providing phones and laptops for remote workers.** One of the significant challenges of contact tracing is actually speaking to or reaching the close contacts of a case. This challenge is further complicated when you have contact tracers working from home. The public is leery to answer a call from an unknown number. Many health departments solved this problem by either providing phones to their remote workers or utilizing software that allowed tracers to make calls from their issued laptops.

So they're using a system right now that actually has an 800-number that shows up on the caller ID so we have a number specifically for case investigations and a number specifically for contact tracing. We didn't give the full number out but we gave the area code and the next 3 digits, we gave that out to the public so they'd be aware of what those numbers may look like when you get called. – *County Health Department Participant*

**Space for on-site workers.** For those health departments requiring their tracers to work on-site, finding adequate space while adhering to social distancing guidelines was also a challenge.



## CONTACT TRACING PROCESS & BEST PRACTICES

### Contact Tracing Process

Local health departments' contact tracing process depicted variation. Within a state, variations existed in workflows and structures. Some health departments combine the contact tracing and case investigation roles. Since two roles involve two phases in the same process, this reduces interruptions and misunderstandings. Variation also exists in which entity is in charge of coordinating contact tracing between state and local health agencies, based on whether the state and local health departments in its jurisdiction are centralized, decentralized, or shared governance authority.

The process often starts once the lab results are entered into the case management system. Generally, the case is then assigned to an epidemiologist to conduct the case investigation. Contacts are elicited from the cases during a case investigation interview. The investigator adds the names and phone numbers of the exposed contacts that were within six feet of the case for at least 15 minutes. A large LHD describes the process:

You know, I think in general the contacts are elicited either directly from cases during a case investigation interview or if there's been an exposure event or an outbreak, the contact might be elicited because they are in that location, so sort of venue-based elicitation of a list of contacts, say everybody in a classroom where there was an exposure, for example.

The contact tracers call the contacts identified by COVID-19 positive cases and notify them that they are a 'contact' and need to be in quarantine and a health officer order is sent to the contact. Contacts are made using phone calls, preferably in the language of the contact. Contact tracers check in with contacts using text or phone call daily until their 14-day period is up.

And for us currently we are calling the contacts the first time, so when we get the call, when they answer, and then we call them at 7 days and then we call them at 14 days. We have those two touchpoints where we're calling them, and then use... the two-way text messaging ... every day to ask them if they have any symptoms... We ask if they have symptoms, we ask if they've been tested, and that's pretty much it that we are doing at this point.

Health departments provide additional written materials via email or postal mail on important topics, including isolation or quarantine recommendations in writing. Contacts are given access to a nurse or epidemiologist if they need more assistance or clarification.

## Best Practices

Adoption of best practices can feed into evidence-based practice, reducing the need for trial and error and in turn improving the efficiency, timeliness, and cost-effectiveness of public health interventions. Best practices are particularly relevant in novel situations such as those created by COVID-19. Things that worked well for health departments can be classified into several broad categories, including those concerning: communication processes and systems; superior information technology and data systems; internal and external stakeholder engagement and valuing stakeholder feedback; willingness to evolve and adapt with changing guidelines, evolving terminology, changing workforce availability, and fluctuations in COVID-19 cases; superior training and coordination of contact tracers; and leveraging local-state agency collaborations. Other significant areas in which health departments shared their best practices included: focus on building trust and rapport with the cases, contacts, and community; identifying and using nationally reputed sources of training on contact tracing, including those available virtually from the Association of States and Territorial Health Officials (ASTHO), Johns Hopkins, and CDC; and having a well-organized contact tracing team with the right skills and organizational support.

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### Communication processes and systems

**Knowing the population and matching cultural competency** of contact tracing workforce works well. Health departments stated that proactively assessing the appropriateness of various means of communication relative to the type of population involved and adjusting communication means based on the community's ability to use those means is useful in the success of the contact tracing information flow. If context of the population is ignored, the contacts and cases avoid communicating with contact tracers and case investigators. For instance, the preference for communication mode and time for communication are age dependent. Older adults are “early birds” and may prefer a morning phone call over email or text messages, whereas younger contacts may prefer text messaging. For non-English speakers, having infrastructure for communication is essential, including culturally competent contact tracers who are bilingual or the availability of language line services where contact tracers can do a three-way call with the persons considered cases/contacts.

Dedicating a part of the team as essential to communicate with special needs **populations** such as homeless community members and migrant farm workers can help mitigate communication challenges. A large county health department shared:

So, for like the homeless group, for someone who identified as homeless, we have a separate team outside of our branch that does homeless investigations and they do more intensive type of investigation with that population.

Several health departments mentioned that **text messaging** can be a low resource, effective, efficient, and convenient means of communication. Health departments realized that for younger people, texting was useful; they tended not to answer the phone. According to a county health department, text messaging was efficient and saved time:

Now, one of our best practices...is our text message campaign which sends text message alerts to individuals who are positive. And it asks them to call into us so that we may perform the case

interview. Because we have so many to call, this really reduces some of the time that our case investigators and contact tracers have to spend on the phone. And so, right now, about 28 percent of the cases that we investigate are derived from individuals who are responding to our text message campaign.

**Pretexting before communication** or informing cases and contacts they will be contacted was named as a best practice. A large county health department adopted this practice upon feedback from community partners and found it extremely useful:

So for case interviews, one of the things – and this actually just came from one of our community-based organizations...so when people didn't answer the phone we would text them to say, "We've been trying to reach you, please call us back," but our ... partners actually said, "If you can do a pretext that would actually help and let them know the morning of that someone's going to call, then they're more likely to answer the phone." So that was something that we implemented and I think that was under the best practice.

Sending **proof of identity** is another best practice to gain the trust of people being contacted. Calling and leaving a message stating the caller's affiliation and revealing identity often helps. But for persons who are hesitant to trust the caller, offering to send them proof of affiliation through official health department email is useful in gaining cooperation. Giving an officially issued e-mail address during the call is also helpful.

**Using jargon-free language** and providing explanations of the terms appropriate for the population is also a helpful practice. Health departments mentioned that they make the messaging user-friendly and easy to understand. For instance, explaining terms such as quarantine and isolation in lay person language.

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## Information technology and data systems

**Embracing technology** and converting paper forms to e-documentation was found useful. Having a **robust data tracking system** is helpful, which is not just related to contact tracing metrics, but helps monitor the productivity of the tracers and assist with different projections in caseload and for planning purposes. Such robust information systems through remote access enable the entire team to do data entry and allow for data access. Such a system may improve efficiency in other related information needs by enabling the real-time retrieval of information, including for media requests, and the requests from governing boards, leadership, and policymakers. For one of the local health departments, such a system came through in partnership with Google: "*...the new system that we have in partnership with Google to do the contact tracing works pretty well.*" Data and metrics that allow case investigation and contact tracing, to avoid 'breakdowns' within the lab reporting and identification of time lags between the collection, reporting, follow-up, etc. Smaller, low-resource local health departments rely on their state or a vendor to build such systems whereas larger city and state health departments developed their own information systems. According to a state health department:

[State HD] had a very robust surveillance system that we were able to quickly expand and customize to fit our needs for COVID. We could customize it, we could expand it and it grew as we grew and as the needs for contact tracing changed, we were able to quickly and easily make those changes in

our surveillance systems. Otherwise, I don't think we would have been nearly as successful in our contact tracing.

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## Stakeholder Engagement

**Valuing stakeholder feedback.** Stakeholder engagement and utility of their feedback plays a crucial role in the success of the contact tracing program. Engaging stakeholders early and often in the process is recommended. Some health departments indicated regular (e.g., weekly or bi-monthly) meetings with stakeholders useful in their success.

