
Digital Tools in Support of Contact Tracing for COVID-19

Core Public Health Stakeholders Meeting Summary

May 27, 2020

Meeting Goals and Objectives

By the end of the meeting, participants

- Gained a shared understanding of the Apple|Google (A|G) exposure notification API and accompanying plans or commitments to support adoption by public health agencies
- Discussed a preliminary national approach by the CDC to pilot, evaluate and develop guidance for A|G's exposure notification API
- Identified and discussed relative perspectives regarding A|G's API, barriers, and short- and long-term next steps to support public health agencies in their efforts to use this technology

Agenda

1. Welcome and agenda overview
2. Presentation and question and answer session with Apple|Google
3. Preliminary national approach to pilot, evaluate and develop guidance
4. Discussion of plans, perspectives, and priorities for public health
5. Next steps and meeting conclusions

Primary Meeting Outcomes

- With regard to the A|G APIs:
 - All agreed this approach had promise
 - A cautious approach to further development is certainly appropriate; however, no 'showstoppers' were identified by the group (i.e., no issues were identified that would require states to stop exploring this approach as an adjunct to contact tracing);
- Recognition that—though there are many details and policy issues to be worked out—the best way forward is for pilot efforts to be launched and carefully monitored in a set of early-adopter states, to inform (via this forum) other states and stakeholders of major challenges, lessons learned, key policy issues, opportunities for collaboration, etc.

- There was general agreement that this group is well-situated to develop guidance and a set of principles to help early-adopting states, addressing, for example, the critical importance of communication and public messaging about this approach; the need to engage the public; the need to have political buy-in from the top (i.e., governor/mayor/city council); the need to avoid politicization of this issue; and the need to specify in advance the expected value of this technology, as well as ways to measure that value); and,

Next Steps and Meeting Conclusion

- **Communications:** what resources need to be considered for national framing/communications on this topic?
- **Piloting:** how to connect people to begin setting up an evaluation framework that is top of mind?
- **Evaluation:** what is the public health value and how can it be moved forward nationally?

Participants

Name (Alpha Order)	Title	Affiliation
Oscar Alleyne	Chief Program Officer	National Association of County and City Health Officials
Travis Beals	Senior Director, Devices and Services Strategy	Google
Scott Becker	Executive Director	Association of Public Health Laboratories
Sara Black	Senior Advisor	National Association of County and City Health Officials
Lauren Block	Program Director, Health Division	National Governors Association
Ricky Bloomfield	Clinical & Health Informatics Lead	Apple
Sheereen Brown	Senior Business Analyst—Public Health Informatics Institute	Task Force for Global Health
Jason Bonander	Deputy Chief Information Officer	Centers for Disease Control and Prevention
Myoung Cha	Senior Director, Health Strategic Initiatives	Apple
Gerd Clabaugh	Director	Iowa Department of Public Health
Jim Collins	Director, Communicable Disease Division	Michigan Department of Health and Human Services
James Daniel	Director, Public Health Innovation	US Department of Health and Human Services
Art Davidson	Consultant & Senior Physician Advisor	Denver Department of Public Health
Karen DeSalvo	Chief Health Officer	Google
Sumbul Desai	Vice President of Health	Apple
Michelle Dethloff	Program Director, Epidemiology and Lab Capacity	North Dakota Department of Health Division of Disease Control
Jeff Engel	Senior Advisor, COVID-19 Response	Council of State and Territorial Epidemiologists
Angelina Esparza	Chief Program Officer	Houston Health Department
Mike Fraser	Chief Executive Officer	Association of State and Territorial Health Officers
Adam Greene	Partner	Davis Wright Tremaine, LLP
Anna Gonzales		

