2021

Identifying Critical Psychological Characteristics Related to Successful Performance as a Contact Tracer: A Job Analysis

Dev Dalal *University at Albany, State University of New York*, ddalal@albany.edu

Jason G. Randall PhD *University at Albany, State University of New York*

Gabrielle Danna *University at Albany, State University of New York*

Joshua Ash *University at Albany, State University of New York*

Please contact the following author for an updated version of this work prior to citing it:
Dev Dalal

University at Albany, State University of New York

ddalal@albany.edu

In April 2020, the University at Albany was asked by Gov. Andrew Cuomo to research why communities of color in New York have been disproportionately impacted by COVID-19. The goal of this research, carried out in partnership with the New York State Department of Health and Northwell Health, is to add to the existing well of knowledge about health disparities in New York State by identifying the environmental, socioeconomic and occupational factors that explain why COVID-19 has disproportionately harmed Black and Hispanic New Yorkers and to propose practical intervention strategies to eliminate these disparities and save lives.
For additional information about this project please see: www.albany.edu/mhd or contact Theresa Pardo, Special Assistant to the President and Project Director for this initiative at tpardo@ctg.albany.edu.

Identifying Critical Psychological Characteristics Related to Successful Performance as a

Contact Tracer: A Job Analysis

Dev K. Dalal[1], Jason G. Randall, Gabrielle C. Danna, & Josh Ash

University at Albany, State University of New York

Preprint: Manuscript currently under review at *Personnel Assessment and Decisions.*

Revised August 26, 2021

[1] *Corresponding Author:* Dev K. Dalal, Ph.D., Department of Psychology, University at Albany, State University of New York. *Mailing Address*: University at Albany, 1400 Washington Ave., SS-399, Albany, NY 12222. ddalal@albany.edu.

Abstract

Although not new, the COVID-19 pandemic highlighted the importance of contact tracing in the fight to slow the spread of COVID-19, with public health officials calling for a massive workforce of contact tracers to help end the pandemic. Rapidly accelerating the recruitment, selection, and training of contact tracers proved to be difficult, though, in part due to the lack of detailed information about this job and therein the inability to launch a valid, structured, and systematic approach to hiring and training contact tracers. This study tackled the first step in developing a systematic selection and training program: we conducted a worker-oriented job analysis of the role of contact tracer to identify the knowledge, skills, abilities, and other characteristics (KSAOs) critical for successfully performing as a contact tracer. Using these results, we then developed predictive hypotheses for these KSAOs, and identified which KSAOs are necessary at the time of hiring and those that are trainable. Using archival records and structured interviews with 15 subject matter experts, we identified 25 unique KSAOs related to successful performance as a contact tracer. Furthermore, we identified 18 KSAOs as candidates for selection, four as candidates for training, and three with aspects that make it suitable for either pre-hire screening or post-hire training. Although future research is needed, the results of this job analysis jump start the process of developing a systematic approach to selecting and training contact tracers to not only help end the COVID-19 pandemic, but to help successfully navigate future public health emergencies.

Identifying Critical Psychological Characteristics Related to Successful Performance as a

Contact Tracer: A Job Analysis

Contact tracing is a powerful method for collecting information about individuals who may have encountered a person infected with a communicable disease to take necessary steps to contain further spread. Although not a new job, the COVID-19 pandemic highlights the importance of this role in the fight to slow the spread of COVID-19, end the pandemic, and safely reopen schools and businesses. Indeed, at the height of the pandemic, public health officials called for building a massive workforce of contact tracers to help slow the spread of this highly communicable disease—a "contact tracer army" (Watson et al. 2020).

Rapidly accelerating the recruitment, selection, and training of contact tracer proved to be difficult, however, with many states' contact tracer workforces well-below recommended levels—even after hiring spikes (Simmons-Duffin, 2020, December). One likely reason for the understaffed contact tracer workforce is the lack of a validated, systematic approach to recruiting, selecting, and training contact tracers. Indeed, using a well-validated selection and training program can help efficiently and quickly hire and train individuals, improve performance, and reduce turnover (Guion, 2011).

The first step in developing such a system is to identify the knowledge, skills, abilities, and other characteristics (KSAOs) needed to perform the job; in short, conducting a job analysis (Brannick, Levine, & Morgeson, 2007). To this end, we conducted a worker-oriented job analysis to identify the critical KSAOs needed to perform successfully as a contact tracer to address this first step in the process of developing a systematic recruitment, selection, and training program for increasing the contact tracer workforce.

The Need for Contact Tracers

Although the COVID-19 pandemic brought to light the importance of contact tracing to the general public, the job of contact tracing is not new. Indeed, early forms of contact tracing were used during disease outbreaks in the United Kingdom as early as 1900 where "sanitary inspectors" would, among other responsibilities, engage in case finding (Mooney, 2020). Contact tracing (also known as partner notification) is also a valuable tool to curb the spread of sexually transmitted infections, most notably during the HIV/AIDS epidemic of the 1980s (Ramstedt et al., 1990). More recently, contact tracing was part of a comprehensive plan to control the spread of Ebola in Liberia during an epidemic in 2014-2015 (Swanson et al., 2018). In short, contact tracing has a long history in addressing public health emergencies to control the spread of infectious diseases. As such, not only is a vast workforce of contact tracers necessary for addressing the challenge of the COVID-19 pandemic, this job remains critical to addressing future public health emergencies across the globe.

To be sure, the dynamic nature of the COVID-19 pandemic continues to shift the public health response, but a consistent and essential component of the COVID-19 response has been contact tracing. Although the development of new therapeutic medicines and changes in medical care have resulted in a better prognosis for COVID-19 infected individuals (National Institutes of Health, 2020, December), deaths related to COVID-19 are high and continue to grow (Stone, 2020, December). Furthermore, although numerous vaccines have been developed, vaccine distribution is slower than needed in the U.S. (e.g., King, 2021, January; Simmons-Duffin & Huang, 2021, January) and globally (e.g., Frayer, 2021, January; Schmitz, 2021, January), and vaccine hesitancy is prevalent (Chou & Budenz, 2020). Added to this, new, more virulent strains of COVID-19 has been identified (Centers for Disease Control and Prevention, 2021, January), and infection rates are increasing rapidly, in part due to social gathering during the holidays

(Adeline et al., 2021, January), and what New York Governor Andrew Cuomo described as "COVID fatigue … lead[ing] to less discipline, less compliance" with public health recommendations as COVID-driven restrictions proceed (Delisco, 2020, November).

Collectively, these factors point to the need for more contact tracers. Indeed, a recent survey of contact tracers showed that the number of individuals contact tracers need to contact is increasing dramatically, and that contact tracers are being forced to "triage" their caseload, focusing on high-risk populations and clusters (Simmons-Duffin, 2020, December). Until the mass vaccination program is successful, COVID-19 will continue to spread (Chou & Budenz, 2020). As COVID-19 continues to spread, there will be a need for contact tracers to track and trace cases. Quickly, fairly, and validly selecting and training individuals to be contact tracers is a central component to maintaining a successful contact tracing workforce—this can be achieved by developing a systematic and structured employee selection and training system.

