Contact Tracing:
Where Are We Now, Where Are We Going and What Have We Learned?

eHealth Initiative and Manatt Health Strategies

July 28th, 2020

- **Introductions**
- **What is Contact Tracing?**
- **Digital Contact Tracing**
- **Challenges and Lessons Learned**
- **Privacy Implications**
- **Q&A**

Introductions

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- Use the **Q&A** box to ask a question related to the presentation

- Use the chat box is for *technical difficulties* and other questions / comments

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https://www.ehidc.org/resources

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Our Leadership

Interoperability
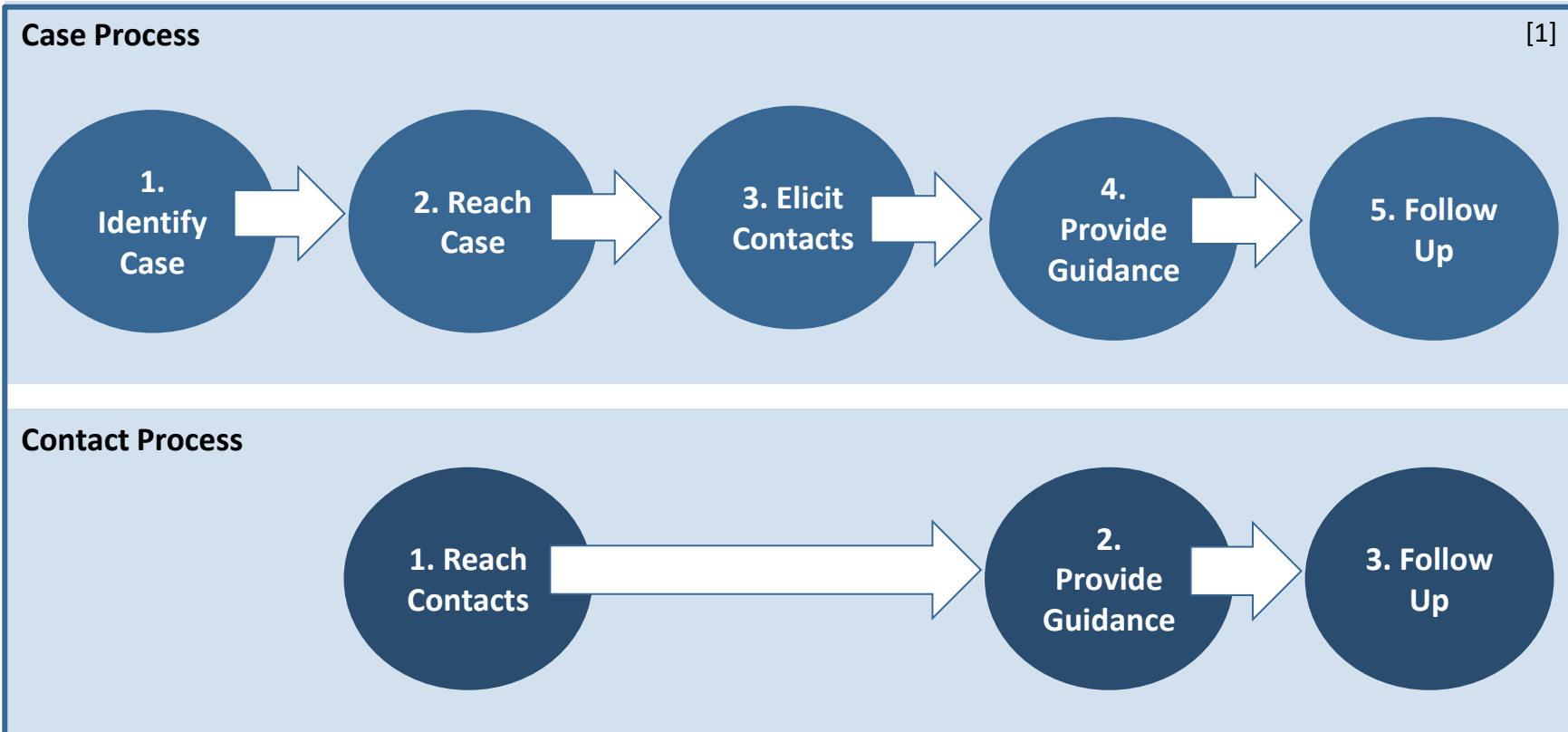
Transparency

Analytics

Privacy

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What is Contact Tracing?

