Education and Training at the time of COVID-19

CARLOS DEL RIO, MD
EMORY UNIVERSITY
@CARLOSDELRIO7

The Numbers

- Globally > 50 Million cases & > 1.2 M deaths
  - 50% of deaths in: US (19%); Brazil (13%); India (10%) & Mexico (8%)
- US > 10 Million cases & > 242,000 deaths
  - > 155 Million tests have been conducted (468,000/Million pop)
  - Texas has > 1 million cases followed by CA with > 965 K and FL with > 832 K
  - NY has > 558,000 cases (28,733/Million pop) and DC 17,891 (25,250/Million)
- India # 2 with > 8.4 M cases & Brazil #3 with > 5.6 M cases
- Russia, France, Spain, Argentina, UK & Colombia have > 1 million cases
Europe Hard-hit with Second Wave

Second Wave in Europe – Nov 5, 2020
Learned from easing COVID-19 restrictions: an analysis of countries and regions in Asia Pacific and Europe

Emeline Han*, Melissa Mei Jin Tan*, Eva Turk, Devi Sridhar, Gabriel M Leung, Kenji Shibuya, Nima Asgar, Juwhan Oh, Alberto L Garcia-Basteiro, Johanna Hanefeld, Alex R Cook, Li Yang Hua, Yik Ying Teo, David Heymann, Helen Clark, Martin McKee, Helena Legido-Quigley

https://www.thelancet.com/action/showPdf?pii=S0140-6736%2820%2932007-9
Lessons Learned from Covid-19 Restrictions

- Can learn lessons from divergent practices
  - More extensive test/tracing/isolating in Asia including isolating in institutions and not at home in some countries
  - More extensive use of face coverings in Asia (which had prior experience)
  - Having more robust public health infrastructure and populations better conditioned to cooperate with strict rules/surveillance (and accept tradeoff with personal rights) makes a difference
- Recognition that removing COVID-19 restrictions should be a cautious return to a new normal and not back to pre-COVID state

[https://www.thelancet.com/action/showPdf?pii=S0140-6736%2820%2932007-9](https://www.thelancet.com/action/showPdf?pii=S0140-6736%2820%2932007-9)
The country reported a record of more than 500,000 new COVID-19 cases in the past week.
Half of U.S. counties saw new cases peak during the past month. Almost a third saw a record in the past week.
The number of people hospitalized reached record highs in almost half of states in recent weeks.
Hot Spots in US

https://covidtracking.com/data/charts/us-all-key-metrics

Source: The COVID Tracking Project

<table>
<thead>
<tr>
<th>Date</th>
<th>Tests</th>
<th>Cases</th>
<th>Hospitalized</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct 15</td>
<td>1,017,871</td>
<td>56,797</td>
<td>47,308</td>
<td>680</td>
</tr>
<tr>
<td>Nov 5</td>
<td>1,537,316</td>
<td>116,255</td>
<td>53,322</td>
<td>1,124</td>
</tr>
</tbody>
</table>

It’s not just colder weather causing high rates

White House Coronavirus Task Force Report Nov 1, 2020
Racial/ethnic inequalities in COVID-19

The Fullest Look Yet at the Racial Inequity of Coronavirus

By Richard A. Oppel Jr., Robert Osterhoff, K.K. Rebecca Liu, Will Wright and Mitch Smith

The New York Times

Coronavirus cases per 10,000 people

Source: Centers for Disease Control and Prevention's [Note: Data is through May 28.]

White House Coronavirus Task Force Report Nov 1, 2020
**Age-adjusted COVID-19-associated hospitalization rates by race and ethnicity**

**COVID-NET, MARCH 1 - SEPTEMBER 6, 2020**

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Rate (per 100,000 population)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic or Latino</td>
<td>341</td>
</tr>
<tr>
<td>Non-Hispanic Black</td>
<td>339</td>
</tr>
<tr>
<td>Non-Hispanic American Indian or Alaska Native</td>
<td>332</td>
</tr>
<tr>
<td>Non-Hispanic Asian or Pacific Islander</td>
<td>98</td>
</tr>
<tr>
<td>Non-Hispanic White</td>
<td>73</td>
</tr>
</tbody>
</table>

COVID-19-associated hospitalization rates are highest among people who are Hispanic/Latino, non-Hispanic Black, and non-Hispanic American Indian/Alaska Native.