Developing a Selection and Training System

Structuring a selection and training system is beneficial for myriad reasons. First, knowing on what KSAOs to select versus train informs recruitment and initial screening decisions (Guion, 2011). Furthermore, using validated selection instruments will result in better quality hires in terms of performance and reduced likelihood of turnover (Guion, 2011), and limit the potential for biased selection decisions (Dalal, Sassaman, & Zhu, 2020). Well-developed training programs are crucial for learning job-relevant information and training transfer—the better developed the training delivery, the more successful training will be (Arthur et al., 2003; Goldstein & Ford, 2002). In addition, standardizing the training delivery will ensure that employees that are geographically dispersed are equivalently trained (Johnson & Randall, 2018). The first step in developing a standardized selection and/or training program is to conduct a job

analysis to understand the critical KSAOs for successful performance. A job analysis

systematically evaluates a job to identify the essential elements of the job in the form of critical

tasks performed and/or the critical KSAOs needed to perform the job (Levine, 1983).

The Current Study

To tackle this first step, this study utilized a hybrid or combined job analysis technique (C-

JAM) to identify critical KSAOs for successful performance as a contact tracer (Brannick et al.,

2007). Despite the history and importance of contact tracing, there is little information on the

KSAOs needed to perform this job. For example, a search on O*NET, a database that records

detailed information about over 1,000 jobs (Rivkin, Gregory, Norton, Craven, & Lewis, 2017),

did not reveal an entry for contact tracer. The most closely aligned entry is "Community Health

Workers" (position code 21-1094.00). However, a review of the tasks of this job does not

indicate responsibilities similar to those of contact tracing as used by public health officials to

address disease outbreaks. As such, an analysis of this job is necessary in order to build the

structured human resource management systems that will help recruit, select, and train contact

tracers.

Therefore, we proceeded with our job analysis in two phases. First, we reviewed available

archival information about contact tracing. Second, we conducted structured interviews with

contact tracer subject matter experts (SMEs); that is, individuals with knowledge of this job.

After identifying and define the critical KSAOs related to performance as a contact tracer, we

developed predictive hypotheses regarding why the KSAO relates to performance as a contact

tracer. Finally, we identify whether or not the KSAOs is one that should be used for selection,

trained, or, in some cases, if elements of the KSAO could be used in both, selection and training.

The main contribution of this study is to start the process of building a systematic selection and

training system for the job of contact tracers in an effort to assist the public health response to the current and future healthcare crises.

Methods

Phase One: Archival Records Review

Procedures and Materials

In phase one, the project team located and reviewed archival records pertaining to the work of contact tracers. Using these documents, we (1) identified critical tasks performed by contact tracers, (2) developed an initial set of KSAOs relevant to contact tracing performance, and (3) developed a list of questions for the structured interviews conducted in phase two. Two research team members read the documents independently and identified critical tasks and/or KSAOs. Using the identified critical tasks, 26 structured interview questions were written for phase 2 (see Appendix A for interview questions).

In total, we identified 11 records for review (Table 1). Of these 11, six records proved particularly useful as they presented direct information on contact tracing. The other records, though useful, did not provide direct information on contact tracing; this was likely due to the fact these records were news media articles.

Table 1: Records reviewed during phase ones of job analysis

Title	Authors/Source	Link to Document
A National Plan to Enable Comprehensive COVID-19 Case Finding and Contact Tracing in the US	Johns Hopkins University	https://www.centerforhealthsecurity.org/our-work/pubs_archive/pubs-pdfs/2020/200410-national-plan-to-contact-tracing.pdf
New York State Contact Tracing	NY State Department of Health	https://coronavirus.health.ny.gov/new-york-state-contact-tracing
A job description for a contact tracer	Public Consulting Group	https://careers-pcgus.icims.com/jobs/5244/contact-tracer/job?mobile=false&width=1140&height=500&bga=true&needsRedirect=false&jan1offset=-300&jun1offset=-240
COVID-19 Contact Tracing training course material	Johns Hopkins University, Bloomberg School of Public Health	https://www.coursera.org/learn/covid-19-contact-tracing
Flipping the Script for Coronavirus Disease 2019 Contact Tracing	Schneider and Pollack, *Journal of American Medical Association Health Forum.*	https://jamanetwork.com/channels/health-forum/fullarticle/2770871
Contact Tracing Resources for Health Departments	Centers for Disease Control and Prevention	https://www.cdc.gov/coronavirus/2019-ncov/php/open-america/contact-tracing.html
14 States make Contact Tracing Data Public: Here's what they're learning	Simmons-Duffin (2020, August 14). *National Public Radio*	https://www.npr.org/sections/health-shots/2020/08/14/902271822/13-states-make-contact-tracing-data-public-heres-what-they-re-learning?sc=18&f=1001
Coronavirus Cases are Surging. The Contact Tracing Workforce is not	Simmons-Duffin (2020, August 7). *National Public Radio*	https://www.npr.org/sections/health-shots/2020/08/07/899954832/coronavirus-cases-are-surging-the-contact-tracing-workforce-is-not
Johns Hopkins and Bloomberg Philanthropies, with New York State, Launch Online Course to Train Army of Contact Tracers to Slow Spread of COVID-19	Bloomberg Philanthropies	https://www.bloomberg.org/press/releases/johns-hopkins-and-bloomberg-philanthropies-with-new-york-state-launch-online-course-to-train-army-of-contact-tracers-to-slow-spread-of-covid-19/
Conspiracy Theories Aside, here's what Contact Tracers Really Do	Appleby (2020, July 14). *National Public Radion*	https://www.npr.org/sections/health-shots/2020/07/14/890628203/conspiracy-theories-aside-heres-what-contact-tracers-really-do?sc=18&f=1001
Contact Tracing, a Key Way to Slow COVID-19, Is Badly Underused by the U.S.	Aschwanden (2020, July 21). *Scientific American*	https://www.scientificamerican.com/article/contact-tracing-a-key-way-to-slow-covid-19-is-badly-underused-by-the-u-s/
For Overwhelmed And Burnt Out COVID-19 Contact Tracers, Help Is (Hopefully) Coming	Simmons-Duffin (2020, December 23). *National Public Radio*	https://www.npr.org/sections/health-shots/2020/12/23/949580432/for-overwhelmed-and-burnt-out-covid-19-contact-tracers-help-is-hopefully-coming?sc=18&f=1001

Phase Two: Subject Matter Experts Interviews

Procedures.

To further develop the list of KSAOs, we conducted structured interviews with contact tracing SMEs. Two trained research team members recorded and transcribed individual interviews with SMEs conducted online via Zoom. Project team members contacted SMEs via recruitment e-mails sent to New York State contact tracers from various public health organizations (e.g., University at Albany School of Public Health; New York State Association of County Health Offices). SMEs completed an online pre-interview survey to gather information on experiences as a contact tracer and demographic information. A project team member later contacted the SME to schedule a time for the interview.