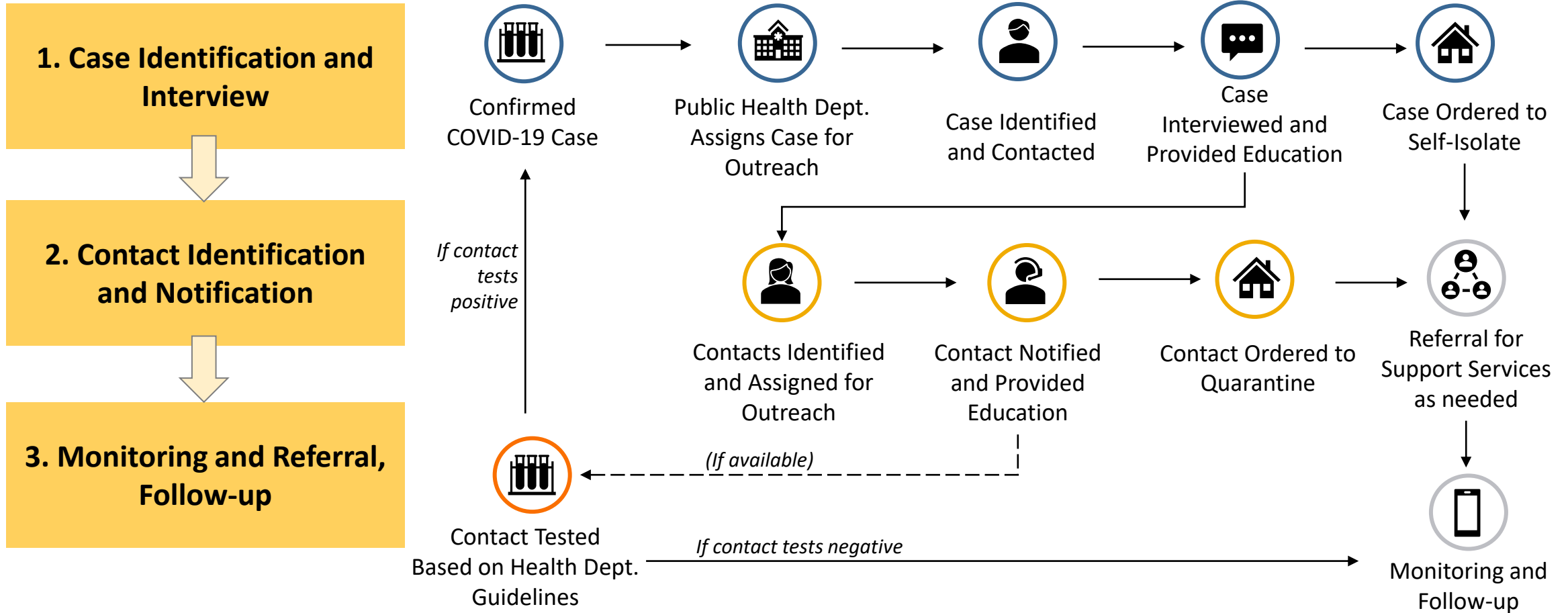**Contact tracing is a tool that has long been used as a public health strategy to respond to and contain infectious disease outbreaks.**

Case Process [1]

Case Process

1. Identify Case → 2. Reach Case → 3. Elicit Contacts → 4. Provide Guidance → 5. Follow Up

Contact Process

1. Reach Contacts → 2. Provide Guidance → 3. Follow Up

Combining contact tracing with testing, isolation, and quarantine strategies can effectively reduce community transmission of COVID-19.

