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Effective Contact Tracing

Is the Key to Reopening Our Communities

In the absence of an effective vaccine and proven treatments, cities, counties, and states will need to trace and treat those who have been in contact with COVID-19-infected patients.

Introduction

We have heard so much talk about "reopening the economy" following the closures brought on by the COVID-19 pandemic. But really, the effort in front of us goes beyond reversing truly horrific economic trendlines; it's about restoring the safety, security, and vitality of our communities and fulfilling local governments' core mission of promoting quality of life and access to opportunity. While we can impose timelines and aspirational goals about when to relax restrictions, the reality is that residents themselves will largely decide when they feel safe enough to reengage in "normal" activities, and doing so before our communities are ready only promotes a lose-lose situation wherein the economy cannot fully recover and the process of containing the virus will be prolonged.

How do we make our communities safe and instill the confidence in residents to resume some activities? Obviously, the presence of a vaccine would help a great deal. But we cannot wait the 12-plus months scientists tell us it will take for delivery of a viable vaccine to return to some form of normal. Community leaders and public health advocates are coalescing around an interim approach to fighting the spread of the disease — some call it The Three T's: Testing, Tracing, and Treatment. While testing has been the focus of much discussion, and treatment approaches are being developed and refined, an area that has received less attention is the massive effort that will be required to trace and quarantine those exposed to infected individuals. So what is contact tracing? Who can do it? And how do cities, counties, and states gear up for it?

- Contact tracing is the process of identifying those who have come into contact with COVID-19-infected patients and reaching out to them so that they may be tested, self-isolated, and, if necessary, treated.
- Each infected individual has likely interacted with up to 50 people in the days surrounding their infection, and it is estimated that a COVID-19-infected individual can infect 2-5-plus individuals.
- Johns Hopkins Bloomberg School of Public Health estimates that the U.S. may need 100,000 contact tracers nationwide throughout the duration of the pandemic; Guidehouse believes this estimate may understate the need for workers and volunteers, and believes an effort similar in scope to the U.S. Census may be required.
- While cities and states have been doing contact tracing for years, they have never done it at anything approaching this scale, and lack the workforce, technology, analytic capability, and management capacity to undertake such an effort.

> Guidehouse has a perspective on how to address these challenges effectively.

Sizing the Contact Tracing Effort

Without a national contact tracing strategy in place, cities, counties, and states will be forced to develop their own approaches, hopefully in coordination with one another. But how do you size such an effort? Well, there are no magic formulas, but the experience of other international contact tracing programs offers some guidance.

The World Health Organization reports that Wuhan, China, the first COVID-19 hot spot, required an army of 1,800 teams of approximately five people to go door-to-door, contact people by phone, and reach impacted individuals through other means. To gain an order of magnitude, we could extrapolate the number of needed tracers by dividing the Wuhan population of about 11.8 million by the roughly 9,000 members of the Wuhan tracing team. Such an extrapolation would yield a ratio of about one tracer per 1,311 in a population, or **about 2,300 tracers for a city the size of Chicago**.

Another way of sizing the effort would be by looking at peak daily identified cases. Using this analysis, Wuhan's peak daily infection level of 2,000 cases (a number that is almost surely suppressed by incomplete testing and reporting) would tell us that a tracing team roughly five times the size of the anticipated infection rate is in range. **For a city the size of Chicago, with about 800 cases detected per day at the current peak, that would imply the need for a team of about 4,500 tracers**.

Lastly, you could calculate more from the bottom up, estimating the amount of time and labor it would take to trace one positive patient's contacts. If each case generates up to 50 contacts, **it is not difficult to imagine that it would take one tracer up to two full days to trace and interview contacts and log the important data**. Such a level of effort would require two to three times the daily identified infection cases in contact tracers.

Try as we may to be precise, we simply do not know how many tracers our communities will need. But we know it's a lot, and impacted regions will need many more than we currently have and must ramp them up immediately. This raises the next question — **who should be doing the tracing?**

Contact Tracing Helps Stop the Outbreak

Even one missed contact can keep the outbreak going

Person **tests positive** with COVID-19.

