

November 2022

Programmatic Impacts of Utilizing Various Staffing Options for COVID-19 Contact Tracers: Recommendations and Lessons Learned

Michael Wiese

University of South Florida, mwiese@usf.edu

Alison Oberne

University of South Florida, aoberne@usf.edu

Laura Rusnak

University of South Florida, lrusnak@usf.edu

Patrick Rodriguez

University of South Florida, prodrig2@usf.edu

Matawal Makut

University of South Florida, matawal@usf.edu; <https://digitalcommons.unf.edu/fphr>



Part of the [Epidemiology Commons](#)

Recommended Citation

Wiese, Michael; Oberne, Alison; Rusnak, Laura; Rodriguez, Patrick; and Makut, Matawal (2022) "Programmatic Impacts of Utilizing Various Staffing Options for COVID-19 Contact Tracers: Recommendations and Lessons Learned," *Florida Public Health Review*. Vol. 19, Article 9. Available at: <https://digitalcommons.unf.edu/fphr/vol19/iss1/9>

This Research Article is brought to you for free and open access by the Brooks College of Health at UNF Digital Commons. It has been accepted for inclusion in Florida Public Health Review by an authorized administrator of UNF Digital Commons. For more information, please contact [Digital Projects](#).

© November 2022 Protected by original copyright, with some rights reserved.

PROGRAMMATIC IMPACTS OF UTILIZING VARIOUS STAFFING OPTIONS FOR COVID-19 CONTACT TRACERS: RECOMMENDATIONS AND LESSONS LEARNED

Michael Wiese, MPH, CPH
Alison Oberne, PhD, MPH, MA
Laura Rusnak, MPH, CPH, CHES
Patrick Rodriguez, MSPH, CPH
Matawal Makut, MBBS, MPH, MBA, CPH

Florida Public Health Review
Volume 19
Published November 1, 2022

Background: The rapidly expanding COVID-19 pandemic created an immediate demand for the Department of Health in Hillsborough County (DOH-Hillsborough) Epidemiology Program to supplement its contact tracing workforce; and, because of the long duration of the response, a sustained workforce was needed. The DOH-Hillsborough Epidemiology Program's COVID-19 response, broadly referred to as "contact tracing", included case investigations, outbreaks, and identification and notifications to exposed individuals. **Purpose:** To understand the differences in work output and efficiency across staffing groups (quantitative analysis) and to understand Core Epidemiology Staff recommendations when hiring temporary staff as contact tracers (qualitative analysis). **Methods:** A mixed-methods approach was used to assess each staffing group hired in Hillsborough County. Quantitative data was analyzed from 3/1/2020 through 1/31/2021, and included data from the state's personnel management system and the state's reportable disease database to represent work output. **Results:** During the evaluation period, 199 staff across the staffing groups worked a collective 132,252.50 hours. The number of hours worked per case and contact ranged from 10.16 in Core Epidemiology Staff to 0.67 in University Partners. During qualitative interviews with the Core Epidemiology Staff, five common themes emerged as ideal characteristics for temporary contact tracing staff. **Discussion:** These mixed methods data can be used to develop best practices to inform future surge staffing needs

Background | The coronavirus disease 2019 (COVID-19) pandemic represents an unprecedented challenge for this generation's public health workforce. Communicable Disease Investigators (CDIs) and Disease Intervention Specialists (DISs) typically perform contact tracing activities within most local health departments.^{1,2} The magnitude of COVID-19 cases forced health departments to quickly hire COVID-19 contact tracers (CTs). Identifying, hiring, training, and supervising individuals who could perform tasks typically accomplished by CDI and DIS professionals³ was a challenge for many hiring managers. Effective CTs require language skills, cultural competency², and the ability to establish trust with community members.¹ Because formal public health training for CTs is not required, many health

departments pursued a variety of avenues to fill these roles.

