

**CDC Activities and Initiatives
Supporting the
COVID-19 Response and the
President's Plan for
Opening America Up Again**

May 2020

**Centers for Disease Control and Prevention
(CDC)**

**Coronavirus Disease 2019 (COVID-19)
Response**

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CDC Activities and Initiatives Supporting the COVID-19 Response and the President’s Plan for Opening America Up Again

This document briefly summarizes CDC’s initiatives, activities, and tools in support of the Whole-of-Government response to COVID-19.

Overview of CDC’s Surveillance and Control Goals and Activities

The principal objectives of COVID-19 surveillance are to monitor the spread and intensity of the pandemic, to enable contact tracing to slow transmission, and to identify disease clusters requiring special intervention. Secondary objectives include understanding the severity and spectrum of disease, identifying risk factors for and methods of preventing infection, and producing data essential for forecasting. In addition to tracking the disease itself, monitoring of healthcare capacity and essential supplies through the National Healthcare Safety Network (NHSN) is critical to ensure adequacy of care.

Because no single system can capture all parameters of the pandemic, CDC has implemented multiple, complementary surveillance systems ([Appendix A](#)). Key systems are case-based reporting through the National Notifiable Diseases Surveillance System (NNDSS), laboratory-based surveillance, syndromic-surveillance data reported through the National Syndromic Surveillance Program (NSSP), and data on healthcare system capacity reported through the NHSN ([Appendix B](#)). Additional systems, such as COVID-Net, provide rich, publicly available information for meeting secondary objectives. CDC continues to explore emerging and experimental surveillance platforms with a critical eye toward proven utility.

Control of the epidemic requires action at the individual, community, and population levels. CDC has provided state, tribal, local, and territorial health departments with extensive detailed [guidance](#) on [contact tracing](#), [infection control](#), and a wide range of other prevention and control topics. Recent models suggest that asymptomatic and pre-symptomatic transmission and delays in case recognition can greatly reduce the effectiveness of contact tracing. To enhance the speed and thus effectiveness of contact tracing, CDC is exploring technologic methods for instantaneous voluntary notification of contacts of confirmed cases.

At the community level, recent events have shown the devastating effects that outbreaks can have among vulnerable populations, especially those in congregate settings such as nursing homes, prisons, and homeless shelters. Similarly, outbreaks in food production plants and other critical industries are crippling communities financially and threatening national food security. Rapid identification and response to these events is a CDC priority that can mitigate the immediate impact and provide critical insights needed to prevent future outbreaks in similar settings. CDC has developed extensive tools to assist states, counties, facilities, and industries in responding to and preventing these events ([Appendix C](#)).

Widespread community mitigation combined with ongoing containment activities represents both an effective intervention for limiting the spread of COVID-19 and a serious threat to the economic well-being of the country and the world.

CRITICAL INITIATIVES AND ACTIVITIES

A. Expanding Testing and Advising Testing Practices

Extensive, rapid, and widely available COVID-19 testing is essential. CDC is working within the “All-of-Government and All-of-America Approach” to increase testing capacity and availability to improve case detection and contact tracing through all phases of the US plan to Opening Up America Again. As the supply and nature of tests expand, testing criteria have been broadened to include a wider range of people and situations.

Prioritizing Patients for Testing: Current recommendations for testing:

<https://www.cdc.gov/coronavirus/2019-nCoV/hcp/clinical-criteria.html>

Focusing Testing Efforts: CDC is working across the US government to support diverse efforts to increase testing in multiple settings to support diagnosis, surveillance, and outbreak control:

- **Testing for Diagnosis and Clinical Management:** CDC is working with federal government partners to support hospitals, healthcare systems, clinics, and public health departments to ensure the capability to diagnose COVID-19 infections with a turnaround time needed for appropriate clinical care and public health decision-making. CDC is:
 - Working with federal government partners to provide a wide range of technical assistance resources to each state to help them develop a state-specific testing plan that meets their unique needs.
 - Equipping state public health laboratories with sufficient quantities of devices, reagents, and testing supplies in the International Reagent Resource (IRR).
 - Working with the White House Coronavirus Task Force to enhance the national supply of reagents and testing supplies so that the commercial market is able to supply state efforts. This supply should be sufficient to achieve a rate of less than 10% positive tests for COVID-19 among symptomatic, asymptomatic, and pre-symptomatic individuals.
- **Testing for Surveillance and Outbreak Control:** Identify newly emergent cases or clusters of COVID-19 among symptomatic and asymptomatic individuals who are prioritized by public health officials and clinicians, and improve reporting of COVID-19 cases to public health systems. CDC is:
 - Utilizing established, nationwide surveillance systems to identify any areas of potential COVID-19 outbreaks, including use of CDC’s Influenza-Like Illness Network and the National Syndromic Surveillance Program.
 - Enabling public health systems at state, local, territorial, and tribal levels to develop a robust system to identify COVID-19 infections, particularly among vulnerable populations such as residents of nursing homes, people of racial and ethnic minority groups (e.g., African Americans, American Indians, Alaska Natives) at higher risk of disease, and those in areas of high social vulnerability, closed settings, and congregate housing.
 - Supporting existing case-based surveillance efforts for identifying infections through routine testing of persons in clinical encounters.
 - Enhancing case investigation and contact tracing efforts through increased public health staff and rapid testing capability.
 - Working with point-of-care diagnostic test manufacturers and state health departments to improve reporting of results from rapid, point-of-care devices
 - Evaluating various serologic assays for use in surveillance and for potential use for returning to work.

Defining Usage: CDC is working with state, local, and other partners to define the circumstances where testing of asymptomatic persons is likely to be helpful in controlling the pandemic, as well as the best application of surveillance serologic testing.