Tracers speak to the patient and/or use enabling technology to find everyone who had **recent close contact** with them including family, coworkers, and public encounters.

Tracers conduct outreach to contacts with guidance on self-isolation, testing , and follow up, thus breaking the chain to **prevent further infections.**

Finding the Right Tracers

Cities, states, and countries are deploying different mixes of labor to perform contact tracing. Commonly used resources include:

- **Professional Call Centers and Agents:** Given the extensive telecommunications capacity necessary, as well as the need for individuals with skills in dealing with outbound calling, some jurisdictions rely on call centers and front-line customer service professionals. This approach is perhaps more costly upfront, but there is less setup time and greater accountability.
- **Redeployed Health Care Workers:** While many health care workers are occupied responding to the pandemic, there is also a group of health care employees whose work has been decreased or outright eliminated due to the shutdown of non-COVID-19 health care delivery. These individuals make excellent tracers, as they have an experienced bedside manner, an understanding of medical conditions, and are familiar with privacy and confidentiality requirements.
- **Redeployed Government Workers:** Governments have been forced to put non-COVID-19 work to the side and redeploy workers to tasks like contact tracing. Redeployed government workers require less sourcing and onboarding activities and can begin work quickly.
- **Minority, Disabled, Veteran, and Women-Owned Business Enterprises:** In our view, it's critical that an operation of this level of importance and impact reflect the community it serves, especially given the over-representation of minority groups in terms of cases and mortality. Many disadvantaged enterprises can perform all or some of the functions critical to successful contact tracing, and governments would be wise to make these organizations a significant component of their management and labor pool.
- **Public Health NGOs:** Public Health NGOs have been doing contact tracing for ages, especially during the height of the AIDS epidemic and the Ebola crisis. These resources know the process of contact tracing and the effort aligns with their missions. They also are eagerly stepping forward nationally to fill these roles.
- **Volunteers:** The use of volunteers to perform contact tracing is attractive both from a cost and a community-building perspective. People want to help their communities, and tracing COVID-19 contacts can be done from home without risking virus exposure. Volunteer workforces can provide enthusiasm for the cause, but also can be a challenge to manage.

Guidehouse recommends a blend of many of the above resources. To start, we recommend the use of an existing call center, whether it be a 311-contact center or a third-party vendor. These resources will maintain the telecom infrastructure, and perhaps even the software necessary to collect data, and they will have experience managing a multi-shift call center operation. We recommend that health care workers be the primary contact tracers to start, especially for the initial interviews with infected patients. Traditional call center employees and volunteers can supplement health care workers.

How Do You Trace Contacts?

With all the people, processes, and technology associated with undertaking such a large effort, success still very much hinges on the nuts and bolts of tracking contacts and making sure they are taking appropriate precautions. Thankfully, public health departments and epidemiologists have been performing effective contact tracing in some form or another for over a century. The tactics remain fairly straightforward — finding infected individuals, asking them with whom they have been in contact, and reaching out to those individuals with recommended action. Their efficacy can be greatly improved, however, with sound management approaches, technology, and data-driven decision-making. Below is an overview of some of these traditional methods and how they can be turbo-charged with today's capabilities:

- **Primary Phone and In-Person Interviews:** Traditionally, when a patient is identified as being infected with the virus, they are interviewed, usually by a health care professional with a prepared script, and asked to identify individuals in their households, workplaces, or frequent social settings. This interview is best conducted by someone who is deemed trustworthy, perhaps someone recommended or introduced by the patient's health care provider. While it may be clinically interesting to understand the nature of contacts, the most important output is the contacts themselves, so obtaining names, phone numbers, and email addresses of potential contacts should be the primary goal.

  These interviews can now be handled virtually. For example, a doctor or nurse can perform a "warm transfer" to a contact tracer if the patient is in a health care setting, and that interview can be conducted over the phone or via video chat. Some jurisdictions have also experimented with online contact submissions, by directing infected patients to secure websites that capture contact data.