One existing cohort of CTs consisted of school health staff available due to school closures.^{4,5} In some areas of the country, the deployment of National Guard and AmeriCorps members also helped meet demand.¹ A long history exists between health departments and university partners to address disease outbreaks. This includes FoodCORE (Foodborne Disease Centers for Outbreak Response Enhancement)⁶ and SAFER (Student Aid for Field Epidemiology Response).^{7,8} These programs strengthened public health and academic partnerships and allowed students to contribute to pandemic response efforts when in-person clinical opportunities were suspended.^{9,10} Thus, hiring students and faculty as CTs during COVID-19

made sense given their subject matter expertise and commitment to public health practice.

The Florida Department of Health (DOH) oversees 67 County Health Departments (CHDs). To control the spread of COVID-19, DOH prioritized state-wide contact tracing efforts as a key mitigation tool.¹¹ Over 1.4 million individuals reside in Hillsborough County, making it the fourth largest county in Florida.¹² Within the Florida Department of Health in Hillsborough County (DOH-Hillsborough) the Epidemiology Program coordinated disease surveillance, case investigation, and contact tracing. To meet demand for contact tracing, DOH-Hillsborough utilized various staffing options. Rapidly expanding case numbers and the extended duration of the COVID-19 response resulted in DOH-Hillsborough hiring, training, and managing multiple staffing groups. There was little precedent for how to best fill staffing needs during a hiring surge. Therefore, this study was guided by the following research questions: 1) what were the differences in work output and efficiency across temporary staffing groups (quantitative analysis) and 2) what were the Core Epidemiology Staff recommendations when hiring temporary staff as CTs (qualitative analysis)?

Methods | The DOH-Hillsborough Epidemiology Program’s COVID-19 response, broadly referred to as “contact tracing”, included case investigations, outbreaks, and contact tracing for all exposed individuals. To assess efficiency and effectiveness of each staffing group hired in Hillsborough County, a mixed-methods approach was used. Quantitative data, collected from 3/1/2020 through 1/31/2021, included database extraction from the state’s personnel management system, PeopleFirst, and the state’s reportable disease database, Merlin, to represent work output. Qualitative interviews with Core Epidemiology Staff were conducted and analyzed to understand how temporary staff acclimated to their responsibilities and to understand Core Epidemiology Staff recommendations when hiring future surge staffing.

Because many staffing groups were involved in this process, a general description of each group is needed, along with a description of duties:

Core Epidemiology Staff: Full-time DOH-Hillsborough employees working in the Epidemiology Program prior to and throughout the COVID-19 response. They were initially responsible for all COVID-19 case investigations, contact tracing, and outbreak investigations; but, because of their epidemiology experience and knowledge, these staff shifted into training and supervisory roles as other staffing groups were added. Only the highest priority case investigations and outbreaks were worked by

Core Epidemiology Staff during later phases of response.

Reassigned Staff: Full-time DOH-Hillsborough employees working outside of the Epidemiology Program before COVID-19. These individuals were cross-trained for temporary COVID-19 response work. Because many of these staff had public health experience, most staff conducted COVID-19 case investigations and contact tracing, or were assigned to the management of high-risk outbreak settings, such as long-term care facilities or schools. These staff returned to their previous roles once additional staff were trained.

University Partners: Faculty and students recruited from the State University System of Florida and assigned to DOH-Hillsborough. Faculty or students with public health, social work, or nursing backgrounds were assigned case investigation and contact tracing duties. The state hired this staffing group through emergency response deployment periods of two-week increments. If staff in this group expressed interest in longer term COVID-19 response functions, they were hired during the DOH-Hillsborough hiring process. This resulted in the periodic transition of individuals from one staffing group to another (i.e., University Partners to DOH-Hillsborough).