Given the qualitative nature of phase two, specific power analysis methods are limited. Therefore, the project team collected data iteratively until reaching data saturation (Carlsen & Glenton, 2011). Data saturation occurs when interviewees no longer provide information unique from past interviews (Carlsen & Glenton, 2011). Using power tables developed by Fugard and Potts (2015), we determined that interviewing ten individuals would result in a 94% chance of hearing a specific KSAO at least five times, if 25% of the population of SMEs believe that said KSAO is related to contact tracer performance. As such, the goal was to recruit as many SMEs as possible with a minimum of ten completed interviews. Fortunately, about 50 individuals responded to the pre-screen survey; unfortunately, due to difficulties scheduling interviews with all interested respondents (as this was an extremely busy time for contact tracers), the project team was unable to schedule interviews with most of them. Nevertheless, we were able to interview 15 SMEs. As such, these interviews had sufficient power to detect KSAOs that are prevalent across interviewees.

The structured interviews were conducted between August and October 2020—within five months of the World Health Organization declaring COVID-19 a global pandemic (March 11, 2020), and between two and three months into states beginning to lift COVID-19 initiated lockdowns (Kantis, Keirnan, & Bardi, 2020, October). Interviews proceeded in eight question phases. First, interviewees answered questions pertaining to critical tasks performed as contact tracers. Phases two through six then asked questions regarding necessary knowledge, skills, abilities, and other personality/individual difference constructs, respectively.

COVID-19 disproportionately affects minority communities (Hooper et al., 2020). One possible reason for this may be attributable to individuals in these communities not complying with contact tracing requests (Randall, Dalal, & Dowden, 2020). Therefore, in phase seven of the interview, SMEs answered questions regarding minority health disparities, and the KSAOs needed to work with minority communities. Finally, the last phase of the interview gave the contact tracer an opportunity to clarify or add anything to their previous responses, and share anything additional they wished. Respondents received a $25 gift card to Amazon.com as a thank you for participating in the study.

Participants

Demographic Characteristics. The final sample of 15 SMEs was, on average, 36.94 years old ($SD = 16.04$), and was about equally self-reported male (53.30%) and female (46.70%). Furthermore, the sample was about equally self-reported White (46.67%) and nonwhite (53.33%).

Evidence of Expertise. We ensured a wide representation of SMEs in order to capture the varied experiences of contact tracers who work in different settings. To gauge this, we asked SMEs to provide some information about their experiences as a contact tracer during the pre-

interview survey. Of the 15, ten reported serving as a contact tracer at the time of the study, three

reported serving as a contact tracer in the past, and two reported that they were not employed as

a contact tracer at the time of the study but were familiar with the role based on training received

and/or as a supervisor of current contact tracers. Furthermore, respondents completed a five-item

scale[2] asking how experienced they believe they are with contact tracing (e.g., sample item: "I

have a good understanding of what it takes to succeed as a contact tracer"). On average, they

reported moderate amounts of experience ($M = 3.86$, $SD = 0.85$). In addition, 46.67% of the

sample reported that they had at least four months of experience contact tracing. Finally, the

sample reported their cumulative experience contact tracing across a variety of communities

(Table 2). In sum, SMEs had a variety of experiences with contact tracing, and represented

varying perspectives on this job.

Table 2: Self-Reported Experiences with
Contact Tracing by Type of Community

Urban Communities	53.85%
Rural Communities	30.77%
Communities of Color	46.15%
Immigrant Communities	46.15%
Low Income Communities	38.45%
High Income Communities	15.38%

Note. Percentages add up to over 100% as respondents
reported on all communities in which they served.

Results

We present the results of the job analysis in six categories, and combine the results from

the archival review as well as the interviews. To identify the critical KSAOs, the project team

first reviewed all of the archival information and SME responses. After identifying the full list of

---

[2] Internal consistency reliability was not estimated because of the sample size ($N = 15$ SMEs).

KSAOs, we combined overlapping KSAOs together. In addition, given the tendency for SMEs to confuse skills, abilities, and individual differences, we rearranged KSAOs into their appropriate categories. For example, an SME noted that active listening was a necessary ability; we reclassified this as a skill. We also utilized respondents' narrative responses to identify KSAOs when an SME did not directly state them. To do this, we utilized the O*NET KSAO taxonomy (Rivkin et al., 2017). Finally, we defined all KSAOs based on the extant literature and/or definitions provided by the O*NET taxonomy. As detailed below, this process resulted in first identifying 45 different KSAOs; these 45 were then reduced to 25 unique KSAOs that were deemed critical for successfully performing as a contact tracer.

After identifying the critical KSAOs required for successfully performing as a contact tracer, we developed predictive hypotheses regarding why these KSAOs relate to performance as a contact tracer (Guion, 2011). In addition, we identified which of the KSAOs are needed at the time of being hired and are, therefore, candidates for a selection system, and differentiate these from the KSAOs that can be trained later and are therefore candidates for a post-hire training program. Predictive hypotheses and proposed position in the human resource management system are included in the tables of results below (Tables 3-6).

Category 1: Primary Tasks and Minimum Qualifications.

Although this job analysis was primarily worker-oriented, meaning we focused on the KSAO's required for successful contact tracing performance, the first section of the job analysis gathered information about the critical tasks performed in this job and any minimum qualifications that would screen out ineligible applicants. This helped to provide context for the remainder of the job analysis by describing, even at a general level, what constitutes successful job performance for a contact tracer.

The SMEs stated that contact tracers are responsible for communicating with 1) someone confirmed to be infected with a communicable disease, 2) individuals known to be in contact with someone who has tested positive for a communicable disease, and/or 3) individuals who have traveled across state lines when travel restrictions have been put in place. Using phone interviews, the contact tracer collects demographic and health information, as well as any additional information needed to communicate with other individuals who may have been in contact with the interviewee. Furthermore, the contact tracer is responsible for communicating to the interviewee information about the communicable disease (e.g., COVID-19), educating these individuals about quarantining and distancing procedures, assessing the individual's resource needs, and providing access to these resources when necessary and possible.

Contact tracing interviews are structured such that each contact tracer asks the same questions to their interviewees. Contact tracers are required to follow the guidelines set out by the local jurisdiction for which they work, and follow legal regulations to safeguard information (e.g., Health Insurance Portability and Accountability Act [HIPAA]). In addition, contact tracers are required to log all information in a centralized database accessible only to other authorized personnel (e.g., *Comcare*, software licensed for use in New York State). An ideal contact tracing interaction involves: 1) rapport and trust building with the interviewee, 2) collecting and recording detailed information from the interviewee, 3) providing detailed information on how to safely and effectively quarantine and/or distance, and 4) providing access to, or information on resources the interviewee needs (including any emergencies) to be able to isolate. Subpar performance during a tracing interaction results from only collecting and recording information from the interviewee without establishing rapport, and not providing follow-up information,

guidance, or resources for next steps. Ideal minimum qualifications for being a contact tracer

based on SME responses include:

1) At least a high school diploma (but a bachelor's degree is ideal),

2) Customer service experience,

3) Communication skills,

4) Organizational skills,

5) Knowledge of contact tracing,

6) Knowledge about the communicable disease, and

7) Knowledge about spread mitigation strategies for said disease.

