Session 2: Data & Research

May 14th, 2021
9:00 AM to 10:00 AM (Pacific Time)
A COVID-19 PANDEMIC RETROSPECTIVE: CLINICAL & NON-CLINICAL DYNAMICS

Tim Suther, Senior Vice President, Data Solutions

May 2021
COVID-19 Research
Engaging leading US academic research institutions

Change Healthcare is a leading healthcare technology company focused on transforming the U.S. healthcare system.
• We serve most healthcare constituents in the US

Academic researchers may access our COVID-19 Analytic Data Set at no charge through:
• COVID-19 Healthcare Coalition
• COVID-19 Research Database
• Amazon Data Exchange
• Directly from Change Healthcare

This data powers industry dashboards that inform public health, including:
• Carnegie Mellon Delphi Group (COVIDCast)
• COVID-19 Healthcare Coalition (Decision Dashboard)

Industry Collaboration

Sample COVID-19 Research

Total health system impacts
• Telehealth
• Non-elective surgery utilization
• Care continuity
• School reopening

Social determinants / disparities in care
• Race/ethnicity
• Gender variations
• Regional variations

COVID-19 intervention effectiveness
• Remdesivir
• Dexamethasone
• Alpha blockers

COVID-19 co-morbidities
• Oncology
• Neurological disease
• Rheumatology
• Kawasaki Disease
• Cardiology

• Mental health
• Post acute utilization
• Long term care
• Long Covid

• Access & impact
• Economic vulnerability
• Water contamination

• Prazosin
• Rheumatology medications
• PCR v temperature testing

• Dermatology
• Reproductive endocrinology
• Childbirth/pre-natal
• Muskosketel
Race & Ethnicity COVID-19 Monthly Indices

Significant variations in COVID-19 diagnoses, hospitalization, mortality & vaccination rates by race/ethnicity
Economic Stability COVID-19 Monthly Indices

Significant variations in COVID-19 diagnoses, hospitalization, mortality & vaccination rates by economic stability
Our takeaway: significant effect from externalities

Significant externalities
- Social: economic stability & health literacy
- Physical: access to care
- Behaviors & attitudes
- Race/ethnicity

Tailored action is needed
- Understand life outside clinical settings
- Then meet people where they are
- Be open to new protocols
We have a new audience for public health data…
Letitia Wright @letitiawright 3h

COVID-19 VACCINE, SHOULD WE TAKE IT? #
Tonight I'm talking about Luciferase, the ingredient allegedly being added to the COVID vaccine that we should take.
https://youtube.com

Yardley Yeadon @MichaelYeadon 3

There isn't going to be a 2nd wave. Professional epidemiologists such as those in Sweden know this. It's biologically & mathematically implausible in U.K. since a very large proportion of people in badly hit countries have already had the virus.

10:18 AM · Dec 4, 2020 · Twitter Web App

not my intention to make anyone upset 🙅♀️ Nor am I saying don’t take it. I'm just concerned about what’s in it that’s all. Isn’t that fair to question or ask?
1. Accessible

If you can't explain it simply, you don't understand it well enough.

ALBERT EINSTEIN
New York State is one of only 3 states that are on track to contain #COVID.

I can’t stress enough how important it is that we don’t blow this incredible progress now.


(Study by @CovidActNow)
covidactnow.org
1. Engaging
Watch COVID spread in 22 seconds

NEW CASES PER 100K PEOPLE

MAR 1

JUL 22

SEP 15

Covid ActNow
COVID cases in California from January to April 2021

DAILY NEW CASES PER 100K PEOPLE

1 10 25 75

JAN 1
JAN 2
APR 27

Covid ActNow
3. Organized
Top Selections from the COVID Scientific Literature

Seven new SARS-CoV-2 variants in the U.S. with similar mutations

- A pre-peer reviewed study reports the discovery of seven SARS-CoV-2 variants, arising in different parts of the U.S., that have mutations in the same location in their genome. The variants developed these similar mutations independently (a process called convergent evolution). The researchers do not yet know how these mutations affect the biology of the virus, however, the amino acid site found mutated in these variants (Q667) is next to a cleavage site for furin. Furin is an enzyme that cleaves and activates proteins and is likely involved in SARS-CoV-2 entry into human cells. Read at medRxiv.