Maybe another thing that's worked really well is having regular communication with the user community, regular kind of timing, and we started office hours to just talk about issues and problems and solutions and kind of group think that with the larger community, and we get about 200 people a week on those calls... We have weekly calls with the community, we like to call it, and we regularly have over 200 members join those calls on a weekly basis where we share updates as the software is updated every few weeks.

Rapport with stakeholders is critical in wrap-around service-availability for the population served by the health departments. Stakeholders can provide the pulse of public perception and help with public trust. Here is what a state health department said about their stakeholders:

We really were listening to kind of where the community was at, where the folks were at with understanding what our program was about and really thinking through how we were messaging out our efforts because we knew that it was so reliant on the public trusting what we were doing. So I think really kind of continuously checking in to see kind of where the public perception was really critical and looking at it through a cultural lens that really kind of helped us understand why people had kind of or distrust and how we could address that in the most culturally appropriate way.

**Leveraging local-state agency collaborations.** Working closely with state and county health departments helps create synergies. Through collaborative efforts, state health departments were able to provide resources and contact tracing support depending upon their own resources, structure, and resource need. One state agency mentioned that they provided need-specific contact tracing support ranging from 25% for some counties to 75% of cases for others. State health agencies were able to share data and information systems, and workforce recruitment and training support. Close state-local collaborations help ensure alignment between local and state efforts. Collaborations regarding data systems improve COVID-19 surveillance at local and state levels.

In centralized states such collaboration is even more essential for health departments when leveraging state resources and guidelines and in many cases, the state's contact tracing infrastructure. Even in decentralized states, such collaborations are useful.

Here in [State Name], we have a decentralized public health system and so normally, our county health departments are local jurisdictions, our county and tribal health departments have the homeroom and primarily provide case investigation and contact tracing services for communicable diseases. So when we were outlining a framework for COVID-19 case investigation and contact tracing, we wanted to specifically acknowledge that we have [X number of] different counties

throughout our state which would require different levels of support. So it's not a one policy fits all sort of thing.

**Focus on building trust and rapport:**

Given the distrust of government supported public health agencies, contact tracers, and the science of COVID-19 as a whole, building trust with the cases, contacts, and community is a promising practice. Study participants discussed the process, reasoning, and activities for trust-building. The need for trust-building stems from the uncertainty of the clients due to COVID-19 being a novel disease, the sensitivity of the information sought, and a whole host of other public concerns about the contact tracing process and purposes, as stated by a state health department:

They have this novel virus that we have never seen before and so really understanding that these phone calls for us are education and collecting data and stopping the response, but these calls for members of the public are intimidating and scary and they're being told that they have a brand-new virus.

Assuring the contacts and cases that the underlying mission for public health agency work is to assure their health is a vital activity in this process. Other approaches for rapport building included addressing concerns about the identities of the contact tracers and confidentiality of the information; adopting customer service principles and advocating for them; educating them in easy-to-understand language about the scientific principles of COVID-19 infection and related processes such as isolation, quarantine, and how one becomes a contact in the process. The study participants mentioned having developed scripts for staff but also trained the contact racers with the recognition that every conversation may differ so the staff should build culturally appropriate rapport catered to the individual clients.

A local health department shared their approach of addressing trust issues by making their script friendly as they learned that people did not trust contact tracers, particularly with their identifying information:

So, we are trying to be more conversational and build a rapport with them in the beginning to talk more about like, well, you were exposed here on this day, and like talk to them more about their exposure and the quarantine and how they're feeling, and if they got tested, and that type of stuff first, before we ask them the personal questions.

A city health department representative shared this approach:

Trust is a huge piece of this because people must understand that there is nothing punitive about it, and we are only trying to help them. If they trust you, they will give you the information you need. But then you in turn can help them. We also remember, while it's our job, we're talking to someone and it's their life. There is a rhythm to it and you have to finesse it, you really do. While we always act in a professional manner, we still must remember that these are human beings we are speaking to and it's very important to them. If you act in a clinical fashion, you're going to go nowhere.

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## Optimizing Processes

**Willingness to evolve and adapt.** Willingness to evolve with changing guidelines, evolving terminology, changing workforce availability, and fluctuations in COVID-19 cases is essential for the smooth functioning of the contact tracing programs. Health departments recognized that as the volume of COVID-case load and national guidelines changed, their contact tracing infrastructure and processes had to match the change. A best practice according to one of the health departments is *“that we've been adaptive. I really think part of our success is that we have evolved our guidance and have been entirely open to evolving our guidance.”* When the caseload was lighter, notifications were easier. When wider community flexibility and adaptability became necessary, health departments depended on IT and superior tech support.

A state health department representative described their flexibility and adaptability as:

I think one of the major essential elements is just flexibility and being able to be agile to make changes. As we learned more about asymptomatic transmission that was a pretty huge component in changing how our thought process of containment would be. As the national strategies for containing and testing change, we have to kind of move quickly on those. ... We learn something new every day, so being able to fit that into our response and move quickly on those kinds of changes.

**Well-prepared contact tracers.** Among the best practices, health departments mentioned that it is critical to have superior training for contact tracers so that they are comfortable in performing their duties, can provide accurate information, and are confident in the use of the technology and in answering questions. Properly screening contact tracers for their competencies, skills, and relevant experience rather than showing haste is crucial in avoiding later errors and quality issues. The best practices in training and recruitment are discussed in detail in an earlier section of the report..

A county health department described this type of training as a best practice:

So, I think that one of the best practices is we now put staff through like a day-and-a-half of training before they ever get onto the phone... And one of the things we started with – and I'm sure it still happens to some extent – is that somebody is there listening to that call and writing on a whiteboard or making notes, like don't forget to say this or ask about this. So we really try to ramp up the experience and intensify it so that they are getting as much experience and practice in a shorter period of time, because they need to have that confidence before they start making those calls themselves. There was something else I was going to say that just blew out of my brain, but it'll come back.

**Using reputed and tested training sources.** Given that contact tracers and disease investigators are going to be the face of the program, their appropriate training was underscored by health departments as a best practice. Challenges, best practices, and training sources are discussed in detail in an earlier section of the report. Identifying and using appropriate and nationally reputed sources of training on contact tracing, including those available virtually from ASTHO, Johns Hopkins, and CDC was named by several health departments as the approach that worked well for them. Some large state health departments developed their own tools but others took advantage of the training courses developed by reputed organizations. A state health department described the utility of these free training courses as follows:

I think the tools that have been laid out by CDC, ASTHO, Hopkins – I think the repository of tools are ever-expanding and they're helpful and they should be there and I'm glad they are. I think the CDC is continuing to expand either through the CDC directly or the CDC Foundation. The tools have continued to evolve. I think that's paramount. We can never have too much training on this.

A city health department highlighted the value of the available trainings in these words:

The first course was fortunately done through Johns Hopkins University, the Coursera course on contact tracing. That was everybody's crash course on contact tracing that hadn't done it before. Then, the other course was the Association of State and Territorial Health Officials contact tracing course. ... The Hopkins course set everything off. We would not have been able to put together a training course as extensive as Hopkins or ASTHO. It would not have been that comprehensive.