- Emerging evidence suggests that asymptomatic infections play an important role in the epidemiology of SAR-CoV-2 infections. Testing for asymptomatic infection should focus (1) on persons with an increased likelihood of infection and (2) on settings with particularly vulnerable populations.
- CDC is working to identify indications for serologic testing. Broadly, the purpose of serologic test falls into two categories: serologic surveillance of populations and serologic testing of individuals to determine if they have had a prior infection. This current CDC COVID-19 test is not currently designed for individual use (i.e., to test people who want to know if they have been previously infected with SARS-CoV-2). Serologic surveillance has the potential to provide important insights into the transmission dynamics of disease, as well as a more complete picture of total burden of COVID-19 infections in a community or among first responders and front-line health providers. More information is needed to determine how the results of serologic testing correlate with possible immunity.
- See [Appendix D](#) and <https://www.cdc.gov/coronavirus/2019-ncov/lab/serology-testing.html> for additional details on testing strategies, testing of asymptomatic infections, and serologic testing.

Augmenting Existing Infrastructure and Technology to Improve Data Flow and Reporting:

CDC is supporting the improvement of current data infrastructure, and the development and integration of digital/technology solutions to augment state and community-wide sites to ensure timely and transparent communication to all citizens inclusive of daily new cases, hospitalizations, use of intensive care units (ICU), and mortality by county and or zip code. To ensure geographic relevant information is continuously available to state and local governments and the public in those communities, this should also include laboratory and potential immunization data systems. Activities include:

- Working with state and local officials and web development groups to develop and support interactive web-based platforms that allow open and transparent data visibility to all communities, such as the Florida Public Health COVID-19 [website](#).
- Working with manufacturers for point-of-care diagnostic tests, commercial laboratories, state and local health departments, testing locations (providers, hospitals, pharmacies), and public health partners (Association of Public Health Laboratories [APHL], Council of State and Territorial Epidemiologists [CSTE]) to improve data quality, integration, and electronic reporting.
- Developing, integrating, and testing the ability for laboratories to securely share data with digital platforms selected by public health, including platforms that may be used for testing, or to support state and local contract tracing.
- Exploring digital solutions to share laboratory results with patients directly and sharing tested best practices with state and local partners. This could also extend to immunization record access.
- Developing recommendations for minimum requirements of platforms to integrate, store, and manage personal laboratory information on digital platforms (what states should consider before investing or having additional standards for platforms handling these data).

B. Phased Plan and Indicators for Reopening America

The plan for reopening America outlines a three-phased approach for reducing community mitigation measures while protecting vulnerable populations. The phased approach can be implemented statewide or community-by-community at governors' discretion. The guidelines propose the use of six "gating" indicators to assess when to move through from one mitigation phase to another.

Gating Criteria and Phase-specific Thresholds

Gating Criteria	Threshold for entering Phase 1	Threshold for entering Phase 2	Threshold for entering Phase 3
Decreases in newly identified COVID-19 cases	Downward trajectory (or near-zero incidence) of documented cases over a 14-day period	Downward trajectory (or near-zero incidence) of documented cases for at least 14 days <i>after entering Phase 1</i>	Downward trajectory (or near-zero incidence) of documented cases for at least 14 days <i>after entering Phase 2</i>
Decreases in emergency department (ED) and/or outpatient visits for COVID-like illness (CLI)	Downward trajectory (or near-zero incidence) of CLI syndromic cases reported over a 14-day period	Downward trajectory (or near-zero incidence) of CLI syndromic cases reported for at least 14 days <i>after entering Phase 1</i>	Downward trajectory (or near-zero incidence) of CLI syndromic cases reported for at least an additional 14 days <i>after entering Phase 2</i>
Decreases in ED and/or outpatient visits for influenza-like illness (ILI)	Downward trajectory (or near-zero incidence) of ILI reported over a 14-day period	Downward trajectory (or near-zero incidence) of ILI reported for at least 14 days <i>after entering Phase 1</i>	Downward trajectory (or near-zero incidence) of ILI reported for at least an additional 14 days <i>after entering Phase 2</i>
Decreases in percentage of SARS-CoV-2 tests positive	Downward trajectory (or near-zero percent positive) of positive tests as a percentage of total tests over a 14-day period (flat or increasing volume of tests)	Downward trajectory (or near-zero percent positive) of positive tests as a percentage of total tests for 14 days <i>after entering Phase 1</i> (flat or increasing volume of tests)	Downward trajectory (or near-zero percent positive) of positive tests as a percentage of total tests for at least 14 days <i>after entering Phase 2</i> (flat or increasing volume of tests)
Treat all patients without crisis care	Jurisdiction inpatient & ICU beds <80% full Staff shortage in last week = no PPE supplies adequate for >4 days	Jurisdiction inpatient & ICU beds <75% full Staff shortage in last week = no PPE supplies adequate for >4 days	Jurisdiction inpatient & ICU beds <70% full Staff shortage in last week = no PPE supplies adequate for >15 days
Robust testing program	Test availability such that percentage of positive tests is $\leq 20\%$ for 14 days Median time from test order to result is ≤ 4 days	Test availability such that percentage of positive tests is $\leq 15\%$ for 14 days Median time from test order to result is ≤ 3 days	Test availability such that the percentage of positive tests is $\leq 10\%$ for 14 days Median time from test order to result is ≤ 2 days

Decisions to move between phases should also consider the public health capacity of the jurisdiction based on the criteria listed below. Other epidemiologic data sources available locally can be used to corroborate trends seen in core epidemiologic gating criteria. Special consideration should be given to infections identified in populations and settings such as healthcare personnel, patients in healthcare facilities (e.g., nursing homes, dialysis centers, long-term care facilities), and residents of congregate living settings (e.g., prisons, youth homes, shelters), underserved populations, and people of racial and ethnic minority groups (e.g., African Americans, American Indians, Alaska Natives) at higher risk of disease. Incidence and trajectory (increasing versus decreasing) of COVID-19 illnesses in the surrounding region should also be considered.

Category	Considerations for Assessing Capacity for Case Identification, Follow Up, and Containment
SARS-CoV-2 testing in jurisdiction	Testing is available as indicated for clinical, public health, and infection prevention needs.
Identification of new COVID-19 cases	All new COVID-19 cases in the jurisdiction can be rapidly identified through active surveillance, including proactive monitoring for asymptomatic cases through surveillance monitoring.
Interviewing new COVID-19 cases	Initial interviews can be conducted for nearly all new COVID-19 cases within one day of health department notification.
Contact tracing	Follow up (isolation, self-monitoring, and rapid testing of selected contacts) can be initiated for nearly all identified contacts of newly identified cases.
Incidence relative to local public health resources	Public health capacity is sufficient to fully perform contact tracing and investigate outbreaks based on local incidence and resources available.