Although listed as minimum qualifications, it is important to note that qualifications five, six,

and seven may be better suited for training than selection. In either case, these qualifications

should be met before beginning contact tracing interviews.

Category 2: Knowledge Domain.

The knowledge domain represents information about specific areas that contact tracers

need to have in order to be successful in their role. Knowledge areas are the general facts and/or

principles of a domain/area. In total, the project team identified seven knowledge areas across the

archival review and SME interviews. These were:

1) Knowledge of the communicable disease (i.e., COVID-19),

2) Knowledge about how symptoms express,

3) Knowledge about the importance of public and community health,

4) Knowledge about HIPAA rules and regulations regarding information privacy,

5) Knowledge about state and county level rules and regulations regarding quarantining

    protocols,

6) Knowledge about community resource providers, and

7) Knowledge about technical aspects of the work (e.g., computing, health information recording).

From these seven, we identified four critical knowledge areas. The first critical knowledge area is knowledge of HIPAA regulations. We expand this knowledge domain to include state and local regulations on recording and sharing health information. Second, we identified knowledge of community health impact as a critical knowledge area. Technical knowledge was the third critical knowledge area. Finally, based on the key functions of a contact tracer, a fourth critical knowledge area is knowledge about the communicable disease. Table 3 provides definitions of these critical knowledge areas, whether these knowledge areas are needed at the time of hire or can be reasonably trained post-hire, and a predictive hypothesis regarding why these knowledge areas are related to contact tracer performance.

Table 3: Critical knowledge areas identified in job analysis.

Construct	Definition	Hire or Train	Predictive Hypothesis
Knowledge of HIPAA / Local health regulations	Information regarding the rules, regulations, and guidelines for recording and sharing health information as legislated in the Health Insurance Portability and Accountability Act, as well as specific state and local regulations.	Train	A critical component of contact tracing performance is to gather sensitive information about individuals' health backgrounds, symptoms, and contact with others. Knowledge of HIPAA and related guidelines is necessary to keep this sensitive data secure in order to increase community members' trust in contact tracers and enable tracers to perform their job more effectively.
Knowledge of community health impact	Information about how the communicable disease has affected different communities/stakeholder groups.	Train	Knowledge of the impact of disease spread in the community is necessary to provide accurate information to contacts in order to ensure compliance with quarantine and isolation requests, and to account for the unique needs of different individuals and groups.
Technical knowledge	Information regarding using computer technology, including specific reporting software used for tracing.	Hire (general knowledge) Train (tracing specific software)	Technical knowledge is necessary to perform key contact tracing functions, including following interview protocols, presenting and recording the correct information, and accessing information and contacts for follow-up.
Knowledge about the communicable disease	Information about the disease being tracked, including symptom presentation, differential diagnosis of the disease from similar illnesses, and information on appropriate actions to be taken by the person being contacted.	Train	One key role of a contact tracer is to communicate accurate information about the disease, and to ensure that those who may have been in contact with someone infected know the warning signs and next steps. Knowledge of the disease, including communicability, comorbidities, symptoms, potential health consequences, mitigation strategies, and when to seek medical attention, is necessary to be able to communicate accurate and up-to-date information to ensure contacts' health and safety.

Category 3: Skills Domain.

The skills domain represents actions and/or behaviors that develop through practice. Skills not only facilitate actions themselves, but also facilitate learning new information. Piano playing, for example, is a skill learned through practice; piano playing skill also facilitates learning to play other instruments. As noted earlier, because SMEs can confuse skills and abilities, we identified skills and ability domains based on the content described by the interviewee, rather than the labels provided. For example, interviewees noted the need to "think on one's feet and effectively change one's thinking habits in certain situations," labeling this "adaptive thinking." In our review of transcribed responses and the O*NET taxonomy, we identified this as a combination of two separate, but related skills: active learning and critical thinking. Using these procedures, we identified nine skill areas (listed alphabetically:

1) Active learning,

2) Active listening,

3) Basic skills (writing, computer work),

4) Critical thinking,

5) Judgement and decision making,

6) Organizational skills,

7) Problem solving,

8) Service orientation, and

9) Speaking skills

Of these, we identified four critical skills based on interviewee comments. These four were active listening, active learning, critical thinking, and judgment and decision-making. Because interviewees identified them as minimum qualifications, we also add speaking skills,

organizational skills, and service orientation as critical skills related to successful contact tracer

performance. Collectively, the identified skills are needed to be an engaged listener, critically

evaluate this information relative to existing and new information to provide well-reasoned and

accurate advice to slow the spread of a communicable disease (See Table 4 for definitions,

predictive hypotheses, and position in HR system).

Table 4: Critical skill areas identified in job analysis.

Construct	Definition	Hire or Train	Predictive Hypothesis
Active Listening	Giving full attention to what someone is saying, making sure one understands the points being made, and avoiding interruptions.	Hire (basic listening skills) Train (active listening techniques)	Active listening will facilitate contact tracing performance by ensuring that requested information provided by contacts is completely and accurately encoded. Additionally, by engaging in active listening, contact tracers will better build rapport and trust with contacts.
Active Learning	Understanding the ramifications of new information for problem-solving and decision-making.	Hire	Contact tracers must continuously engage in active learning in order to acquire new knowledge regarding a disease and its transmission, for policies and regulations affecting contact tracing and disease spread mitigation, and for novel issues facing the contact. This is necessary to provide accurate and up-to-date guidance and solutions to new problems contacts face as circumstances surrounding disease mitigation often arise and change quickly.
Critical Thinking	Using logic and reasoning to identify potential solutions or approaches to a problem.	Hire	Critical thinking skills are necessary for contact tracers as they are often the first point of contact for the public's response to disease exposure. This requires logic and reasoning to help contacts identify potential problems and workable solutions to issues such as symptom tracking and reporting, isolation, and quarantine orders in ways that maintains their health, safety, and well-being.
Judgment and Decision Making	Analyzing the positives and negatives of potential choices to select the most appropriate course of action.	Hire	Although contact tracers have set protocols to follow in order to track disease spread and help individuals respond accordingly, each individual they contact has unique circumstances (e.g., health, home, family, finances) that affect their ability to comply with requests. Therefore, judgment and decision making skills are necessary to help contact tracers respond appropriately to individuals' queries and circumstances in ways that uphold regulations while still ensuring individuals' health and safety.