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**COVID-19 CASES, HOSPITALIZATION, AND DEATH BY RACE/ETHNICITY**

<table>
<thead>
<tr>
<th>Rate ratios compared to White, Non-Hispanic Persons</th>
<th>American Indian or Alaska Native, Non-Hispanic persons</th>
<th>Asian, Non-Hispanic persons</th>
<th>Black or African American, Non-Hispanic persons</th>
<th>Hispanic or Latino persons</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CASES</strong>¹</td>
<td>2.8x higher</td>
<td>1.1x higher</td>
<td>2.6x higher</td>
<td>2.8x higher</td>
</tr>
<tr>
<td><strong>HOSPITALIZATION</strong>²</td>
<td>5.3x higher</td>
<td>1.3x higher</td>
<td>4.7x higher</td>
<td>4.6x higher</td>
</tr>
<tr>
<td><strong>DEATH</strong>³</td>
<td>1.4x higher</td>
<td>No increase</td>
<td>2.1x higher</td>
<td>1.1x higher</td>
</tr>
</tbody>
</table>

Race and ethnicity are risk markers for other underlying conditions that impact health — including socioeconomic status, access to health care, and increased exposure to the virus due to occupation (e.g., frontline, essential, and critical infrastructure workers).
From late January to early October 2020, the U.S. had 299,000 more deaths than the typical number during the same period in previous years (excess deaths)

At least

2 out of 3

of these excess deaths were from COVID-19

The largest percentage increases were among people who were Hispanic or Latino and adults aged 25–44

Compared with patients hospitalized with flu, hospitalized COVID-19 patients had a higher risk for
17 complications* and death

5xhigher risk of dying in the hospital

*Includes COVID-19, sepsis, acute respiratory failure, adult respiratory distress syndrome, acute kidney injury, respiratory failure, respiratory failure on mechanical ventilation, septic shock, severe sepsis, acute myocardial infarction, arrhythmia, acute liver failure, acute gastrointestinal hemorrhage, hospital-acquired pneumonia, and hospital-acquired bloodstream infection.

Morbidity and Mortality Weekly Report

COVID-19–Associated Hospitalizations Among Health Care Personnel — COVID-NET, 13 States, March 1–May 31, 2020

Anna K. Embree-Barnes, MPH; Allison C. O’Herron, MPH; Michael Whitney, MPH; Shaelyn B. Loflin, MD, MPH; Nora Cheh, MD; John J. Giroux, MD, MPH; Pascale Daily King, MPH; Rachel H. Hedin, MD; Brevna Kowalski, MPH; James Mark, MPH; Kimberly Young-Heo, MPH; Debra J. Anderson, MD; Ryo F. O’Toole, DPM; Maria L. Montano, MPH; Patricia A. Ryan, MD; Sue Kim, MPH; Emily Riegel, MD; Keltkey Carrasco-Sabini, MPH; Richard Dearth, MD; Sarah Gruman-Ochs, MPH; Salon Tenner, MD; Grace Bonner, MPH; Nancy J. Irons, MPH; Nancy M. Bristow, MD; Christopher T. Foy, MPH; Lauri M. Begg, MPH; Jessica Miller, MPH; Melissa A. Saxon, MD; Nicole Wiener, MPH; William Schaffner, MD; H. Keffy Tabo, MD; Lynne Charlton, MPH; Mary F. H. Lee, MPH; Lynnemore Borojevic, MPH; Alyce M. Tso, MD; Anne J. Hall, DVS; Jonathan M. Workman, MD; Shilpa Garg, MD; Lindsay Kim, MD; CDC COVID-19 Response Team

Summary

What is already known about this topic?
Data on characteristics and outcomes of U.S. health care personnel (HCP) hospitalized with COVID-19 are limited.