While some communities will progress sequentially through the reopening phases, there is the possibility of recrudescence in some areas. Given the potential for a rebound in the number of cases or level of community transmission, a low threshold for reinstating more stringent mitigation standards will be essential. The decision to reinstate community mitigation strategies will undoubtedly be very difficult and will require careful thought to define an evidence-based monitoring strategy and specific guidance for these decisions.

Technical Support for States

As part of the “Whole-of-Government” public health effort, CDC is providing states and other jurisdictions with technical assistance regarding testing, surveillance data collection and reporting, contact tracing, infection control, and outbreak investigation. Implementation of these activities is supported by the Paycheck Protection Program and Health Care Enhancement Act, which includes \$11 billion to be awarded, within 30 days, directly to states, localities, territories, tribes, tribal organizations, urban Indian health organizations, or health service providers to tribes to develop, purchase, administer, process, and analyze COVID-19 tests, conduct surveillance, trace contacts, and related activities. Listed below are additional strategies CDC is using to strengthen the capacity of state, tribal, local, and territorial (STLT) health departments to fight against COVID-19. This technical assistance is essential to ready the nation to re-open and minimize future COVID-19 outbreaks in jurisdictions across the country.

Contact Tracing

Contact tracing, a core disease control measure used by local and state health department personnel for decades, is a key strategy for preventing further spread of infectious diseases, including COVID-19. Contact tracing is part of the process of supporting affected individuals and warning contacts of exposure in order to stop chains of transmission. CDC is ramping up America's capacity to perform contact tracing. As part of this effort, CDC has developed multiple training tools for communities to train the newest frontline workers in public health. CDC will train newly identified contact tracers on how to quickly locate and talk with the affected individuals, assist with isolation issues, and work with affected individuals to identify people with whom the affected individuals have been in close contact. Identification of contacts will allow further outreach by public health to identify individuals who need to self-isolate.

Priorities	Strategies
<p>Contact tracing guidance and training</p> <p>https://www.cdc.gov/coronavirus/2019-ncov/php/contact-tracing/index.html</p>	<p>Provide CDC guidance on case investigation and contact tracing to STLT health departments</p> <ul style="list-style-type: none"> • Address key issues such as staffing and roles, when to initiate an investigation, steps to the investigation, confidentiality and consent, self-isolation, quarantine, and necessary support services (housing, food, medicine); data management; digital contact tracing tools and technology; and evaluation and monitoring • Work with states to develop a comprehensive proactive plan for the identification of asymptomatic case in areas of high vulnerability and/or high rates of co-morbidities
<p>Deploy COVID-19 Response Corps</p> <p>https://www.cdc.gov/coronavirus/2019-ncov/php/open-america/response-corps.html</p>	<p>Use a multi-pronged approach to enhance and complement the efforts of STLT health department staff through innovative hiring mechanisms designed to address the surge staffing needs of STLT health departments.</p> <p>Provide access to a variety of mechanism to complement local efforts to increase capacity.</p> <ul style="list-style-type: none"> • Realign existing CDC field staff • Deploy CDC teams to address outbreaks in special settings • Partner with CDC Foundation and other organizations to place surge staff for STLT health departments across the nation • Partner with other federal agencies (e.g., AmeriCorps) to offer staffing options with states • Facilitate access to a variety of contact tracing and case investigation training products and tools for a diverse and evolving public health workforce
<p>Innovative technologies</p>	<p>Support implementation of innovative methods and technologies at the STLT levels to help inform and guide the national response.</p> <ul style="list-style-type: none"> • Develop guidance for assisting states and locals in evaluating tools, refining guidance, and identifying gaps in contact tracing workflow • Leverage partnerships to facilitate information sharing among our state and local partners regarding digital contact tracing tools • Share the landscape of digital tools, including those for contact tracing, case management, workforce management, and proximity tracking

Conclusion

As part of the Whole-of-Government Response, CDC has developed and is continually evaluating and improving the comprehensive surveillance program to generate essential data for tracking the pandemic and guiding the overall response to COVID-19. In addition, CDC is working with federal, state, and local partners to improve testing and to advise and support communities during the phased reopening of America.

Appendix A: Surveillance for COVID-19

The goals of US surveillance are to produce timely and accurate information at national, state, local and community levels to inform decisions on public measures for implementing and adjusting disease reduction strategies, to guide clinical decisions, to educate the public and key stakeholders, and to provide data for estimating and forecasting disease burden.

Surveillance Objectives

- To identify both symptomatic and asymptomatic/presymptomatic cases and track contacts to slow transmission of COVID-19 in the United States
- To monitor spread and intensity of COVID-19 disease in the United States
- To understand disease severity and spectrum of illness
- To understand risk factors for severe disease and transmission
- To monitor for virus changes
- To estimate disease burden
- To produce data for forecasting spread and impact
- To identify when thresholds have been met to adjust community mitigation measures

Approach

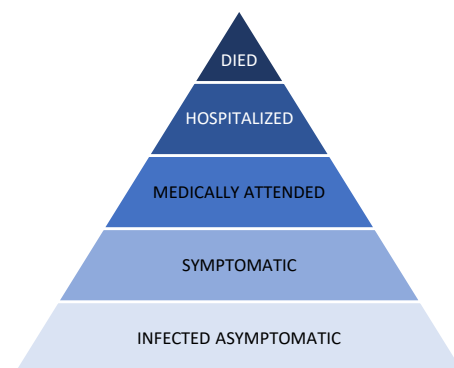
Using multiple surveillance systems and epidemiology networks, CDC in collaboration with state, local, and academic partners, monitors the progression and impact of COVID-19 spread in the United States. The combination of data from the different systems is used to generate an ongoing picture of virus spread and produce data to address the key questions for directing and refining the US response. Surveillance data are used for:

