

A Coordinated, National Approach to Scaling Public Health Capacity for Contact Tracing and Disease Investigation

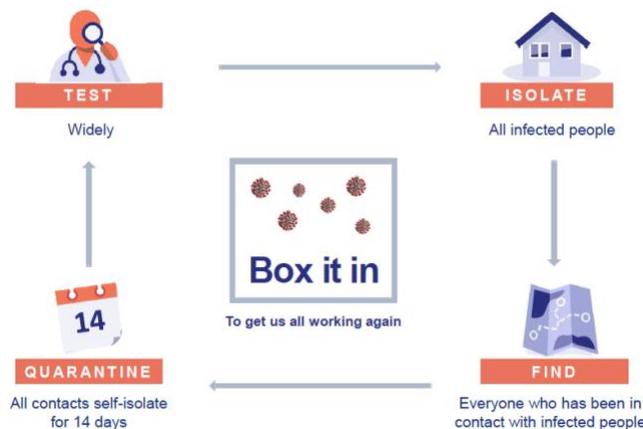


As the nation looks to restart the economy and recover from the COVID-19 pandemic, reopening entirely will depend on expanded public health testing and contact tracing efforts, sustained healthcare system capacity to respond to new outbreaks, and public compliance with existing and new containment and mitigation efforts.

More specifically, decisions and plans to restart, recover, and reopen local and state economies rest on three things: (1) local and state COVID-19 testing capacity, (2) the ability of the public health and healthcare system to quickly contain future outbreaks and associated healthcare surges, and (3) public understanding of and compliance with localized stay-at-home orders and other prohibitions on mass gatherings as these restrictions are safely and gradually reduced and eliminated.

“Boxing in” COVID-19 will require rapidly scaling our public health capacity at the local, state, territorial, tribal, and federal levels. *Resolve to Save Lives* President Dr. Tom Frieden has aptly described the “Box It In” approach, which includes four tactics: (1) testing, (2) isolation of all infected people, (3) finding everyone who has been in contact with infected people, (4) quarantine all contacts for 14 days, and (1) re-testing of those people. See Figure 1 below:

Figure 1



Source: Resolve to Save Lives. Used with permission.

Testing and adequate personal protective equipment (PPE) are vital components needed to reopen but in order to meet current and future demands, we’ll need greater coordination across the international supply chain and greater oversight of national supplies and resources. The public and private sectors are increasing testing capacity daily, including in public health, hospital, and commercial laboratories. The dynamics of supply and demand and the national and international supply chain for reagents and testing materials is beyond the scope of the public health system to control at this point. Additionally, not all tests on the market have been FDA approved, leaving local communities and community leaders confused and frustrated by outreach from ambitious companies. It is important to note, however, that expanding testing capacity in community settings, including places of work, congregate care and other group settings, etc., is essential. A national strategy to manage and match state needs and requests

for testing materials and PPE should be a priority for federal intervention and increased national leadership from private sector producers and manufacturers.

In the absence of widely available point-of-care testing, universal precautions and presumptive positivity for any individual with COVID-19-like symptoms will be necessary. This means that PPE, including adequate masking supplies and other face coverings, should be widely available to all residents and businesses in order to reopen. Any gathering place, including places of business, houses of worship, and recreation areas, must have adequate masks or face covers and disinfectant supplies to safely reopen.

Contact tracing, monitoring, and provision of social supports to infected individuals and their contacts is an urgent priority of local, state, territorial, and tribal health departments and will require rapid and massive scaling up of existing contact investigation resources in every community in the United States and its territories. Because restarting society involves some risk of further COVID-19 infection and transmission, the ability of local and state health agencies to quickly identify, isolate, track, and alert potential exposures and the capacity of the healthcare system to handle new cases or “surge” is vital to any reopening plan. Social supports and incentives to promote compliance with isolation are also needed to assure individuals comply with public health guidance. Technology can be a tool in their work, but the effort must be driven by people trained in public health response.

Local and state response can be informed by international approaches and the work of early local and state public health leaders. We do not have to reinvent the wheel when it comes to contact tracing. Instead, we should build on the disease investigation system on which our citizens rely every day in United States to control sexually transmitted infections, tuberculosis, and other communicable diseases. That capacity needs to be scaled and coordinated nationally. International approaches and early leaders in Massachusetts and California can inform our future efforts, as described below.