What is added by this report?
Analysis of COVID-19 hospitalization data from 13 sites indicated that 6% of adults hospitalized with COVID-19 were HCP. Among HCP hospitalized with COVID-19, 26% were in nursing-related occupations, and 73% had obesity. Approximately 28% of these patients were admitted to an intensive care unit, 16% required invasive mechanical ventilation, and 4% died.

What are the implications for public health practice?
HCP can have severe COVID-19–associated illness, highlighting the need for continued infection prevention and control in health care settings as well as community mitigation efforts to reduce SARS-CoV-2 transmission.
Compared with non-pregnant women, pregnant women more frequently were:

- Admitted to an ICU (10.5 versus 3.9 per 1,000 cases)
- Received invasive ventilation (2.9 versus 1.1 per 1,000 cases)
- Received ECMO (0.7 versus 0.3 per 1,000 cases)
Very little influenza activity in Australia, Chile and S. Africa during the 2020 flu season.

Source: CDC, https://www.cdc.gov/mmwr/volumes/69/wr/mm6937a6.htm
2. Mask mandates help control the rise in hospitalizations

Symptom Duration and Risk Factors for Delayed Return to Usual Health Among Outpatients with COVID-19 in a Multistate Health Care Systems Network — United States, March–June 2020

Weekly / July 31, 2020 / 69(30);993-998
March 1 – Sept 19, 2020 = 277,285 cases reported among school aged children

Weekly incidence (per 100,000 children):
- Children 5 – 11 yo = 19.0
- Adolescents 12 – 17 yo = 37.4

5% no symptoms
3,240 (1.2%) hospitalized (404 or 0.1% required ICU)
51 (< 0.01%) died

Hispanic ethnicity, Black race and underlying conditions were more common in those hospitalized.

Other countries experience

Geneva: Ages 5-9 risk was 32% that of adults age 20-49 and no significant difference between 10-19 yo and 20-49 yo

Iceland:
- More than 22,000 residents
- Age < 10: 6.7% positive,
- Age > 10: 13.7% positive

https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)31304-0/fulltext
Children and transmission: less than adults?

Multiple studies have found children are the index cases in fewer than 10% of COVID-19 familial clusters.

Contact Tracing during Coronavirus Disease Outbreak, South Korea, 2020

59,000 contacts of 5,700 index patients Jan – March, 2020
- 10,600 – household contacts (12% positive)
- 48,000 – non-household contacts (2% positive)

HIGHEST rates: Index pt was 10-19 years of age (18.6% contacts+)
LOWEST rates: Index pt was 0-9 years of age (5.3% contacts+)


Over 10 days in March, all 50 states closed K-12 schools and childcare centers and enacted other non-pharmaceutical interventions to slow the spread of SARS-CoV2.

Interrupted time series analyses, adjusted at the state level for testing capacity, population density, health status, social vulnerability.

JAMA. Published online July 29, 2020. doi:10.1001/jama.2020.14348
What can we learn from experiences with school re-openings in other countries?
School reopening: Denmark and Norway

Mid-April:
- Younger students only
- Class size 12-15
- Distancing, handwashing
- Cohorting

No outbreaks

School reopening: Israel

35-38 students/class
- Heat wave: A/C in each class, mask exemptions
- 6 hrs/day, 6 days/week
- Sports and extracurriculars continued
- 153 students, 25 staff members, 87 additional contacts
- 139 schools closed again

Opened early May to all ages with limited class size.
Liberalized in 2 weeks. Outbreaks 2 weeks later (JH/HS)

https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2020.25.29.2001352#html_fulltext
Evidence based thoughtful protocols

Mitigation
- Face masks, face shields, classroom size, hours/day, ventilation, room design, hallways, lunch/meals, physical distancing, cleaning

Screening
- Temperature checks?, symptoms screens?, HOME screening without penalty

The Positive Student
- It is going to happen
- Cohorting, School closure, School Nurses
- How much disruption to school loses the benefit of in-person school?