- *Situational awareness* – Timely monitoring of the spread and intensity of COVID-19 disease in the United States. Surveillance systems allow for efficient targeting of public health measures, developing timely communications, and preparing health systems for increasing numbers of ill people. Data from these systems will be updated daily or weekly to create an ongoing, accurate understanding of impacted regions, affected populations, trends over time, and viral characteristics.
- *Understanding impact and forecasting disease spread* – All surveillance systems will be employed to produce data to understand overall impact and epidemic characteristics to inform future use of public health and medical resources.
- *Characterizing COVID-19 infection* across a spectrum of conditions include:
 - asymptomatic infections
 - symptomatic infection
 - medically attended outpatient and ambulatory visits
 - hospitalizations
 - deaths

Operational Plan

The plan is operationalized according to the following components:

- Increase laboratory testing and reporting to detect cases quickly and reliably for timely public health action
- Use robust syndromic surveillance, proactive monitoring for asymptomatic cases in settings with people at risk for infection or with known vulnerabilities
- Use laboratory reporting systems to monitor local disease trends to identify if thresholds (gates) have been met
- Corroborate trends and risk assessment with high-quality data from sentinel surveillance and systems



- Monitor disease and outbreaks in healthcare, institutional, workplace and group settings
- Use data for estimation of disease burden over time and to aid disease and transmission forecasts

Federal, State, and Local roles

The surveillance strategies rely on collaboration at federal, state, and local levels. The federal government will work with the states to establish the data platforms used by states and local jurisdictions to monitor transmission, public health, and health system capacity and provide technical assistance and coordination of information sharing and decision making across jurisdictions. These data platforms will be public facing to maximize transparency and maximize information to communities at the most granular level. Using the federal data systems, states can share data and information and communicate with residents’ decisions under consideration and clear guidance on adhering to mitigation levels. In addition to implementing federal programs, states can also coordinate resource allocation within their regions and across communities and monitor indicators closely to make decisive adjustments to mitigation measures. Finally, local governments are responsible for feeding data and information into state and federal data systems and adjoining communities.

Components of the US COVID-19 surveillance plan

The surveillance program is built on a combination of existing influenza and viral respiratory diseases surveillance systems, syndromic surveillance systems, case reporting systems, proactive monitoring for asymptomatic cases in areas of demonstrated vulnerabilities, commercial laboratory reporting, ongoing research platforms employed for the COVID-19 response, and new systems. The systems are summarized in Table 1 and a more fully described in Appendix A.

Table 1. Surveillance Systems Used by Objective. Surveillance data for decision-making uses multiple systems and epidemiology networks. These approaches use laboratory submitted specimens, electronically transmitted data, and other sources to generate an ongoing picture of disease spread, intensity, and severity, and produce data to address the key questions for directing and refining the US response.

Goal addressed	Outcome	Platform
Trends in disease spread and intensity	No. of cases, by location, trends, demographics, underlying diseases, outcomes	COVID-19 case-based surveillance
	No. of lab-positives; %positive, by age groups, location, over time	Public Health Laboratories (PHLs)
		National Respiratory and Enteric Virus Surveillance System (NREVSS)
	Outpatient, syndromic - %ILI, trends in ILI by region, age group, concordance and discordance between surveillance data	Commercial labs
		ILInet
		National Syndromic Surveillance Program (NSSP)
Outpatient – laboratory-confirmed, % positive, by location, by age group	Laboratory-confirmed outpatient (OP) surveillance	
	US Flu Vaccine Effectiveness (VE) network (acute respiratory illness)	
Severity / clinical spectrum	Hospitalizations rates, by age group, underlying condition	FluSurvnet – all ages
	Hospitalizations	New Vaccine Surveillance Network (NVSN) – pediatrics

Goal addressed	Outcome	Platform
Viral changes	Virus characterization, sequence changes	PHLs and CDC/DVD SPHERES
Risk factors for severe disease	Risk of severe disease given underlying illness, age	COVID-19 case-based surveillance
		US Flu VE network
		FluSurvnet – all ages
		NVSN – pediatrics
		Hospitalized Adult Influenza Vaccine Effectiveness Network (HAIVEN)
		Influenza ICU Vaccine Effectiveness Study
Disease burden	Overall number of persons affected by severity and age	All systems, plus additional special research studies
		Serologic surveys
Pandemic severity	Pandemic Influenza Severity Assessment (PISA)	Modeling based on epidemiological inputs
Forecasting and modeling spread and impact	When will it peak, how many disease outcomes, how will it spread	Modelling work with broad coalition of modelers led by CDC, using data above
Transmissibility	Attack rates and risk factors for transmission	Field studies
		Flu Transmission Evaluation Study (FLuTES)
		Household Influenza Vaccine Effectiveness Study (HIVES)
		Pandemic cohorts (community, households, healthcare workers, pregnant woman, long-term care facilities)
Risk Factors for Severe disease	Risk of severe disease given underlying illness, age	COVID-19 Case-based surveillance
		US Flu VE network
		FluSurvnet – all ages
		NVSN – pediatrics
		HAIVEN
		Influenza ICU Vaccine Effectiveness Study
Disease Burden	Overall number of persons affected by severity and age	All systems, plus additional special research studies
		Serologic surveys
Pandemic Severity	PISA	Modeling based on Epi inputs
Forecasting and modeling spread and impact	When will it peak, how many disease outcomes, how will it spread	Modelling work with broad coalition of modelers led by CDC, using data above

Goal addressed	Outcome	Platform
Transmissibility	Attack rates and risk factors for transmission	Field studies
		FLuTES
		HIVE
		Pandemic cohorts (community, households, HCWs, pregnant woman, LTCFs)

Appendix B: Healthcare System Surveillance

Rationale and Objective

Measuring and reporting the impact of COVID-19 on the capacity of the US healthcare system—including both acute-care hospitals and long-term care facilities—is an essential public health function in the pandemic response and in plans for Opening Up America Again. To make critical decisions, all levels of government, including federal, regional, state, local, tribal, and territorial, and the healthcare system need detailed and timely information about the availability and shortages of key resources, including hospital beds, intensive care unit (ICU) beds, ventilators, personal protective equipment, and healthcare personnel shortages. Reporting needs to be comprehensive across all states.

