

# Contact Tracing Programs of California and New York State

## A Comparison and Evaluation

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*The contact tracing programs for the COVID-19 pandemic of the states of California and New York are compared using a system of criteria developed by a group of scientists with Vital Services, a global public health organization that creates documents and guidelines that larger government bodies are meant to implicate into their own systems to have the most success possible in a public health crisis. Positive case data from the Center for Disease Control (CDC) and pieces of legislation passed in each state were analyzed in the lens of the criteria from the COVID-19 Contact Tracing Playbook provided by Vital Services. Findings showed that each state had certain strengths and weaknesses within the ten criteria used to measure the efficiencies of their contact tracing systems. In summation, the states of California and New York, as well as states and nations globally, could benefit from assessing their systems in this fashion in order to maintain high standards of public health throughout the COVID-19 pandemic.*

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### Background on the COVID-19 Pandemic in the United States

The COVID-19 pandemic began in December 2019 when the first case was identified in Wuhan, China (“First”). On 20 January 2020, the first positive case was identified in the state of Washington, and due to the rapid spread of the disease, the lockdown of the United States began on 13 March 2020 (“First Travel-Related Case”). In the weeks preceding the lockdown, the positive case counts across the country continued to rise,

between 20 January 2020 and 13 March 2020, 1,317 cases were identified (US Department of Health and Human Services).

Contact tracing is a method of disease containment that has been commonly used in the COVID-19 pandemic (Steele, et al.). The process prevents infected individuals from further infecting others while simultaneously providing care to the isolated infected people. After being tested for COVID-19, positive cases are notified of their status as either positive or probable positive cases and apprised of their isolation and treatment options. Contact tracers communicate with such cases to identify their contacts during their infectious period, or the time in which a person can transmit the disease. Communication



I am a Molecular Biosciences and Biotechnology major, and I wrote this piece in Composition I in my first semester at the University of Hawai‘i. I gained valuable insight by writing a scientific paper for an English course, and overall the process reminded me of the importance of accessibility to any audience, scientific or otherwise. I thoroughly enjoyed the development of this piece, from initial research to the final stages of publication.

is needed with identified contacts to inform them of potential exposure, assess symptoms if existent, provide guidance to a testing center regardless of whether they are symptomatic or asymptomatic, offer medical care if the cases are symptomatic, and give clear instructions on quarantine procedures. The positive case that was initially identified and all of their contacts need to be monitored each day until the 14-day infectious period of the coronavirus is over; taking note of any symptoms the cases present, as well as daily temperatures (Steele, et al.). This system of contact tracing repeats itself as new positive cases are identified and more potential contacts are provided, and as more infected individuals isolate themselves, they prevent further infection of the population, thereby controlling the disease outbreak.

The United States is a particularly interesting case study of COVID-19 contact tracing effectiveness because of the independence that each state has concerning disease control among the state populations. This independence granted to state governments and state health departments permits a more focused study of the measures taken to contain the coronavirus in each state, therefore a comparison of two states ought to reveal the areas in which states must improve upon their efforts and which areas states have success in. The states selected for comparison, California and New York, are optimal for study for a multitude of reasons: they are both very large in population, both have large cities that are densely populated and are major international travel centers, therefore they have been “hotspots” (major infection areas) for coronavirus cases. The similarities between the two states allow an accurate comparison based on positive case data over time that will not be skewed by population differences.

## Framework of Comparison

The *COVID-19 Contact Tracing Playbook* is a resource that provides, “clear and actionable technical guidance and tools for U.S. health departments to rapidly set up and implement contact tracing to support COVID-19 containment” (Steele, et al.). This resource was compiled by experts in the medical field and world health crises of a global public health organization called Vital Services to communicate the most important aspects of a contact tracing program that are vital to disease containment in a pandemic situation (Steele, et al.).

The playbook outlined ten “domains” of a successful contact tracing program, and for this study, four categories have been identified to group similar domains. The italicized categories and the domains within them are listed.

The *Preparation* category includes “creating contact tracing protocols and forms” and the “public health workforce” (Steele, et al.). As previously stated, the state government and the state health department are responsible for creating their contact tracing methodologies for contact tracers as well as the

procedures for healthcare workers, with guidance from the federal government as well as the CDC. This time for preparation is not simply about creating policy, it is about implementing it through the distribution of information and training (Steele, et al.).