Contracted Staff: Staff hired by a contracted staffing agency and assigned to DOH-Hillsborough. Hiring was conducted by the contracted agency and most staff had little or no public health education or experience. This staff was given data entry and general tasks while undergoing longer training. Eventually staff were given contact tracing duties. Some contract staff were registered nurses who required less training and were assigned contact tracing duties sooner. This group was made available to the county and paid for at the state level, so the duration of this staffing group was based on the state’s funding resources. As contracted services ended, some staff were hired during the DOH-Hillsborough hiring process (and therefore future work was attributed to the DOH-Hillsborough Hires group).

DOH-Hillsborough Hires: Staff hired directly by DOH-Hillsborough. As funding for the contracted staffing group and university partnership deployments was shifted from the state to the county, Hillsborough County retained many of the staff from these groups as they were phased out, hiring them into the DOH-Hillsborough Hires group. Staff were assigned the full range of duties, including high priority investigations, routine investigations, contact tracing, outbreak investigation, facility management, and data analysis.

State Level Hires: Staff hired at the state level, then assigned to Hillsborough County. The state hired epidemiologists at a higher level (requiring either a Master of Public Health degree and/or previous epidemiology field experience) and then assigned this

staff to the county. These staff were assigned higher priority case investigations and the management of high-risk outbreaks.

Database Extraction and Review | All DOH-Hillsborough Epidemiology staffing groups employed between 3/1/2020 and 1/30/2021 were eligible for inclusion. Data on hiring, start and end dates, hours worked, and hours spent on COVID-19 work were retrieved from PeopleFirst. Similar data was collected on Contracted Staff through reviewing timesheets, deployment paperwork, and work schedules.

Hillsborough County COVID-19 cases and contacts from 3/1/2020 through 1/31/2021 were queried from Merlin. Analysis was first determined for an individual's hours worked on COVID-19, and their number of cases and contacts investigated. Measures of workload and work time for each individual was summed and analyzed within their respective staffing groups. Fourteen staff began employment in one staffing group but transitioned to another staffing group. These individuals were counted once in their original staffing group. However, their work time, cases, and contacts were allocated within the staffing group in which they were working when the time and work was performed. Measures of workload and efficiency were analyzed within and across staffing groups. To calculate work load, the sum of the cases and contacts investigated was calculated for each hire. These individual calculations were then summed to represent the workload of each staffing group. To calculate efficiency, the number of hours each individual worked across all cases and contacts was summed. These individual calculations were then summed to represent the total work hours per staffing group. Finally, each staffing group's total work hours were divided by total cases and contacts investigated to determine COVID-19 work hours per case and contact. This final value indicated staffing group efficiency.

Interviews | Semi-structured interviews were conducted with DOH-Hillsborough Core Epidemiology Staff primarily responsible for onboarding, training, and managing COVID-19 staffing groups. In total, six Core Epidemiology Staff were recruited, and all agreed to participate. These six Core Epidemiology Staff were part of the total 14-member team who worked full-time in the DOH-Hillsborough Epidemiology Program. All interviews were conducted using Microsoft Teams. Staff were all interviewed by one research team member (A. Oberne). Participants consented to have the interviews be recorded. Data were aggregated to promote confidentiality.

A semi-structured interview guide, with associated probes, was used. This allowed participants to expand on topics of interest as they related to staffing

procedures and practices. Key questions asked participants to describe their experiences working with staff hired across all staffing groups. In addition, questions were asked to assess limitations of individuals hired for contact tracing, as well as characteristics of individuals that were most important for conducting contact tracing.

Audio-recordings, lasting an average of 31 minutes, were transcribed verbatim by the research team. Then, one research team member (A. Oberne) conducted quality checks to assure completeness and accuracy in transcription. One research team member (A. Oberne) conducted thematic analysis using a codebook that was adjusted to accommodate ad hoc and post hoc codes. All transcripts were coded for inductive and deductive themes using an iterative process. Upon completion of coding, the research team met to discuss major themes and reach a consensus. In total, three major themes emerged.