**Well-organized contact tracing team.** A related best practice to appropriate training is having a well-organized contact tracing team with the right skills and organizational support. Essential skills for contact tracing teams are also discussed in an earlier section of this report, but this has been underscored among the best practices. In addition to having a competent contact tracing and disease investigator workforce, an essential ingredient is having enough supervisory staff to cover both case investigations and contact tracing. A local health department was not appropriately organized until they engaged 15 supervisors: “...*there are 12 on the case investigation side and 3 on the contact tracing side.*”

And I would say my three on the contact tracing side have been integral, and they took over and revamped how we structure our scheduling. They – and that scheduling has made it more effective for us to be able to reach the contacts that need to be reached in a timely manner. They are meeting one on one with each staff every other week to address gaps and training needs, and that productivity measurement has weeded out some of our low performers, which is huge. And they're going to be helping train the eight new people that start on Monday. So, they are like huge in managing the team in a way that I couldn't do because I just don't have capacity by myself.

Devising and implementing an effective quality control mechanism for identifying quality gaps and their root-causes, providing feedback to relevant team members, and dedicating training, emotional support and other resources are crucial. Keeping in view that the contact tracers, case investigators, and other members of the team are also having to deal with challenges associated with this pandemic and being empathetic and respectful about their emotional needs is equally important. A county health department stated:

Because there's – sometimes we forget that the folks that are doing the work of public health are also experiencing COVID the way that the rest of the world is that isn't doing that. In terms of all of those extra stressors and struggles, the issues of family members that may be at-risk, the economic challenges, et cetera. They are not immune to them just because they are working. We need to keep reminding folks and encouraging them.

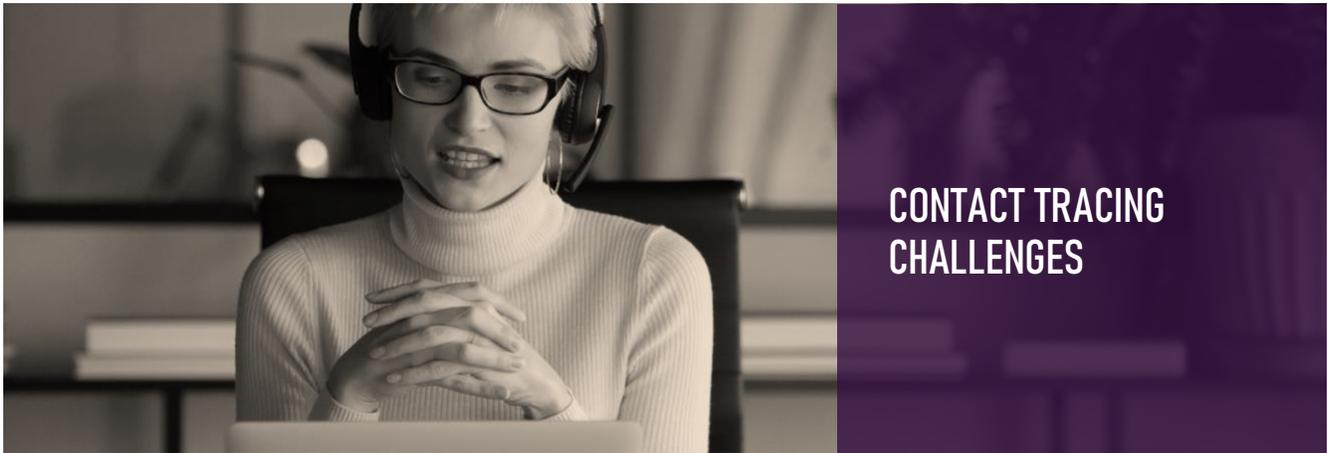
Developing an appropriate structure and a reliable script for the contact tracers to handle all situations is essential. According to a county health department:

I was going to say our program is very structured in the sense that we took scripts from places around the country that we knew had already been worked and were good and we adapted them and our data collection drives off of our scripts. And our scripts are guides, you know you don't have to read

your way through it, but they're guides for people, so we feel pretty confident with good supervision and leadership from the contractor that people are able to use the tools they have. And so we think we're going to get pretty high consistency in the quality of the work the contact tracers do.

The role of leadership support was considered key, as pointed out by a state health department:

One thing that worked really well is..., we have really supportive, engaged, involved leadership and so it was easy to brainstorm with leadership. It was easy to bring our concerns to them, to bring challenges to them, and to work as a team to figure out what the next steps look like and so that worked really, really well for us and just having really this comfort level both with [department name] leadership and then within the contact tracing program.



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## Contact Tracing Challenges

Understanding the potential challenges facing health departments in the contact tracing process is as critical as knowing best practices. Documentation of these challenges can be beneficial in putting these problems into perspective. Anticipating these challenges can help in planning and conducting contact tracing, enabling health departments to formulate mechanisms to counter these challenges.

Health departments shared several inter-related challenges. The foremost challenge was the **trust deficit**. Public trust, misconception, and misinformation coupled with distrust in the science of COVID-19 transmission and management as well as a general distrust of contact tracers and government agencies characterized the nature of distrust. Many interrelated issues worsened the challenge caused by distrust, including the fear of the stigma associated with disclosure of COVID-positivity, and a general lack of cooperation with contact tracers due to privacy-related concerns.

Additional challenges pertained to contact tracers and organizational procedures. These challenges included the steep learning curve for some contact tracers; the lack of robust IT and informatics capacity; team burnout; state-county communication challenges; supervision of remote workers; issues with telephone contact tracing; problems concerning timely contact tracing (including issues with accuracy and timeliness of lab results); and challenges in reaching certain populations (e.g., homeless, and immigrants).

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### Trust Deficit and Public Compliance

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#### Public trust, misconception, and misinformation

People are reluctant to be interviewed for a variety of reasons and they do not want to reveal their close contacts, especially related to their jobs. This is particularly true about **immigrant communities**, where some new immigrants may be undocumented and work as seasonal workers, some farmworkers, and other construction site workers. The reluctance may be based on fear of losing the job and consequently inability to feed their children. Undocumented immigrants may not be able to receive unemployment and other institutional assistance. Since a lot may be unknown about personal situations of people, health departments train tracers to be sensitive in explaining the requirements of quarantining. Here is how a county health department puts it:

We definitely have had some immigration status reasons why we think people have been unwilling to provide specific contact information within the Hispanic community. – *County Health Department Participant*

The biggest challenge was for individuals that were new Americans or seasonal workers and the fear of being perceived as a public charge. – *State Health Department Participant*

So yes, there is some pushback ... when people don't want to be interviewed, do not want to reveal their close contacts, especially related to their job. Specifically, immigrant communities relating to construction site work. I had one contact tell me in an interview that they wear respirators on their construction site. So, he does not really have any contacts at the job. That kind of fear of contacting an employer and, A, the job site getting shut down and they will lose employment, or just bringing reprisal upon themselves. I don't think it's a distrust of the health department in any way. I think it's just they're afraid of getting personally dinged in some way, socially or financially from COVID infection. – *City Health Department Participant*

**Fear of stigma.** A related reason for distrust is the perceived stigma associated with the disease and the inability of people to comply with the Covid-19 preventive restrictions. A county health department describes the dilemma as follows:

When we first started, I don't think that we thought that there was going to be a stigma around this, ...we had people that were living in the same household with other people and they had become a case and they were very, very hesitant to tell us who they were and name them as contacts... So definitely very early on we realized that there was a very big stigma around having COVID. That was very challenging because I think it goes back to not being able to get accurate information.

Fear of getting blamed for inconveniencing others was also mentioned by some. A city health department linked the perception of Covid-19 stigma with perceived consequences for work and family as:

The next wave of this work is going to be all about stigma, people not wanting to test because it's going to make it harder for them. It'll prevent them from being able to be working, worried about stigma from their community, family, where they work, etc. Just like in HIV and STDs, it's going to be right there in front of us next.

