



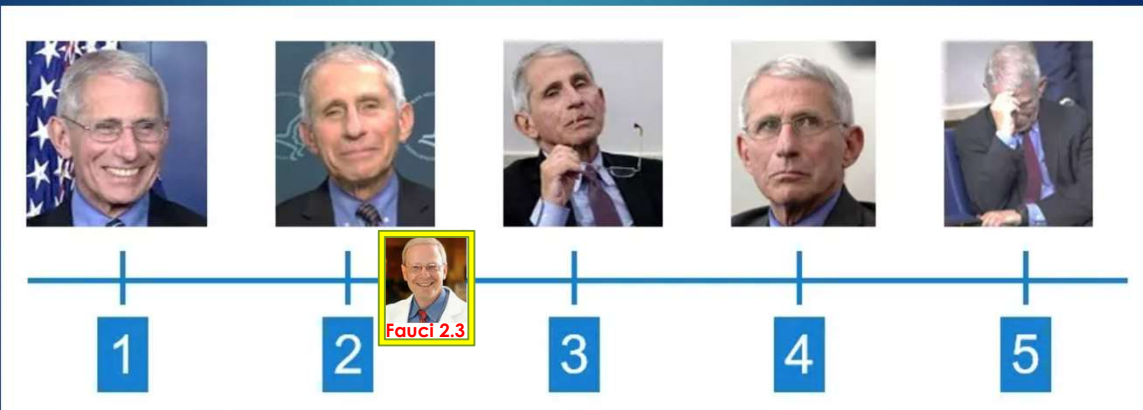
Covid-19 and the Transformation of Healthcare: Managing the Challenges, Capitalizing on the Opportunities

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Before we start, let's check in to be sure everybody is feeling OK...

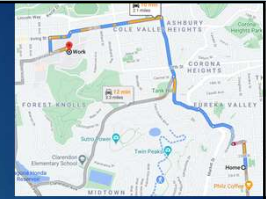


A horizontal timeline with five numbered blue boxes (1-5) below a line. Above the line are five corresponding photos of Anthony Fauci. The second photo is highlighted with a yellow box and labeled 'Fauci 2.3'.

2

Talk Roadmap

- ▶ A few thoughts on how we've managed the pandemic and the problems it has exposed in our politics and society
- ▶ A few tech innovations that were accelerated by Covid
 - ▶ Telemedicine, dashboards
 - ▶ Plus a few that might have hit the tipping point, but didn't
 - ▶ Entering the post-EHR era: why and what that means
- ▶ A couple of areas in which everyone is saying the right things, but I worry about follow-through



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The Dominant Challenge in Preparing for a Pandemic

“Everything we do before a pandemic will seem alarmist. Everything we do after will seem inadequate.”