Results |

RESEARCH QUESTION 1: QUANTITATIVE OUTCOMES

Between 3/1/2020 and 1/31/2021, 199 staff participated in CT efforts within DOH-Hillsborough. Table 1 displays the number of personnel within each staffing category. The total COVID-19 work hours recorded during this period was 132,252.50. The largest staffing group was the DOH-Hillsborough Hires (n=107), accounting for 53.72% of CT work during this timeframe. The fewest work hours were contributed by University Partners (n=15), with only 2.76% of the total work period hours attributed to that group.

From 3/1/2020 through 1/31/2021, 108,068 COVID-19 cases and 53,539 contacts were reported for a total work volume of 161,607 cases and contacts. Figure 1 reflects average epidemiology workload atop a timeline of staffing groups. Core Epidemiology Staff were in place at the beginning of the response and were involved through the duration of the study period. Reassigned Staff began early in the response and lasted beyond most staffing groups. State Level Hires were added shortly thereafter. Then, University Partners and Contracted Staff were hired as workload sharply increased during the summer of 2020. At the beginning of August, Hillsborough County began shifting toward DOH-Hillsborough Hires, and shortly thereafter use of Contracted Staff ended. This was followed by an end to the University Partners and Reassigned Staff in October 2020. By November 2020, only Core Epidemiology Staff, State Level Hires, and DOH-Hillsborough Hires remained working the COVID-19 response.

The highest number of hours per case and contact was recorded in the Core Epidemiology Staff, at 10.16. This was followed by State Level Hires at 4.41, then Reassigned Staff at 3.28, DOH-Hillsborough Hires at

1.14, Contracted Staff at 0.81, and then lowest number of hours per case and contact was in University Partners with 0.67.

Core Epidemiology Staff, Reassigned Staff, and State Level Hires had the highest work hours per case and contact. These staffing groups were employed early in the response when workload was comparatively low. University Partners and Contract Staff had the lowest work hours per case and contact, and these groups were employed during the peak workload in summer 2020.

RESEARCH QUESTION 2: QUALITATIVE OUTCOMES

Six interviews were conducted with Core Epidemiology Staff to identify recommendations for hiring temporary staff. Three major themes emerged in the data regarding: 1) best hires during hiring surges, 2) temporary staff ideal characteristics, and 3) hiring recommendations for departments of health.

Major Theme 1: Best Hires

Two staffing groups emerged as the “best hires” for seamlessly transitioning into their roles: State Level Hires and University Partners. State Level Hires started early in the pandemic and received more training due to their extended length of service. University Partners “...were already working and understand the importance of the job and public health and our role.” Interviews revealed that these two staffing groups were interested in working in public health long-term so they were passionate about the work.

Major Theme 2: Temporary Staff Ideal Characteristics

Core Epidemiology Staff commented on ideal characteristics among CTs. Within these recommendations, five subthemes emerged: 1) communication skills, 2) professionalism, 3) public health knowledge, 4) following official guidance, and 5) flexibility. Table 2 offers illustrative quotes for each characteristic. Most Core Epidemiology Staff (n=5) indicated the importance of communication skills. Contact tracing requires communication, rapport-building, and customer service; therefore, having the ability to connect with residents, provide clear information, and reduce potential tension is valued. Related to communication skills is the importance of professionalism. Most Core Epidemiology Staff (n=4) described a host of characteristics surrounding professionalism. These characteristics included reliability, integrity, honesty, critical thinking, and a willingness to learn new information. These skills promote public health efforts and support trust within a community.

Most Core Epidemiology Staff (n=5) identified the importance of public health knowledge. Although not

required for temporary staff, Core Epidemiology Staff indicated that public health knowledge can improve CT efforts and assure accurate information is communicated. For example, having public health knowledge can improve how staff explain disease transmission and quarantine/isolation recommendations. By delivering accurate public health information, residents may be more likely to follow contact tracing recommendations and support evidence-based practices.