Regional variations in disease burden place a premium on supporting a surveillance system that can provide standardized data that are timely, easy to interpret, and readily accessible for multiple end users at all geographic levels. Among the main objectives for a national healthcare surveillance system in the current crisis are providing timely and readily available metrics with which to monitor the pandemic's trajectory and progress toward Opening Up America Again. The key surveillance metrics available from NHSN are reported counts and a panel of additional summary statistics on hospitalized COVID-19 patients, hospital bed capacity, intensive care unit bed capacity, ventilatory capacity, supplies of personal protective equipment, and staffing shortages. These metrics, produced daily, serve as indicators that can drive decisions and actions at the national, state, county, tribal, territorial, and healthcare facility levels but needs to be expanded to be inclusive of all hospitals.

Key System

Implementation of several key surveillance metrics for monitoring the impact of the pandemic on the healthcare system are available through the existing Centers for Disease Control and Prevention's (CDC) National Healthcare Safety Network (NHSN). NHSN's role as a shared platform for healthcare-associated condition surveillance provides a powerful and unique foundation for COVID-19 surveillance.

CDC is already efficiently leveraging NHSN—which was launched in 2005 and now is the nation's most widely used healthcare-associated condition tracking system—to support the nation's COVID-19 response. NHSN provides a well-established technical infrastructure, readily extensible platform, and a strong set of partnerships with healthcare facilities, state and local health departments, the Centers for Medicare and Medicaid Services (CMS), and electronic health record system (EHRs) companies, and other healthcare information technology suppliers. This system will need to continue improving to ensure 100% reporting of all cases and outcomes.

The US healthcare system relies on NHSN to track healthcare-associated conditions, improve patient safety, fulfill mandatory federal and state reporting requirements, and ultimately eliminate healthcare-associated conditions. NHSN serves as the operating system for hospital-associated infection reporting through legislation established by 36 states, Washington, D.C., and Philadelphia, PA. NHSN will need to be expanded to all states and all hospitals to provide a comprehensive analysis of COVID-19. CMS uses NHSN reporting to enable healthcare facilities to fulfill CMS requirements for submitting healthcare outcome data that are used in CMS's public reporting and incentive payment programs. Currently, over 25,000 healthcare facilities, including almost every hospital in the nation, more than 7,500 dialysis facilities, and over 3,000 nursing homes participate in NHSN. To be effective, this system must be

nationwide and be comprehensive in reporting. Personnel in these facilities have extensive experience submitting data to NHSN, adhering to the system’s surveillance protocols, and using their own data and national benchmarks provided by NHSN for local prevention and control purposes. NHSN’s collaborations with EHR companies, infection surveillance system providers, and the Health Level Seven (HL7) data standards organizations enable healthcare facilities to submit data electronically to NHSN by using HL7 data exchange specifications.

On March 27, 2020, CDC launched the NHSN COVID-19 Patient Impact and Hospital Capacity Module (<https://www.cdc.gov/nhsn/covid19/report-patient-impact.html>), and as of April 24, 2020, over 56% of acute care hospitals and over 53% of critical access hospitals have reported COVID-19 surveillance metrics. This level of participation needs to continue to improve until reporting is at the 95-100% range. Additionally, as of April 28, 2020, all ~15,000 nursing homes will be required to report COVID-19 cases and deaths, as well as staffing and personal protective equipment supply metrics, to NHSN (<https://www.cdc.gov/nhsn/itc/covid19/index.html>) per a new CMS Interim Final Rule. The adaptation of NHSN to the immediate needs of the emergency response is a clear example of how CDC is retooling, modernizing, and updating its existing national surveillance capabilities to confront the pandemic.

Data as of May 5, 2020 at 5:30 AM



National Estimates by Day, NHSN (Apr 1st-May 2nd)

- National estimates based on NHSN for April
- Estimates use weighting for non-response and multiple imputation for missing data
- Total inpatients increased, while the share of total inpatients with COVID-19 continues to trend down
- Total ventilator use is steady

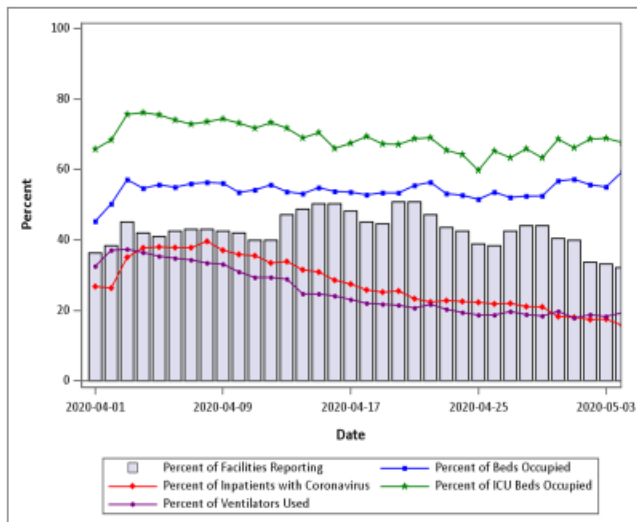


During the COVID-19 pandemic, data on key metrics are submitted daily to NHSN, where the data are analyzed daily and presented out to the key components at all levels of the public health response. NHSN COVID-19 data are an integrally important asset in the US government response. The NHSN data are provisioned for use in secure access systems maintained by the White House Coronavirus Task Force, the National Response Coordination Center (NRCC), CDC, FEMA, ASPR, and CMS. In addition, all state health departments, several local health departments, and many HHS ASPR and FEMA Regional Offices receive data from NHSN and rely upon it for regional and state emergency response decisions.

NHSN uses COVID-19 data to develop and report national and state-wide estimates that serve as indicators of stress on the healthcare system. Figures below show examples of national trend-data as well as an example of a state trend.