— Michael Leavitt, former HHS secretary

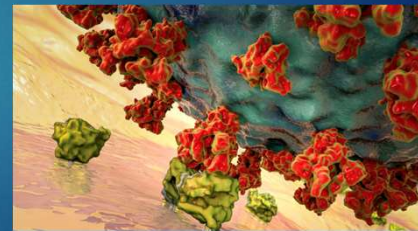


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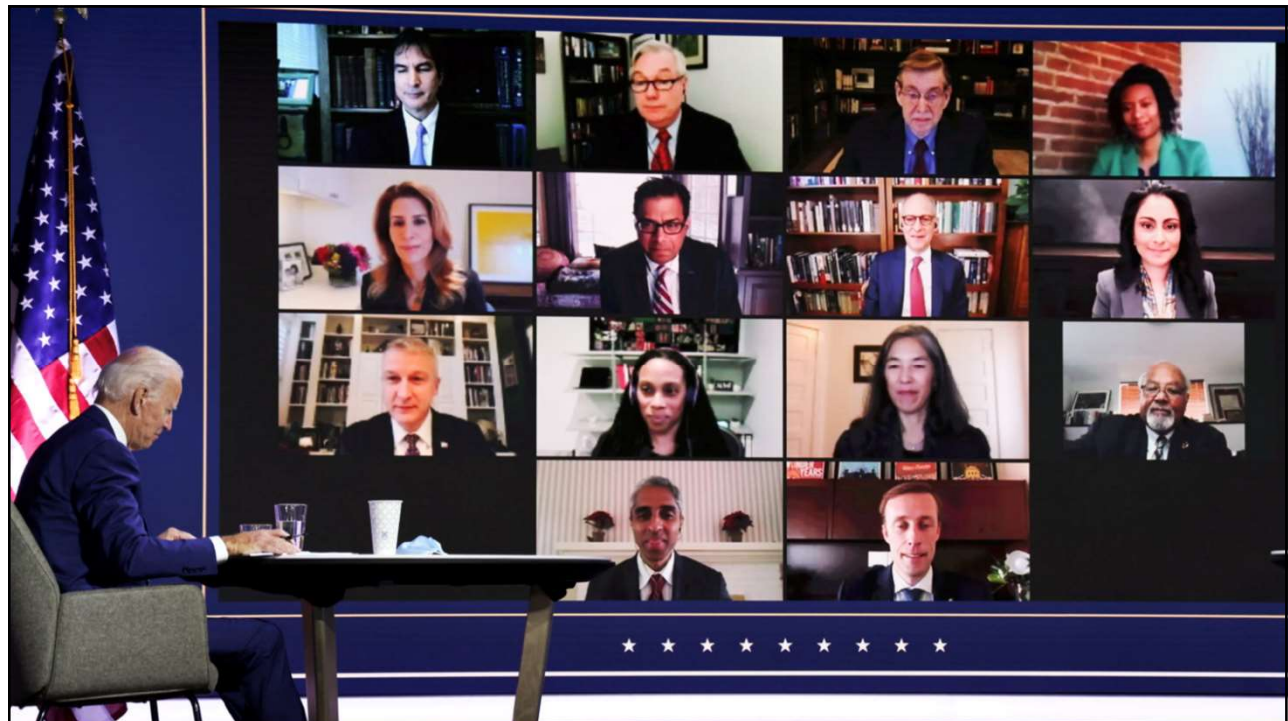
The American Response

“Aspects of America’s identity may need rethinking after COVID-19. Many of the country’s values have seemed to work against it during the pandemic. Its individualism, exceptionalism, and tendency to equate doing whatever you want with an act of resistance meant that when it came time to save lives and stay indoors, some people flocked to bars and clubs. Having internalized years of anti-terrorism messaging following 9/11, Americans resolved to not live in fear. But SARS-CoV-2 has no interest in their terror, only their cells.”

Ed Yong, *The Atlantic*, March 25, 2020



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What Will 2021 Look Like?



- ▶ A coherent and more aggressive plan from Washington, with competently led federal agencies, relatively free of political interference
 - ▶ Efforts to promote/de-partisan-ize non-pharma interventions, especially masks and testing
 - ▶ Business and school openings depend on regional specifics
- ▶ Surges won't be tamped down until we reach population immunity levels of ~40% (combination of prior infections plus vaccines) – probably late spring
 - ▶ But new, more infectious variant may challenge this timeline and threshold
- ▶ Improved therapeutics will continue to lower mortality rate (though people's comfort with that will be tempered by potential for "Long Covid" & long-term health threats)
- ▶ Vaccine distribution will remain contentious – particularly who goes first and the question of requiring vaccination/immunity passports
- ▶ "Back to normal": impossible to predict when; probably in fall and not quite "normal"