- **Contact Outreach:** When contacts have been identified, they are teed up for secondary tracers to perform outreach. In the past, this has been done largely via phone or door-to-door canvassing, wherein the individual is informed that they have potentially been in contact with an infected individual and should either seek testing or self-quarantine. The information provided is typically straightforward and direct, with minimal, if any, detail on the nature of the potential exposure.

  While the proliferation of cellphones provides advantages, it also poses challenges. The "hit rate" of accepted calls can be lower than 20%, with many people simply refusing to answer calls from unknown sources. Also, the relatively diminished level of trust in institutions makes some reluctant to believe information conveyed via the government or media. Some jurisdictions have secured dedicated telephone exchanges and worked with cellphone carriers to identify these calls as coming from authoritative sources.

- **Automated Outreach:** The ability to perform automated outreach in the past has been limited, but we are now able to alert broad populations of risk based on geographic or other parameters. Amber Alerts, for example, are broadcast widely, as are threats of major storms or other threats. These alerts provide the potential to reach many more people and to penetrate individuals' consciousness in a way that phone calls or emails cannot. While the messages must be simpler, they may have more influence. Cities like Chicago, for example, used this technique, with a message from the mayor, in a way that seemed to have a strong impact.

App-Based Contact Tracing

- Australia deployed an app-based contact tracing where users within 5 feet of each other exchange a **virtual handshake**, which is stored. It was downloaded by 1 million users in the first 24 hours.

- South Korea used **cell phones** to both trace infected patients' movements and notify people with whom they came in contact via messaging, directing them to testing centers.

- Apple and Google have partnered on a **contact tracing app and platform**. When individuals meet, they exchange a key code - if someone then tests positive, they indicate so, and their contacts are informed with the infected patients' permission.

- **App-Based and Crowd-Sourced Solutions:** A new frontier in contact tracing involves the deployment of either centralized mobile apps for contact tracing (as was done in South Korea) or more de-centralized tools, as is being contemplated by the Apple and Google partnership. These tools work similarly, allowing individuals to exchange a virtual handshake, which is then stored. If an individual tests positive, depending on the model, either the government or the individual themselves can notify those with whom a virtual handshake was exchanged.

  These models have great promise, and South Korea credits their use with some of its success in slowing the virus spread. There are unanswered questions about what scale these apps would have to be deployed to be effective (Australia estimates that 40% of its residents would need to download their app for maximum efficacy) and whether there is a bias in those who download the tool to be more proactive anyway. Regardless, app-based tools should be a component of a contact tracing program at scale.

- **Location-Based Canvassing:** Infected individuals typically identify locations they have frequented throughout the virus' contagious period. Contact tracers in previous public health emergencies have then performed outreach to these locations to share information and raise awareness.

  In the current pandemic, with a highly contagious virus spreading across a community, location-based canvassing presents challenges as well. It would be unwise to create a panic, or needlessly harm a private business, based on incomplete information related to exposure. That said, by geo-coding location data, jurisdictions can see common places of congregation, where exposure may have been particularly high, and create measured outreach campaigns commensurate with the nature of the risk.

- **Data-Driven Targeting:** Contact tracing has always professed to be guided by data, and even in the pandemics of the early 1900s, data was used to target neighborhoods, populations, and activities that were shown to contain a greater risk of infection.

  Our ability to gain insights from data, however, and to merge unstructured data from a variety of dimensions (behavioral, geographic, demographic, economic, etc.) allows us to be smarter about where outreach can be directed. Guidehouse, for example, has been using advanced analytics to identify ZIP codes where risk is greater. This data can similarly be used to perform more targeted outreach.

If deploying all these resources and processes sounds easy, we hate to break it to you: It's not. Staging potentially thousands of workers, providing service in multiple languages, managing their shifts, and assessing their performance is a significant logistical and management effort, the likes of which already strained local governments will struggle to address.