Name (Alpha Order)	Title	Affiliation
Adi Gundlapalli	Chief Public Health Informatics Officer – Center for Surveillance, Epidemiology, and Laboratory Services	Centers for Disease Control and Prevention
Janet Hamilton	Executive Director	Council of State and Territorial Epidemiologists
Charlie Ishikawa	Principal Consultant	Kahuina Consulting
Asad Islam	Associate Director of Technology	Centers of Disease Control and Prevention
Michael Judd	Lead, Innovative Technologies Team - Workforce Development and Innovation Taskforce	Centers of Disease Control and Prevention
Chelsey Kamson	Project Manager—Public Health Informatics Institute	Task Force for Global Health
Lilly Kan	Senior Director - Infectious Disease & Informatics	National Association of County and City Health Officials
Bryant Karras	Chief Informatics Officer	Washington State Department of Health
Jim Kretlow	Special Projects, Health	Apple
Denise Koo	Senior Regional Advisor - Region 7	CDC Foundation
Yul Kwon	Senior Director of Product Management	Google
Becky Lampkins	Manager, Surveillance and Informatics Program	Council of State and Territorial Epidemiologists
Wendy Logan	Senior Principal, Product Strategy & Business Operations	Google
Jelisa Lowe	Communications Manager—Public Health Informatics Institute	Task Force for Global Health
Monica Valdes Lupi	Chief Program Officer	Association of State and Territorial Health Officers
Megan Light	Deputy Team Lead, Innovative Technologies Team - Workforce Development and Innovation Taskforce	Centers of Disease Control and Prevention
Sharon Moffatt	Chief of Health Promotion and Disease Prevention	Association of State and Territorial Health Officers
Judy Monroe	President, CEO	CDC Foundation
Dale Morse	COVID-19 Senior Regional Advisor	CDC Foundation
Patrick O'Carroll	Head, Health Systems Strengthening Sector	Task Force for Global Health
Anita Patel	Lead Advisor – Influenza Coordination Unit, National Center for Immunization and Respiratory Diseases	Centers for Disease Control and Prevention
Anura Patil	Health	Apple
Carol Pertowski	Senior Regional Advisor – Region 9	CDC Foundation
Juneka Rembert	Senior Business Analyst—Public Health Informatics Institute	Task Force for Global Health
Dave Ross	President, CEO	Task Force for Global Health
Kelsey Ruane	Health Policy Analyst	National Governors Association
Sharon Sartin	Chief Technology Officer, Center for Medicare and Medicaid Innovation	US Department of Health and Human Services

Name (Alpha Order)	Title	Affiliation
Boone Spooner	Product Manager	Google
Priyanka Surio	Director, Data Analytics and Public Health Informatics	Association of State and Territorial Health Officers
Mark Stenger	Epidemiologist, Innovative Technologies Team - Workforce Development and Innovation Taskforce	Centers of Disease Control and Prevention
Vivian Singletary	Executive Director – Public Health Informatics Institute	Task Force for Global Health
Karen Smith	Medical Specialist, Health	Google
Brandon Talley	Vice President, Non-Infectious Disease Programs	CDC Foundation
Jimica Tchamako	Requirements Lab Director – Public Health Informatics Institute	Task Force for Global Health
Hemi Tewarson	Director, Health Division	National Governors Association
Mylynn Tuft	State Health Officer, North Dakota	Association of State and Territorial Health Officers
Kathryn Turner	Chief, Bureau of Communicable Disease Prevention Control	Idaho Division of Public Health
Richard Vogt	Clinical Professor & Consultant	Colorado School of Public Health
Patina Zarcone	Director, Informatics Program	Association of Public Health Laboratories

Welcome and Agenda Overview

Rapid contact tracing and notification of those potentially exposed is a critical tool to stop the spread of diseases, like COVID-19. Technology companies have started developing solutions to support various parts of the contact tracing process. However, there has not been a forum to have essential conversations between public health and IT groups to align efforts and ensure these tools are useful.

Level Setting

- “Exposure notification,” “proximity notification,” and “Bluetooth technology” are terms used interchangeably
- Technology is not a replacement for public health work related to contact tracing; rather, it is used to support that work.

Apple | Google Presentation

Apple and Google have partnered to create a piece of technology to add to the suite of contact tracing digital tools to improve the efficiency of the work frontline public health practitioners do. The goal is to shorten the timeline for notifying a person if he or she may have been exposed to COVID-19 through exposure notifications. These are alerts people can receive on their phones that are designed to be privacy-preserving (the system does not use GPS or location data) and configurable. The system is meant to support and augment public health’s existing contact tracing efforts, not replace them.

A|G became involved because traditional contact tracing techniques introduce challenges:

- Resource-intensive
- Takes time while there is a need to move quickly regarding COVID-19
- Issues with completeness of a person’s memory (i.e., a person may not know everyone they came into contact with)

Solution: public health authorities began building mobile apps to support traditional efforts digitally; however, there were challenges with different operating systems and compatibility or interoperability between different phones → Apple and Google best positioned to solve.