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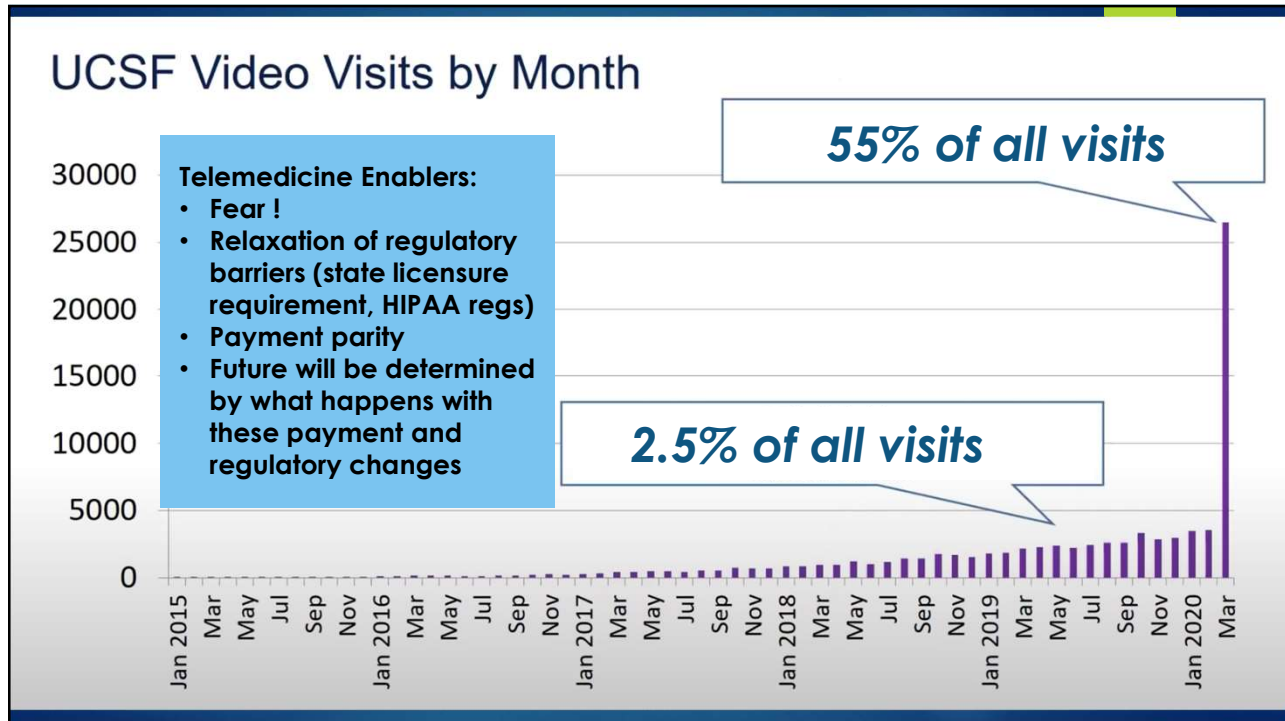
Technology-related Innovations: Which Ones Will Endure?







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The Fundamental Question About Telemedicine/Virtual Visits

- ▶ Is it simply a visit replacement?
 - ▶ Fine if so: convenient for patients, maybe for providers
 - ▶ Opens up new non-geographically-determined care options
 - ▶ Potentially good for patients, but new competitive threats for health systems
- ▶ Or does it pave the way for true virtual care – the real game-changer
 - ▶ Patients no longer coming into office to get BP, weight, glucose checks, etc. means new dependence on digital data streams
 - ▶ Measures less episodic; more semi-continuous
 - ▶ The billion-dollar question: how will we manage these new data flows?

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Heart Rate 92 bpm
92 bpm, 4m ago

Patient 42 has irregular HR and is SOB. Let's do a televisit ASAP

Patient 13's weight is up and O2 sat is worse. I'll lock the salt shaker and the fridge

Patient 112's sugar is high again: the algorithm bumped the insulin but let's get the coach involved

The Care Traffic Controllers

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Dashboards

Finally taking all that data and delivering usable, real time information in visually attractive and actionable form to managers and clinicians

UCSF Health COVID-19 Enterprise Dashboard

Current Hospitalizations by current level of care: 42 (85,653 Pending to date, 7 Hours to result)

COVID-19 Test Positive Patients Hospitalized: 57 (Acute Care/ICU/ED)