Several health departments have tried to allay public fears around disclosure by emphasizing confidentiality: *I think especially early in the outbreak, there was a lot of stigma and people being worried that they would be named. So, we have a lot of scripting around confidentiality.*

**Fear of “snitch” label.** Health departments also noted that some contacts were hesitant to disclose contact information because of sharing contacts’ information is perceived as violating the trust of their [i.e. the contacts’] trust. This was particularly true among younger people.

The younger population has been a little bit more hesitant to provide information because they don’t want to be “snitching” on their friends and get parties shut down now that schools are back in session. – *State Health Department Participant*

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## Trust Deficit: Distrust of Contact Tracers or Government

The political divide was named as a contributory factor for distrust in contact tracers and the information they shared because information concerning the pandemic had been highly politicized.

A state HD described their experience as:

COVID-19 has become very political so when we are reaching out to people, people already have their formed opinion and if they think it's a hoax or think the government is a scam, they shut down and they will not verify any information with our contact tracers and don't even receive their voter notification because we at least have to verify that we have the correct person so first name and last name.

A local health district mentioned that racial divide and the charged cultural climate of the state and country was to blame:

Around Easter we had some pockets of cases related to churches and those individuals from rural areas had high mistrust of government and refused to talk to us, hanging up on us, that kind of thing. ... And even then, most of them refused to talk to us because of mistrust of government and things that were happening at that time with different protests and things.

Public distrust of contact tracers were in part driven by privacy concerns and the difficulties in verifying the identity of contact tracers and their association with the health department. Health departments noted that their contact tracing teams are often questioned about how they were able to access people's personal information, such as phone numbers or even the lab results:

People just don't trust that we are who we are. And it's super challenging. I just had this happen like five minutes ago, right before I called you. Somebody called our call center to verify one of the case investigators. – *District Health Department Participant*

And this [distrust] is critical because all of this is so – at the end of the day, all of the information we get from our contacts is self-reported, and there's such a distrust right now anyway, and it's been increasing, of government, anybody has to do with government, anything that has to do with COVID, et cetera...I think the hardest part about it is trying to prove you are who you are when you call, because there are a lot of scams. – *County Health Department Participant*

Health departments mentioned some remedies to address the situation of mistrust, including training contact tracers in communication skills and educating the public about Covid-19 and its consequences. Another helpful remedy was avoiding seeking sensitive information. A district health department stated:

So having some kind of knowledge about like the health belief model and those kinds of health education or health promotion techniques that can be used to maybe convince someone to participate that may have some mistrust in government or just not want to give their personal information to anyone. ... I made sure that my staff were knowledgeable about not asking for residency status and making sure people felt comfortable in letting them know that we aren't interested in that information so that we could obtain the contact stuff. So, there's been a lot of mistrust of the government, a lot of privacy concerns.

And so, I think there's been a lot of information on the news and stuff about why contact tracing is important and all these things, but when it comes down to someone asking you for that information most people are not comfortable giving it. ... We really are pushing people to really educate them on why we need to notify people and making sure it's kept confidential and working that piece – *City Health Department Participant*.

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## Trust Deficit: Distrust in Science, COVID as Hoax

Lack of trust in scientific facts in favor of here-say and conspiracy theories can be challenging to science-based interventions. COVID-19 contact tracing and disease investigation face this challenge, particularly in an environment when some have equated COVID-19 with common flu and undermined the value of protective gear and preventive measures. Distrust in science may lead to an inability to learn or believe even the simplest facts about COVID.

With people that are asymptomatic they just don't understand why they must stay home and there's just a general misunderstanding of virus transmission, but most of the noncompliance, what we get is they don't care. They're going to go to their granddaughter's wedding, and they don't care who they infect. – *District Health Department Participant*.

We have also had some people who don't necessarily – who seem to believe conspiracy theories over facts, who may not be willing to provide information. That's another category of people who are difficult to contact trace. – *County Health Department Participant*.

Having multiple sources of information, some contradicting each other, often pushed through social media exacerbated the challenge, as described by a state health department:

Yeah, and I think I would just add also that there's definitely an impact of just kind of the politics of the pandemic. I mean people are familiar with politics and public health and government, but I think not to the extent that we're seeing nowadays.

Solutions discussed by health departments for addressing distrust in science and seriousness of the pandemic included informing and educating people about the science of COVID-19 through grass-roots level campaigns. A county health department states such effort as:

I'd be given or some of my staff would be given a stack of letters, and at the end of the day, we would just hop in the car at the end of the work day and drive down to the Amish country and start driving around and stick it in mailboxes...; at least we could inform, so, yeah... [Name] County is politically oriented in the direction of folks who are still calling it a hoax, so it's tough to get at. So we try to build those relationships where we can. We know we're not getting all the information that we need, but the health educators, I think, are really good at that.

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## Fatigue of Contacts and General Public

Fatigue was also a significant barrier to compliance among the contacts, which in combination with other barriers discussed earlier resulted in non-compliance. The fatigue sets in gradually said a county HD representative:

And the first couple of days, you know, the compliance is pretty well and it just slowly takes off. Now, when you have an individual who, through contact tracing, has been instructed to quarantine

for three or four days, compliance level is higher, right? But when you have those other individuals that are being asked to comply for 10 days or almost 2 weeks—again, they'll comply for a few days and then they slowly drift off.

The high frequency of calls received by contacts coupled with lengthy questionnaires adds to the fatigue. A city and a state health department perspective are reflective of these issues:

People don't like to answer their phone. ... it is very time-consuming and maybe not the most efficient way to do it is to call people every day. ... a lot of times they stop answer the phone because they're just like, okay, I already know who this is. – *City Health Department Participant*

We have local health jurisdictions who might be trying to track exposure sites in the community. So, the questionnaire becomes quite lengthy. – *State Health Department Participant*

The uncontrolled, prolonged pandemic dampened people's hopes for normalcy. As a result, people started losing hope and patience. A city health department shared the situation in their jurisdiction as:

Just because many were on lockdown early on, and that was fine at that time. But then, they've developed the COVID exhaustion. The community is just tired of the length. We keep hearing, when are we going to be back to normal? Well, there is no normal. This is the new normal. – *City Health Department Participant*

I think also there are a lot of challenges related to community engagement and building community trust and just the population being fatigued with this work and not necessarily answering the call or filling out our surveys or engaging with us on our contact tracing mission. Not necessarily giving us their close contacts information for various reasons, various concerns. – *State Health Department Participant*

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## Non-Compliance

As discussed in the previous sections, for a variety of reasons, contacts were non-compliant, which has been challenging. Non-compliance comes from the fatigue of reporting, the time commitment needed for testing, non-availability of social and wrap-around services, or simply because of the organizational culture of non-seriousness about COVID-19. Here are a few excerpts from health department interviews.

And the other issue that we have is, is that, to me, the biggest goal of contact tracing is to get someone tested, because you have been identified as an individual who has been in contact with a known positive person. So, getting those individuals to actually go get tested is one of our biggest hang ups. A lot of them simply just don't want—don't want to get tested. – *County Health Department Participant*

But I think that there has been somewhat an increase in the resistance to provide that information, and specifically... Definitely not in all, but we're finding that percentage to be a little bit larger and that non-compliance rising a little bit more than it had been. – *City Health Department Participant*

Yes. There have been several cases, specifically with one large company where their workers I can think of think that they don't need to quarantine when they've been exposed. That has been a challenge, but yes. – *County Health Department Participant*

## Procedural Challenges

**Steep Learning Curve.** In addition to the challenges concerning COVID-19 cases and their contacts, health departments faced organizational challenges, mostly concerning infrastructure and workforce. Some of these challenges have been previously covered in detail in the sections of this report on infrastructural needs and workforce recruitment and training. The most prevalent challenge was concerning the steep learning curve for some staff and volunteers on the contact tracing team, given that a wide variation existed in the relevant experience, training, competencies, and general soft skills such as those pertaining to communication, computer literacy, cultural competency, and people-skills. Another challenge included scarcity of readily available best practices and standardization of the practices.