Three Core Epidemiology Staff described the importance of following official guidance. Because COVID-19 is complex, there exist many sources of information. It is essential that CTs use approved sources to communicate with residents.

Finally, many Core Epidemiology Staff (n=4) described flexibility as an important skill for temporary staff. Information is constantly changing during a pandemic and staff duties may also shift to accommodate the community’s needs. Therefore, staff must be able to adapt to these changes. It is important to note that the use of official guidance to inform communication is closely connected to flexibility. As guidance changes, staff need to stay abreast of these changes to provide safe recommendations for residents.

Major Theme 3: Hiring Recommendations

Core Epidemiology Staff described many hiring recommendations for dealing with future staffing surges. One recommendation was to ensure counties have input regarding hiring processes. The state may have less insight into specific processes occurring at the county level, so local oversight allows county staff to hire temporary staff who best fit local needs. This recommendation was further echoed by another Core Epidemiology Staff member who indicated that Core Epidemiology Staff should participate in the hiring process to assure that human resources appropriately identify temporary staff for this type of work. Human Resource staff alone may not best identify temporary staff to fill CT roles and responsibilities. Therefore, Core Epidemiology Staff should participate in the hiring process, or at least identify minimum qualifications for these position postings. Last, it was indicated that many departments within departments of health should prepare for additional staff. Although temporary employees most closely worked with the Core Epidemiology Staff, HR staff and IT staff are also affected by these hires and should be adequately prepared. These other departments may need to increase internal staffing capacity to complete the following tasks: process new hires, acclimate new staff to database systems, allocate resources to new staff, increase bandwidth for CT databases, etc.

Discussion | Evidence suggests that several factors affected the work output of each staffing group hired during the COVID-19 response. These included timing of when groups were hired, complexity of case investigations, and supervisory tasks assigned to more experienced groups. The quantitative analysis found the most efficient group was the University Partners. These staff worked the fastest, followed by Contracted Staff, and DOH-Hillsborough hires. These three groups were hired later in the pandemic, reflecting an overall trend of higher efficiency in the last hired groups. This is likely explained by a more well-established set of policies and procedures. Less efficiency was identified among Core Epidemiology Staff, State-Level Hires, and Reassigned Staff staffing groups. The workload represented by these staffing groups likely reflects the transition period during which contact tracing processes and procedures were being established early in the pandemic.

Case complexity and supervisory tasks also affected staffing group efficiency. Although State Level Hires and Core Epidemiology Staff ranked worst in efficiency, these outcomes do not accurately reflect their workload. Core Epidemiology Staff training and supervision of the different staffing groups reduced the time they spent engaging in quantifiable case work. The most complex case investigations were also delegated to Core Epidemiology Staff and State Level Hires. Since the State Level Hires experienced an extended length of service, their in-depth training and real-world experience allowed them to implement infection control guidance for outbreaks, conduct case investigations in high-risk settings, respond to challenging customer service situations, and perform data analysis and create reports for leadership, none of which was quantifiable in this analysis. These types of tasks, along with supervisory duties and complex case investigations, affected the measured efficiency of these groups and contributed to an underestimation of their workload.

The qualitative analysis highlighted University Partners and State Level Hires as the groups that showed the best promise for supporting staffing needs. The benefits of these groups included professionalism, strong communication skills, and public health interest and knowledge. In fact, many of the characteristics described by individuals supervising these groups are included in the CDC's guidance on CTs.¹³ There was a strong overlap between qualitative results and what the CDC describes as cross-cutting knowledge, skills, and abilities that enable effective contact tracing. This overlap includes professional conduct, critical

thinking, problem-solving, flexibility, adaptability, and emotional intelligence. Qualitative feedback also found that staffing groups who remained employed for longer time periods required less training, and promoted workflow and effectiveness. It was repeatedly stated by Core Epidemiology Staff that as individuals from different staffing options remained assigned, communication became clearer and easier. Although University Partners were hired for a shorter duration than State Level Hires, their skills and discipline-specific knowledge resulted in a high ranking from supervisory staff.