COVID-19 Test Positive Daily Patients Hospitalized: 20 (Critical Care)

Hospitalizations To Date by highest level of care: 569 (7 Avg Hosp Days, Acute Care/ICU/ED)

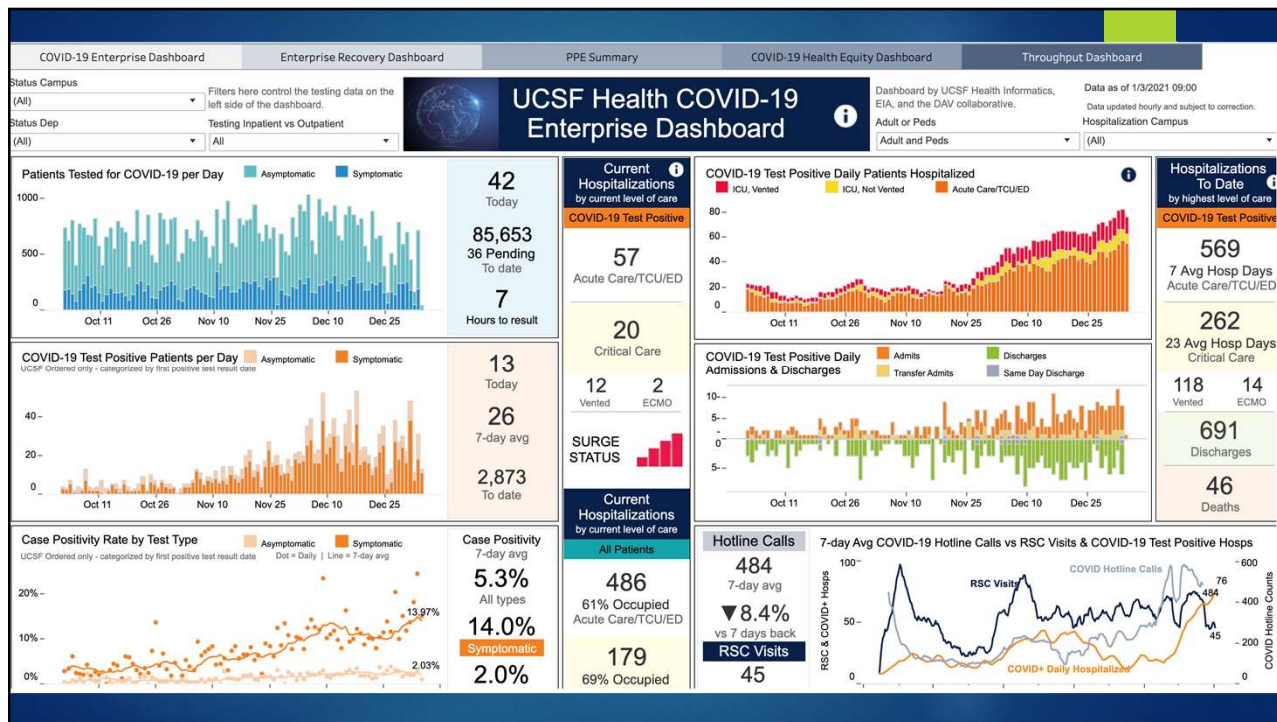
COVID-19 Test Positive Patients per Day: 13 (Today, 26 7-day avg, 2,873 To date)

COVID-19 Test Positive Daily Admissions & Discharges: 118 (Adms, 14 Discharges, 691 Discharges, 46 Deaths)