While contact tracing is a simple concept, the full process of contact tracing is time and resource intensive, and requires a skilled workforce and data coordination to be effective.

1. Case Identification and Interview

2. Contact Identification and Notification

3. Monitoring and Referral, Follow-up

Confirmed COVID-19 Case

Public Health Dept. Assigns Case for Outreach

Case Identified and Contacted

Case Interviewed and Provided Education

Case Ordered to Self-Isolate

If contact tests positive

Contacts Identified and Assigned for Outreach

Contact Notified and Provided Education

Contact Ordered to Quarantine

Referral for Support Services as needed

(If available)

Contact Tested Based on Health Dept. Guidelines

If contact tests negative

Monitoring and Follow-up

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Amid the COVID-19 pandemic, it is critical to ensure contact tracing is conducted quickly and thoroughly to limit the spread of infection and interrupt the chain of transmission.

Why?

- **COVID-19 can be transmitted asymptomatically**
 - Researchers found that pre-symptomatic and asymptomatic cases account for 50% of virus transmission. [1]

- **COVID-19 has high disease transmissibility**
  - Transmission can occur via "close contact" to an infected person, which is defined as being within 6 feet of an infected person for at least 15 minutes. [2,3]

- **There is currently no option for treatment of COVID-19**
  - While there are treatments available to mitigate the symptoms of COVID-19, a proven and effective treatment is not yet available. [4,5,6]

Scaling contact tracing systems to sufficiently curb the spread of COVID-19 requires an unprecedented effort to expand the public health workforce, technology, and infrastructure
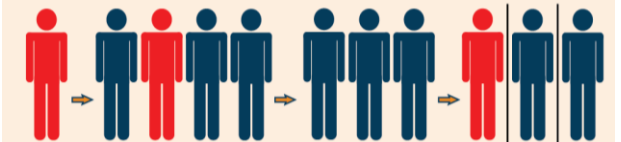
Key Challenges with Contact Tracing

Workforce/Scale

Technology

Privacy/Trust

Cost/Funding

Key Challenges with Contact Tracing

Workforce/Scale	Technology	Privacy/Trust	Cost/Funding

Contact Tracers Must be Skilled Workers.

- Contact tracing requires people with the training, supervision, and access to social and medical support for patients and contacts.

- Skills contact tracers are recommended to have include:
  - An understanding of patient confidentiality
  - Understanding of medical terms and principles
  - Excellent and sensitive interpersonal and interviewing skills
  - Basic skills of crisis counseling
  - Cultural competency

It's Tough to Hire and Train Thousands of Contact Tracers.

- The National Governor's Association recommends staffing between 4 - 81 contact tracers per 100,000 people, based on severity. [1]
  - New York has set a goal in May to hire between 5,000 and 10,000 contact tracers to fight the COVID-19 pandemic. As of July, the state has hired 3,000.

Manual Contact Tracing is Time-Consuming and Imprecise.

- Information provided through the case/contact's working memory may be unreliable or inaccurate.

- Contact tracers attempt dozens of calls a day; each can take anywhere from 20 minutes to 3 hours. [2]

- Contract tracers are not immune to errors, and may miss or mis-record information from phone call interviews.

- Rising caseloads can easily overwhelm contact tracing and isolation/quarantine support programs.

Key Challenges with Contact Tracing

| Workforce/Scale | Technology | Privacy/Trust | Cost/Funding |

Phone-Based Outreach Relies on Provided Contact Information and Has Low Response Rates.

- While 85% of New York City residents who are positive or presumed positive were successfully reached, only 55% completed the interview. [1]
- 30-40% of cases and contacts in Massachusetts did not pick up the phone in the first month of the statewide contact tracing program. [2]
- Community-based outreach may be necessary to improve response rates.