NHSN Daily Crude Percent Occupancy, Louisiana



NHS

Appendix C: Guidance on Infection Control and Contact Tracing

General CDC Guidance Hub <https://www.cdc.gov/coronavirus/2019-ncov/communication/guidance-list.html?Sort=Date%3A%3Adesc>

Infection Prevention Control

- What CDC is doing for infection control
 - <https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control.html>
- Standard CDC guidance on infection control in healthcare settings
 - Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 (COVID-19) in Healthcare Settings: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html>
- Best practices currently in use by states and private sector
- Link to virtual training
 - Training for Healthcare Professionals (including clinical care and infection control, PPE, nonpharmaceutical interventions, emergency preparedness and response, and additional topics): <https://www.cdc.gov/coronavirus/2019-ncov/hcp/training.html>
 - Preparing Nursing Homes and Assisted Living Facilities for COVID-19 (CDC webinar): <https://www.youtube.com/watch?v=p1FIVFx5O78>
- Focus areas/congregate settings:
 - Long-term care facilities
 - Preparing for COVID-19: Long-term Care Facilities, Nursing Homes: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/long-term-care.html>
 - Assisted living facilities
 - <https://www.cdc.gov/coronavirus/2019-ncov/hcp/assisted-living.html>
 - Dialysis facilities
 - <https://www.cdc.gov/coronavirus/2019-ncov/hcp/dialysis.html>
 - Dental facilities
 - <https://www.cdc.gov/coronavirus/2019-ncov/hcp/dental-settings.html>
 - Ambulatory care facilities
 - <https://www.cdc.gov/coronavirus/2019-ncov/hcp/ambulatory-care-settings.html>
 - Pharmacies
 - <https://www.cdc.gov/coronavirus/2019-ncov/healthcare-resources/pharmacies.html>
 - Emergency Medical Services (EMS)
 - <https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-for-ems.html>
 - Food processing facilities
 - Meat and Poultry Processing Workers and Employers: Interim Guidance from CDC and the Occupational Safety and Health Administration (OSHA)
 - <https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/meat-poultry-processing-workers-employers.html>
 - Correctional facilities
 - Resources for Correctional and Detention Facilities: <https://www.cdc.gov/coronavirus/2019-ncov/community/correction-detention/guidance-correctional-detention.html>.
 - Businesses
 - Interim Guidance for Businesses and Employers to Plan and Respond to Coronavirus Disease 2019 (COVID-19): <https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-business-response.html>

- Prepare your Small Business and Employees for the Effects of COVID-19: <https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-small-business.html>
- Other IPC tools/Resources:
 - IPC FAQs: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-faq.html>
 - Using PPE, including donning & doffing resources: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/using-ppe.html>
 - Healthcare preparedness tools: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/preparedness-checklists.html>
 - Strategies to mitigate staffing shortages: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/mitigating-staff-shortages.html>
 - Key strategies to prepare LTCFs: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/long-term-care-strategies.html>
 - LTCF Letter to residents, family members and visitors: <https://www.cdc.gov/coronavirus/2019-ncov/downloads/healthcare-facilities/Long-Term-Care-letter.pdf>
 - Cleaning and disinfecting school and community facilities: <https://www.cdc.gov/coronavirus/2019-ncov/community/disinfecting-building-facility.html>
- Cleaning and disinfecting non-emergency transport vehicles: <https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/disinfecting-transport-vehicles.html>
- External partners tools/resources
 - **Centers for Medicare & Medicaid – COVID partner toolkit** – <https://www.cms.gov/outreach-education/partner-resources/coronavirus-covid-19-partner-toolkit>
 - **American College of Emergency Physicians** – Field guide - <https://www.acep.org/corona/covid-19-field-guide/cover-page/>
 - **American Academy of Pediatrics** – Guidance for Telehealth Payer Policy in Response to Covid-19 <https://services.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/aap-guidance-telehealth-payer-policy-in-response-to-covid-19/>
 - **Society for Critical Care Medicine** – COVID-19 Resource Center – Includes literature and training <https://www.sccm.org/COVID19RapidResources/Home>
 - **Society for Healthcare Epidemiology of America**
 - COVID-19 Resource Page: <http://shea-online.org/index.php/practice-resources/priority-topics/emerging-pathogens/novel-coronavirus-2019-2019-ncov-resources>
 - Hospital epidemiology training - <https://learningce.shea-online.org/content/sheacdc-outbreak-response-training-program-ortp#group-tabs-node-course-default1/index.php>
 - Rapid Response Program podcast and webinar series <https://learningce.shea-online.org/content/novel-coronavirus-covid-19>
 - **Association for Professionals in Infection Control and Epidemiology**
 - COVID-19 Page: <https://apic.org/covid19/>
 - LTC text chapters: <https://apic.org/resources/apic-text/apic-text-chapter-collection-long-term-care/>
 - **American Medical Association, Resource Center for Physicians** - <https://www.ama-assn.org/delivering-care/public-health/covid-19-2019-novel-coronavirus-resource-center-physicians>
 - **American Nurses Association Resource Center** - https://www.nursingworld.org/practice-policy/work-environment/health-safety/disaster-preparedness/coronavirus/?utm_campaign=261605+COVID-19+MKT&utm_source=hero&utm_medium=digitalad&utm_content=covidresourcepage
 - **American Dental Association** - COVID-19 Center - <https://success.ada.org/en/practice-management/patients/infectious-diseases-2019-novel->

