

CA Notify:

Getting to Immunity with Automated Reporting



Emerging & Innovative Technology

Amy Tong, amy.tong@state.ca.gov
Director and State CIO,
California Department of Technology

Holly Howard, holly.howard@CDPH.ca.gov
Program Director, CA COVID-19 Contact Tracing
Program, California Department of Public Health

Project launched in Fall 2020 and
fully implemented by December 2020

Idea

Private, Secure and Anonymous Reporting

Late in 2020, before vaccine was available, the only way to slow the spread of COVID-19 was through limiting exposure through social distancing and mask wearing. It was imperative to find a way to securely and privately notify other people that they may have come in contact with the virus.

Automating the reporting process would allow contact notifications to people who didn't know each other, and the anonymous exposure alerts would speed up notification and reach contacts who would not be picked up by manual tracing. The basic idea was for users to download or sign up for the app, keep their blue tooth on, and if they receive a positive COVID-19 test, share their results with CA Notify. Any other CA Notify user that came in close proximity would receive an alert of possible exposure. Safe, secure, private and contactless.

Implementation

Collaboration between State, University and Private Partners

Major partners in the CA Notify project included the California Department of Technology, the California Department of Public Health, University of California San Diego, Google, Apple and the California Governor's Office.

CDT worked closely with Google engineers to devise a method to automate the distribution of verification codes, which was the cornerstone of success for California. Building on an innovation piloted by the State of Colorado to use automated scripting to distribute codes to all individuals that tested positive for COVID, CDT's technical architects expanded, perfected and automated this process. This allowed the state to seamlessly and automatically distribute these codes via SMS, at the very moment that cases were rising dramatically at the beginning of December.

Impact

One-third of California's Adult Population is Using CA Notify

Within days of the statewide launch of CA Notify, more than 5 million smartphones in California had enabled the exposure notifications, and the state was automatically distributing upwards of 20,000 verification codes a day to those who had tested positive.

Currently the number of users is estimated around 10.4 million.

CA Notify offered a digital and innovative solution that made contact tracing anonymous and easy, and erased the stigma of reporting COVID-19 positivity at the height of the virus.

Idea

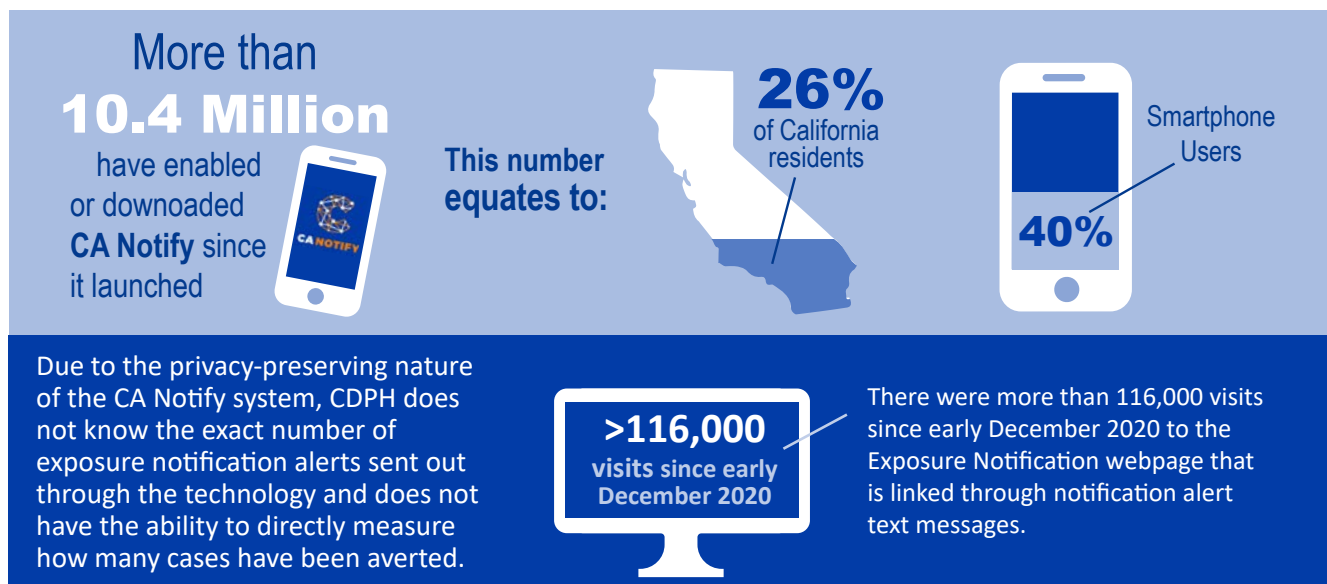
Find an easy reporting solution to preserve anonymity

