PANDEMIC RESPONSE HACKATHON
HACK COVID-19
CONVENED BY DATAVANT

March 27-29, 2020 | www.pandemichackathon.org

Welcome to the Pandemic Response Hackathon

The Pandemic Response Hackathon is a virtual hackathon aimed at better understanding and mitigating the spread of COVID-19 and future pandemics. Our goal is to bring public health professionals alongside the technology community's talent to contribute to the world's response to the pandemic. Hackathon projects will be formulated and judged by an interdisciplinary panel of public health, health IT, and policy experts.

Projects will be divided into four tracks. We are seeking submissions for ideas in these four tracks, which will be curated ahead of the event to inspire specific project ideas.

- **Public Health Information Sharing** For example, tools for local governments to share information with citizens, tools for information exchange between healthcare professionals, tools for information sharing with patients.

- **Epidemiology & Science of the Disease** For example, information sharing tools between researchers investigating the disease; novel use of data sets to understand the rate of spread of the disease; tools to facilitate clinical trial recruitment and operations for COVID-19 studies.

- **Keeping our Health Workers Safe** For example, workload coordination tools; information sharing tools with best practices.

- **Second-Order Societal Impacts** For example, projects to address mental well-being at nursing homes in light of restricted visitors; ways to help curate public health information and curb disinformation

Steering Committee & Judges

David Shulkin
Former Secretary of the VA

Tom Daschle
Former Senate Majority Leader

Don Berwick
Former Administrator of CMS

Andrew von Eschenbach
Former Commissioner of FDA

Mark McClellan
Former Commissioner of FDA

Tom Leppert
Former Mayor of Dallas

Eric Perakslis
Former CIO of FDA

Peter Neupert
Healthcare Technology Leader

Olympia Snowe
Former Senator

Sheila Burke
Current Lecturer, Former Dean of Harvard Kennedy School

Idea: COVID Companion/Concierge

Problem Patients are isolated at home and cannot access usual resources and information for proper medical care (i.e., seeing a doctor). This leads to underdiagnosis and late intervention.

Solution Create a patient-facing app that:
- Connects patients to telemedicine resources, filters by location and insurance coverage, and triages patients
- Collects self-reported symptoms and physiologic data (temperature, heart rate, respiratory rate)
- Integrates with smart medical or wellness devices (Fitbit, smart thermometers etc)
- Alerts the patient if there is an outbreak near patient's residence or work location

Idea: Health System Map

Problem Providers do not have sufficient information to triage, transfer, or support patients.

Solution A real-time web-based application that helps manage patient flow by informing hospitals and health professionals:
- Which hospitals have negative pressure rooms available?
- Which hospitals have open intensive care unit beds?
- Which hospitals have ventilators left?
- What are emergency department wait times?
- Who needs extra staff or volunteers?
- Which hospitals need supplies like masks or gloves?

Idea: Telehealth Clinical Decision Support

Problem Telehealth services are overwhelmed and cannot coordinate to triage patients and balance capacity.

Solution Create a telehealth switchboard that diagnoses and triages patients at a national level to help manage telehealth provider capacity. Since telehealth providers have been authorized to consult with patients out-of-state, they will not be familiar with local geographic patterns and will need additional context. This could extend to building national infrastructure so that doctors can easily identify patients who are in hotspots and/or have tested positive.

Idea: Digital Front Doors

Problem Patients may not know what to do besides showing up to the hospital emergency department when they feel sick. This exposes them, their families, other patients, and healthcare workers to infection risk and puts strain on the system.

Solution Digitize the front door / admissions workflow of the hospital and put a qualified healthcare professional on the other end of the line (phone, text, app etc). Triage to telemedicine consultation, ambulance, or emergency department based on factors like location, accessibility, and insurance coverage.

Idea: Come Together – Virtually

Problem Social distancing can lead to loneliness, which can increase the risk of engaging in activities (going out in public, gathering in groups) that may put people at risk of spreading the virus.

Solution Create a platform that hosts virtual happy hours at "virtual bars/restaurants", coffee chats and readings at "virtual coffee shops" and "virtual bookstores" at designated times. The platform could also provide a means for revenue for local businesses (through subscription fee, shipping beer or coffee beans to users, providing a way to purchase gift cards, etc.)

Idea: Corona Package

Problem Providers lose sight of patients once they go home, leading to delayed escalation of care and inadequate monitoring. This is exacerbated by the social distancing policies that are necessary to prevent viral spread.

Solution Create a package with a digital thermometer and pulse oximeter for patients who may be symptomatic of COVID-19. The package is paired with an app that gathers this information and relays to a central monitoring service that alerts patients and providers when someone may need higher acuity care. Opportunity to work with remote patient monitoring companies on the services layer.

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Idea: Corona Literature

Problem Researchers are inundated with new information and requests for coronavirus research, making it difficult to keep track of our current understanding of the virus and the underlying literature, as well as develop new hypotheses.

Solution Natural language processing (on the article content) or metadata analysis (author name, publication date, affiliation) on scientific literature pertaining to COVID-19 to create a COVID knowledge map. This can enable researchers to connect with each other and also retrieve information more easily to develop new research ideas/hypotheses.

Existing dataset available: https://www.kaggle.com/allen-institute-for-ai/CORD-19-research-challenge

Idea: Coronavan

Problem Patients can't get access to health professionals because of health system overload, social isolation, and impaired transportation networks.

Solution Set up mobile clinics with qualified health professionals that travel to high-priority areas to test and diagnose COVID-19. This can also help educate and advise the community how to isolate, protect, and when to seek higher acuity care. Prevents overloading of the health system, facilitates disease education / awareness based on credible sources, and allows for more effective social distancing.

Idea: Negative Pressure Tents

Problem Infected patients need to be isolated in negative pressure rooms. These rooms are large and technically difficult to construct, and there is a big shortage of negative pressure rooms in the nation.

Solution Invent a new negative pressure room, in the form of tents or other mobile/light-weight structures that enable a scalable way to provide enough rooms for infected patients.

Idea: Biothreat Tracker

Problem It's difficult to determine what areas or people to avoid contact with, especially since infected patients can be asymptomatic.

Solution Design an app that tracks where confirmed COVID-19 patients have been for the past 2 days and what locations could potentially be compromised. Cross-correlates with the user's own location history to indicate a personal "biothreat exposure level." For highly exposed patients, recommend isolation and possibly early intervention.