*Enabling Isolation and Quarantine* encompasses the domains, “providing services to support people in isolation and quarantine,” “clinical consultation,” and “facilities for out of home isolation and quarantine” (Steele, et al.). Each state is responsible for providing resources for the positive and probable positive cases, and the more resources that are available, the better individuals can isolate or quarantine. Isolation and quarantine are measures that lessen the risk of disease spread through a community, therefore more effective isolation and quarantine results in fewer positive cases (Steele, et al.).

*Transparency* is a very important aspect of a contact tracing program, and it includes “digital and technology solutions,” “privacy and data sharing,” and “public communication” (Steele, et al.). The amount of technology in existence today lends a potential for contact tracing to include technological additions that could increase the effectiveness of the tracing process, however as the breadth of technological reach has expanded over time, the concern about privacy has increased. Communication between the public and the state governments in charge of public safety is relevant as well, as quelling public concerns is key to encouraging participation and cooperation with contact tracing procedures (Steele, et al.).

Each state engages in *Performance Assessment* to secure the quality of their contact tracing programs, and that is achieved through the domains, “case reporting” and “metrics and monitoring” (Steele, et al.). Case reporting is the term used to describe the timeliness of identifying individuals that have tested positive for COVID-19. Metrics and monitoring is a way of tracking performance indicators for the contact tracing programs themselves, and some performance indicators used in this study are: the number of tests performed, the number of positive cases, and the positivity rates of each state (Steele, et al.).

The “10 Domains” provide a credible and unique base for measuring the success or effectiveness of contact tracing programs because they show that a program can have strengths in one domain but weaknesses in others; meaning that the measure of a programs’ efficiency is multifaceted. These measures can be used to assess the contact tracing programs of California and New York, and the effects of each state’s strengths and weaknesses can be observed through the analysis of their COVID-19 case data.

## Preparation

### CONTACT TRACING PROTOCOLS

The sequence of events that capture contact tracing is relatively similar between California and New York. Once a positive

result is identified, the individual is asked for their name, age, where they have gone, and who they have been in contact with (“Contact Tracing”; New York State Department of Health). Once the exposed are identified, they must be contacted as well. California contact tracers call, text, and email if they must to get in contact, while New York tracers only use call and text. In both states, the exposed individuals are told their status, but not given the identity of the person who exposed them. The follow-up process is extremely important, as a thorough review is necessary to ensure all possibly infected individuals are contacted. If tracers are unaware of the length of an infection chain (or the number of people that are potentially infected), the data provides unrelated smaller chains in local areas without an understanding of where the hotspots are located specifically. These hotspots need direct attention from the public health departments to gain control of an outbreak. The identification of geographical trends is particularly vital to larger states, such as the two in question. California tracers follow up with exposed individuals to track whether or not symptoms arise, as do New York’s (“Contact Tracing”; New York State Department of Health).

#### PUBLIC HEALTH WORKFORCE

The training given to contact tracers in California and New York is significantly different. Primarily, the training for Californians consists of the COVID-19 Virtual Training Academy and the course, “Making Contact: A Training for COVID-19 Contact Tracers” (“COVID-19 Virtual Training Academy”). New York contact tracers must complete a course called “COVID-19 Contact Tracing,” offered by John Hopkins Bloomberg School of Health and funded by Bloomberg Philanthropies (Gurley). The required training for California (CA) requires 23 hours to complete while New York (NY) training requires 7 hours. Californian tracers are given over three times the training hours that New Yorkers receive, which suggests a difference in competency. The CA training consists of independent study and pre-lesson materials that must be reviewed before the actual training that is given over Zoom for synchronous instruction (“COVID-19 Virtual Training Academy”; Gurley). NY’s lessons are asynchronous and composed of instructor videos, readings, and quizzes (Gurley). The scope of these training modules differs as well. The tracers must be knowledgeable about the protocols and regulations established at federal and state levels, and the CA program accomplishes this through the requirement of the “Making Contact: A Training for COVID-19 Contact Tracers” course, which provides an overview of federal regulations brought about by COVID-19 and is used as a supplement to their state training (“ASTHO & NCSD Launch Training”). The education that contact tracers receive is deemed the responsibility of the state government, therefore the state decides to prioritize aspects of contact tracer education as they see fit.

#### SUMMATION

It seems that in both domains, New York and California are nearly evenly matched. The only hindrance lies in New York’s contact tracer training. The education contact tracers receive in New York is significantly less than that of California tracers, suggesting a gap in understanding of pandemic regulations at multiple levels of government in NY contact tracers. Without a cumulative education, tracers’ ability to inform positive and exposed citizens is debatable.