Early in the COVID 19 response public health departments turned to tried-and-true methods for contact tracing; however, these tools and methods did not provide a way to identify and reach out to individuals that may have been exposed without knowing the person or place where they were exposed (for example in a restaurant, public transportation, or a store). Exposure Notification emerged as a tool that could supplement conventional contact tracing efforts to help control the COVID-19 infection rate. The Exposure Notification technology standardized by Google and Apple provided the framework for the state to launch an Exposure Notification pilot to complement traditional contact tracing as a tool to help prevent the spread of COVID-19.

A user who tests positive for COVID-19 may use the CA Notify system to activate anonymous exposure notifications to other users who have had a high-risk exposure to the COVID positive user. This is entirely voluntary.

Similarly, users who receive notification through the CA Notify that they may have been in proximity to an individual who tested positive for COVID-19 may choose to contact public health entities to alert them of the exposure. Public health entities do not receive this information unless the user decides to contact them.

Augment traditional contact tracing to saves lives



The webpage provides self-quarantine information and resources. This saves valuable time in getting contacts into quarantine before they can be reached with a manual contact tracing calls. Additionally, some of these contacts may be unknown to the infected person and so would not be identified in a subsequent contact tracing interview. As an example of the reach and added value of this tool, an average of 4.1 exposure notification alerts are sent out to potentially exposed users for every COVID-19-positive user who chooses to alert other users by submitting a verification code into the CA Notify system. That is approximately twice the number of contacts (2.1, on average) elicited from COVID-19 infected individuals during traditional contact tracing activities in California, potentially indicating the expanded reach of the CA Notify technology in alerting exposed contacts who are otherwise unknown to infected individuals. Modeled data from other settings suggest that exposure notifications can substantially avert new cases and prevent deaths (UK NHS study and WA modeled study).

Learn from others to speed innovative solutions

Many other states and countries implemented various exposure notification technologies. What California did that was distinct was to automate. While the technology is new, it was believed that widespread adoption of Exposure Notification technology had a strong potential to reduce the rate of infection and death from COVID 19.

This technology was being investigated by many states, and CA was able to collaborate with Washington, Oregon, Colorado and Hawaii in our approach, as well as learning from other states that implemented prior to us, including Virginia, New York, New Jersey and Arizona.

The level of collaboration among multiple partners, including multiple state departments, other states, private sector partners, and the university system was a model for state government to replicate to rapidly bring innovative new solutions to market to solve public problems.

Implementation

Project delivery through aligned partnerships

Major partners in the CA Notify project include the California Department of Technology, the California Department of Public Health, University of California San Diego, Google, Apple and the California Governor's Office.

Initially, the Governor's Innovation and Technology Task force established the Technology Solutions Group (TSG), led by the State Chief Information Officer and a Special Advisor to the Governor, which included state team members and private sector innovators and partners. That group collected and vetted hundreds of ideas for innovative technology to help address the COVID-19 crisis. One of the early themes that emerged was the use of smartphone technology for what became known as "Exposure Notification." In June and July, the State did extensive research, including exploration with several companies, studied how the technology was being implemented in other states and countries, consulted with University of California researchers, and worked closely with Apple and Google who developed the Exposure Notification API.