Systems are Needed to Integrate Disparate Data Streams into Public Health Information Systems

- Labs, providers, and clinics that provide test results to contact tracing operations often use different information sharing systems.
  - Disparate data streams can diminish the integrity of existing workflows.
  - Implementing data integration systems is an extensive lift that may not be feasible for all states/localities.

Contact Tracing Apps are Limited by User Adoption.

- While apps demonstrate a promising opportunity, they require a high level of user adoption to be effective.
  - At least 56% of the total population should download any contact tracing app to be effective. [4]
  - Voluntary contact tracing apps abroad have uptake rates that range from 15-38%. [5,6]
- Apps require Bluetooth-capable smartphones and high-quality internet access, which communities of lower socioeconomic status may not have.

Key Challenges with Contact Tracing

Workforce	Technology	Privacy/Trust	Cost

Not Everyone is Willing to Disclose Personal or Contact Information to Public Health Workers.

- Contact tracing programs, including NYC Health + Hospitals, have had difficulty eliciting personal information from NYC residents to support contact tracing.
  - Only 42% of New York City residents who are positive or presumed positive provided contact information to contact tracers. [1]
- Communities of color, LGBTQ communities, immigrant communities and/or minority and ethnic groups may feel wary about cooperating with contact tracing outreach efforts out of fear that their positive result could be improperly shared.
- To be effective, contact tracing programs must convince cases and contacts to isolate and quarantine, a major disruption in the person's life, for the greater good of their family and the community.

Adoption of Contact Tracing Apps in the US is Hindered by Data Security and Privacy Concerns.

- Though contact tracing apps hold promise and can significantly expedite the manual contact tracing process, mistrust over how sensitive health information will be used facilitates resistance to participating in contact tracing efforts and the adoption of contact tracing apps.
- There is often a tradeoff between efficiency and security when establishing contact tracing program operations and programs, particularly when considering the scale of contact tracing programs

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Key Challenges with Contact Tracing

| Workforce/Scale | Technology | Privacy/Trust | Cost/Funding |

Contact Tracing and Isolation is Estimated to Cost Billions of Dollars Nationwide.

- **The Association of State and Territorial Health Officials (ASTHO) estimated a need of $3.6 billion at minimum to hire 100,000 contact tracers nationally, using a $17 per hour base pay rate.** [1]
- A letter from bipartisan public health leaders, including Gottlieb and Slavitt, urged Congress to appropriate **$46.5 billion** in federal emergency funding for contact tracing and isolation support, requesting:
  - **$12 billion** for 180,000 additional contact tracing jobs until a vaccine is available
  - **$4.5 billion** to repurpose vacant hotels for exposed individuals to use for self-isolation
  - **$30 billion** for 18 months of income support for those voluntarily self-isolating, based on a per-person stipend of $50 per day [2]

Funding and Resources for Contact Tracing Remain Extremely Limited

- The US public health infrastructure has diminished significantly in the past decade, with local health departments shedding significant numbers of staff due to shrinking budgets and underfunding. [3]
- Available federal funding for contact tracing efforts is extremely limited. Expanding contact tracing efforts to the scale needed to address the COVID-19 pandemic at the state and local level may not be feasible given the budget shortfalls and limited public health resources.

Digital Contact Tracing Tools

Digital Contact Tracing Tools

Outbreak Response	Proximity Tracing	Symptom Tracking
• Designed for public health response personnel involved in contact tracing activities and outbreak investigations • Enable management of complex data through electronic data entry to streamline contact tracing ***Examples:*** *WHO's Go.Data tool, Salesforce's Work.com platform*	• Some apps use location-based (GPS) technology to find and trace the movements of individuals to identify people who may have been exposed to an infected person • Other apps record a "digital handshake" via Bluetooth ***Examples***: *Australia's COVIDSafe app, Germany's Corona-Warn-App, South Korea Corona 100m app*	• Applications designed to routinely collect self-reported signs and symptoms • Function to assess disease severity or probability of infection ***Examples***: *UK's COVID Symptom Study app, China's WeChat and AliPay's integrated COVID-19 tools*