### Enabling Isolation and Quarantine

#### PROVIDING SERVICES TO SUPPORT PEOPLE IN ISOLATION AND QUARANTINE

Once a positive case is identified, they are asked by contact tracers to *isolate* for fourteen days to prevent infection of others. Any person those positive cases have been in physical contact with are asked to *quarantine*, hence the difference in the terms. New York has released a variety of resources, and “...local health departments (‘LHDs’) must help these individuals meet their housing, social, medical, mental health, and economic needs” (Sholinsky); meaning all areas of the state have access to the resources dictated at the state level. Governor Andrew Cuomo of New York released guidance in early March dictating that the following resources were available: provision of food, shelter, medications, and laundry; access to mental health and social service needs that are culturally and linguistically appropriate, communication needs such as phones and internet, personal hygiene supplies, financial resources if unemployed, and support for the family, friends, and pets. The resources accessible to California residents, however, are less variant. Those that have tested positive for COVID-19 have access to medical care, “regardless of income, health insurance, or immigration status” and those exposed to the infected are qualified to receive, “free, confidential testing regardless of income, health insurance, or immigration status” (“Contact Tracing”). There may be subsidies available for childcare as well. Nathan Nau, the Chief of Managed Care Quality and Monitoring Division of the Department of Health Care Services of California, released a letter in April encouraging all Californians with Medi-Cal managed health plans to use the dial, “211” for all local food and human service needs.

#### CLINICAL CONSULTATION

The state of California Public Health Department details how Californians can gain access to telehealth services, which the California Connected initiative deems is specifically for COVID-19 symptom assessment and advising, while mental health concerns can be directed to various hotlines. Uninsured and MediCal managed insureds can call Medi-Nurse to speak

with a health care professional and be advised on treatment (“Getting Health Care From Home”). Those with private insurance, MediCal plans, or MediCal Advantage plans are advised to call their primary care physician (PCP) if they have one. If the physician is not available or they do not have a PCP, the best course of action is to call the Medi-Nurse or to use the search tool provided to find telehealth operations that use the type of insurance an individual carries (“Getting Health Care From Home”). New Yorkers with private plans and Medicaid plans are covered in terms of telemedicine as of 2016, and providers of telemedicine are reimbursed through Medicaid for their services (eVisit). New York has taken a different approach to the issue of uninsured people; rather than providing uninsured resources, the state is allowing all uninsured people to apply for coverage through the NY State of Health, New York State’s health insurance marketplace, or directly through insurers; an option that was extended from the original date of 15 September 2020 to 31 December 2020 (Press Office, Governor of NY).

#### FACILITIES FOR OUT-OF-HOME ISOLATION AND QUARANTINE

In California, the Department of Public Health determined in late July that local health departments (LHDs) must work with local sectors to find places for unhoused people or those that cannot isolate or quarantine in their homes safely, including hotels, college dormitories, and the conversion of public areas for isolation and quarantine purposes (*Guidance on Isolation and Quarantine*). In the state of New York, however, it is not clear if they provide out-of-home isolation facilities for those that cannot isolate themselves properly in their homes. New York homeless shelters were given guidelines by the Office of Temporary and Disability Assistance in collaboration with Governor Cuomo, Commissioner Michael P. Hein, and Executive Deputy Commissioner Barbara C. Guinn to ensure proper safety measures were followed to protect the homeless and the shelter staff.

#### SUMMATION

The resources that New York provides for its residents far surpass those offered by the state of California, both in quantity and quality. New York’s approach to the crisis that uninsured individuals are facing in the COVID-19 pandemic is proactive compared to California’s because the state is providing insurance rather than providing resources that enable baseline care that the uninsured community typically receives. California seems to provide a wider scope of facilities for out-of-home isolation and quarantine than New York. New York and California have taken different approaches to the resources they provide; in the cases of resources provided and uninsured services, California can improve, while the same can be said about New York in its lack of out-of-home facilities.