The State consulted with Legislators, as well as privacy and security experts, to make sure that the proposed technology truly provided privacy-centric design which would be completely voluntary for the public. The State also leveraged relationships with Local Health Jurisdictions to share information and receive feedback. While Exposure Notification is a fairly simple technology, it is not intuitive to understand, and there were understandable concerns as to whether the technology would really be anonymous and voluntary, and would not disclose personal information to vendors or the government. Getting buy in from these stakeholders was critical to the acceptance of the project, and entailed numerous meetings as well as written questions and answers.

Deliver a cost-effective solution with out-of-the-box technology

Ultimately, the State decided to use Exposure Notification Express (ENEX), provided by Apple and Google, as a no cost out-of-the-box path to implementing exposure notification without requiring a contract with a third-party vendor for application development and implementation.

After the research was completed, stakeholders were satisfied, and approval was received from

the Governor's Office to proceed, California quickly implemented a pilot of CA Notify. California announced its plan to use ENEX along with several other Western States as soon as it was available at the beginning of September. Working against a deadline to get it up and running at UC San Diego before students returned to campus for the start of the fall term, the integrated team, including State, University, Apple and Google resources, had the pilot ready for launch in a matter of weeks.

UCSD launched on September 24, as part of its comprehensive "Return to Learn" program efforts to keep students, staff, and faculty on campus safely, and enabled UCSD to host approximately 15,000 students on campus safely during the COVID pandemic. UCSF followed one week later with their campus and hospital system launch.

The goals of the pilot were:

- Test the ENEX technology for potential expansion statewide
- Test a new preventive process in which exposure notifications cascade to potentially exposed individuals early at the point of testing rather than later at the point of contact tracing
- Determine the efficacy of mobile exposure notification in slowing community COVID spread

After a short pilot on the two campuses, the pilot was expanded to the other UC campuses in the state. While proving out the technology, the state developed a plan for statewide expansion. Aspects that needed to be considered included call center support, methods for distribution of verification codes statewide in a way that didn't overburden the local health jurisdictions or cause delays; marketing and communication, a website, project management, data and analytics.

In order to meet these needs, in an environment where the CDT and CDPH staff were already overburdened with numerous COVID response priorities, the state again turned to UC San Diego, using an interagency agreement, to fulfill many of the project management, implementation and operations roles.

CDT worked closely with Google engineers to devise a method to automate the distribution of verification codes, which was the cornerstone of success for California. Building on an innovation piloted by the State of Colorado to use automated scripting to distribute codes to all individuals that tested positive for COVID-19, CDT's technical architects expanded, perfected and automated this process. This allowed the state to seamlessly and automatically distribute these codes via SMS, at the very moment that cases were rising dramatically at the beginning of December.

The Governor's Office provided approval to expand statewide one week before Thanksgiving, and by the first week of December the program expanded statewide.

Project cost: Interagency Agreement with UC San Diego for \$2M. That covered project management, website design and management, data reporting and analysis.

Exposure Notification Express (the Google/Apple product on which this was built) was free.