Benefits of Digital Contact Tracing Tools

Facilitate implementation of contact tracing on large scale

Improve data collection and quality

Expand data capacity and shorten collection time

Improve analytic ability

Streamline and support traditional contact tracing teams

(Source: WHO, Digital Tools for Covid-19 Contact Tracing)

MIT's Safe Paths Open Source Tech

- **Open source tool** for agencies and individuals to trace positive cases of COVID-19
- **Uses GPS and Bluetooth** to log people's locations so if they test positive, they can provide health officials with a record of where they've been
- **Being developed collaboratively** with input from the Department of Health and Human Services, Harvard University and the Mayo Clinic
- **Several countries and 15 cities and states have expressed interest** in the technology

Apple/Google's Exposure Notification API

- **Exposure Notification Application Program Interface (API) launched in May** [2]
- **Set of interoperable protocols** inside Android and iOS
- **Bluetooth-enabled, voluntary** and **decentralized**
- **Only a few states have announced willingness to use the API** (Alabama [3], North Dakota [4], South Carolina [5])
- **Several countries have expressed interest and/or have implemented the API**, including Germany [6], Poland [7], and Saudi Arabia

Only three states to date have launched their own contact tracing apps: North Dakota, South Dakota, and Utah

As of mid-June:

- **19 states said they were considering** using contact-tracing apps

- **17 states said they were not planning to create an app** or use smartphone-based contact tracing

- **11 states did not clarify any plans** to use contact-tracing apps

North Dakota

South Dakota

Utah

Care19 is an app that allows COVID-positive users to consent and share real-time data with the state Department of Health to support contact tracing and pandemic forecasting

- As of late June, only 4% of North Dakotans are using the app

- Apx. 2% of South Dakotans have downloaded the app
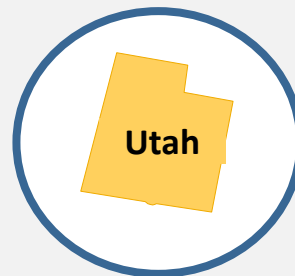
Healthy Together is an app that uses Bluetooth and location information to trace potentially exposed individuals

- As of late May, less than 2% of Utah residents have downloaded it

International Contact Tracing Apps – Asia

Much of Asia's success with contact tracing came from a multiple-front approach: aggressive manual contact tracing, use of public surveillance data, individual self-reporting, and more.

Singapore

- First country to roll out digital contact tracing technology, TraceTogether
- Bluetooth-enabled, voluntary
- A third of the country downloaded the app, but actual efficacy is low
- Added wearable devices to fill gaps, particularly among those who don't have or use mobile phones (ie: elderly, who tend not to be digitally connected)

South Korea

- Didn't rely on a specific contact tracing app
- Anonymized location data released to third-party sites for anonymous locating of infected individuals and their whereabouts
- Corona 100m (Co100), the most popular mobile app for COVID-19 in S. Korea, leveraged this data

China

- Enlisted domestic tech companies to build QR code-based quarantine apps
- Collected wide variety of users' data, including location
- Apps assign users a color code using an algorithmic assessment of travel history and health status
- Largest-scale adoption in the world; users required to register for "health codes"

The European experience and approach to leveraging digital contact tracing tools was highly fragmented and faced challenges with interoperability

France

- France's app – StopCovid – uses Bluetooth for proximity tracing
- COVID-19 confirmed users receive a QR code to submit to the app for reporting
- All contacts are uploaded to a centralized database for tracing
- Heavily criticized for its invasive nature
- Uptake has been slow due to relatively few notifications to users

Germany

- Germany changed course in late April due to pressure from civil society groups
- New app called Corona-Warn-App
- Uses Bluetooth and GPS data, but once tested, individuals get a QR code to submit and report their diagnosis to public health departments
- Relies on Apple/Google Exposure Notification API

United Kingdom

- U.K. started trial of contact tracing app, using a centralized model
- Initially chose not to use Google-Apple API
- Preliminary rollouts indicated wide-ranging security flaws, user problems and trust issues
- Pivoted and now relying on a decentralized model and the Apple/Google API

Challenges and Lessons Learned

Effective contact tracing technology is by definition invasive.