Table 4: Critical skill areas identified in job analysis (*Continued…*)

Construct	Definition	Hire or Train	Predictive Hypothesis
Organizational skills	Planning, prioritizing, and structuring activities to achieve goals on time and with minimal errors.	Hire	The job of a contact tracer requires organization skills to effectively manage the varied sources of information gathered and activities performed so that work tasks are properly planned, prioritized, and structured in order to accomplish work goals, reduce task errors, and otherwise perform well.
Service orientation	Actively looking for ways to help people.	Hire (Customer service experience) Train (Service skills)	Contact tracers with service orientation skills will be better equipped to meet contacts' needs, answer their questions, and provide them with the guidance and support they need to adequately understand and comply with tracing and quarantine requests. Since service, support, and kindness demonstrate respect and care, service orientation skills should also improve performance by helping engender trust in those contacted.
Complex problem solving skill	Identifying complex problems and using relevant information to evaluate and implement solutions.	Hire	Contact tracers often work in unique communities (e.g., minority communities). Individuals in these communities often face nontraditional challenges to which standard contact tracing solutions do not apply. Successful contact tracers need the skill to identify unique situations, and amend recommendations accordingly.
Cultural Sensitivity	Understanding individuals from differing cultural backgrounds, and using this information to successfully serve individuals within their own communities.	Train	Contact tracers interact with individuals from various cultural backgrounds; sensitivity to the unique needs, customs, and experiences of different cultural groups will enable a contact tracer to more effectively communicate with all contacts and to increase the likelihood of compliance with tracing requests.

Category 4: Ability Domain.

The ability domain represents capacities to act or perform a behavior; these relatively stable attributes facilitate performance. As noted earlier, piano playing is a skill learned through practice; however, the ability to differentiate tones (hearing sensitivity) and the ability to manipulate one's fingers across the keys of a piano (finger dexterity) are enduring abilities. Although it may be possible to improve some abilities with practice, others cannot easily improve.

Similar to the skill domain, we extracted relevant abilities from the content of SME descriptions and our knowledge of KSAO taxonomies (e.g., O*NET) rather than just the categories/labels provided by interviewees. From these contributions, we identified the following 11 abilities (sorted alphabetically):

1) Category flexibility,

2) Deductive reasoning,

3) Inductive reasoning,

4) Oral comprehension,

5) Oral expression,

6) Perceptual speed,

7) Problem sensitivity,

8) Speech clarity,

9) Speech recognition,

10) Written comprehension, and

11) Written expression

From these, we identified two critical clusters of abilities needed for successful contact tracing work. The first, including oral comprehension, oral expression, speech recognition, and speech clarity, are related to the need for contact tracers to understand what is being said to them and the ability to effectively communicate with those with whom they are speaking. The second critical cluster of abilities relates to being able to effectively make decisions and adapt to changes as needed. These abilities include inductive and deductive reasoning, category flexibility, and problem sensitivity (see Table 5).

Table 5: Critical ability areas identified in job analysis.

Construct	Definition	Hire or Train	Predictive Hypothesis
Oral Comprehension	The ability to listen to and understand spoken information.	Hire	Contact tracers' core work requires oral conversations over a telephone. Therefore, oral comprehension is a necessary ability for contact tracers to perform their work.
Oral Expression	The ability to communicate in an understandable way through speech.	Hire	Contact tracing requires oral conversations over a telephone. Therefore, it is necessary that contact tracers have the ability to express themselves through intelligible speech. Contact tracing may require the ability to speak various non-English languages to communicate effectively, although this is not a requirement for all tracers.
Speech Recognition	The ability to understand another's speech.	Hire	Contact tracers have telephone conversations with a variety of individuals whose oral expression, accents, and circumstances may impede normal speech recognition. Therefore, it is essential that contact tracers have adequate levels of the ability to understand others' speech.
Speech Clarity	The ability to speak clearly.	Hire	Contact tracers must possess the ability to speak clearly in order to plainly communicate important information to those they contact by phone.
Inductive Reasoning	The ability to combine different information to form general conclusions.	Hire	Contact tracers rely on inductive reasoning to help them make sense of the information they obtain through their information gathering protocols in order to assess risk and provide targeted guidance based on individuals' unique health histories, disease exposure, and other circumstances.

Table 5: Critical ability areas identified in job analysis (*Continued...*)

Construct	Definition	Hire or Train	Predictive Hypothesis
Deductive Reasoning	The ability to apply rules to specific problems.	Hire	Contact tracers must rely on specific protocols, rules, and laws (e.g., HIPAA) that dictate information gathering and sharing, and recommendations for when to seek medical attention, and when and how to quarantine and isolate from others. Deductive reasoning is required for contact tracers to effectively interpret and apply these rules and regulations to individuals' unique situations.
Category Flexibility	The ability to use different rules to combine information in different ways.	Hire	Category flexibility enables contact tracers to resolve potential discrepancies or unique accommodations given different rules from various sources (e.g., HIPAA laws; federal, state and local public health, education, or employment-related regulations) and the varied needs of individuals contacted.
Problem Sensitivity	The ability to identify when something is or could go wrong; identifying that something needs addressing.	Hire	Contact tracers need problem sensitivity to help them identify possible challenges they may face in their attempts to ensure compliance with their requests, and to gather and record the information needed to track disease spread. Problem sensitivity would also help contact tracers to assist contacts with their own challenges, including those that might prevent compliance with requirements to track and report symptoms, isolate, and/or quarantine.

Category 5: Personality Domain.

Personality traits are general patterns or tendencies to behave, think, and feel in a certain way across different situations (Fleeson, 2004; McCrae & Costa, 2008). As such, these are individual psychological characteristics that represent a person's expected response to situations that are, for the most part and with some exceptions, unlikely to change. Although the situation in which one finds oneself can affect the expression of personality traits (Mischel & Shoda, 1995), these behavioral patterns/tendencies do tend to be cross-situational (Fleeson, 2004). Across the SME interviews and archival records, we identified ten traits (listed alphabetically):

1) Attention to detail,

2) Caring,

3) Compassion,

4) Empathy,

5) Friendliness,

6) Honesty,

7) Open-mindedness,

8) Persistence,

9) Trait positive affectivity, and

10) Understanding

As can be seen, some of these traits overlap, and, after accounting for overlap, we identified four critical personality traits related to being a successful contact tracer: attention to detail (or more broadly, conscientiousness), trait positive affectivity, empathy/compassion, and friendliness/sociability (see Table 6).

Table 6: Critical personality traits identified in job analysis.

Construct	Definition	Hire or Train	Predictive Hypothesis
Attention to detail	The tendency to be thorough in accomplishing all aspects of one's tasks.	Hire	Contact tracers need high levels of attention to detail in order to carefully follow all protocols and steps in their tracing attempts to ensure the correct information is shared, gathered, and stored in the correct manner.
Trait positive affectivity	The tendency to have a positive and upbeat disposition.	Hire	Contact tracers need to establish rapport and trust with whomever they contact. Being pleasant and positive can help ease communication and increase trust building, especially when communicating sensitive, challenging, and important or alarming information regarding disease and disease prevention.
Empathy / Compassion	The tendency to be understanding of and show concern for others' challenges.	Hire	Contact tracers must be able to express understanding and concern for the challenges, needs, and fears of those with whom they are communicating. This will help to establish trust and care for individuals who are facing the possibility of disease infection and the negative side effects of this exposure and subsequent treatment or mitigation strategies, making compliance more likely.
Friendliness / Sociability	A tendency to be actively engaged with other people.	Hire	Contact tracers who are more friendly and sociable when interacting with contacts will find it easier to establish rapport and trust, which is important for effective two-way communication. Contact tracers should make an effort to be friendly and sociable so that individuals feel that they can trust the information and requests made by contact tracers.