- **Wuhan, China:** Estimates of the number of contact investigators needed to effectively “box in” COVID-19 range widely. In Wuhan, China, a city of 11 million people, 1,800 contact investigator teams of five people each were needed before the city reopened (approximately 1 investigator for every 1,200 individuals). Extrapolating from the Wuhan experience, that would mean that the United States would need over 300,000 contact investigators for the entire U.S. population.
- **South Korea:** In South Korea, state and local public health agencies support contact tracing activities with support from the Korean CDC if the severity/size of the outbreak called for it. Korea has nine states and an overall population of 52 million people. State medical epidemiologists were the lead for contact investigation activities, supported by local public health staff who conducted data collection and tracing activities.
- **Singapore:** In Singapore, a centralized city-state with 5.6 million people, contact tracing “centers” managed reporting and oversight in each administrative district of the city. A national headquarters managed reporting and provided oversight. National health officials and military personnel comprised contact tracing teams. Epidemiology officers

(military and civilian personnel) were in charge of case tracing and investigation. A call center reached out to contacts and a specialized team of senior epidemiologists and police investigators served as referral and escalation support for complex cases requiring further investigation and support.

- **Massachusetts:** In Massachusetts, a decentralized state with 351 local health departments and a population of 7 million, the *Community Tracing Collaboration* is a partnership between Massachusetts government and *Partners in Health (PIH)*. A state COVID-19 response command center leads their case tracking initiatives. The Massachusetts Department of Health manages data, guides activities, and supports oversight of processes. The Commonwealth Health Insurance Connector Authority provides virtual support via a call-center that contacts cases and provides care resource management. *PIH* hires, trains, and supervises staff and contributes technical assistance and expertise to community tracing activities. Contact tracer supervisors are employed by *PIH* and supervise ten COVID-19 community team units.
- **San Francisco:** In San Francisco, California, (population 883,305 residents), the city-county government is assembling a task force to interview and trace the contacts of every individual testing positive for COVID-19. The city-county health department is growing its workforce by adding university staff and medical students and workers from other city departments. The team currently includes 40 people and is expected to increase to at least 150 (approximately 1 contact tracer for every 5,553 residents).

The Johns Hopkins Center for Health Security and the Association of State and Territorial Health Officials (ASTHO) estimate that to begin effective reopen and restart efforts, a cadre of at least 100,000 contact investigators is needed to rapidly identify, contain, support, and re-test individuals who are infected and have been exposed. Based on these numbers, an estimate of the number of contact investigators that may be needed by state using the total population of each state is included in *Appendix A*.

A National, Tiered Approach to Scaling Up Contact Tracing

The diversity of the United States and the vast difference in how COVID-19 infection has played out in various local, state, territorial, and tribal jurisdiction requires a national response that leverages the role of states in public health decision-making and policy development and implementation. Federal entities can continue to support local and state governmental public health agencies by providing technical and scientific support and on-site consultation. In addition, COVID-19 infection control efforts will require a substantive nationwide communications campaign to assure the public will understand and comply with restrictive and intrusive measures like isolation, contact tracing and quarantine, which could be developed federally in partnership with state and local public health officials.

A plan to build upon existing local, state, territorial, and tribal capacity and scale the workforce in existing agencies is needed using existing recruitment mechanisms *and* by developing new and innovative ways to quickly share open positions and recruitment strategies nationally via national associations and partner groups.

At a time in our country when many Americans have lost their jobs, there is a willing, motivated and available workforce that can fill these roles in all our communities. State and local health departments may be able to repurpose staff or bring back furloughed workers like schoolteachers and librarians. They could also directly hire from the community under the more permissive conditions of state emergency declarations. In some situations, it may be more efficient for states to contract hiring with other partners like universities, local entities, and other trusted partner organizations in the community.

A three-tiered approach to building the national contact investigation workforce is needed to recruit the people public health agencies need to rapidly build capacity and complement extant expertise in every public health agency. Each local or state public health agency will develop contact tracing teams that make sense for their geography, existing local and state assets and expertise, the workforce they have and plan to recruit, and the needs of every community in their jurisdiction. In their “resources for response” role, federal agencies including FEMA, HHS/CDC, and HHS/HRSA can provide support to states, territories, and tribes with congressionally appropriated funds and sharing scientific and surge capacity support to aid local and state governmental public health agencies.

We suggest public health agencies use at least three tiers to layer contact investigator recruitment and training efforts: (1) a lay or para-professional contact tracer position, (2) a professional Disease Investigator Specialist (DIS) position, and (3) a healthcare provider or other clinical, epidemiologist, or other specialist positions to support tiers 1 and 2. These layers can be adapted by public health agencies based on their needs and specific circumstances, human resources systems, and available assets and resources.