Many health departments mentioned that contact tracers not trained in public health faced greater learning challenges, given that COVID-19 surveillance is a new model, and the contact tracing concepts and principles are complex. Contact tracers with no experience and training in computer and IT struggled more because contact tracing involved the use of certain software and information systems. A local health department stated this challenge as:

There are significant barriers to that because most of the people that we have doing contact tracing right now are not trained public health professionals. Some of them we have found had their own agendas. So, the contact tracers themselves require a lot of hands-on day-to-day monitoring to make sure that they give out the right guidance, and that takes a significant amount of time from our supervisors.

To address some of these issues, health departments learned to evolve, and new contact tracers were sought with medical or public health background. In addition, health departments found it useful to monitor the quality of communications, particularly by monitoring calls. Sometimes, community members provided critical feedback about contact tracers, which is brought to the notice of supervisors for corrective action.

We determined that contact tracing isn't simply just pick up the phone, talking, and then writing notes down, right? There is a lot of IT involved in the contact tracing process..., taking good notes, knowing how to navigate the CRM system, but also knowing how to navigate our communication systems. We use Microsoft Teams as our primary mode of communication, and there were a lot of folks who actually didn't know how to turn on a laptop, didn't know how to start a Word document, right? Didn't know how to sign into Teams and log in. ...So, we found that the qualifications were modified over time for that reason. We were no longer looking for people who can just talk well or call center, because yes, they can speak well, but they didn't have the medical knowledge to be able to understand the responses that they were receiving from the public. So, that was one of those kinds of things that we learned as we went through the process. – *County Health Department Participant*

**Testing-related Challenges.** Given that timing is important in curbing the spread of Coronavirus, **delay in lab results** was mentioned as a challenge. The accuracy of those results was sometimes in question as well. Two county HDs stated this challenge as:

[Issues concerning] getting lab results in the appropriate amount of time, having those lab results actually have usable information that helps us contact folks.

The turnaround time on tests, availability of tests, reporting of tests, moving that information around quickly, that has been a significant challenge. That lag time with the testing, when you do reach them, they are like, 'I already feel better, so I don't want to talk to you,' kind of situation?

## General Challenges

Public health infrastructure has “atrophied” over many years. Health departments had to “do more with less” as many had to reassign staff from other units for COVID-related work. Most the health departments just do not have the resources to respond as quickly as needed. In addition to the challenges specific to the development of the contact tracing plan, recruitment, training, and contact tracing, study participants also shared some general challenges.

**Constantly changing guidelines.** Constantly changing guidelines, protocols, and definitions intensify contact tracing challenges. The guidelines change because COVID-19 is caused by a novel virus, so there is a need for continual learning and adopting the latest guidance from the various public health entities. This makes contact tracing a continuous work in progress in that it involves spotting issues due to changes and continuously refining and improving. As a result of the changes, the response is constantly evolving. Additional challenges arise from time lags between new national or state guidelines and their dissemination to the health department’s contact tracing teams. Confusion may arise when local jurisdictions do not agree with national guidelines. Study participants from county and state health departments stated this issue as:

I think there has been a lot of changes in protocols and standards and guidelines. It's been tough to keep up with all the guidelines and make sure that we are then training our staff to the guidelines. A lot of times guidelines get changed and we're not informed ahead of time, so sometimes the staff will notify us that there was a change in the guidelines. [Laughs] A little backwards. And so, where you have to clarify. The other thing is that it's been very challenging with our local jurisdiction may not agree with the CDC guidelines that have been posted. – *County Health Department Participant*

So, one of the biggest barriers is staying on top of the ever-evolving guidance and making sure people understand that as a government employee for the state of [name], if the CDC guidance differs than the [state] guidance we can only go off of what the [state] guidance says. So, if – for example, I don't remember when exactly this happened, but there was a four-day delay. The CDC had updated some information and the state guidance took four days to update, and so during those four days we had to continuously remind our staff, yes, the CDC guidance does say this but our state guidance, which is what we are – the only thing we can legally use says this. And so just that changing guidance and making sure people understand what the process is and what the guidance means is one of the biggest barriers. – *State Health Department Participant*

**Staff Burnout.** Understaffing and increasing workloads leads to staff burnout. Being chronically understaffed, public health agency staff is generally ready for short-term surges in workload but with COVID-19, some health department staff had long-term surges of 60 to 80 hours a week. Staff on COVID-19 teams were required to work through the weekend and holidays as well.

We started in March – just now in October we are starting to get personnel to help us, so it was very challenging. The staff were working 16-hour days because we were very limited with the staff that we had available to do all these requirements. – *County Health Department Participant*

It's so frustrating that on the jurisdictional level we haven't gotten resources in order to hire staff, sustainable staff to do this work, and have been just left up to ourselves, everyone scrambling to identify how to build out a sustainable workforce. But it leads to this burnout, especially for people who have been doing this for six months now and have trained hundreds and hundreds of people that still don't have a stable staff and workforce. – *City Health Department Participant*

**Other General Challenges.** With the fluctuation in COVID-19 cases, particularly sudden increases, many HDs mentioned that fluctuations in need for contact tracing, supervisory and disease investigation staff posed some challenges, as stated by a state health department representative:

I would just say that one of the challenges that I've identified is the unpredictability of the workload, right, which is to be expected with a pandemic, that the local health departments and the [State] Department of Health worked tirelessly to build our capacity at both levels of public health so that we could meet the needs for contact tracing and make sure that we were getting folks quarantined and investigated as quickly as possible. And as case counts fluctuate, it can be challenging to identify what capacity is needed to meet that need.

With the sudden increase in the cases and their contacts, the speed with which the contact tracing teams had to not only work long hours, they had to work fast to not fall behind the “epi-curve” in disease investigation and contact tracing, despite resource scarcity. A city HD described the phenomenon as:

We're in a discipline that tends not to move at the speed of change. So again, anchored to our governmental enterprises, we've had to pivot at light speed. And so, part of what you're hearing here, while by scale we aren't the second largest local health department, we've benefited by having ample support by our clinical staff and nurses in particular, we do have dedicated epi's. But I would say that the challenge on the ground is that most of the cities, most health departments just don't have the means, the resources to respond as quickly as needed.



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## Health Equity Issues

Health departments were overwhelmingly cognizant of the health inequities resulting from COVID-19 inequitable availability of social support and wrap-around services. Appropriate planning and assuring availability of wrap-around social support services either through direct provision or through organized referral system were considered essential for effective disease investigation, contact tracing, and more importantly, the implementation of guidelines for testing, quarantine, and use of preventive strategies. Inequities manifested themselves through non-availability of wrap-around services such as transportation, non-availability of work from home, and lack of social support including childcare, adequate housing, food security, laundry assistance, and garbage disposal.

Inability to fulfill the additional challenges and unmet socio-economic needs facing some population groups due to COVID-19 related social and economic changes presents inequitable health risks for those population groups. Many are reluctant to get tested or reveal their self-determined positivity for the fear of restrictions leading to loss of wages, and other costs. Participants cited examples of immigrant communities not wanting their workplace to be shut down and stigmatized. They were afraid of getting laid off and not finding a job again. A city health department representative captured this phenomenon as:

That kind of fear existed of [authorities] contacting an employer, and the job site getting shut down and they will lose employment, or just bringing reprisal upon themselves. There is a little bit, I don't think it's a distrust of the health department in any way. I think it's just they're afraid of getting personally dinged in some way, socially or financially from COVID infection.