There were several strengths to this case study. First, mixed methods data were used to give different perspectives on the strengths and weaknesses of temporary staffing options. Quantitative data describe how each staffing group performed assigned tasks, as measured by workload, work time, and efficiency. At the same time, qualitative data offer insights from Core Epidemiology Staff on each group's contributions to contact tracing efforts and ideal characteristics when hiring CTs. Analyzing mixed methods data offers a robust picture of the strengths and weaknesses for each staffing group so county health departments can maximize effectiveness in disease investigations. Second, this study was conducted when the largest surge of COVID-19 was occurring. This gives an accurate representation of how a local county health department responded to the pandemic. The findings provide a picture into how staffing options can be used at different points in a pandemic.

These findings have limitations based on the scope of the data collected. First, the quality of contact tracing data was not analyzed. Second, contact tracers' effectiveness was not assessed, which could provide a relative value of individual staffing groups. Third, space and technology limitations were not properly accounted for in the quantitative findings, potentially impacting efficiency. It was challenging to provide temporary staff with computers, desk space, and access to databases. Fourth, there was a lack of data quantifying the work placed on Core Epidemiology Staff. The extra work performed to manage and train temporary staff and handle complicated cases erroneously inflated workload represented in the quantitative analysis. Finally, there were difficulties in reaching saturation for qualitative findings. There were only six Core Epidemiology Staff and their responsibilities differed and several of their roles changed over time.

Table 1: Summary of Staffing Groups Utilized by The Florida Department of Health in Hillsborough County Epidemiology Program From 3/1/2020 - 1/31/2021 for COVID-19 Case Investigation and Contact Tracing.

Staffing Group	Number of Staff	Total COVID-19 Work Hours	Percentage COVID-19 Work Time	Total Cases & Contacts	COVID-19 Work Hours Per Case & Contact
Core Epidemiology Staff	14	17,955.00	13.58%	1,768	10.16
Reassigned Staff	25	17,590.00	13.30%	5,370	3.28
University Partners	15	3,644.50	2.76%	5,410	0.67
Contracted Staff	32	14,885.25	11.26%	18,286	0.81
DOH-Hillsborough Hires	107	71,043.75	53.72%	62,146	1.14
State Level Hires	6	7,134.00	5.39%	1,618	4.41
Sub Total	199	132,252.50	100.00%	94,598	1.40
Unattributed Work ¹				16,857	
Other Group ²				50,152	
Total				161,607	

¹ Any instance where the case or contact was completed and marked as interviewed but did not have an investigators name selected, so staffing group could not be assigned.

² Includes all remaining cases and contacts assigned to Hillsborough County during 3/1/2020 - 1/31/2021 that are otherwise uncounted for. This category includes, but is not limited to, cases and contacts completed by the State call center, other State level staff, and by the cases and contact themselves, using a phone based application.

Figure 1: Department of Health in Hillsborough County Epidemiology Program Timeline of Staffing Groups With an Overlay of the 7-Day Average Daily COVID-19 Cases and Contacts From 3/1/2020 – 1/31/2021.