## Transparency

### DIGITAL AND TECHNOLOGY SOLUTIONS

California currently uses a Virtual Assistant, which is a text system that acts as a check-in service as part of their follow-up procedure to use with exposed individuals. California does not use any app based technology in their contact tracing program, however, New York does. On 1 October 2020, the state of New York released the app, “COVID Alert NY” for iPhones and Androids, developed by Apple and Google with the collaboration of Bloomberg Philanthropies (Leswing, et al.). The app uses Bluetooth technology: when Bluetooth signals interact between cell phones, the phone detects the other device. If a person using this app becomes ill, the phone will have a record of any other phones’ signals it interacted with, which leads to greater accuracy in the number of exposed individuals (Leswing, et al.). This app is only used if New Yorkers opt into its use, therefore it is completely voluntary and according to Governor Cuomo, it does not collect any personal information whatsoever. It is estimated by Apple and Google that if fifteen percent of the population installs this app, it could reduce the infections through their exposure notification technology (Leswing, et al.). The app is meant to be a facilitator of the current contact tracing program used in New York, not a replacement for it (Leswing, et al.).

### PRIVACY AND DATA SHARING

New York and California have passed legislation to protect their citizens’ privacy in the data they provide in the contact tracing process. New York bills A10500 and S8450A state that all information collected by contact tracers is confidential and can only be accessed by law enforcement with a court order or to health care providers that need verification to permit sick leave or reimbursement of healthcare services (Association of State and Territorial Health Officials). Bill A10462 details increased privacy protection for contact tracing data and an individual’s continued control over their data post-collection. Another bill, S8327, states that it is against the law to purposefully disclose contact tracing information to an unauthorized person or party. The bills A10583 and S8448B detail the laws specific to the app “COVID Alert NY,” which are that the app must disclose information to those that download it, including the right to opt-in, right to privacy, the privacy policy, the time data is maintained, and the individual’s right to access their data. These bills also allow users to sue for violations of the above laws (Association of State and Territorial Health Officials). California’s laws are similar, and less complex because CA does not use an app within their contact tracing system. The Virtual Assistant collects private information and is protected and used strictly for public health reasons (COVID-19 Contact Tracing). The Virtual Assistant is accessed through a

secure link that is unique to each person. Some codes pertain to the entire system, California Connected, as well. Civil code 1798.17 requires that each individual is notified that information collected through California Connected is requested by the Division of Communicable Disease Control and that the request is authorized by the California Health and Safety code section 120130 and Title 17 of California Code of Regulations Section 2505. All of the information provided to California Connected is confidential, collected in a manner that protects privacy, and is pursuant by law. Everyone can access their information and it can only be disclosed to those with a judicial order or warrant or by request of the California State Auditor (“COVID-19 Contact Tracing”).

### PUBLIC COMMUNICATION

The public communication domain is assessed by the ease of finding information in all of the domains listed thus far and by the educational resources available to the public. Citizens of California and New York are likely to report to the public health sites of their respective states. Therefore, these sites need to have as much information as possible. There is much more information localized to one area on California’s public health site, although reference to other non-state government sources for some information is necessary, such as the privacy laws for New York and the testing strategies of California. There are instances in which information provided by state websites is vague and unclear, such as information on California’s resources provided to isolated and quarantined citizens. There are also instances in which information is almost impossible to find, such as New York’s out-of-home isolation facilities. Each state has some weaknesses in its information accessibility.

### SUMMATION

California does not use an app to facilitate the efforts of contact tracers. Although an app could be helpful to the containment of COVID-19, studies are still being conducted and the choice to not use an app does avoid many public privacy concerns. It is concerning that New York’s contact tracing app was co-developed by Bloomberg Philanthropies because this private group is very involved in the training of contact tracers as well. Bloomberg Philanthropies’ involvement in a state program is slightly odd: Mike Bloomberg is the former mayor of New York City; however, he is no longer a politician in charge of public safety, he is a private citizen and a businessman. The contact tracing program is the responsibility of the state and federal government, not the private sector. Bloomberg’s involvement puts the validity and reliability of New York State’s contact tracing program in jeopardy. Both states have strong legislation to protect citizen’s privacy and defend against data sharing. There are bills and codes about the specific technological solutions each state uses as well as their contact tracing systems overall,

which generates strong public trust. New York and California have some weaknesses in public communications, however, the amount of information that was found surpassed the amount that was unclear or unable to be found. Both states have room for improvement in the public communication domain.

## Performance Assessment

### CASE REPORTING

There is a range of turnaround times on test results depending on the state and sometimes at the county level if it is a hotspot for coronavirus infections; therefore it is difficult to ascertain the effectiveness by the estimated turnaround times in these areas. Rather than attempting to find an average turnaround time for each state, the testing plans for each state from the Epidemiology and Laboratory Capacity for Prevention and Control of Emerging Infectious Diseases (ELC) for Enhancing Detection provide details on the current testing capacity and plans for New York and California.