- [coronavirus?utm_source=cpsorg&utm_medium=covid-nav&utm_content=nav-covid-19-center&utm_campaign=covid-19](https://www.cdc.gov/coronavirus/2019-ncov/community/critical-workers/transportation/index.html)
- **Argentum (senior living)** - Toolkit - <https://www.argentum.org/coronavirustoolkit/>
 - Critical infrastructure workers
 - Implementing Safety Practices for Critical Infrastructure Workers Who May Have Had Exposure to a Person with Suspected or Confirmed COVID-19: <https://www.cdc.gov/coronavirus/2019-ncov/community/critical-workers/implementing-safety-practices.html>
 - Transportation and Delivery Workers:
 - <https://www.cdc.gov/coronavirus/2019-ncov/community/transportation/index.html>
 - Airport, Airline Workers
 - What Airline Customer Service Representatives and Gate Agents Need to Know about COVID-19: <https://www.cdc.gov/coronavirus/2019-ncov/community/airport-customer-factsheet.html>
 - What Airport Baggage and Cargo Handlers Need to Know about COVID-19: <https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/airport-baggage-cargo-handlers.html>
 - What Airport Custodial Staff Need to Know about COVID-19: <https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/airport-custodial-staff.html>
 - What Airport Passenger Assistance Workers Need to Know about COVID-19: <https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/airport-passenger-assistance-workers.html>
 - What Aircraft Maintenance Workers Need to Know about COVID-19: <https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/aircraft-maintenance-workers.html>
 - Other transit workers:
 - What Bus Transit Operators Need to Know About COVID-19: <https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/bus-transit-operator.html>
 - What Rail Transit Operators Need to Know About COVID-19: <https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/rail-transit-operator.html>
 - What Transit Maintenance Workers Need to Know About COVID-19: <https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/transit-maintenance-worker.html>
 - What Transit Station Workers Need to Know About COVID-19: <https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/transit-station-workers.html>
 - Occupational Safety and Health Administration resources
 - Control and Prevention: <https://www.osha.gov/SLTC/covid-19/controlprevention.html>
 - Guidance on Preparing Workplaces for COVID-19: <https://www.osha.gov/Publications/OSHA3990.pdf>
 - Return to work
 - Criteria for Return to Work for Healthcare Personnel with Confirmed or Suspected COVID-19 (Interim Guidance): <https://www.cdc.gov/coronavirus/2019-ncov/hcp/return-to-work.html>
 - PPE reuse guidance
 - Strategies to Optimize the Supply of PPE and Equipment (including eye protection, isolation gowns, facemasks, N95 respirators, elastomeric respirators, and ventilators): <https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/index.html>

- Decontamination and Reuse of Filtering Facepiece Respirators: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/decontamination-reuse-respirators.html>
- Personal Protective Equipment (PPE) Burn Rate Calculator: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/burn-calculator.html>
- Sustainable Isolation
 - Interim Infection Control Guidance for Public Health Personnel Evaluating Persons Under Investigation (PUIs) and Asymptomatic Close Contacts of Confirmed Cases at Their Home or Non-Home Residential Settings at <https://www.cdc.gov/coronavirus/2019-ncov/php/guidance-evaluating-pui.html>
 - Public Health Guidance for Potential COVID-19 Exposure Associated with International Travel or Cruise Travel at <https://www.cdc.gov/coronavirus/2019-ncov/php/risk-assessment.html>
 - Public Health Recommendations for Community-Related Exposure at <https://www.cdc.gov/coronavirus/2019-ncov/php/public-health-recommendations.html>
 - Links to programs to support people in isolation: <https://www.cdc.gov/coronavirus/2019-ncov/daily-life-coping/index.html>
 - Links to housing support for people without safe places for isolation: <https://www.cdc.gov/coronavirus/2019-ncov/community/homeless-shelters/unsheltered-homelessness.html>
 - Links to federal programs- unemployment etc.
 - www.coronavirus.gov
 - <https://www.coronavirus.gov/smallbusiness/>
 - <https://www.irs.gov/coronavirus-tax-relief-and-economic-impact-payments>
 - <https://www.usa.gov/unemployment>
- Call center for clinical inquiries 24/7 (770-488-7100)
 - <https://www.cdc.gov/cdc-info/ask-cdc.html>
- Others
 - NIH COVID-19 Treatment Guidelines: <https://www.covid19treatmentguidelines.nih.gov/overview/>
 - Therapeutic options: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/therapeutic-options.html>
 - Infectious Diseases Society of America Guidelines: <https://www.idsociety.org/practice-guideline/covid-19-guideline-treatment-and-management/>
 - Information for Pediatric Healthcare Providers: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/pediatric-hcp.html>
 - Considerations for Inpatient Obstetric Healthcare Settings: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/inpatient-obstetric-healthcare-guidance.html>
 - Interim Guidance for Implementing Home Care of People Not Requiring Hospitalization for Coronavirus Disease 2019 (COVID-19): <https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-home-care.html>

Contact Tracing

- [Contact Tracing Overview: https://www.cdc.gov/coronavirus/2019-ncov/php/open-america/contact-tracing.html](https://www.cdc.gov/coronavirus/2019-ncov/php/open-america/contact-tracing.html)
- [Principles of Contact Tracing : Part of a Multipronged Approach to Fight the COVID-19 Pandemic: https://www.cdc.gov/coronavirus/2019-ncov/php/principles-contact-tracing.html](https://www.cdc.gov/coronavirus/2019-ncov/php/principles-contact-tracing.html) (also see PDF booklet: <https://www.cdc.gov/coronavirus/2019-ncov/downloads/php/principles-contact-tracing-booklet.pdf>)

- [Sample Contact Tracing Training Plan: https://www.cdc.gov/coronavirus/2019-ncov/downloads/php/contact-tracing-training-plan.pdf](https://www.cdc.gov/coronavirus/2019-ncov/downloads/php/contact-tracing-training-plan.pdf)
- Digital Contract Tracing Tools for COVID-19: <https://www.cdc.gov/coronavirus/2019-ncov/downloads/digital-contact-tracing.pdf>
- Preliminary Criteria for the Evaluation of Digital Contact Tracing Tools for COVID-19: <https://www.cdc.gov/coronavirus/2019-ncov/downloads/php/prelim-eval-criteria-digital-contact-tracing.pdf>
- External partners tools/resources
 - **Association of State and Territorial Health Officials:** Making Contact: A Training for COVID-19 Contact Tracers Introductory Online Course: <https://learn.astho.org/p/ContactTracer>
 - **Johns Hopkins Bloomberg School of Public Health Center for Health Security:** Review of Mobile Application Technology to Enhance Contact Tracing Capacity for COVID-19 <https://www.centerforhealthsecurity.org/resources/COVID-19/COVID-19-fact-sheets/200408-contact-tracing-factsheet.pdf>
 - **National Association of County & City Health Officials:** Building COVID-19 Contact Tracing Capacity in Health Departments to Support Reopening American Society Safely: <https://www.naccho.org/uploads/full-width-images/Contact-Tracing-Statement-4-16-2020.pdf>