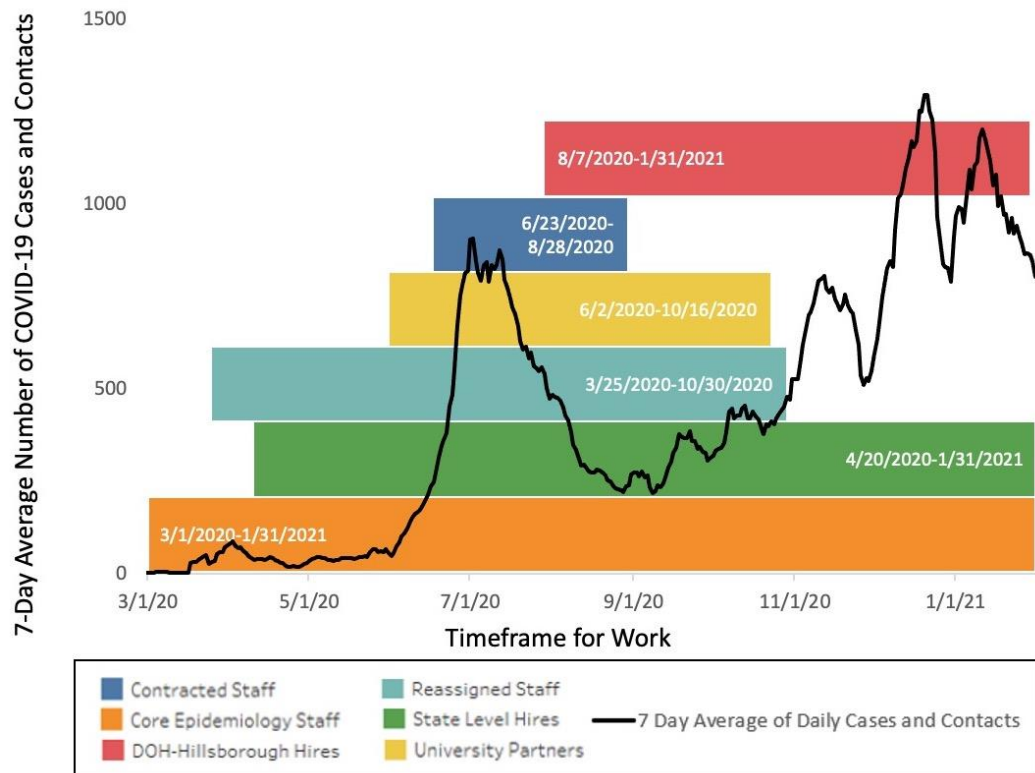


Table 2: Ideal Characteristics of New Hires Conducting COVID-19 Contact Tracing at Department of Health in Hillsborough County Epidemiology Program from 3/1/2020 – 1/31/2021.

Communication Skills	"I think it is important to have someone who is non-judgmental or at least won't show the judgment in a conversation and can remain calm when the person on the other end of the phone is becoming very heated over the situation. Because that's something that happens often in calls like this. And so, the ability to kind of remove yourself from the situation and stay calm and try and calm the other person down. And so, professionalism and customer service-oriented type of way can help make these conversations go much smoother during contact tracing"
	"Empathy, you know, having some compassion, especially right now, listening to people, I think a lot of it is just listening, hearing people out. And, and I think being able to, in the, in the context of what we do, being able to build rapport with your case and meet them where they are, you know, at their level of understanding at their want of wanting to make changes or institute control measures."
Public Health Knowledge	"I think that can be helpful to have an epidemiology background in public health where you have some level of understanding of you know stuff like infectious period, incubation period and those concepts in your head already"
	"Someone who was a public health major. Someone who understands public health and understands what the job is and how important that it really is and the [epidemiologists] do, and how important that is to the community"
Flexibility	"Flexibility. We need people who are flexible. I used to say having just a pulse would be okay but I've since regretted that."
	"[The] person is typically very flexible with whatever work needs to be done. They're ready to do what they need to do... whatever task might be at hand... and they're excited to learn something new."
Professionalism	"I would say the biggest, especially during COVID is like just being able to think on your feet critically and make a decision."
	"A willingness to learn...Somebody who has integrity and honesty. You know, like, be honest about your cases...make sure you're asking the questions; you're writing your notes. Those things are important."
Following Official Guidance	"Stay in line with what the messages and what we're doing and the things they're supposed to be doing and following the guidelines that we have."
	"The people who came in and were able to follow the direction of the CDC, of the state, and the guidance and kinda critically think with that information was very helpful."