Case reporting can be measured by the number of tests through-put per day because, in theory, the more tests completed a day results in a larger amount of the population being tested, which is an asset to a contact tracing program when outbreaks can be determined more rapidly. The state of California through-puts 67,000 tests each day, while New York produces 50,000 each day (ELC: California; ELC: New York). Although this makes it seem as though California is producing greater results than New York, relative to the population of each state, the opposite is true. At the current number of test results produced each day, California is testing approximately .17% of its population each day and New York is testing .25% (ELC: California; ELC: New York). New York is testing a significantly higher percentage of its population, therefore the state is likely able to identify outbreaks faster.

Another factor that can contribute to the case reporting of these states is the number of testing entities that the state uses. As outlined in the ELC for Enhancing Detection for California and New York, it is stated that California is utilizing 53 testing entities while New York is utilizing 74 entities. The state of California is taking advantage of the University of California campuses as testing entities, while New York has taken a different approach by positioning testing entities in each county of the state. New York’s approach produces faster results by its population size because it has many entities that analyze a smaller amount of the total tests each day. Therefore, they are not overloaded and turnaround times are shorter.

### METRICS AND MONITORING

The overall number of tests performed in California is 18,308,063, while New York has performed 14,152,636 (Cen-

ters for Disease Control and Prevention). California has indeed tested more than New York, although that is to be expected because California's population is larger. A test rate per 100,000 can be used to make the numbers more accurate to population size. California has a test rate of 46,282 per 100,000, while New York's is 127,003 per 100,000 (Centers for Disease Control and Prevention). This indicates that New York has tested in a greater volume throughout this pandemic. It is also important to note that these figures do not indicate that each test represents one person in the population, rather one person could have tested multiple times. Although this note reduces the probable test rate per 100,000 the difference between those of New York and California are significant enough that a margin of error would not impact the fact that New York has tested in greater numbers, especially because their population is smaller in comparison to California.

The number of positive cases since the beginning of the pandemic in March of 2020 has an interesting trend over time. Figure 1 and Table 1 show these trends in the number of cumulative positive cases since the first confirmed case in each state by calculating the sum of cases reported at the end of each month, from March through September.

By the end of March, New York had a significant lead on positive cases by over 75,000 cases (see table 1). However, by 31 July 2020, California had surpassed New York in its positive case count. This can be explained by the spike seen in the trendline in Figure 1 that occurs just to the right of the date of 30 June 2020, not coincidentally close to the date 4 July 2020. This holiday caused many to celebrate in groups without practicing social distancing and wearing masks, although authorities advised against it. After that day, the cases in California continued to grow. By 30 September 2020, the state in the lead in terms of COVID-19 cases had reversed and the difference

was greater than 300,000 cases (see table 1). In general terms, the slope of the trendline is an indicator of how fast the disease has spread over time. The slope of the New York trendline is visibly less steep than that of California, meaning that the spread of coronavirus in California is more rapid. This figure holds accuracy despite the population sizes in each state.

The positivity rate is an important measurement that is calculated by dividing the total number of positive cases by 100,000, which is 7.9 in California and 4.5 in New York. This reinforces the idea presented in Figure 1, that the rate of increase in positive cases is greater in California than in New York. Granted, the population in California is larger than that of New York, which could influence the positivity rate. To calculate the percent of the population in each state that has or has had coronavirus, the total number of positive cases is divided by the total population, then multiplied by 100. These calculations revealed that 20% of California has/had COVID-19, compared to approximately 2.4% of New York's. It is unmistakable that the spread of coronavirus in California has gone more widely unprevented over seven months.

## SUMMATION

New York has higher case reporting than California, as shown by the greater throughput per day due to the greater number of testing entities. The state of California also has tested less overall and has a higher positivity rate than New York. It stands to reason that the contact tracing program in New York can trace more effectively because of their reduced reaction time due to better case reporting, and the effects of faster case reporting are shown by the metrics and monitoring of the efforts of contact tracers.