Surveillance technology tracking or blocking free movements of citizens is not consistent with American values.

While centralized databases allow more effective tracking and tracing, they are also more vulnerable to privacy and security risks.

Lessons Learned from International Experiences

Digital contact tracing technology can help traditional virus-combatting efforts, but is not a magic bullet.

You can prioritize privacy or prioritize curbing the disease – but it's challenging to prioritize both.

Apps rely on near universal adoption to be effective, which may not be compatible with every nation's values.

Privacy Implications

Privacy Implications of Digital Contact Tracing

Digital contact tracing programs come with new privacy challenges that have to be addressed to ensure security, efficacy, and equity

- Difficulty in truly anonymizing data, particularly in low-population density areas
- The degree of personal insight into daily activities that geolocation data can reveal about users
- Discrimination or exacerbation of disparities
- Ensuring high participation while preserving right to refuse
- False positives and false negatives from proximity data
- Duration of the data storage

Even in addressing those challenges, there remain significant privacy risks to users and their data

- Potential third-party access and/or secondary use
- Potential for data breaches in centralized model
- Potential overreach – databases could be used for more widescale health surveillance at a later time

Data collected by contact tracing apps fall outside of HIPAA protections, making bills particularly important for ensuring necessary privacy protections as contact tracing apps gain traction
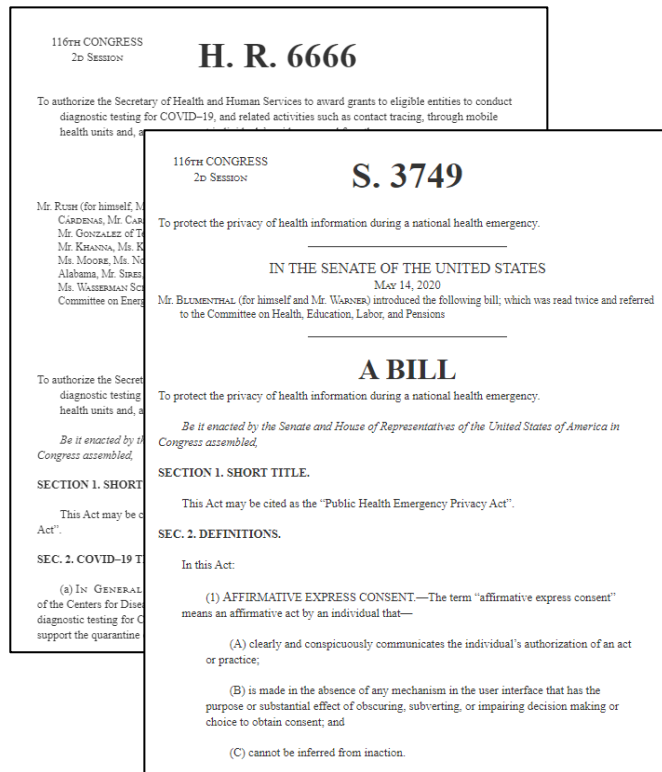
- **Two bills proposed in Congress** in May, both motivated by the need to build public trust in the use of personal data and to ensure companies are held accountable for any misuse of data collected during the pandemic

  – Democratic bill requires opt-in consent and data minimization, limits data disclosures to government, has a strong private right of action and does not preempt state laws

  – Republican bill preempts state action, does not contain a private right of action and exempts broad array of surveillance by employers

- **How legislation evolves and aligns with contact tracing efforts will have implications for establishing precedent and future contact tracing efforts**

Questions?

Thank You!