Early anticoagulation reduces mortality

- A study of over 4,000 COVID patients admitted to the hospital found that administration of anticoagulants (blood thinners that reduce the blood’s ability to form blood clots) within 24 hours of admission reduced risk for 30 day mortality by 27 percent. Patients who were given anticoagulants did not experience an increased risk of serious bleeding events. Read at BMJ.

Structure of SARS-CoV-2 spike protein with D614G mutation

- A study reports the detailed molecular structure of the SARS-CoV-2 spike protein carrying the D614G mutation. The spike protein is found on the surface of the virus and is responsible for its ability to attach to and invade human cells. The D614G mutation first appeared in Summer 2020 and the strain with this mutation quickly became dominant around the world. The researchers found that this mutation changes the structure of the spike protein, allowing it to more readily attach to cells. Read at PNAS.

Watch. Listen. Learn.

- The Economist recently released the first episode of their new podcast, "The Jab," which will focus on global vaccination efforts. The weekly podcast is slated to run for twelve weeks and is hosted by science correspondent Alok Jha and health-policy editor Natasha Loder.

- As part of the Coronavirus Structural Task Force, the lab of Dr. Janet Iwasa has produced a detailed animation of the entry of SARS-CoV-2 into human cells. Dr. Iwasa is an Assistant Professor of Biochemistry at the University of Utah working on a diverse array of visualization projects. The blog post accompanying the animation indicates that a companion annotation tool is forthcoming.

Know a great multimedia feature that deserves to be highlighted? Please write to meredith@covidactnow.org to submit suggestions for our review.
4. Transparent

LUKE, COME WITH ME.

Why?

BECAUSE IT IS THE ONLY WAY.

Why?

BECAUSE.

Because why?
Code powering Covid Act Now - A site urging Public leaders & health officials to take action now to prevent the spread of COVID-19

covidactnow.org
positive test rate

CALIFORNIA

A low percentage (1.2%) of COVID tests were positive, which suggests enough widespread, aggressive testing in California to detect most new cases.

Positive test rate is the number of positive PCR tests over the last 7 days, divided by the total number of PCR tests over the last 7 days.

Learn more about where our data comes from and how we calculate our metrics.
5. Actionable

Only YOU can control YOUR future.

- Dr. Seuss
Recommended actions
FOR CALIFORNIA

These recommendations match the guidelines set by the CDC. Based on California’s new cases per 100k in the last 7 days (27.8) and positive test rate (1.2%), people in California are advised to adhere to the following recommendations.

Notifications: Add your phone to California’s exposure notification system to receive alerts when you have been in close contact with someone who later tests positive for COVID.

Indoor gatherings should be avoided with people outside the immediate household, unless you are fully vaccinated. See guidance for vaccinated individuals. Outdoor gatherings with masks and distancing are a safer alternative.

Masks should be worn for public, indoor activities. For outdoor activities, the need to wear a mask depends on the activity and your vaccination status. See guidance on masks.

Schools can safely offer in-person learning only when these infection control measures are in place.

Travel should be avoided unless it is necessary or you are fully vaccinated.