How A|G Tool Plug into Traditional Contact Tracing

- Public health workers can ask users to provide their contact information
- Feedback can be used to provide information on where to go for testing or provide a symptom questionnaire
- The app can be used to provide resources about COVID-19
- Public health agencies set the threshold for what constitutes a meaningful exposure and define risk functions

Steps for Public Health Agencies to use A|G Technology

1. Build an app (develop iOS & Android User-Facing App)
2. Connect to diagnosis key server to verify positive tests (determine and implement positive test verification methodology)
 - Develop a national diagnosis key server that operates at a national level (holds positive diagnosis Bluetooth keys, which are used to help trigger exposure notifications)
3. Define meaningful exposure thresholds and messaging on next steps for someone who is exposed
4. Integrate with existing CRM Solution
5. Create a public health awareness campaign to spread the word and encourage adoption

Question and Answer Session

1. *Why have one server vs. many?*
 - a. The advantage of one national diagnosis key server is better support for interstate travel. Having multiple servers doesn't change the cost, it would just create a more complexity, if each state is doing their own thing.
2. *[The presentation] mentioned that keys of positives would be downloaded 'regionally.' What region? What about travel outside of the region?*
 - a. One way to set up the national key server is that everyone downloads keys from the entire country. The upside of that is simplicity; the downside of that download size is a little bit larger if you're downloading the keys for your region. Apple|Google are having a discussion on if they get to the point that the download size becomes an issue, can we break it up into regional downloads. We would need to enable the app to know what region it's in without using GPS capability.
3. *In metropolitan areas with high density, how well does the connectivity to Bluetooth devices address distance (e.g., in high density housing)?*
 - a. You're unlikely to run into a scenario where you get a false positive because you're close to someone else. There is a possibility, but the risk is low. Tests are currently underway

at MIT to understand configurations and testing with phones and how that might happen.

4. *Have you done any marketing surveys on the accessibility of using this technology?*
 - a. [Apple and Google] have been talking to different states and national public health authorities and using their input to design [this solution]. End users have not been surveyed, but A|G has been engaging marketing teams on best way to get this out. The high mark might be Iceland which is 40 percent adoption. The system is built in response to interest from public health, who wanted to have an additional tool in the toolbox for contact tracing.
5. *What percentage of the population needs to use this for it to be effective?*
 - a. There's a team at Oxford who [published a paper](#) about digital exposure notification. They concluded that if you did nothing else but digital exposure notification, you need to hit 60 percent adoption to stop COVID-19. One of their results is that it's also useful at lower levels of adoption. Everyone with an app installed can help stop COVID-19.
 - b. From that article: "Our models show we can stop the epidemic if approximately 60 percent of the whole population use the app and adhere to the app's recommendations. Lower numbers of app users will also have a positive effect; we estimate that one infection will be averted for every one to two users."
 - c. The system was originally conceived to operate at a national level, but the U.S. public health system is variable in structure. Therefore, the focus shifted to individual state levels to figure out an efficient way for the system to be useful and assess similarities for how it has been working.
6. *Can you explain 14 days rolling duration of stored keys on phone (might this be adjusted if info about this virus or next virus changes)?*
 - a. Yes, the app can selectively upload less than 14 days of keys if it's determined that the user was not infectious for the full 14 days (e.g. based on symptom onset date)
7. *Any estimates of how many Bluetooth key exchanges people have on average each day and how it varies by setting? Do the Bluetooth keys distinguish between types of devices (cell phones, headsets, printers, computers, etc.)?*
 - a. The exposure notification (EN) system only counts Bluetooth broadcasts from other phones using the EN system and ignores other types of devices
8. *For this EN system, has Apple/Google learned anything from other countries (e.g., South Korea)?*
 - a. Yes, we've been in conversation with South Korea and many other countries interested in or already doing digital exposure notifications and have incorporated their feedback into the design.
9. *In order for this system to be helpful, there needs to be significant numbers of accurate testing results which produce both with positive and negative tests. Is there not a possibility that non-tested COVID-19 positive individuals will give false negative results under this scenario?*
 - a. The verification system would allow public health authorities to ensure only confirmed positive tests could report and upload their keys.

Apple | Google Asks from Public Health

There is an opportunity for public health to come together on:

- Developing what a system architecture for contact tracing looks like

- Deciding what are the component parts (i.e., what's needed for the labs, for the tracer, for the end user, and epidemiologists etc.)
- Identifying what are best practices and how systems become interoperable, as well as what policy advancements need to be made
- Gaining alignment between state and local health departments on how to have harmony across jurisdictions so that apps have a set of ethical and technical standards for privacy protections
- Creating a playbook for a best practices model of how the system can be rolled out
- Developing a public health 3.0 model leveraging new technology
- Continuing to have a convening body related to technology implementations and providing guidance to the states

Preliminary National Approach to Pilot, Evaluate and Develop Guidance

The CDC Innovative Technologies Team is assessing the public health value of the A|G exposure notification framework, including perspectives on what the risks and opportunities are. It is important to emphasize that the A|G tool is not an app: it's a framework on which state and local jurisdictions build their *own* proximity-tracing apps to augment COVID-19 contact tracing.