As part of this rapid workforce expansion, public health leaders and hiring officials should consider prioritizing the recruitment of individuals from the communities in which the investigators will be working and who reflect the diversity of the communities being served. Because contact investigation is based on trust, the ability to quickly build trust requires cultural knowledge and humility that makes community membership vital to success. As such, additional contact investigators could include the workforce that is part of and trusted by the communities in which they are working whenever possible. Individuals from the community are more likely to speak the language and understand the community traditions and norms.

Tier 1: Entry level, “lay,” and para-professional contact investigators

Using the experience of China and other countries that have contained COVID-19, it is clear that a cadre of community members, volunteers, and individuals who are quickly trained, including just-in-time training, and oriented to the task of contact tracing, can identify cases and link individuals to public health agencies for follow-up. Local and state health agencies are already supporting basic contact investigation with entry level, rapidly trained individuals including:

- Government employees from other agencies that are redeployed to COVID-19 response such as librarians, teachers and school personnel, and other professionals that have experience working in communities.

- Community health workers (CHWs), *promotoras*, and other health navigators from the community.
- Staff from local community health assets, such as community health center, healthcare coordinators, medical assistants, para-professional home-visitors, and staff from other community-facing programs or city and state agencies.
- Staff from local nonprofits, faith communities, community development organizations, etc.
- Students and faculty at local academic institutions including schools and programs in public health and schools of nursing, social work, and other allied health professions.
- Staff from Public Health Institutes and organizations with which the public health agencies may have staffing arrangements and existing relationships.
- Volunteer groups and other local non-government organizations.
- Individuals identified through state response volunteer recruitment tools.

Individuals in this tier should have basic analytical and problem-solving skills, be fluent in local cultures, including spoken languages, and have a working knowledge of the public health and healthcare resources to which they will be referring individuals.

ASTHO and the National Coalition of STD Directors is currently developing an introductory course for entry level COVID-19 contact tracers that will be available to all local and state health agencies for use in rapid training and competency assessment of new contact tracers. This training would then be augmented by state or local specific training required for individuals working in specific jurisdictions, for example workers in this tier should be familiar with or trained in the structures and assets of the existing public health system at the city, county, district/regional, and state levels to streamline reporting and sharing of information and to assure effective supervision and liability protections for patients and contact tracers.

Massachusetts is currently working with PIH to recruit contact tracers in this tier using [this](#) position description. In addition, the Massachusetts effort includes recruiting Care Resource Coordinators who will conduct virtual needs check for isolated individuals and connect at-risk COVID-19 positive individuals to community resources for supports to make a 14-day isolation workable given their specific circumstances. These coordinators can be associated with existing health care and public health resources and/or community navigators with knowledge of local resources in their jurisdictions.

Resolve to Save Lives has created a list of “Resources for Isolated Cares and Quarantined Contacts” that includes incentives and supports to manage isolation with strong wrap-around services at the local level (*Appendix B*). Strong incentives will be needed to address the social needs of individuals ordered to stay at home, including paid sick leave, food delivery, and other services that they may not have access to otherwise. Linking people to both needed health and needed social supports is a massive undertaking and a critical piece of contact investigation support and public compliance.

Potential or Existing Funding Sources: Local and state public health agency funds, including federal emergency response funding/CDC PHEP grants. New funding will be essential to recruiting these individuals at scale. *ASTHO* has requested an appropriation of \$3.6 billion for a 12-month effort.

Tier 2: Professional disease investigation specialists (DIS) and DIS supervisor/trainers

Local and state health agencies currently employ approximately 2,200 DIS professionals or their equivalents (to conduct disease investigations related to STD/STIs, HIV, and TB (see *Appendix C, NCSD Generic DIS Position Description*). A rapid expansion of this profession is needed. Existing DIS professionals can be quickly trained on COVID-19 basics and deployed to contact investigation activities in support of their jurisdiction.

DIS professionals have deep knowledge of the communities they serve, local and state public health system, and health care resources. Because existing DIS work is needed to simultaneously address STI, TB and other “routine” diseases, an expanded workforce of DIS professionals need to be quickly recruited and trained to meet new demands. DIS professionals may also be considered for supervising entry level teams, and/or acting as mentors and peer coaches for other staff new to contact tracing work. DIS professionals and their equivalents in states may serve as supervisors for Tier 1 contact tracers and care resource coordinators and may lead case tracking teams at the local and state level. Because of rules regarding state-specific patient privacy, liability protections, and governmental collective bargaining agreements, it is recommended that these individuals be directly employed through existing local and state public health agencies and/or government entities familiar with these issues as part of the normal operating procedures unless the jurisdiction has ways to waive such requirements as needed.