Managing the Contact Tracing Operation

To think of the contact tracing operation as a bunch of people on the phone surely underestimates the management challenges associated with such a large-scale operation. After all, what is most important is slowing the spread of the disease, which means investing in the skills and capacity to make sure the process works. In essence, this effort requires scaling up a medium-size government agency within a matter of weeks, maybe days, with all of the associated human resources, procurement, technology, and business process challenges. Moreover, effective contact tracing depends just as much on the strategy of managing and tracking the disease as it does the execution of the calls itself. Targeting approaches must necessarily change as data on tracing efficacy becomes available, so having an effective reporting and analytics capability is essential. All of this capacity must be brought online and produce real results before leaders feel comfortable relaxing social distancing restrictions.

This is work that Guidehouse understands very well. Based on our experience, below are some key areas to consider in the management of an effective contact tracing operation:

Strategy, Planning & Mobilizing

Create the program governance and infrastructure. Develop the overall strategy and requirements for outreach, data collection, and management technology interaction, and reporting. Create workforce recruitment and training plans with cultural sensitivity and privacy/ethical considerations.

Deploy Contact Management

Rapidly deploy front line contact management teams to enable a fast response and begin to build important trace networks. Ensure enabling technology support the speed and accuracy of tracing efforts. Provide continuous change management and strategic communications support.

Scale Outreach

Expand the platform to include more data, contacts, and follow-up. Track, manage and mitigate risks around data collection activities. If needed, additional recruitment and mobilization of trained personnel allows for a rapid scale-up of the workforce. Provide concrete reports and information as necessary to the state, medical community, and public health agencies.

Provide Actionable Analytics

Generate reposts and dashboards to help keep decision makers up to date and provide data to inform evolving policies. Manage, analyze, and communicate data collected during contact tracing and surveillance activities to aid in the decision making processes for state and local jurisdictions.

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Improve and Iterate

Remain adaptable to the changing situation and feedback from the field to address any issues that occurred and mitigate future risks. Gather and disseminate lessons learned from the contact tracing teams to iterate on the interview and data collection processes as needed.

And one of the largest challenges associated with starting a contact tracing operation is selecting and implementing the technology to support the outreach and data capture. A function of this size cannot be run on spreadsheets, so below are some thoughts on contact tracing-enabling technology.

Technology-Enabled Contact Tracing

Traditionally, contact tracing activities are managed and tracked using spreadsheet tools and office software. This may be fine for an operation with a few tracers working out of a single location, but the size of the COVID-19 tracing effort will demand something far more robust. Most contact tracing will be done by workers operating outside of a traditional office setting, meaning software will likely need to be cloud-based, highly secure, and easily accessed. Also, personal cellphones may not offer the privacy and security protections that will be required, so some forms of advanced telephony may be necessary. Some technology components that will be required for a contact tracing program are presented below:

- **CRM Software:** As counterintuitive as it may seem, at its core, contact tracing is a Customer-Relationship Management (CRM) function, requiring the facilitation of thousands of daily contacts, the tracking of output, the ability to generate emails, texts, and other outreach, and the capacity to report on progress. Guidehouse recommends a Salesforce-based solution, which we and our partners have brought to market, but there are also other CRM tools that may fit the bill. This technology must be ready to work in days, not weeks, with out-of-the-box security, storage, and workflow capabilities.
- **Advanced Analytics Software:** Predictive modeling, location-based analytics, and case monitoring will be a key part of measuring the efficacy of the tracing operation. Guidehouse and its partners have developed tools that can predict, at a ZIP code level, where outbreaks are likely to be most intense and at what time. These and other modeling tools can allow agencies to not only respond to existing cases, but to proactively target outreach to locations and populations that are most at risk.
- **Call Center Technology:** The ability to rapidly dial, redial, manage dropped calls. and queue up the next caller is something that most call center operations do "out of the box." These capabilities, a luxury in low-volume situations, can mean an additional 20% capacity, which means more people reached more quickly. Additionally, the ability to manage individuals operating their own cellphones is also a specialized capability that can be helpful. Lastly, it is likely that the ability to send text messages and deploy chatbots will eventually help lessen the workload and reach more people, especially as individuals are less likely to accept phone calls from unknown sources. Experimenting with self-reporting apps and cellphone movement tracking may also be an important part of an effective contact tracing operation.
- **Hardware:** Tracers will need hardware, either computers or tablets, to capture data, and scaling up 1,000-plus devices, loaded with the correct software, is incredibly complex. Now consider that these must be shipped to tracers who must then be trained on their use. When you add on the inevitable break-fix and support issues, IT support and asset management will be a significant part of running an effective tracing operation.