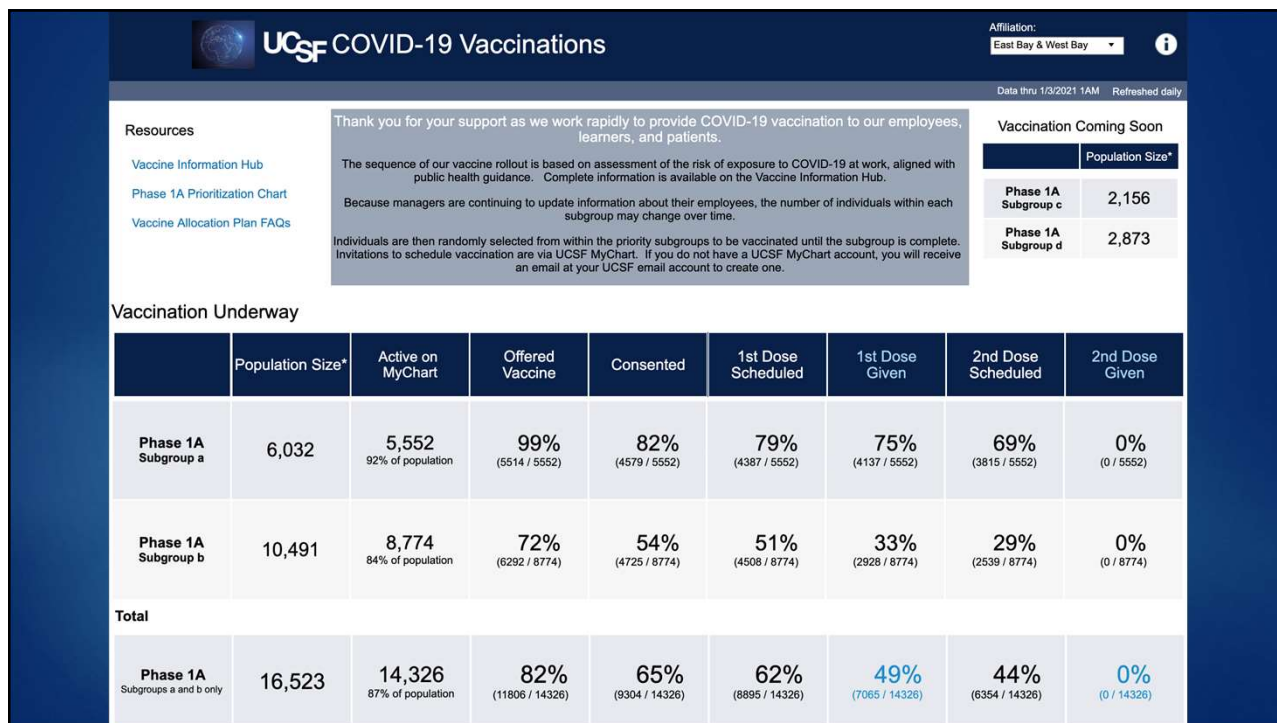
Case Positivity Rate by Test Type: 5.3% (All types, 61% Occupied)

Hotline Calls: 484 (7-day avg, 8.4%)