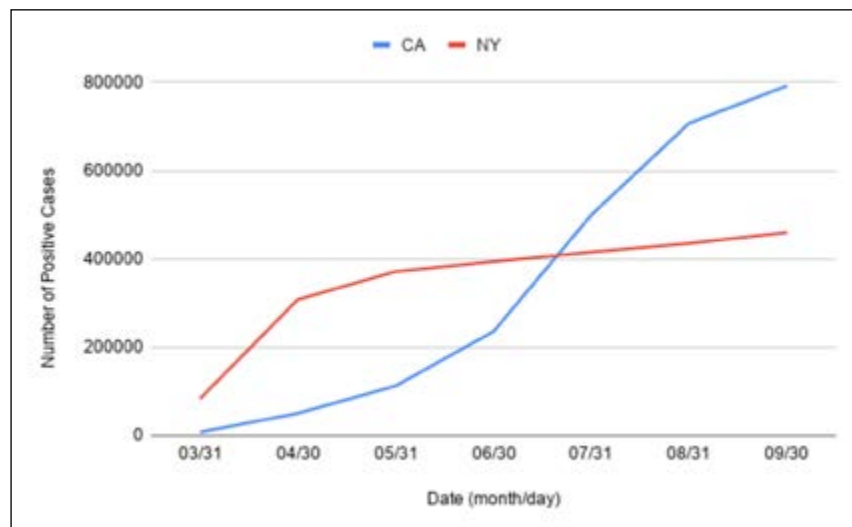


Figure 1. Total Positive Cumulative Cases by Date. Sources: California Open Data, NYS COVID 19 Dashboard, CDC COVID Data Tracker.

## Conclusion

The data explained in “metrics and monitoring” and “case reporting” shows that New York has a stronger handle on its contact tracing abilities. The numbers show that New York State is doing well, which means that their strengths over California must be considered as influential factors: greater amounts of resources provided to the isolated and quarantined, provision of insurance to the previously uninsured, the use of the COVID Alert NY app, testing greater amounts of the population daily, and using a greater quantity of testing entities. New York’s contact tracing system, however, is not without its faults: it has a lack in the breadth of the contact tracer training, the out-of-home isolation and quarantine facilities, the training of contact tracers, and the COVID Alert NY app are influenced by Bloomberg Philanthropies. California ought to consider its weaknesses and find ways to improve its contact tracing system, as should New York.

## Applications of Conclusions

As the coronavirus pandemic continues, programs will have to improve upon themselves and the use of an evaluative framework such as the one used in this study are perfect for evaluating all aspects of a contact tracing program, not simply judging the effectiveness of a program by the positive case data over time. This idea of consistent evaluation can stretch beyond the United States; it can extend to countries around the world that are also struggling with the COVID-19 pandemic. It may be possible that collaboration between states and countries concerning contact tracing programs could lead to an analysis of all programs. Through the same process used in this study, strengths from all programs can be identified and an agreed-upon worldwide pandemic plan could be reached, which could prepare the world for the next pandemic and save many lives.

**Table 1** Total Cumulative Positive Cases

STATE	DATE						
	03/31	04/30	05/31	06/30	07/31	08/31	09/30
CA	8155	5 0443	112797	236139	500130	707797	792369
NYS	83712	308314	371711	394079	415767	435510	460031

Sources: California Open Data, NYS COVID 19 Dashboard, CDC COVID Data Tracker.

**Table 2** Summary of Similarities and Differences by Category

	PREPARATION	ENABLING OF ISOLATION AND QUARANTINE	TRANSPARENCY	PERFORMANCE ASSESSMENT
Similarities	<ul style="list-style-type: none"> <li>Step by step contact tracing basic process</li> <li>Follow up with positive and probable cases</li> </ul>	<ul style="list-style-type: none"> <li>Offer medical care to positive cases</li> </ul>	<ul style="list-style-type: none"> <li>Privacy legislation for contact tracing information was passed</li> <li>Room for improvement in accessibility of information</li> </ul>	<ul style="list-style-type: none"> <li>Spikes in positive cases in early July</li> </ul>
Differences	<ul style="list-style-type: none"> <li>NY has lesser tracer training, both in hours and in content</li> </ul>	<ul style="list-style-type: none"> <li>NY offers more resources overall than CA</li> <li>NY offers insurance to the uninsured, CA offers uninsured resources</li> <li>CA offers many out-of-home isolation options, those of NY are unclear</li> </ul>	<ul style="list-style-type: none"> <li>NY uses an app for contact tracing, CA does not</li> <li>NY has the private sector involved in the creation of the app, CA does not have private sector involvement</li> </ul>	<ul style="list-style-type: none"> <li>NY positioned testing entities in each county, CA did not</li> <li>NY has a higher case reporting than CA</li> </ul>

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