Category 6: Working within Minority Communities.

The final area of inquiry in this job analysis was to identify any KSAOs specifically related to working with minority communities, given the disproportionate impact of COVID-19 in these communities (Hooper et al., 2020). First, SMEs identified a series of work context factors that affect the performance of contact tracers in these communities. These included factors such as uncertainty and mistrust of contact tracers and fears of immigration and/or law enforcement actions initiated by contact tracing. Furthermore, SMEs noted that contact tracers working in minority communities interact with individuals who are likely to be less engaged, less likely to answer their calls, and less compliant with contact tracing requests because of a distrust in the credibility of contact tracers. As such, when considering candidates for contact tracing roles in minority communities, the following KSAOs may need to be emphasized:

1) *Knowledge of HIPAA, State, and Local Health Information Regulations*. In order to gain the trust of individuals in minority communities, a contact tracer must establish their bona fides. This should include knowledge of how health information will and will not be shared based on both federal and local regulations. Contact tracers should share with the person they are contacting how these laws and regulations protect their privacy and data. This will enhance trust in the contact tracers.

2) *Knowledge of Community Health Impact.* Contact tracers can further establish their bona fides by having knowledge about how a communicable disease is affecting different communities. Having this knowledge, and being able to share it with the person being contacted will signal to said person that the contact tracer is legitimate and knowledgeable, and that the contact tracer understands the interviewee's unique situation. This will also enable the contact tracer to provide guidance appropriate for the

interviewees' community; this will further enhance perceptions of contact tracers'

competence and trust in the contact tracers' motives and abilities.

3) *Active Listening Skills*. To some extent, distrust in healthcare systems among minority

individuals stems from experiences of healthcare professionals not taking individuals

from these communities seriously (Whetten et al., 2006). As such, contact tracers who

work in predominantly minority communities need to be particularly adept at active

listening to foster trust. This skill is critical for working with minority community

members who may be particularly distrusting of healthcare and/or government officials

as a results of past experiences in which they have been made to feel ignored.

4) *Complex Problem Solving Skill*. This skill is being able to identify and successfully

resolve unique challenges. SMEs said that individuals in minority communities have

unique challenges to compliance with contact tracing requests that contact tracers must

address (e.g., inability to physically isolate; lack of access to groceries during

quarantine). As such, contact tracers who work with minority communities will need

complex problem solving skills to help the contact comply (Table 4). Such solutions

might include access to groceries, food banks, medical care, and methods for isolating

safely when space is limited.

5) *Cultural Sensitivity Skill*. Having cultural sensitivity means that a contact tracer has the

skills needed to understand individuals from different backgrounds, and use this

information to serve these individuals within their own communities. Working in

minority communities means that contact tracers have to be aware of the unique

situations that these individuals experience, and be sensitive to their unique needs. This

will not only help build trust, but also result in more useful suggestions for mitigating spread by understanding the context in which a contact is currently (Table 4).

6) *Empathy/Compassion*. Similarly, contact tracers working in minority communities need to show a heightened amount of empathy and compassion to build report with individuals in minority communities. These individuals, having likely developed mistrust in healthcare and government systems, are likely to be apprehensive about trusting contact tracers. As noted above, SMEs noted the difficulties they have faced trying to trace individuals who have deep mistrust of the motives of contact tracing. Contact tracers who work with these individuals will need to be particularly empathetic and understanding of this mistrust in order to successfully work through it.

In sum, contact tracing in minority/underserved communities presents unique challenges that contact tracers need to be able to address. Randall and colleagues (2020) identified the main issues being distrust in and misinformation about contact tracing present in these communities. Indeed, the results of our job analysis dovetail with their findings insofar as the critical KSAOs for contact tracers working in minority communities are those that promote trust in the contact tracers' skills (e.g., complex problem solving skills; knowledge of community health impact), trust in the contact tracers' motives (e.g., cultural sensitivity; empathy/compassion), and communicating accurate information about contact tracing work (e.g., knowledge of HIPAA). This will require selecting for and/or training on these specific KSAOs, in addition to the others identified.

Discussion

Communicable diseases affect large groups of individuals by spreading from an infected person to others. To slow the spread of a communicable disease, then, localities need to quickly

identify infected individuals, contact those who have come in close proximity to an infected individual, and convince these individuals to follow health guidelines to slow the spread of the disease (e.g., testing, isolation, quarantine). Contact tracers undertake this work.

Contact tracing is a critical component to slowing the spread of a communicable disease, and the importance of this job was made particularly apparent during the COVID-19 pandemic (Kretzchmar et al., 2020). Contact tracing has been a central component of public health responses to disease outbreaks, and despite the need for a vast "contact tracer army" (Watson et al, 2020), little systematic investigation into this critical job has, heretofore, been undertaken. As such, rapidly recruiting, selecting, and training contact tracers has been unsystematic, and differed vastly between localities—even within the same state. Therefore, we conducted a worker-oriented job analysis (Brannick et al., 2007) on the role of contact tracer to provide a more systematic picture of the KSAOs related to successfully performing in this position.

After reviewing archival records and conducting structured interviews with 15 contact tracing SMEs, we identified 25 KSAOs critical to the performance of contact tracers. These KSAOs were then distinguished between those that are needed at the time of hire (and should therefore be selection criteria) from those that could be trained after being hired into the position. To this end, we identified 18 KSAOs as candidates for selection systems, four as candidates for training, and three with aspects that made them suitable for either pre-hire screening or post-hire training. We also drew from our job analysis data to create predictive hypotheses detailing how or why these KSAOs would facilitate job performance of contact tracers therein facilitating future research. The KSAOs identified in this work can be used by public health officials to develop comprehensive recruitment, selection, and training programs to rapidly identify, hire, and train contact tracers during public health emergencies. In other words, this work forms a

critical foundation for a more scientific approach to staffing contact tracers (i.e., knowing who to hire and what to train).

Limitations and Future Directions

As would be expected in any study, but particularly one conducted during a volatile public health crisis, there are limitations to this work that should be considered when using these results, and that should be addressed by future studies. First, this study only utilized contact tracers in the state of New York. On the positive side, New York was the early epicenter of the COVID-19 pandemic in the U.S. (Thompson et al., 2020, November) meaning the contact tracers interviewed in this study had plenty of examples from which to draw. A limitation, though, is that these results may be contaminated by some New York State specific viewpoints, and may be deficient in representing contact tracing in other states/countries. We took care in our sampling approach to ensure that the contact tracers we interviewed had experience in different community settings (see Table 2) as upstate and downstate New York face unique challenges in more rural and urban settings. Nevertheless, future research should assess the applicability of these KSAOs to other localities, and users of this work are encouraged to evaluate this list relative to their specific communities. KSAOs can be removed from or added to this list in order to more appropriately represent the needs of contact tracers serving communities.