Poor and disenfranchised people were also disadvantaged because of inaccurate identifying information. Contacts may have been evicted due to nonpayment of rent. They may have lost their phone service due to the affordability issue. So for a variety of reasons, when cases could not provide accurate information about the contacts, that raised the contacts' risk of inadvertently infecting their loved ones, friends, and co-workers.

Lack of health education and literacy worsened the health risks for some groups. Language barriers were an issue, particularly when the contacts did not speak English and health departments did not

have bilingual contact tracers or translation services. Another health equity issue arose from a lack of access to a healthcare provider.

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## Ways to Address Health Equity

A variety of activities and priorities helped health departments neutralize the disadvantages faced by individuals who were socio-culturally and economically disadvantaged. To address the inequitable access to testing, efforts were made to ensure **testing was made available** throughout the state by state health departments. Availability of such testing was properly advertised through various means, including building comprehensive websites of all the testing locations to ensure that people were able to check the location of free testing sites.

But also making sure that we had enough testing available throughout our state and being able to – we built a comprehensive website of all of the testing locations throughout the state and so we just continuously refer back to that in terms of where free testing is available and whether or not you have insurance or not to address some of the health equity issues. – *State Health Department Participant*

Anticipating that health inequity may arise for a certain type of workers who cannot afford to stop working and lose wages, as they may not get leave of absence, health departments provided **support in dealing with employers**. The strategies also included ways to address the perception that COVID-19 infection at the workplace may bring stigma for the workplace if workplace information is revealed:

People are afraid like they might lose their job and they are going to quarantine if they have to quarantine. So, with that, we have letters that the CDC has created ... to help with [such situations] ... to give to their employers and all this so they don't like you know, lose their job or to make sure they're okay. – *City Health Department Participant*

It was also important that contact tracing staff were representative of and knowledgeable about the communities they served. To understand the type of staff needed to match community needs, **some health departments used their community partners**. Other health departments with research capacity conducted rapid research for the purpose of understanding community preferences and needs for cultural competency of their workforce. A large county health department narrated such efforts:

We looked at of course our county partners. But beyond that, one of the things that we started doing was in looking at the folks that were not answering the phones we actually did an analysis of neighborhoods where people were not answering the phones... We actually did a focus group with some of our youth to ask them, 'What would help, what would work? Like what do you want from us? Okay, you're not going to answer the phone unless it's your mom, but what can we do so you can answer our call?'

Once needs are determined, training the contact tracing team in **cultural competency techniques** and priorities helped address inequities. Health departments deployed staff who were local and therefore could culturally relate to the people with who they were communicating. For example,

Spanish-speaking and other bilingual staff were deployed to communicate with non-English speaking contacts and cases. A city health department's perspective highlights their take on it:

You really need people that are familiar with your local community and how to access resources, and that's not going to be somebody who's just on the phone and calling from New York or wherever, you know? ... It was a little bit of a challenge, but we had different, nurses with different background, nationality and we had like medical interpreters and all this stuff you know so that helps a lot.

Partnering with civil society organizations to receive training about addressing challenges faced by immigrant communities and the contact tracers working with those communities has worked well for some health departments, as stated respectively by a county and city health department.

Actually, the Office of Immigrant Affairs reviewed our survey and they kind of pushed back a little bit with us, because one of the things that we do ask for is where do they work, and he said, "You know, if you're asking people who are undocumented where they work this is really tough for them because you know they're undocumented and now you're saying that they're actually legally working."

**The relatability** factor seemed to play a big role in acceptability of COVID-19 messaging and guidelines by the contact tracers and disease investigators in their community. Health departments that realized the value of this strategy were able to address some barriers to conformity, as discussed by a county health department representative:

We want to have individuals on the phone that are of different demographics or are from different areas of our community. So, the [county name] County area is probably one of the most diverse areas in the entire United States. ... And, you know, if you have an individual who lives in the Southeast quadrant of our county, they are likely to have a lot of things in common with some of the residents down there where they may not as much on the Northeast or the Northwest side. And so, getting them to relate to the folks that they are trying to investigate a lot of times allows those folks to open up and be a little bit more friendly and a little bit more understanding where they're [like], 'Oh, yeah, you're from my same side of town. You get me, you are the same as me. I'm okay, I'm comfortable, I trust you.'

**Analyzing non-response patterns and getting to the root-cause of non-response** helped health departments pinpoint the communication barriers between their COVID-19 team and the contacts. In turn, they were able to devise evidence-based strategies to successfully address the issue. A county health department employee described their process as:

And it's interesting; we were reviewing a lot of the records where there was not a response and, in some cases, we called, they answered the first time and then they either didn't speak English so they had to get an interpreter, and then they never answered the phone ever again. So, I think there is some real barriers there, ...that's where we're working with our community-based organizations to look at how can we make sure that we are targeting those populations with community-based organization staff and community health workers to go out and make those face-to-face visits.

Health departments also tried to adjust messaging modes to match people's available means of communication. This included texting or calling contacts and cases based on their individual preferences, adjusting call times according to cultural and age-group preferences, being sensitive in

their scripts, and ensuring they were people-friendly rather than intimidating. A district health department stated their process:

And then if they speak Spanish, we use the language line or a Spanish speaking contact tracer to call them. And if they can't, the text is available in Spanish, but we've found that most Spanish speakers still just want us to call them daily using the Language Line to do their symptom check. So, we've worked around like – even though the text is available now, they don't really like it. So, we're just calling them manually.

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## Wrap-Around and Social Services

Connecting individuals and their communities with healthcare resources when they lacked them was another strategy discussed by study participants to address health inequity. Social support becomes extremely important for certain population subgroups to be able to quarantine. Health departments went above and beyond to connect people with wrap-around services and social support. Such access was often assured through community partners. Rather than simply providing a phone number of a community partner providing the specific services, some health departments proactively connected people with those services, using dedicated resource or care coordinators. A state health department approach is stated below:

We couldn't turn to just our 211 system to refer people. We needed to do something. We needed to provide food, we needed to provide housing. We needed to do something more than just saying call 211 and see if you can find someone that can buy your groceries or – you know? And so that is when we evolved and we started incorporating something called care coordinators into our team, people that are able to follow up and assess what the need is and try to provide that need in order to help that individual to be able to isolate or quarantine.

A county health department provided the wraparound services along-with assuring access to care:

And having a wraparound services program where we use the CARES Act money to distribute rental assistance, food services like grocery delivery, has been a way to help those who don't have access to that while they're quarantining or isolating. And those tend to be those who already are experiencing issues already.

Some health departments had resources and strategies to use a holistic approach. With the evidence that isolation and loneliness can trigger and exacerbate stress and behavioral health issues, some health departments addressed behavioral health issues emanating from isolation by connecting people with behavioral health services as needed. Access to food, transportation, rent, mortgage, and other basic social determinants of health were addressed. For example, crowded housing and multi-generation living arrangements made it difficult for the contacts to isolate. Health departments identified the issues and as their resources allowed, addressed the needs of individuals by making hotel arrangements. A participant from a state health department stated:

We work really hard to provide support to assist with compliance, so if that means somebody needing a hotel because they live in a multigenerational home or need food services. We work so hard to

ensure that the local health departments are connected to providing those resources to the people who might need them and identifying those needs.