With all these individuals, devices, and patients moving data across a city or state, security and privacy must be a centerpiece of contact tracing. Some key considerations in running a secure contact tracing operation are presented on the following page.

Privacy and Security

One of the concerns with the many well-intentioned, boot-strapped contact tracing operations is that they are potentially handling very sensitive personally identifiable information and even more sensitive health care data, subject to stringent federal, state, and local guidelines. A few volunteers operating on their cellphones can unknowingly run afoul of these considerations and place the government, and perhaps even the individuals themselves, at risk. Below are some important tips that can help to protect patient and residents' data.

1

Professionalize the Operation

Call center companies, health care professionals, commercial software packages, and IT experts know how to handle sensitive data. While it is tempting to get something going quickly to start making an impact, relying on tried-and-true people and tools will bring a lot of capability to your organization right away. These experts can always be supplemented with volunteers who can follow the guidelines the professionals produce.

2

Anonymize Data

In most cases, tracers can perform notifications without any information on the original exposed patient. Software can reach out to the appropriate contact, and scripts can be developed that do not require sharing information with the individuals they are reaching. While people may want to know the names of the individuals with whom they had contact, this information is generally not necessary to convey the need to take appropriate measures.

3

Bring in your IT/CSO and HIPAA Compliance Officers

Most cities, counties, and states have chief security officers and/or Health Insurance Portability and Accountability Act experts who are used to providing guidance on applicable rules and regulations. Bring these individuals in early when establishing processes, training, and technology.

Rollout Approach

If all of this is not daunting enough, consider that our cities, counties, and states cannot safely begin to relax social distancing restrictions until an effective contact tracing capability is in place. That means time is of the essence and we must demonstrate the capability to effectively isolate at-risk people quickly.

Guidehouse recommends a phased approach that can begin a contact tracing operation in weeks, with initial traces occurring within just a few days. Our approach begins with an initial strategy and planning effort, followed quickly by a pilot of approximately two weeks, wherein scripts, staffing, and technology are refined. Then the operation moves into Wave One, which entails phone-based contacts. Wave Two would include outreach to locations, as well as outreach via text, chat, email, and other advanced means. Wave Three involves more proactive, analytics-driven outreach.

How Guidehouse Can Help

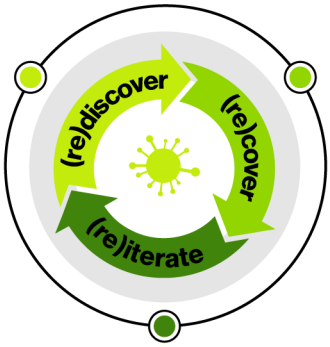
Guidehouse can assist cities, counties, and states with any and all aspects of establishing and executing an effective contact tracing operation. We can provide management expertise, call center capabilities, supporting software, and health care professionals. We also leverage dozens of minority and women-owned business partners and can leverage volunteer and community organizations.

We know how to stand up large operations, create program strategies and plans, hire and train people at scale, develop reporting tools, manage vendors and stakeholders, and deploy enabling technology. That said, if it is not us who helps you, we urge you to make sure that you have a partner that can bring management capacity to you so that you are not straining resources needed in other parts of the response and recovery.