Tier 3: Advanced COVID-19 response professionals, including epidemiology/surveillance professionals, clinical specialists, epidemic intelligence services officers, and CDC COVID-19 Corps team members

Local and state public health agencies employ teams of professionals with the clinical and epidemiological expertise to manage outbreaks and make clinical recommendations for individuals being assessed, screened, and isolated. CDC staff are routinely deployed to support local and state agencies as needed to complement existing expertise. The teams may include laboratory professionals, health care professionals, and other resource staff needed to manage response activities and assure critical public health and health care guidance is established and implemented.

Specialists in this tier may perform advanced analysis of epidemiological and surveillance data and forecast trends, and use local, state, and federal guidance to assess and recommend gradual reduction of community mitigation and other interventions the jurisdiction may have in place to control COVID-19. They may also help manage the clinical care of individuals in isolation and quarantine. States can work with schools and programs of public health and local or statewide hospital systems to contract for this expertise as needed.

In addition, the CDC and the CDC Foundation have created a COVID-19 Corps and are currently recruiting the following positions to be placed in health departments via a COVID-19 Corps website [here](#). As of April 15, 2020, 54 professional staff listings have been posted on the COVID-19 Corps website, including Public Health Nurse, Microbiologist, COVID-19 Corps Regional Team Leads, Health Communications Specialists, Epidemiologists, Public Health Practice Coordinators, Clinic Assistant, Licenses Vocational Nurse, Public Health Analyst, Administrative Assistants, Emergency Response Specialists, and Contact Tracer.

Potential or Existing Funding Sources: CDC has designated \$50 million in a cooperative agreement for an organization to support COVID-19 workforce development. It is unclear if that funding is being used to support this recruitment. To achieve the scale needed to restart and reopen most local and state jurisdictions, more funding will be needed to support these professional positions in addition to this initial federal investment.

Summary

The next phases of the response to COVID-19 (restoration, recovery, and resilience) depends on local, state, territorial, tribal, and federal public health and health care capacity and public compliance with containment and mitigation efforts. The public health and health care system must also prepare to contain future outbreaks and associated health care surges. Public understanding of and compliance with isolation, contact tracing, and quarantine protocols must be developed through a national communications campaign. Time is of the essence given the workforce need and training. This national plan, with a tiered approach to recruitment, is recommended as a way to quickly scale our nation's public health workforce. ASTHO and its partners are committed to rapid dissemination of this plan and is advocating for the resources needed to implement it.

Appendix A: Estimates of Contact Tracers Needed for Each State and Territory

Based on 1:1000 individual-to-tracer ratio and a total of 100,000 initial investigators.

# of Contact Investigators Needed	2019	1 per 1000	% of US population	Of 100,000 contract tracers needed, state estimate
United States	328,239,523	328,240		
Alabama	4,903,185	4,903	0.015	1,494
Alaska	731,545	732	0.002	223
Arizona	7,278,717	7,279	0.022	2,218
Arkansas	3,017,804	3,018	0.009	919
California	39,512,223	39,512	0.120	12,038
Colorado	5,758,736	5,759	0.018	1,754
Connecticut	3,565,287	3,565	0.011	1,086
Delaware	973,764	974	0.003	297
District of Columbia	705,749	706	0.002	215
Florida	21,477,737	21,478	0.065	6,543
Georgia	10,617,423	10,617	0.032	3,235
Hawaii	1,415,872	1,416	0.004	431
Idaho	1,787,065	1,787	0.005	544
Illinois	12,671,821	12,672	0.039	3,861
Indiana	6,732,219	6,732	0.021	2,051
Iowa	3,155,070	3,155	0.010	961
Kansas	2,913,314	2,913	0.009	888
Kentucky	4,467,673	4,468	0.014	1,361
Louisiana	4,648,794	4,649	0.014	1,416
Maine	1,344,212	1,344	0.004	410
Maryland	6,045,680	6,046	0.018	1,842
Massachusetts	6,892,503	6,893	0.021	2,100
Michigan	9,986,857	9,987	0.030	3,043
Minnesota	5,639,632	5,640	0.017	1,718
Mississippi	2,976,149	2,976	0.009	907
Missouri	6,137,428	6,137	0.019	1,870
Montana	1,068,778	1,069	0.003	326
Nebraska	1,934,408	1,934	0.006	589
Nevada	3,080,156	3,080	0.009	938
New Hampshire	1,359,711	1,360	0.004	414
New Jersey	8,882,190	8,882	0.027	2,706
New Mexico	2,096,829	2,097	0.006	639
New York	19,453,561	19,454	0.059	5,927
North Carolina	10,488,084	10,488	0.032	3,195
North Dakota	762,062	762	0.002	232
Ohio	11,689,100	11,689	0.036	3,561
Oklahoma	3,956,971	3,957	0.012	1,206
Oregon	4,217,737	4,218	0.013	1,285
Pennsylvania	12,801,989	12,802	0.039	3,900
Rhode Island	1,059,361	1,059	0.003	323
South Carolina	5,148,714	5,149	0.016	1,569
South Dakota	884,659	885	0.003	270
Tennessee	6,829,174	6,829	0.021	2,081
Texas	28,995,881	28,996	0.088	8,834
Utah	3,205,958	3,206	0.010	977
Vermont	623,989	624	0.002	190
Virginia	8,535,519	8,536	0.026	2,600
Washington	7,614,893	7,615	0.023	2,320
West Virginia	1,792,147	1,792	0.005	546
Wisconsin	5,822,434	5,822	0.018	1,774
Wyoming	578,759	579	0.002	176
Puerto Rico	3,193,694	3,194	0.010	973