Daily new cases per 100k population

CALIFORNIA

Over the last week, California has averaged 1,905 new confirmed cases per day (4.8 for every 100,000 residents).
Guidance on outdoor activities

<table>
<thead>
<tr>
<th>UNVACCINATED PEOPLE</th>
<th>OUTDOOR ACTIVITIES</th>
<th>VACCINATED PEOPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Walk, run, or bike with members of your household.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Attend a small, outdoor gathering with other fully vaccinated people.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Attend a small, outdoor gathering with fully vaccinated and unvaccinated people.</td>
<td></td>
</tr>
<tr>
<td>More risky</td>
<td>Dine at an outdoor restaurant with people from multiple households.</td>
<td></td>
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<tr>
<td></td>
<td>Attend a crowded, outdoor event, like a live performance, parade, or sports event.</td>
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Less risky

I got vaccinated. What do I do with my COVID vaccine card?
You'll need to keep your card for a second dose appointment and proof of vaccination.

**DO**

- Make a copy by taking a photo or scanning it.
- Keep it with your important personal papers.

**DON'T**

- Laminate the original card. You may need to add info to the card later.
- Post pictures of the card online. Protect your privacy and avoid ID theft.

If you've lost your card and don't have a backup, you can be re-issued a new card at the place where you got your first shot. You should not let a lost vaccine card deter you from getting your second shot.

Updated as of April 30, 2021

#CovidActNow

Source: CDC

Visit the COVID-19 Information Center for vaccine resources.
COVID-19 Global Mortality

Comparing Actual and Modelled Patterns in Space and Time Using an Infection Rate Fatality (IFR) Model

John Church MSc
and
Raj Bhopal DSc (hon)

Usher Institute, Medical School, University of Edinburgh, Teviot Place, Edinburgh EH8 9AG
Institute website: http://www.ed.ac.uk/usher
Study Results: model

**IFR Model**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Model IFR (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;=80</td>
<td>9.11</td>
</tr>
<tr>
<td>70-79</td>
<td>2.05</td>
</tr>
<tr>
<td>60-69</td>
<td>0.68</td>
</tr>
<tr>
<td>50-59</td>
<td>0.25</td>
</tr>
<tr>
<td>40-49</td>
<td>0.08</td>
</tr>
<tr>
<td>&lt;40</td>
<td>0.009</td>
</tr>
</tbody>
</table>

**Diamond Princess Data**

- 712 infection cases
- 13 deaths

Model output: 13 deaths
Commentary

• Model generates age based national average IFR variation well over an order of magnitude
  • Range from 0.06% (Uganda) to 1.2% (Japan)

• Clear regional separation of mortality and predicted spread of infections
  • South America showing infections spread 60% +
  • Europe and North America with infections spread 20-40%
    • Significant internal European variability
  • Sub-Saharan Africa very low levels of infection spread (<2%) with exception South Africa which has much higher age distribution
  • Limited infection spread in East Asia and SE Asia (<5%)

• Limitations
  • IFR model Euro-centric (UK and DP data)
  • Variable administrative reporting (multiple countries XS deaths 50% higher)

• Study visualised a ‘hypothetical spread of infection’, but variable IFR also a possibility
  • Need some explanation for clear regional variation on Covid impact / susceptibility
Reflecting on a year of COVID data and its impact on global modelling

David Pigott
pigottdm@uw.edu
14th May 2021
Tracking daily numbers
Global Parameterization

Figure 1a. Cumulative or admission hospitalization data availability, global

Pubmed: “clinical characteristics covid” – 5,462 results

“clinical characteristics covid” +
“china” – 2,043 results
“united states” – 700 results
“italy” – 517 results
“india” – 164 results
“mexico” – 66 results
“south africa” – 30 results

Cited by 27,954

N = c.40 patients
Tracking countermeasures
Solutions?

Community of Madrid (60361)

Cases

Hospitalizations

Deaths

Infections
Solutions?

WHO, Germany launch new global hub for pandemic and epidemic intelligence

Figure 1. The eight outbreak milestones are ordered as shown for illustrative purposes as the actual sequencing may vary. For example, laboratory confirmation may occur simultaneous to outbreak verification. In another case, public communication may be the first outbreak intervention. As an example, Ending Pandemics’ timeliness metrics are shown as the intervals between the relevant outbreak milestones.
15-Minute Break

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