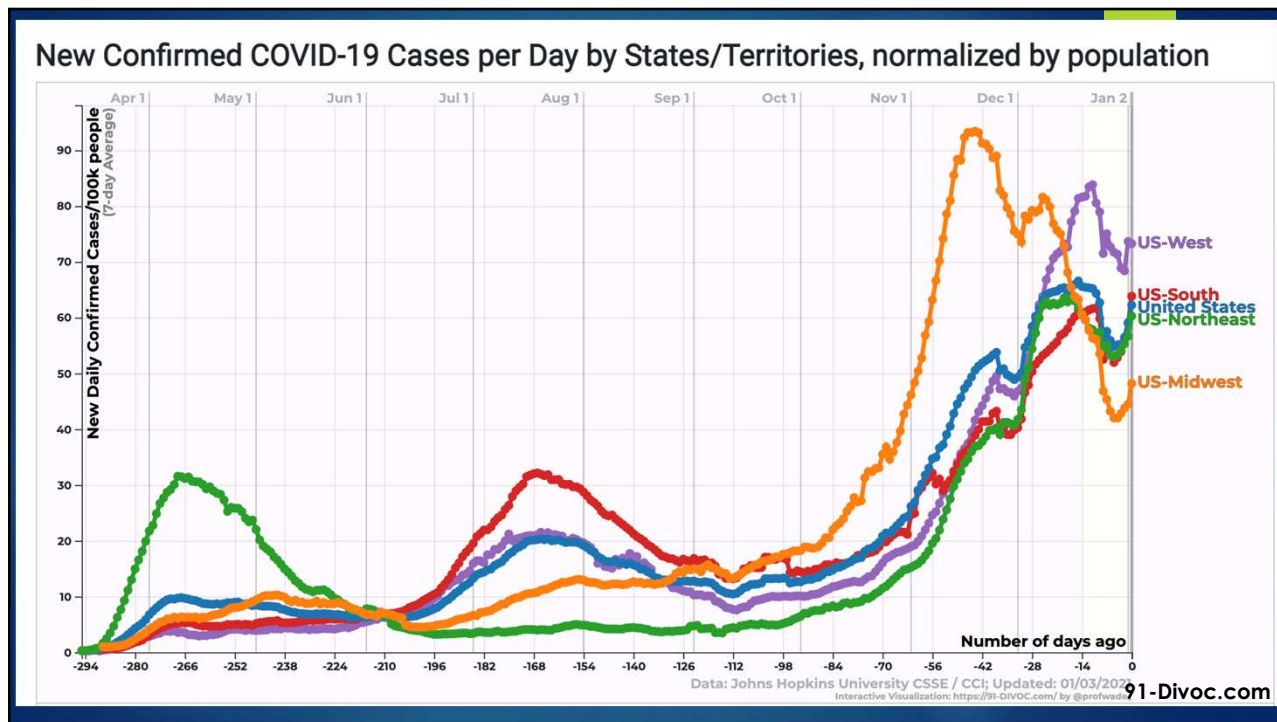
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Step 1: Enter your location

California

San Francisco

Details

Reported prevalence: 0.23%
Adjusted prevalence: 0.68%

Reported cases in past week: 2,015
Total population: 881,549
Percent increase in cases from last week to this week: 11%
Percent of tests that come back positive: 3.7%
Data last updated: January 02, 2021

Copy location data for the spreadsheet

Prevalence data consolidated from [Johns Hopkins CSSE](#) (reported cases), [Covid Act Now](#) (US positive test rates), and [Our World in Data](#) (international positive test rates).

Step 2: Describe the activity or relationship

Is this a specific activity or an ongoing relationship?
One-time interaction or repeated activity [6% chance of transmission per hour]

Nearby people

People: How many people are usually near you during this activity?
4

Within 15 feet

Distance: How close are these nearby people, on average?
Normal socializing (~3 feet / ~1 meter apart) [baseline risk]

Duration: How long is the activity, in minutes? (For a repeated activity: minutes per week?)
15

Risk Profile: What is their risk profile?
Lives alone and only grocery shops

Precautions

Environment: Is it indoor or outdoor? Is the space ventilated, or is the air filtered?
Indoor [baseline risk]

Your mask: What mask are YOU wearing?
Surgical mask or mask with PM2.5 filter insert [1/2 the risk]

Very Low Risk

0.2% of your weekly risk budget

~0.4 microCOVIDs each time (probably between: 0.1 to 1)

What is a microCOVID?
The calculator introduces a new concept, the microCOVID. One microCOVID is a one-in-a-million chance of getting COVID.

An activity that's 20,000 microCOVIDs is very unsafe, as you have a 2% risk of getting COVID every time you do it. An activity that's 20 microCOVIDs is relatively safe, as you could do it every week for a year and still have only about a 0.1% chance of getting COVID.

Microcovid.org

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How About AI, Data-sharing Apps, and Interoperability?