Related to this, a second limitation of this is that the results, although informative, need expanding upon in future research work. The KSAOs can be further refined by conducting an SME survey of these KSAOs. Specifically, a large sample of SMEs can read the identified KSAOs and their definitions from this study, and rate the importance of these KSAOs for successfully performing as a contact tracer. This information would provide more guidance on which KSAOs to target for selection given that not everything can be included in a selection

system (i.e., screening for 20-25 different KSAOs is too unwieldy, but screening for 8-12

KSAOs may not). Given the rate at which the coronavirus spread was increasing when we

completed this report and the difficulty of securing a large sample of contact tracers for a survey,

which would necessitate interrupting their schedule during this extremely busy and critical time,

we leave this work for future research.

Finally, the results of this study present KSAOs that are candidates for selection systems

versus training programs. However, we were not able to fully develop systems to select or train

applicants. Future research should develop the selection tools and training programs using these

results to provide public health officials with standardized and efficient methods for hiring and

training contact tracers. Regarding the former, this could include the development or utilization

of standardized tests and/or structured interview protocols to assess these KSAOs; such an

approach is more valid and less biased (Dalal et al., 2020). Regarding the latter, training

programs that deliver new information on the trainable knowledge and skill areas should be

developed such that training is delivered quickly and effectively, and has mechanisms in place to

evaluate the training. Finally, these selection and training programs should be carefully and

systematically validated. Organizations/Localities are encouraged to work with trained Personnel

Psychologists[3] to accomplish the goals of developing, implementing, and validating selection

and training systems for hiring and training contact tracers.

Conclusion

Drawing on the toolkit of personnel psychology in response to a global health crisis, we

conducted a worker-oriented job analysis (Brannick et al., 2007) to identify critical KSAOs for

---

[3] Appropriately trained Personnel Psychologists can be found by using the "Consultant Locator" on the *Society for Industrial and Organizational Psychology* website (https://www.siop.org/Business-Resources/Consultant-Locator), or by partnering with College/University faculty with expertise in Personnel Psychology.

the position of contact tracing—a position that is critical to fighting the spread of communicable

diseases like COVID-19. Through a combination of archival and interview methods, we

identified 25 critical KSAOs for this position and provided recommendations for hiring and

training that will hopefully enable quicker and more effective personnel decisions to ensure

successful contact tracing both now and in the future for public health planning and emergency

response.

References

Adeline, S., Jin, C. H., Hurt, A., Wilburn, T., Wood, D., & Talbot, R. (2021, January 21).

Coronavirus is surging: How severe is your state's outbreak?

https://www.npr.org/sections/health-shots/2020/09/01/816707182/map-tracking-the-

spread-of-the-coronavirus-in-the-u-s

Arthur, W. Jr., Bennett, W. Jr., Edens, P. S., & Bell, S., T. (2003). Effectiveness of training in

organizations: A meta-analysis of design and evaluation features. *Journal of Applied*

Psychology, 88, 234-245.

Brannick, M. T., Levine, E. L., & Morgeson, F. P. (2007). *Job and work analysis: Methods,*

research, and applications for human resource management (2nd Ed.). Thousand Oaks,

CA: Sage.

Carlsen, B., & Glenton, C. (2011). What about N? A methodological study of sample-size

reporting in focus group studies. *BMC Medical Research Methodology*, *11*, 1-10.

Centers for Disease Control and Prevention (2021, January 15). *Emerging SARS-CoV-2*

Variants. https://www.cdc.gov/coronavirus/2019-ncov/more/science-and-

research/scientific-brief-emerging-variants.html

Centers for Disease Control and Prevention (2020, April 30). *Contact tracing: Get and keep*

America Open supporting states, tribes, localities, and territories. Retrieved May 6, 2020

from: https://www.cdc.gov/coronavirus/2019-ncov/php/open-america/contact-

tracing.html

Chou, W. Y. S., & Budenz, A. (2020). Considering emotion in COVID-19 vaccine

communication: Addressing vaccine hesitancy and fostering vaccine confidence. *Health*

Communication, *35*, 1718-1722.

Dalal, D. K., Sassaman, L., & Zhu, X. S. (2020). The impact of nondiagnostic information on

      selection decision making: A cautionary note and mitigation strategies. *Personnel*

      Assessment and Decisions, *6*, 54-64.

Deliso, M., (2020, November 3). *How to combat "COVID fatigue:" Medical experts on what*

      workds—and doesn't. https://abcnews.go.com/Health/combat-covid-fatigue-medical-

      experts-works/story?id=73861469

Fleeson, W. (2004). Moving Personality Beyond the Person-Situation Debate. *Current*

      Directions in Psychological Science, *13*, 83–87.

Frayer, L. (2021, January 7). *How India plans to provide COVID-19 vaccines to its population.*

      https://www.npr.org/2021/01/07/954562174/how-india-plans-to-provide-covid-19-

      vaccines-to-its-population

Fugard, A. J., & Potts, H. W. (2015). Supporting thinking on sample sizes for thematic analyses:

      A quantitative tool. *International Journal of Social Research Methodology*, *18*, 669-684.

Goldstein, I. L., & Ford, J. K. (2002). *Training in organizations*. Belmont, CA: Wadsworth.

Guion, R. M. (2011). *Assessment, measurement, and prediction for personnel decisions* (2nd

      edition). New York, NY: Routledge.

Hooper, M. W., Nápoles, A. M., & Pérez-Stable, E. J. (2020). COVID-19 and racial/ethnic

      disparities. *JAMA, 323*, 2466-2467.

Johnson, R. D. & Randall, J. G. (2018). A review of design considerations in e-learning. In D. L.

      Stone & J. H. Dulebohn (Eds.), *Research in Human Resource Management* (pp. 141-

      188). Charlotte, NC: Information Age Publishing, Inc.

Kantis, C., Kiernan, S., & Bardi, J. S. (October, 2020). Updated: Timeline of the Coronavirus. A

      Frequently updated tracker of emerging developments from the beginning of the COVID-

19 outbreak. *Think Global Health*. Retrieved 12/16/2020 from:

https://www.thinkglobalhealth.org/article/updated-timeline-coronavirus

King, N. (2021, January 7). *Fauci says U.S. needs more time to "catch up" on vaccine rollout.*

https://www.npr.org/sections/coronavirus-live-

updates/2021/01/07/954324536/december-was-pandemics-deadliest-month-vaccine-

process-has-been-slow

Kretzschmar, M. E., Rozhnova, G., Bootsma, M. C. J., van Boven, M., van de Wijgert, J. H. H.

M., & Bonten, M. J. M. (2020). Impact of delays on effectiveness of contact tracing

strategies for COVID-19: A modelling study. *The Lancet Public Health, 5*, e452-e459.

Levine, E. (1983). *Everything you always wanted to know about job analysis…and more: A job*

analysis primer. Tampa, FL: Mariner Publishing.

McCrae, R. R., & Costa, P. T. (2008). Empirical and theoretical status of the five-factor model of

personality traits. *The SAGE handbook of personality theory and assessment*, *1*, 273-294.