Testing/Contact tracing
- Access, Turn around time, tracers

Detailed and Described in ADVANCE of school opening, with opportunity for revision

School systems cannot do this alone

Federal dollars
Attention to EQUITY
Significant risk of worsening disparities
We are the adults in the room

Schools are a microcosm of their communities. They do not operate in a vacuum. The community must be responsible for its own health and that of our children. Opening schools requires community sacrifices in order to benefit us all.
Rapid COVID-19 vaccine development

- Developing a vaccine is a global imperative
- The ability of the virus to achieve pandemic spread is diminished by establishing higher levels of community (heard) immunity.
- This will require that ~ 60-70% of the population be immune either via natural infection or vaccination.
- A vaccine will allow that level of protection to occur faster and without the unacceptably high mortality of repeated waves of infection.
Developing and testing a vaccine at pandemic speed

- In January the SARS-CoV-2 genome was sequenced
- The first vaccine safety trials started in March
- The first phase 3 trial begun in July

Coronavirus Vaccine Tracker

By Jonathan Corum, Sui-Lee Wee and Carl Zimmer  Updated October 29, 2020

[Diagram showing phase 1, phase 2, phase 3, limited, and approved vaccines with numbers: 36, 14, 11, 6, 0]

Percent of U.S. Population:
- Phase 1a ~ 5%
- Phase 1b ~ 10%
- Phase 2 ~ 30 – 35%
- Phase 3 ~ 40 – 45%
- Phase 4

COVID-19 VACCINE ALLOCATION PHASES WITHIN THE FRAMEWORK

Phase 1
- Phase 1a: "Start-up" Phase
  - High-risk health care workers
  - Frontline responders
- Phase 1b
  - People of all ages with comorbidities and underlying conditions that put them at significantly higher risk
  - Older adults living in congregate or overcrowded settings

Phase 2
- 8–12 teachers and school staff and school-aged children
- Critical workers in high-risk settings—workers who are in industries essential to the functioning of society and at substantially higher risk of exposure
- People of all ages with comorbid and underlying conditions that put them at moderately higher risk
- People in homeless shelters or group homes for individuals with disabilities, including persons with mental illness, developmental and intellectual disabilities, and physical disabilities or in recovery, and staff who work in such settings

Phase 3
- Young adults
- Children
- Workers in industries and occupations important to the functioning of society and at increased risk of exposure not included in Phase 1 or 2

Phase 4
- Everyone residing in the United States who did not have access to the vaccine in previous phases

Equity is a crosscutting consideration: In each population group, vaccine access should be prioritized for geospatial areas identified through CDC’s Social Vulnerability Index or another more specific index.

The Holiday Bubble

Today:
- Get your Flu Shot
- Have a serious family conversation and obtain a REAL COMMITMENT to form a bubble
- Agree on a location

2 weeks prior:
- Limit contact with others
- Work from home
- Scrupulous attention to social distancing and masking

5 – 7 days prior:
- Get a PCR test
- Stock up on hand sanitizer and wipes
- Complete grocery shopping (remember you are quarantined)

https://www.bcm.edu/coronavirus/for-the-baylor-community/from-dr-james-mcdeavitt/build-your-own-holiday-bubble
We must confront the fact that we are taking a far too narrow approach to managing the outbreak.

Our interventions have focused on cutting lines of viral transmission, thereby controlling the spread of the pathogen.

However we have learned that two categories of disease are interacting: one an infection and the other an array of non-communicable diseases.

These conditions are clustering within social groups according to patterns of inequality deeply embedded in our societies.

This is not a “pandemic” but a “syndromic”

The most important consequence of seeing COVID-19 as a syndromic is to underline its social origins...one that requires an approach encompassing education, employment, housing, food and environment.

https://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736
Conclusions

- Racial and ethnic disparities are the hallmark of this pandemic
- A “silver lining” of COVID-19 is that it could be an opportunity to finally eliminate inequalities in health in the United States
  - A new kind of “herd immunity”
- Our ability to defeat COVID-19 will depend on our willingness to fight and defeat the pandemic of social determinants of health and racism.
- Health equity is the road to ending COVID-19

Questions?

@CARLOSDELRIO7