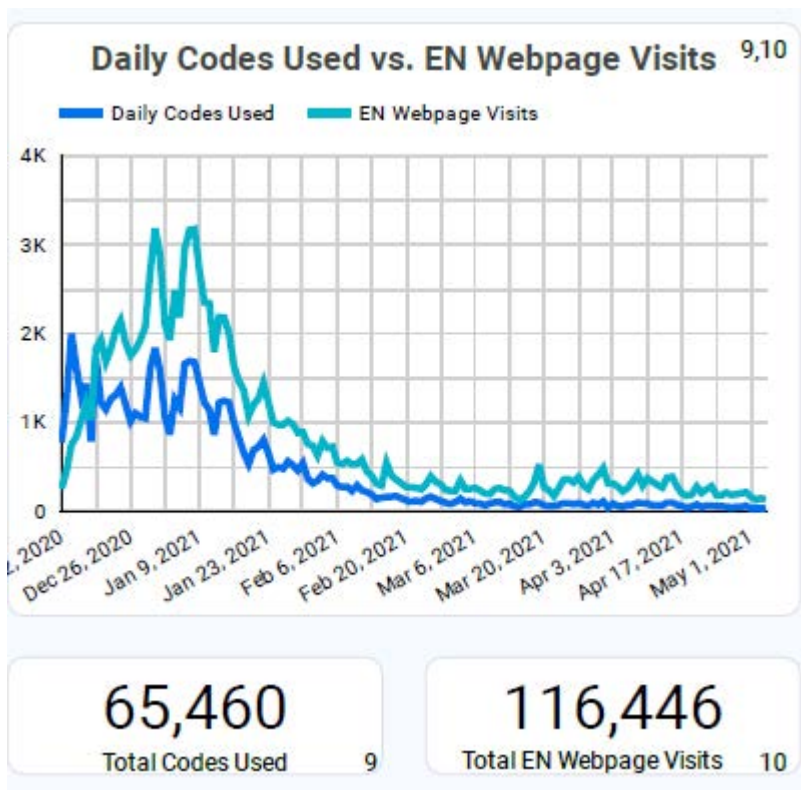
Impact

Quick delivery and uptake in the darkest days of COVID-19

Within days of the statewide launch of CA Notify, more than 5 million smartphones in California had enabled the exposure notifications, and the state was automatically distributing upwards of 20,000 verification codes a day to those who had tested positive.

As of May 2021, there are 10.4 million Californians who have activated the CA Notify app.

More than 65,000 Californians have used a code, indicating they reported a COVID-19 exposure, and more than 116,000 Californians have visited the webpage following receiving an alert.



Getting human contact tracers up and running took time, and there weren't enough to handle volume as the virus peaked in winter months. The CA Notify app was adopted by millions who were fearful of spread and looking for a way to contribute to suppressing the disease. By December 2020, Californians and people all over the world were suffering from social distance fatigue and politicization of attitudes on mask-wearing as illness grew. The quick adoption by 40 percent of all cell phone users indicates people were hungry for solutions. The app allowed people to anonymously report without fear of retribution or judgment, and without the effort of completing a verbal survey with a human agent.

The webpage visits indicate 116,446 Californians were notified of exposure and could take proactive steps to prevent illness in others and begin early treatment if sickened. The average number of individuals one COVID-19 positive patient sickens with the disease is estimated at 5.7. That means that the more than 100,000 individuals who received the alert of exposure had the potential to at least partially reduce illness and exposure in hundreds of thousands more.

California's multipronged approach to combatting the virus, from early lockdown imposed by Governor Newsom, adoption of CA Notify, and now aggressive vaccination goals, is why the state has the lowest infection rate in the nation.

Future use case

Based on the success of the CA Notify project, CDPH is now planning to build on this technology to create a one-stop-shop public health response smartphone app for Californians to: optimize the state's existing CA Notify Exposure Notification (EN) system; enhance, streamline, and target public access to public health information/alerts, tools, and services related to the COVID-19 response; and leverage the current development of public health technology solutions towards future public health needs including future emergencies.

The CA Public Health App will:

- 1) Be a fully customizable Bluetooth based privacy-preserving exposure notification system.
- 2) Serve as a platform for rapid disseminating mass public health messaging and alerts.
- 3) Be ADA compliant and available in multiple languages.
- 4) Integrate with existing testing and vaccination scheduling tools and with new tools developed by CDPH in the future in response to the pandemic response needs.
- 5) Increase efficiencies by integrating into various public health workstreams and information flows.
- 6) Provide California residents with a streamlined and transparent public health communication channel.
- 7) Allow end users to opt into various levels of engagement, notifications, and data sharing interfaces.
- 8) Allow customization for specific settings or sub-populations.
- 9) Allow agile adaption to the dynamic nature of the COVID pandemic and for future public health emergencies.

To develop, launch, and operationalize the app, the state leveraged well-established CA Notify partnerships

- Apple/Google Enhancement/Evolution of the ENS
- UCSD Participation and value-added role in design science and data analysis
- CDPH inter-department participation: contact tracing, testing, vaccinations, communications
- Governor's Office strategic marketing and communications
- CDT