Mischel, W., & Shoda, Y. (1995). A cognitive-affective system theory of personality:

Reconceptualizing situations, dispositions, dynamics, and invariance in personality

structure. *Psychological Review*, *102*, 246–268.

Mooney, G. (2020). "A menace to the public health" - Contact tracing and the limits of

persuasion. *The New England Journal of Medicine, 383*, 1806-1808.

National Institutes of Health (2020, December 17). *Investigational COVID-19 therapeutics to be*

evaluated in large clinical trials. https://www.nih.gov/news-events/news-

releases/investigational-covid-19-therapeutics-be-evaluated-large-clinical-trials

Ramstedt, K, Hallhagen, G., Lundin, B. I., Håkansson, C., Johannisson, G, Löwhagen, G. B., ...

    & Giesecke, J. (1990). Contact tracing for human immunodeficiency virus (HIV)

    infection. *Sexually Transmitted Diseases*, *17*, 37-41.

Randall, J. G., Dalal, D. K., & Dowden, A. (2020). Improving contact tracing in minority

    communities by combating misinformation and distrust. White paper submitted to the

    Differential Impacts of COVID-19 in New York State: Understanding and Eliminating

    minority health disparities in a 21st-century pandemic. Albany, NY: University at

    Albany, State University of New York.

Rivkin, D., Gregory, C. M., Norton, J. J., Craven, D. E., & Lewis, P. M. (2017). Advancing

    O*NET data, application and uses. In J.L. Farr & N.T. Tippins (Eds.), *Handbook of*

    Employee Selection 2nd edition (pp. 874-912). New York, NY: Routledge.

Schmitz, R. (2021, January 6). *Europeans criticize the slow start to COVID-19 vaccine rollout in*

    EU. https://www.npr.org/2021/01/06/953857348/europeans-criticize-the-slow-start-to-

    covid-19-vaccine-rollout-in-eu

Simmons-Duffin, S. (2020, December 23). *For overwhelmed and burnt out COVID-19 contact*

    tracers, help is (hopefully) coming. https://www.npr.org/sections/health-

    shots/2020/12/23/949580432/for-overwhelmed-and-burnt-out-covid-19-contact-tracers-

    help-is-hopefully-coming

Simmons-Duffin, S., & Huang, P. (2021, January 8). *Here's how the U.S. can jump-start its*

    sluggish COVID-19 vaccine rollout. https://www.npr.org/sections/health-

    shots/2021/01/08/954662748/heres-how-the-u-s-can-jump-start-its-sluggish-covid-19-

    vaccine-rollout

Stone, W. (2020, December 14). How do we grieve 300,000 lives lost?

>https://www.npr.org/sections/health-shots/2020/12/14/946045921/how-do-we-grieve-

>300-000-lives-lost

Swanson, K. C., Altare, C., Wesseh, C. S., Nyenswah, T., Ahmed, T., Eyal, N., ... & Altmann,

>M. (2018). Contact tracing performance during the Ebola epidemic in Liberia, 2014-

>2015. *PLoS Neglected Tropical Diseases*, *12*, e0006762.

Thompson CN, Baumgartner J, Pichardo C, et al. (2020, November 20). COVID-19 Outbreak —

>New York City, February 29–June 1, 2020. *Morbidity and Mortality Weekly Report,* 69,

>1725–1729. DOI: http://dx.doi.org/10.15585/mmwr.mm6946a2.

Watson, C. et al. (2020). *A national plan to enable comprehensive COVID-19 case finding and*

>*contact tracing in the US*. Baltimore, MD: Johns Hopkins University.

Whetten, K., Leserman, J., Whetten, R., Ostermann, J., Thielman, N., Swartz, M., & Stangl, D.

>(2006). Exploring lack of trust in care providers and the government as a barrier to health

>service use. *American Journal of Public Health*, *96*, 716-721.

Appendix A:
Structured Interview Questions/Protocol

The goal of this project is to identify the knowledge, skills, abilities, and other personal characteristics that are associated with being a successful Contract Tracer. We will used the information collected from this interview today to identify the characteristics of contact tracers that are needed at the time of hire and those that need to be trained..

Opening Questions
1. It would help us to know a bit about the communities you have served as a contact tracer. Can you tell us about the key characteristics of the community (or communities) in which you have served as a contact tracer? You can include characteristics such as: (1) the neighborhoods/towns you've served, the range of ethnicities of the people you've interacted with, whether there were many immigrants, the general income level(s), whether it was rural or urban, those types of things.
2. What area(s) of prior experience are required for a new contact tracer?
3. What area(s) of prior experience are helpful, but not necessarily required, for a new contact tracer?
4. Could you describe your typical workday?
5. What do you consider to be the major tasks of your job?

Interactions with Others
6. What types of interactions do contact tracers have with coworkers, supervisors, etc.?
7. What types of interactions do contact tracers have with community individuals?
8. Think of the best contact tracer you know. How did they interact with different individuals to be successful?
9. Now think of the worst contact tracer you know. How did they interact with different individuals to be unsuccessful?

Knowledge
10. What kind of knowledge do you need for your position?
11. What policies, procedures, guidelines, and/or rules do you need to follow?
12. What kind of training did you receive learn/acquire this knowledge?
13. Thinking about successfully performing as a contact tracer, which of these knowledge areas do you think are needed at the time someone is hired, versus which of these can be trained? [READ EACH KNOWLEDGE AREA INDIVIDUALLY AND WAIT FOR RESPONSE]
14. In your opinion, what is the minimum degree, amount of education, and/or experience required to perform your position?

Skills
15. What skills does a successful contact tracer need to learn to do their job well?
16. Thinking about successfully performing as a contact tracer, which of these skills do you think are needed at the time someone is hired, versus which of these can be trained? [READ EACH SKILL INDIVIDUALLY AND WAIT FOR RESPONSE]

Abilities

17. What abilities does a successful contact tracer need to have to do their job well?
18. What specific mental abilities do you think are critical for successfully performing as a contact tracer? (e.g., Memorization, Decision Making)
19. What specific interpersonal abilities do you think are critical for successfully performing as a contact tracer? (e.g., Communication, Oral Comprehension)
20. Thinking about successfully performing as a contact tracer, which of these abilities do you think are needed at the time someone is hired, versus which of these can be trained? [READ EACH ABILITY INDIVIDUALLY AND WAIT FOR RESPONSE]

Personality
21. Think of the best contact tracer you know. What personality characteristics did they have that made them successful?
22. Now think of the worst contact tracer you know. What personality characteristics did they have that made them unsuccessful?
23. What are the essential personality traits a person should have in your position?

Minority Health Disparity Specific Questions
24. In what ways does your job and the performance of your job as a contact tracer change when you are interacting with individuals from diverse ethnic and cultural groups, particularly with those who are considered ethnic minorities (i.e., people of color)?
25. What knowledge, skills, or abilities are particularly useful when working amongst minority populations in your job as a contact tracer?

Conclusions
Is there any additional information that we have not covered that you wish to tell us about, or otherwise feel is important for our analysis of contact tracers?