Homeless people are among the most vulnerable in COVID-19 era. To assist them, some health departments used targeted approaches, as described by a county health department professional:

The county has tried a couple of things with housing and there is also a whole other initiative going on with homeless folks and COVID and looking at that whole aspect of equity so there's like – and then there's 1 other initiative going on with the undocumented population where we've started working with the interfaith community to try and gain access to those folks.

Immigrant populations tend to have their own health equity issues. Some of those issues arise from their reservations about declaring their immigrant status for fear of any implications for their work status. Being sensitive about their reservations and respecting their concerns helps health departments address some of the immigrant population issues concerning COVID-19 communications. Doing employer training to support immigrant populations was another strategy shared by a city health department participant:

But we noticed, our undocumented population and our low-income population was impacted from a surveillance perspective a little bit later than the rest of the population is what we noticed. By that point, some of these things had already been established. In the early days, we weren't jumping on top of employers: restaurants, landscapers. We weren't jumping on top of them because many of them weren't operating. ...Once they opened back up, we started to do employer trainings, going out to sites, making sure they were doing the right things for their employees. Then, advocating for their testing where necessary, and how to make sure that they can obtain it. That helped, just the progression of when these cases started to come in.



## DEVELOPING & IMPLEMENTING ROBUST CONTACT TRACING PROGRAMS: OPPORTUNITIES AND RECOMMENDATIONS

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### Opportunities

Participants noted that while the pandemic had undoubtedly upended the public health infrastructure, it may have also presented public health an opportunity to demonstrate its value and increase its visibility to the public. Participants noted that public health could take advantage of the increased visibility to boost branding and recruitment efforts.

I do think that it's a great opportunity for public health students and for public health schools to really leverage the situation to kind of see what public health really does and what we can do. – *District Health Department Participant*

[We have been presented] the ability to leverage the pandemic to hire more people and make public health at the forefront. Finally, to retrieve the workforce that we need. – *City Health Department Participant*

In addition, participants noted that the pandemic presented an opportunity for public health to take a closer look at its infrastructure and to build capacity for a more coordinated response across states for future emergency response efforts, through standardization and enhanced peer learning efforts.

From a technology standpoint, I'm so disappointed by the CDC's lack of leadership here. This was an opportunity to take all of the lessons we've learned from HIV and STD contact tracing and develop like a universal system for contact tracing to work across state lines and utilize that data to populate not only for the positive cases, but also for negative, populate negative contacts as well, and be able to much better address networks and prevent outbreaks. – *City Health Department Participant*

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### Recommendations

Participants provided the following recommendations for a more robust contact tracing infrastructure for an effective response for future pandemics:

**More coordinated and robust public health messaging and community engagement efforts are needed for future emergency responses.**

I would just add that this whole experience has reiterated to me the importance of health departments and the scientific community having comms, a communications team and being able to share

information with the public in a digestible way to the average person. – *State Health Department Participant*

**There is a pressing need to develop robust contact tracing infrastructure, including a unified contact tracing response system at the national level.**

I think in the future, it would be really helpful if we had more options for having a unified platform for this type of work because at that point, I think this type of more technical training would be useful. – *State Health Department Participant*

I think a tracking system that is nationwide would be beneficial. In HIV we do have centralized reporting and network reporting and network analysis work that happens. It's a missed opportunity because we know better and it's frustrating to see that we did not take lessons that we've learned from other diseases and apply them when we had an opportunity to do that here and build more infrastructure. – *City Health Department Participant*

**Public health must continue to identify, document, and apply evidence-based approaches to contact tracing planning and implementation efforts, including the development of standardized contact tracing practice guidelines.**

I would love to just see a much more evidence-based approach to contact tracing and then just identifying what are the thresholds when it's most effective and what are the thresholds when it may not be as effective so that people aren't just spinning their wheels and getting frustrated that contact tracing didn't work, which is what then we started seeing like towards the end of July. – *City Health Department Participant*

It is just really challenging not to have best practices and standardization of the practices already. And I know that that is not exactly something that with a new and emerging disease, we just can kind of automatically snap our fingers and have. But I have worked in the realm of TB for example, and in the realm of STDs, it seems like those larger, national overarching boards and [agencies] really have tried and true methodologies behind a lot of the contact tracing or partner services. And so, I guess I was just a little surprised that there was no standardization that came out to support and provide that technical assistance from the get-go. – *State Health Department Participant*

**There is a need for expanded workforce training and development efforts targeted at developing a robust contact tracing and disease investigation workforce.**

This would be an appropriate place to put that recommendation about the DIS certification. Some sort of standardized, 'these are the skills that you need'. And that people spend their entire career perfecting and something that we can hand over to contractors or the National Guard. – *State Health Department Participant*

Having maybe some type of uniform or some type of advanced statistical training for local health departments that can maybe compile numbers [would be helpful]. – *City Health Department Participant*

**Greater attention to the mental health of the public health workforce is warranted.**

If there was a way to help with the burnout, because I feel like the public health workforce in general that normally works with the health department that is now working on COVID response, we are already normally stretched thin, and this is just kind of going to break the system – *District Health Department Participant*

**Participants also provided recommendations for improving the effectiveness of the contact tracing process, including improving interpersonal skills, using interpreters and having dedicated official phone lines to improve the public trust of contact tracers.**

To have a municipal number call you. It will make contact tracing much more effective. – *City Health Department Participant*

We have been trying to get a system where basically whenever a contact tracer makes a call it shows up on the caller ID that [our state department of health] contact tracing is reaching out to the individual. – *State Health Department Participant*



The COVID-19 pandemic, which was first identified in the US in January 2020, has significantly affected population health and wellbeing. State and local public health departments continue to play a pivotal role in slowing the disease and enhancing public safety. One of the main tools used in this regard is contact tracing.

If used effectively and early, contact tracing identifies and isolates cases and all those that may have come in contact with them. Contacts are provided with information, counseling, and direction on what to do to protect their health and the health of others. Given the novelty of the COVID-19 virus and its rapid spread, health departments have faced challenges scaling their contact tracing programs in response to the virus.

The rapid spread of the virus and changing guidelines necessitated a very fluid and adaptive response to the pandemic, including developing and implementing contact tracing plans. Many health departments modified existing contact tracing plans to deal with this pandemic. Most states took the lead in providing broad plans that local health departments modified to suit their specific needs. However, there was consensus among health departments participating in this study that the historical levels of underfunding of public health services in the nation significantly constrained their ability to respond swiftly.

Participants discussed difficulties in ensuring an adequate staffing level, driven in part by the need to hire a large workforce against the backdrop of resource scarcity and an existing public health workforce shortage. Several health departments had to rely on existing state or local government staff reassigned to public health from other areas or a volunteer workforce. Many health departments discussed being overwhelmed with the sudden need to hire and train a new workforce, many of whom did not have previous public health training, to be contact tracers.

Information technology (IT) infrastructure to support communication and data management was identified as another challenge. Several bemoaned the lack of existing IT and informatics infrastructure to support an effective response to the pandemic. In some instances, IT and data management infrastructure to support contact tracing were built from scratch in response to the pandemic, necessitating additional training to help the contact tracing workforce use this technology

to its full potential. There was the need to recruit information technology support staff to maintain these needed IT infrastructures.

In addition to these infrastructural challenges, contact tracers also faced issues pertaining to their public interactions. Trust was an important issue to navigate, with some contacts not wanting to answer their phones or share information with health departments. Others refused to abide by public health guidelines due to significant public misinformation regarding the COVID-19 virus.