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90+ Healthcare AI Startups To Watch

Imaging & Diagnostics



Drug Discovery




While one might have anticipated the pandemic would be a moment for AI to shine, I can't identify a true game-changing AI application



Created by You. Powered by CBINSIGHTS

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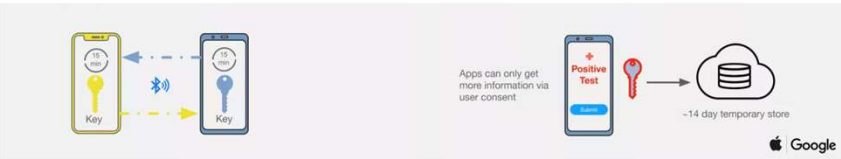
Alice and Bob meet each other for the first time and have a 10-minute conversation.

Bob is positively diagnosed for COVID-19 and enters the test result in an app from a public health authority.

Perhaps months too late, the Apple-Google Covid-19 contact tracing tool comes to America

Virginia is the first US state to come out with an app that uses Bluetooth-based tech, nearly three months after its release.

By Sara Morrison | Aug 6, 2020, 4:46pm EDT



Apple and Google

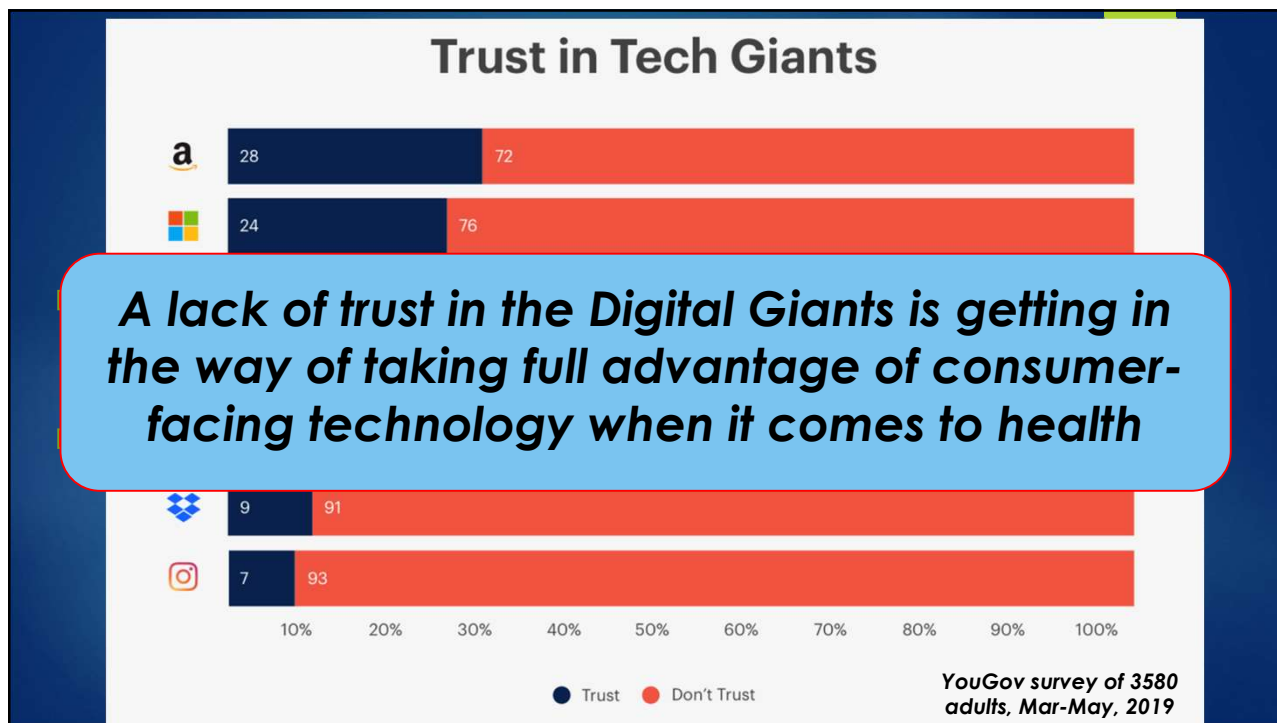
Vex

Apps can only get more information via user consent.