Implications | Data from this analysis can be used to understand the perspective of public health professionals during the rapid surge of COVID-19 cases. These observations of COVID-19 staffing can inform strategies for future hiring and reduce barriers associated with planning and logistics. As the COVID-19 pandemic evolves, best practices can be established in preparation for the next public health crisis.

Acknowledgments | The authors would like to thank staff members within these departments for their support and participation throughout this process: Department of Health-Hillsborough Department of Epidemiology, Community Health and Human Resources Staff for their assistance, cooperation, and participation in interviews and surveys.

References |

1. Ruebush E, Fraser MR, Poulin A, et al. COVID-19 case investigation and contact tracing: early lessons learned and future opportunities. *J Public Health Manag Pract.* 2021;27(1):S87-S97. doi: 10.1097/PHH.0000000000001290
2. Centers for Disease Control and Prevention. Interim guidance on developing a COVID-19 case investigation & contact tracing plan. Accessed March 7, 2021. <https://www.cdc.gov/coronavirus/2019-ncov/php/contact-tracing/contact-tracing-plan/scaling-staff.html>
3. Centers for Disease Control and Prevention. Training, evaluation, and monitoring guidance for health department supervisors and training leads: ensuring high quality and continuous improvement of COVID-19 case investigators' interviewing skills. Published November 19, 2020. Accessed April 29, 2021. <https://www.cdc.gov/coronavirus/2019-ncov/downloads/php/open-america/Training-Evaluation-and-Monitoring-Guidance-for-Health-Departments.pdf>
4. Kalyanaraman N, Fraser MR. Containing COVID-19 through contact tracing. *Public Health Rep.* 2021; 136(1):32-28. doi:10.1177/0033354920967910
5. Flaherty EA. School nursing and public health: the case for school nurse investigators and contact tracing monitors of COVID-19 patients in Massachusetts. *NASN School Nurse.* 2020;35(6):327-331. doi:10.1177/1942602X20950670
6. Biggerstaff GK. Improving response to foodborne disease outbreaks in the United States: findings of the Foodborne Disease Centers for Outbreak Response Enhancement (FoodCORE), 2010-2012. *J Public Health Manag Pract.* 2015;21(4):E18-E26. doi:10.1097/PPH.0000000000000115
7. Pogreba-Brown K, Harris RB, Stewart J, et al. On linkages: outbreak investigation partnerships: utilizing a student response team in public health responses. *Public Health Rep.* 2010;125(6):916-922. doi:10.1177.003335491012500621
8. Pogreba-Brown K, Austhof E, Rosa Hernandez AM, et al. Training and incorporating students in SARS-CoV-2 case investigations and contact tracing. *Public Health Rep.* 2021;136(2):154-160. doi:10.1177.0033354920974664
9. Koetter P, Pelton M, Gonzalo J, et al. Implementation and process of a COVID-19 contact tracing initiative: leveraging health professional students to extend the workforce during a pandemic. *Am J Infect Control.* 2020;48(12):1451-1456. doi:10.1016/j.ajic.2020.08.012
10. Niccolai L, Shelby T, Weeks B, et al. Community trace: Rapid establishment of a volunteer contact tracing program for COVID-19. *Am J Public Health.* 2021;111(1):54-57. doi:10.2105/AJPH.2020.305959
11. Rivkees SA, Roberson S. The Florida Department of Health STEPS public health approach: the COVID-19 response plan and outcomes through May 31, 2020. *Public Health Rep.* 2020;135(5):560-564. doi:10.1177/0033354920946785
12. Florida Department of Health. FLHealthCHARTS – population query system. Accessed April 29, 2021. <http://www.flhealthcharts.com/FLQUERY/New/Population/Count>
13. Centers for Disease Control and Prevention. Training case investigators and contact tracers. Accessed December 8, 2021. <https://www.cdc.gov/coronavirus/2019-ncov/php/contact-tracing/contact-tracing-plan/training-investigators.html>