Source: U.S. Census Bureau, Population Division. Release Date: December 2019.

Appendix B: Resources for Isolated Cases and Quarantined Contacts

RESOURCES FOR ISOLATED CASES AND QUARANTINED CONTACTS

Need incentives to manage isolation and quarantine with strong wraparound services

EXAMPLES AND IDEAS



Care packages could include

- Masks
- Thermometers
- Food, laundry, pharmacy services
- Health education materials
- Passwords for on-demand movies, e-books, learning channels
- Access to high-speed internet & laptops
- Hand sanitizer & alcohol-based cleansers
- Encouraging note from the mayor



Core resources such as

- Daily check-in phone calls
- Instructions of how to keep space clean for those sharing space
- A hotline for counseling, information, social services, and medical support
- Garbage removal
- Access to telehealth and care if ill
- Relocation to safe and desirable place, if requested



Financial support could include

- Stipend from government to those without sick leave or who need to take care of child or elderly dependents
- Work with employers to provide support, with possible tax credits

Source: Resolve to Save Lives. Used with permission.

Appendix C: NCS D Generic DIS Position Description.

Source: NSCD, used with permission.

Position Description: Disease Intervention Specialist I

Description based on lowest level of DIS within a DIS career pathway with multiple steps in a health department.

Summary

Under general supervision, is responsible for interviewing, screening, and counseling patients with infectious diseases to ensure proper treatment and prevention of the diseases; performs related duties as required.

Responsibilities

- Counsels clients before and after testing for infectious diseases, including information on disease, treatment and future prevention, benefits and possible ramifications of testing, and specific referral for medical evaluation.
- Interviews clients and conducts field investigations in a variety of settings including clinics, residences, prisons, and other public facilities.
- Conducts contact tracing activities in accordance with established guidelines for individuals who are infected with an infectious disease and their recent contacts; encourages testing for persons who may have been exposed to an infectious disease.
- Prepares client interaction summaries and completes required documentation.
- Gathers epidemiologic data to assist in the determination of probable source and spread relationships and the development of an agenda for prospective re-interviews.
- Establishes and maintains effective working relationships with host area officials, agencies, and individuals who have impact on the disease prevention program.
- Provides advice and information to the private medical community regarding diagnosis, treatment, and control of infectious diseases.
- Makes client referrals to physicians and other community-based organizations for testing and treatment service
- Provides support services for research or special project programs
- Performs infectious diseases education for target groups according to CDC's Guidelines for Education.
- Utilizes computer to order laboratory tests and to access and enter client charting information
- May transport clients to and from clinics or other facilities for treatment and preventive services.
- May be assigned to serve as a member of a disaster recovery/business resumption team, incident response team, or similar public health response team which may include the conduct of operations on a 24/7 basis at remote locations.

Education and Experience

- High school diploma; bachelor's in public health, health sciences, or related program area preferred.
- Two years' experience in a health care setting, preferably experience in interviewing/counseling patients.
- Possession of a valid motor vehicle operator's license.

Knowledge, Skills, and Abilities

- General knowledge of the various types of infectious diseases, including manner of transmission, symptoms, and methods of treatment.
- Some knowledge of HIPAA regulations and ability to maintain confidentiality
- Effective verbal and written communication skills.
- Ability to counsel patients and explain technical information to persons of varied educational levels and backgrounds.
- Ability to obtain highly personal information in a non-judgmental and professional manner.
- Ability to apply investigative techniques.
- Writing skills, including ability to prepare case and workload summaries.
- Knowledge of basic math, including calculation of fractions, decimals and percentages
- Computer skills, including accessing and entering information; maintaining records concerning patients and case investigations.

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