Guidehouse's Approach Addresses These Challenges With a Scalable Solution

(re) Discover

Mobilize contact tracing efforts, ramping up a rightsize workforce of trained contact tracers with enabling technology to effectively apply contact tracing leading practices.



(re) Cover

Prevent the spread of COVID-19 through innnovative tracing practices, testing, and recovery support. Utiliz behavioral economics and wraparound services to motivate compliacne with isolation protocols.

(re) Iterate

Utilize proactvie, analytics-driven approaches to remain adaptable to the changing situation and feedback. Learn from experience and quickly iterate changes to the contact tracing platform and approach.

Key Enabling Support Functions

- Program Management
- Strategic Communication
- Information Technology
- Data Analytics & Reporting
- Workforce Training
- Change Management
- Vendor Mgmt. & Acquisition Support
- Risk & Compliance
- Privacy & Ethics
- Leadership & Governance

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It has been pointed out in various quarters that the COVID-19 pandemic is the type of event that transforms society. We speak of returning to normal, but also know that the normal we knew is one we may never return to. We at Guidehouse share this concern, but as a firm that has its roots in enabling the mission of government, we also are hopeful that some good can come of these incredibly difficult circumstances. That good, we think, can come in the form of a renewed understanding of the importance of local government, and a greater trust therein.

Our mission as a firm is to build trust in society and solve important problems. There is no more important problem that safeguarding the lives and livelihoods of our residents, and we are committed to helping our clients build the confidence necessary among residents to emerge from this crisis and define our "new normal."

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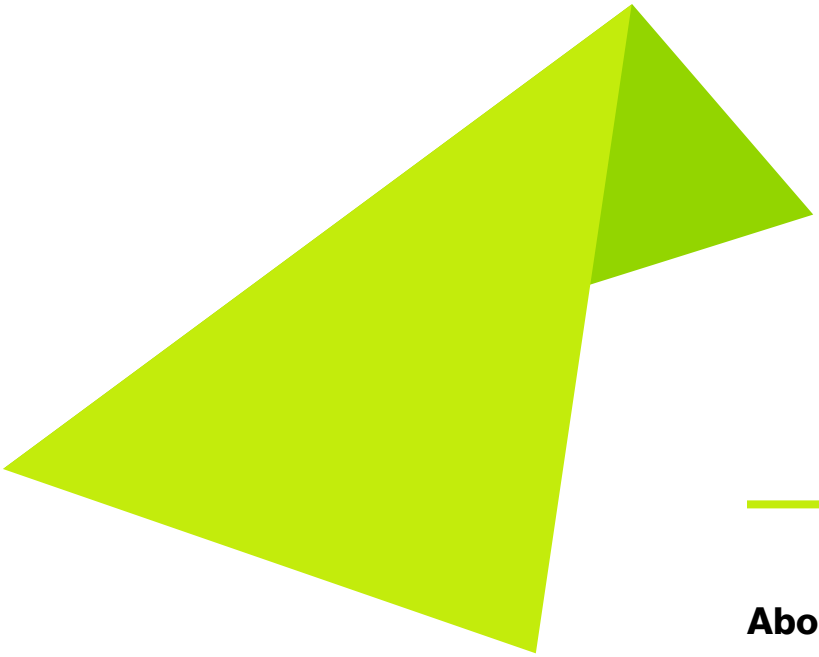

About Guidehouse

Guidehouse is a leading global provider of consulting services to the public and commercial markets with broad capabilities in management, technology, and risk consulting. We help clients address their toughest challenges with a focus on markets and clients facing transformational change, technology-driven innovation and significant regulatory pressure. Across a range of advisory, consulting, outsourcing, and technology/analytics services, we help clients create scalable, innovative solutions that prepare them for future growth and success. Headquartered in Washington DC, the company has more than 7,000 professionals in more than 50 locations. Guidehouse is a Veritas Capital portfolio company, led by seasoned professionals with proven and diverse expertise in traditional and emerging technologies, markets and agenda-setting issues driving national and global economies. For more information, please visit: **www.guidehouse.com**.

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