Appendix D: Guidance on Test Usage (Asymptomatic Populations and Serology)

Information on testing prioritization can be found here: <https://www.cdc.gov/coronavirus/2019-nCoV/hcp/clinical-criteria.html>

Testing asymptomatic populations

Testing of asymptomatic individuals is a growing consideration as the role of asymptomatic and subclinical infections in transmission becomes more apparent. Emerging evidence suggests that asymptomatic infections may play an important role in the epidemiology of the disease. Nevertheless, it is important to define the circumstances where testing asymptomatic persons is likely to be helpful in controlling the COVID-19 pandemic. Effective testing programs will focus on (1) persons with an increased likelihood of infection and (2) settings with particularly vulnerable populations, including but not limited to the following:

- Contacts of known (symptomatic or asymptomatic) cases. This may include testing of contacts going back one to two weeks before the onset of symptoms, particularly contacts who work with vulnerable populations.
- Residents and staff of long-term care facilities. Periodic testing and sentinel surveillance in these settings may serve to detect outbreaks early in this setting, where devastating outbreaks are known to occur and to be associated with high rates of asymptomatic infection. CDC is updating guidance for surveillance in these settings <https://www.cdc.gov/coronavirus/2019-ncov/hcp/long-term-care.html>.
- Other healthcare facility workers and first responders. Healthcare facilities may consider testing staff periodically, starting with staff in high traffic, high risk areas such as emergency departments.

Serologic testing

Serologic testing currently has little role in the diagnosis of acute disease but is already playing an important role in the response to the pandemic. The uses of serologic testing fall into two broad categories: serologic surveillance of populations and serologic testing of individuals for proof-of-prior infection.

Serologic surveillance

<https://www.cdc.gov/coronavirus/2019-ncov/covid-data/serology-surveillance/index.html>

Serologic surveillance has the potential to provide a more complete picture of how much infection has occurred already in the United States. Case-based surveillance for anything with a wide spectrum of severity will always miss many cases, and it is increasingly clear that a substantial proportion of SARS-CoV-2 infections are asymptomatic. To the degree that SARS-CoV-2 infection results in measurable antibodies, serologic testing will pick up any infection.

The purposes of serologic surveillance are the following:

- To provide a more complete estimate of the incidence of infection.
- To determine the proportion of the population that is already immune.
- To better understand transmission.
- To evaluate the impact of community mitigation measures.

CDC has published its COVID-19 Serology Surveillance Strategy at

<https://www.cdc.gov/coronavirus/2019-ncov/covid-data/serology-surveillance/index.html>

External serosurveys

- CDC will support state, tribal, local, and territorial health authorities to plan and implement serosurveys in their populations with known prior exposure. Serial antibody tests, initial and confirmatory, will be used in all field studies to ensure enhanced positive predictive values.

Serologic testing of individuals for proof-of-prior infection (immunity)

<https://www.cdc.gov/coronavirus/2019-ncov/testing/serology-overview.html>

While the lay public often mistakenly refers to this as “serologic surveillance”, it is fundamentally different and is at its core a clinical activity designed to guide decisions about specific individuals by determining whether or not they are already immune to the infection. Serologic testing may play a role in a back-to-work strategy provided it can be shown that serologic testing can reliably infer immunity. This immunity may not need to be absolute: protection against severe infection may be enough even if immunity against reinfection isn’t reliable or durable.

While there appears to be considerable public optimism that serologic testing will allow return to work without the need for PPE or other precautions, there are many unknowns at this early date that limit implementation of serology for this purpose:

- The correlates of immunity to SARS-CoV-2 are not known and there are few or no data to confirm that antibodies detected in serologic tests correlate with such immunity. Studies in the US military during the 1970s showed that reinfection with endemic coronaviruses occurred in the presence of low levels of antibodies. Nonetheless, most experts feel immunity from infection is likely at least in the short term.
- The performance characteristics of serologic assays are not yet known, although there is much work ongoing to define those characteristics. Typically, a well-performing single step serologic assay may be expected to have a specificity of 95% (sensitivity is a secondary concern here, although also important), which is likely not enough for this purpose, given the potential consequences of COVID-19. Combining two different tests will be critical for improving performance and should be part of any strategy to utilize serologic testing for “immunity” determinations.
- The current seroprevalence is likely to be highly variable. In New York City, for example, with one of the highest incidence rates in the country, a recent survey among customers of retail outlets found a seroprevalence of 22%. Preliminary data at CDC from remainder clinical specimens in the New York City area found about half that rate; in Western Washington, the preliminary rate was closer to 5%. This has two implications:
 - At best, the use of serologic testing for a back-to-work strategy would likely benefit fewer than 10% of the population currently.
 - In the setting of a relatively low seroprevalence, any serologic test would have to have excellent performance characteristics. If a test with 95% specificity were used in a population with a true seroprevalence of 5%, almost half all “positives” would be false-positive and not immune and therefore must include 2 serial tests to confirm all positive results.
- There is a need for high-level consensus on the role of serologic testing in a back-to-work policy. The stakes are high for such a policy, so that in addition to the scientific data, there is also a need to have political consensus on this issue. Consensus is also needed on a plan for how to provide documentation of that immunity, be it through federal- or state-based immunity registries, digital proof-of-immunity, or physical documentation such as “immunity certificates”.

Despite these limitations, continued interest in the use of serologic testing in a back-to-work policy is likely. In the meantime, CDC is doing the following:

- Working with NIH/NCI, FDA, and ASPR on evaluating the first panel of 25 serologic assays. More testing will quickly follow these tests.
- Designing studies to track healthcare workers long term to monitor for evidence of reinfection.
- Tracking seroprevalence nationally, as described above.