Health departments' ability to effectively and efficiently implement their contact tracing programs, despite these challenges, was facilitated through partnerships with external stakeholders. Notably, health departments leveraged academic partnerships to recruit personnel (in many cases, students) to contact tracing jobs and develop and deliver contact tracing workforce training content. Many participants expressed gratitude to academic partners, such as Johns Hopkins University for their leadership in this regard. Contact tracing programs also leveraged community partnerships to recruit staff, reach hard-to-reach populations, gain community trust, especially among diverse populations, and provide wraparound services to cases and contacts.

It is evident from these conversations that there are many lessons to be learned from this pandemic, including the pressing need to **develop robust contact tracing infrastructure** and the need for **more coordinated and robust public health messaging and community engagement efforts** as needed for future emergency responses. In addition, public health must continue to **identify, document, and apply evidence-based approaches to contact tracing** planning and implementation efforts, including developing **standardized contact tracing practice guidelines**. Further, public health **partnerships with external stakeholders that were forged during and before this pandemic need to be deepened**. That is especially true of the academic-health department partnerships and community partnerships that were mainly instrumental in extending the limited capacity of health departments in a meaningful way during this pandemic.

**Perhaps more importantly, funding for health departments needs to be improved.** Participants reported unanimously that health departments struggled with the limited budgets they had in the initial phases. Some of their early efforts were curtailed by the limited amount of funds available to support a robust response. A well-funded public health system would most likely have been better prepared to handle the sudden onset of this pandemic.

However, in the face of significant challenges, public health departments continue to demonstrate resilience and resourcefulness. Collectively, health departments nationwide, fueled by their passion and commitment to protecting the health of all Americans, have responded to this pandemic with grit and competence. While there have been gaps in the pandemic response, including the scaling up of contact tracing programs, health departments participating in this study were quick to note the need to take advantage of the increased visibility public health has experienced as a result of this pandemic. As stated by one participant, the public can now *"see what public health really does and what we can do."* Thus, as stated succinctly by another participant, we now have the *"ability to leverage the pandemic to hire more people and [put] public health at the forefront."*



- Beech, B. M., & Woodard, L. (2020). Contact Tracing: A Clarion Call for National Training Standards. *Ethnicity & Disease, 30*(3), 437–440. <https://doi.org/10.18865/ed.30.3.437>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Burns, K. F., Strickland, C. J., & Horney, J. A. (2020). Public Health Student Response to COVID-19. *Journal of Community Health. https://doi.org/10.1007/s10900-020-00910*
- Centers for Disease Control. (2020). Contact tracing: Part of a multipronged approach to fight the COVID-19 pandemic. Retrieved from <https://www.cdc.gov/coronavirus/2019-ncov/downloads/php/principles-contact-tracing-booklet.pdf>
- Centers for Disease Control (2020). Contact tracing for Covid-19. Retrieved from <https://www.cdc.gov/coronavirus/2019-ncov/php/contact-tracing/contact-tracing-plan/contact-tracing.html>
- Clark, E., Chiao, E. Y., & Amirian, E. S. (2020). Why contact tracing efforts have failed to curb COVID-19 transmission in much of the U.S. *Clinical Infectious Diseases: An Official Publication of the Infectious Diseases Society of America. https://doi.org/10.1093/cid/ciaa1155*
- Dar, A. B., Lone, A. H., Zahoor, S., Khan, A. A., & Naaz, R. (2020). Applicability of mobile contact tracing in fighting pandemic (COVID-19): Issues, challenges and solutions. *Computer Science Review, 38*, 100307. <https://doi.org/10.1016/j.cosrev.2020.100307>
- Eames, K. T., & Keeling, M. J. (2003). Contact tracing and disease control. *Proceedings of the Royal Society of London. Series B: Biological Sciences, 270*(1533), 2565–2571.
- Inglesby, T. V. (2020). Public Health Measures and the Reproduction Number of SARS-CoV-2. *JAMA, 323*(21), 2186–2187. <https://doi.org/10.1001/jama.2020.7878>
- Keeling, M. J., Hollingsworth, T. D., & Read, J. M. (2020). Efficacy of contact tracing for the containment of the 2019 novel coronavirus (COVID-19). *Journal of Epidemiology and Community Health, 74*(10), 861–866. <https://doi.org/10.1136/jech-2020-214051>
- Koetter, P., Pelton, M., Gonzalo, J., Du, P., Exten, C., Bogale, K., Buzzelli, L., Connolly, M., Edel, K., Hoffman, A., Legro, N. R., Medina, D., Sood, N., Blaker, J., Kearcher, K., & Sciamanna, C. (2020). Implementation and Process of a COVID-19 Contact Tracing Initiative: Leveraging Health Professional Students to Extend the Workforce During a Pandemic. *American Journal of Infection Control, 48*(12), 1451–1456. <https://doi.org/10.1016/j.ajic.2020.08.012>

- Lucivero, F., Hallowell, N., Johnson, S., Prainsack, B., Samuel, G., & Sharon, T. (2020). COVID-19 and Contact Tracing Apps: Ethical Challenges for a Social Experiment on a Global Scale. *Journal of Bioethical Inquiry*, 17(4), 835–839. <https://doi.org/10.1007/s11673-020-10016-9>
- MacIntyre, C. R. (2020). Case isolation, contact tracing, and physical distancing are pillars of COVID-19 pandemic control, not optional choices. *The Lancet. Infectious Diseases*, 20(10), 1105–1106. [https://doi.org/10.1016/S1473-3099\(20\)30512-0](https://doi.org/10.1016/S1473-3099(20)30512-0)
- National Academy for State Health Policy (2020). State Approaches to Contact Tracing During COVID-19 Pandemic. Retrieved from <https://www.nashp.org/state-approaches-to-contact-tracing-covid-19/#tab-id-5>
- QSR International (1999) NVivo Qualitative Data Analysis Software. Available from <https://qsrinternational.com/nvivo/nvivo-products/>
- Ross, A. M., Zerden, L. D. S., Ruth, B. J., Zelnick, J., & Cederbaum, J. (2020). Contact Tracing: An Opportunity for Social Work to Lead. *Social Work in Public Health*, 35(7), 533–545. <https://doi.org/10.1080/19371918.2020.1806170>
- Selena, S. (2020, August 7). Coronavirus Cases Are Surging. The Contact Tracing Workforce Is Not. *National Public Radio*. Retrieved from <https://www.npr.org/sections/health-shots/2020/08/07/899954832/coronavirus-cases-are-surging-the-contact-tracing-workforce-is-not>
- Selena, S. (2020, June 18). As States Reopen, Do They Have the Workforce They Need to Stop Coronavirus Outbreaks? *National Public Radio*. <https://www.npr.org/sections/health-shots/2020/06/18/879787448/as-states-reopen-do-they-have-the-workforce-they-need-to-stop-coronavirus-outbre>
- Stephenson J. (2020, September 15). National Academies Offers Strategies to Encourage Cooperation in COVID-19 Contact Tracing. *JAMA Health Forum*. Retrieved from [doi:10.1001/jamahealthforum.2020.1167](https://doi.org/10.1001/jamahealthforum.2020.1167)
- The George Washington Health Workforce Institute (2020). Contact Tracing Workforce Estimator. Retrieved from <https://www.gwhwi.org/estimator-613404.html>
- Watson et al. (2020). A National Plan to Enable Comprehensive COVID-19 Case Finding and Contact Tracing in the US. [https://www.centerforhealthsecurity.org/our-work/pubs\\_archive/pubs-pdfs/2020/200410-national-plan-to-contact-tracing.pdf](https://www.centerforhealthsecurity.org/our-work/pubs_archive/pubs-pdfs/2020/200410-national-plan-to-contact-tracing.pdf)