Opportunities

- A lot of expression of optimism and the importance of preserving privacy and fostering trust between government and the public, leading to widespread adoption and significant value-added for augmenting the traditional contact tracing process with minimal burden
- Appropriate messaging crafted within the app to promote healthy behaviors

Risks

- Poorly conceived approaches that don't address issues of trust can have a detrimental effect on the relationships between the public and the government
- Compromise the effect of the traditional contact tracing process
- Apps that don't integrate well into workflows may overwhelm an already-stressed public health system
- Sensitivity can lead to false-positive alerts

Potential Questions for Finding a Solution

There are three fundamental layers of questions: physical layer (actual Bluetooth signal layer), application layer (where the Bluetooth signal resides) and the public health system layer (how the app and other parts of contact tracing play well together).

Key Takeaways:

- How to measure the accuracy of the Bluetooth signal? MIT is already doing work on this to get a better sense of the credibility.
- Is the signal strength accurately translated to distance between phones and how do we improve it? Do we need to consider alternative modalities?
- How to package accurate exposure assessment into an app that is acceptable to the public? How do we encourage participation?

- How to communicate risks?

Thirty-thousand-foot-view: How will this be valuable to public health? It is important to define in this forum what “value” is (e.g., to identify more contacts/identify them faster than traditional contact tracing alone? If so, how many more contacts/how much faster would be valuable?).

Proposed Approach

- Work with states to trial and make data-driven solutions
- Share results rapidly and iteratively
- Work with partners to establish any supporting infrastructure
- Don’t impede states already moving forward with their own solutions

Summary: It’s valuable to figure this out together. Looking for interested states or jurisdictions to work with on robust challenges.

Question and Answer Session

1. *What is the intent to integrate local participation in pilots?*
 - a. The intent is to integrate the needs of the locals, and the overall focus on the state-level implementations reflect the needs of jurisdictions within states. There is interest in being engaged with all levels of public health to provide value. For pilots at state level, we wouldn’t want to exclude the input of local jurisdictions.
2. *The Digital Bridge project conducted a thorough multisite evaluation (MSE) of the pilot jurisdictions. Could CDC fund a similar MSE?*
 - a. It is likely possible but would need to discuss internally to see how we can accommodate one within existing funding framework.
3. *How much interest have you seen from state and local health departments? Is there a market?*
 - a. Partners are interested but are cautious—they’re looking for a set of standards and a consensus approach before setting off by themselves

Discussion of Plans, Perspectives and Priorities for Public Health

The landscape of where we stand is going to be important to address next steps and where there is consensus. There are significant touchpoints that are going to be important to place mile markers:

- The need for rapid and acute deployment
- Allowing for effective use of technology to address public health need

To do this requires incredible communications that is helpful for public health practitioners

- People will want to know if we are snooping on them; need to answer them in a way that builds public trust within communities
- Be thoughtful on how this gets introduced and making it usable; successful pilots will make it less likely to be viewed as a threat

- The technology has been released without public health input → is it too late?
- Messaging is key. The operating system has been released, but the technology hasn't → still an opportunity for public health to release the technology and message it as a successful addition to the toolkit.
- Beyond the technology, the CDC team also recognizes the need for a robust social mobilization and social marketing initiative that promotes adoption and public participation. This should be done in collaboration with multiple partners.
- Suggest we consider the communication challenges with public. Survey of public perceptions will be important. Making a distinction of Digital tools for case management (i.e., Sara Alert) vs Proximity Tracking (i.e., Goggle/Apple). Support Jeff Engle's suggestion of assessing state readiness as was done in Digital Bridge.
- This group is well-situated to articulate a set of principles to guide early-adopting states (e.g., importance of communication, need to engage public, need to have political buy-in from the top i.e., governor/mayor/city council; need to avoid red-blue state divide; need to be clear upfront regarding the expected value and ways to measure that value)

There are opportunities to socialize ideas of partnering with the public. This group should decide: are there any showstoppers for testing and is there an opportunity to explore?

- No showstoppers were identified
- Resource required: public-private partnership
- Recognize that though there are many details and policy issues to be worked out, the best way forward is for pilot efforts to be launched in a set of states and carefully monitored and evaluated
- Trepidation in pursuing this in the middle of a global pandemic → different ways to do this where the false positives are more controlled and contained
 - Idea: piloting in a controlled, local setting like a university
- Think about the end state and what it is → interim mid-level success metrics to derive [from the A|G tool]
- Different messaging for governors; decisions that used to be made by public health for public health are not being driven that way → agree on assumptions to live with
- Concerns about acceptability, potential adverse effects and need to prepare messaging before implementing even on a pilot basis