~14 day temporary store

Google

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 THE VICE PRESIDENT
 WASHINGTON
 March 29, 2020
 Dear Hospital Administrator:

The pandemic might have been an opportunity to promote interoperability, but we still find ourselves faxing spreadsheets

- i. Commercial laboratories: LabCorp, BioReference Laboratories, Quest Diagnostics, Mayo Clinic Laboratories, and ARUP Laboratories.
- b. Reporting Instructions: We request that all data for COVID-19 testing completed at “in-house” laboratories or a laboratory not listed above be **reported** using the attached spreadsheet.

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Health IT Needs Its Golden Spike






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Maybe the Stupidest Thing I Ever Said to a Mentee



“What will you do after we’ve implemented our EHR?”

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Digital Health Investments Are Growing

DIGITAL HEALTH FUNDING AND DEAL SIZE
2011-Q3 2020



Note: Only includes U.S. deals >\$2M; data through September 30, 2020
Source: Rock Health Funding Database

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(Re) Enter the Digital Giants....



BRIEFING - ARTIFICIAL INTELLIGENCE

Here's How Microsoft Plans To Modernize Healthcare

By Erin Corbett February 7, 2019

Amazon's joint health-care venture finally has a name: Haven

PUBLISHED WED, MAR 6 2019 - 4:05 PM EST | UPDATED WED, MAR 6 2019 - 5:09 PM EST

Angelica LaVite Christina Farr Hugh Son
#ANGELICALAVITE #CHRISSEYFARR #HUGH_SON



Understand how your patients can use health features on Apple Watch.

See how heart rate notifications, irregular rhythm notifications, and the ECG app on Apple Watch can help give your patients an early warning sign that further evaluation may be warranted.

[Learn more about health features on Apple Watch >](#)



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Why Health IT May Finally Be Entering a New (Post-EHR) Phase



- ▶ Winners in EHR derby: healthcare-specific companies, good at collecting data & moving it around
 - ▶ They were ready when healthcare went digital
 - ▶ Not expert in consumer-facing tools, user interface, learning from data, communication, visualization....
- ▶ Now entering the post-EHR era, facilitated by value pressure, population health needs, interoperability, cloud computing, AI, digital companies maturing... and the obvious limitations of what EHRs can offer

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UCSF Health Digital Patient Experience



The Right Patient. The Right Provider. The Right Time. The Right Modality.

Together, we are creating a unified digital experience enabling UCSF Health patients and consumers easily and efficiently access and interact with care delivery in a way that is empathic, delightful, personalized, and modern.

The Digital Patient Experience (DPE) is an ambitious, multi-year effort to make UCSF Health the premier digitally enabled care provider. It represents collaboration across multiple skills, disciplines, and areas across UCSF.

Health

Home > Medical

Me
Hart
and

The Medical Informatics and provider expert created by physician decision support.

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ve Faster Care

effective digital
that transform
d enable
ionate care delivery


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entful collaboration we are a

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I have three boxes on my desk: In, Out, and Too Hard.

— Warren Buffett —

Palpably Unmet Needs:

- Public Health/Preparedness
- Healthcare Disparities



AZ Quotes

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Preparing for the Next Pandemic

“The most promising way to deal with a possible recurrence is, to sum it up in a single word, *preparedness*. And now is the time to prepare.”

*Surgeon General Rupert Blue
October 1918*



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“Obvious” Changes That May Go Into the “Too Hard” Box

- ▶ Everyone will profess to be committed to adequately resourcing public health. Beyond having an off-the-shelf plan for the next pandemic, this support will weaken once the Covid-19 pandemic is over
 - ▶ No powerful constituency
 - ▶ Hard to find resources for prevention when pitted against current needs
- ▶ Everyone will profess to be shocked by the disparities illustrated by Covid-19 (although they've been well appreciated for decades). Expect lots of lip service about addressing them, and then it too will recede
 - ▶ Most relate to social determinants of health, so they'll require investments in housing, jobs, justice system, and education, as well as significant income redistribution... all of which are politically challenging

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A Time for Optimism?



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