Ain’t Nothing Like the Real Thing: Teaching Under COVID-19

MARK A. STRAND
NDSU FACULTY CONFERENCE
AUGUST 19, 2020
COVID-19 Update
## The Numbers

<table>
<thead>
<tr>
<th></th>
<th>Globally</th>
<th>United States</th>
<th>U.S. %</th>
<th>North Dakota</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infected</td>
<td>21,869,976</td>
<td>5,569,520</td>
<td>25.5%</td>
<td>8,587</td>
</tr>
<tr>
<td>Deaths</td>
<td>773,741</td>
<td>173,143</td>
<td>22.4%</td>
<td>125</td>
</tr>
<tr>
<td>CFR</td>
<td>3.5%</td>
<td>3.1%</td>
<td></td>
<td>1.5%</td>
</tr>
<tr>
<td>Recovered</td>
<td>14,591,932</td>
<td>2,922,936</td>
<td></td>
<td>7,249</td>
</tr>
<tr>
<td>Recovery</td>
<td>66.7%</td>
<td>52.5%</td>
<td></td>
<td>84.4%</td>
</tr>
</tbody>
</table>

Worldometer -- [https://www.worldometers.info/coronavirus/](https://www.worldometers.info/coronavirus/)
Number of COVID-19 Cases Per Capita

SARS CoV-2
The Reproductive Number

$R_0$ – how many people are infected by one person with the disease

- When $R_0 < 1$ the infection will die out in the long run.
- But if $R_0 > 1$ the infection will require control measures

CoVid-19 $R_0 = 2.5$
Influenza $R_0 = 1.3$

Source: ECDC, UMICH, Lancet
<table>
<thead>
<tr>
<th>Case Fatality Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. SARS 2003, China</td>
</tr>
<tr>
<td>2. MERS 2012, Saudi Arabia</td>
</tr>
<tr>
<td>3. CoViD-19 2019, China</td>
</tr>
<tr>
<td>4. Seasonal influenza</td>
</tr>
</tbody>
</table>

3.5X
## COVID-19 Transmission Concerns

<table>
<thead>
<tr>
<th>Factor</th>
<th>Low risk</th>
<th>High risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Outdoors</td>
<td>Indoors</td>
</tr>
<tr>
<td>Air quality</td>
<td>External air exchange, filtered air</td>
<td>Stagnant air, no filters</td>
</tr>
<tr>
<td>Human density</td>
<td>&gt;6 ft, communities of &lt;1000/sq km</td>
<td>&lt;6 ft, high population density cities</td>
</tr>
<tr>
<td>Self-protection</td>
<td>Mask, distance, no contact, hand hygiene</td>
<td>Unmasked, close, intimate contact</td>
</tr>
<tr>
<td>Exposure time</td>
<td>&lt; 15 min</td>
<td>&gt;15 min</td>
</tr>
<tr>
<td>Personal risk level</td>
<td>Young, healthy</td>
<td>&gt; Age 65, Chronic disease</td>
</tr>
<tr>
<td>Likelihood of compliance</td>
<td>Libraries, museums, clinic, offices</td>
<td>Bars, concerts, sports stadiums</td>
</tr>
</tbody>
</table>
COVID-19 Clinical presentation

- **Mild** (no or mild pneumonia) reported in about 80%.
- **Severe disease** (e.g., with dyspnea, hypoxia, or >50% lung involvement on imaging within 24 to 48 hours) reported in about 15%.
- **Critical disease** (e.g., with respiratory failure, shock, or multiorgan dysfunction) reported in 5% (these complications mainly in elderly and those with other health problems).
What about masks?

- Masks provide an additional level of protection along with social distancing and good hand hygiene.
- "States that put in mandates saw a 2% drop, per day, in the number of cases occurring.” Dr. Gregory Poland, Mayo Clinic, Journal of Health Affairs
- Face coverings go back over 100 years
- Most of the data on the benefits of face coverings is lab-based testing, comparing what is expired, exhaled with and without a mask, and it is significant.

Minnesota COVID-19 Epidemiology Curve

Cases per Day
Data as of 0:00 GMT+0

Novel Coronavirus Daily Cases

Flattening the Curve

South Korea’s Experience

Do nothing

Mitigation

“The Hammer”

“The Dance”

Stringency index: 82
Flattening the Curve

**Peak 6557**

Stringency index: 94

20% of peak - 1331

Stringency index: 85

Stringency index: 74

Stringency index: 73
Testing and Contact Tracing

- Once fall semester begins, NDSU may be asked by the North Dakota Department of Health to assist with contact-tracing if someone in one of our classrooms is diagnosed with COVID-19.
- To assist in this effort in identifying individuals who may have been in proximity to infected individuals keep seating charts and take daily attendance.
- A close contact is currently defined as those within 6’ for 15 minutes or more.
- Download Care19 Alert app.
  - https://ndresponse.gov/covid-19-resources/care19

Email, Margaret A. Fitzgerald, Interim Provost, August 17, 2020.
Nationwide Testing and Prevalence

State Performance Managing COVID-19

Per 10,000 of Population tested  |  Point prevalence per 10,000
Future for the U.S.
Herd Immunity

- Not immunized, but still healthy
- Immunized and healthy
- Not immunized, sick, and contagious

No one is immunized.
Contagious disease spreads through the population.

Some of the population gets immunized.
Contagious disease spreads through some of the population.

Most of the population gets immunized.
Spread of contagious disease is contained.
Vaccines

<table>
<thead>
<tr>
<th>PRECLINICAL</th>
<th>PHASE 1</th>
<th>PHASE 2</th>
<th>PHASE 3</th>
<th>APPROVAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>135+</td>
<td>19</td>
<td>12</td>
<td>8</td>
<td>2</td>
</tr>
</tbody>
</table>

- Vaccines not yet in human trials
- Vaccines testing safety and dosage
- Vaccines in expanded safety trials
- Vaccines in large-scale efficacy tests
- Vaccines approved for early or limited use

Coronavirus Vaccine Tracker (as of 8/16/20)
2009 H1N1 Epidemiology

Jhung et al. 2009 Pandemic H1N1 Epidemiology d CID 2011:52 (Suppl 1) d S13
Careers in Public Health

Stop COVID: Earn an MPH

NDSU Public Health
Guarding Our Well-being
Physics Class, University of Montana, 1919
COVID-19 Impact: Faculty

How has the COVID-19 pandemic impacted the following:
- Overall psychological well-being
  - 60%
- Overall physical well-being
  - 39%
- Exposure to violence or witnessing violence
  - 9%
- Academic performance/ability to pursue your studies...
  - 47%

Concerns with returning to campus
Group: Faculty*

- Being around others on campus and/or large crowds of people: 82%
- Impact of COVID-19 on your family: 80%
- Impact of COVID-19 on yourself: 76%
- Campus sanitation practices: 73%
- Being able to participate in traditional campus activities (e.g. football games, concerts, socializing with friends, ...): 35%
- Access to mental and physical health care services: 35%
- Access to resources needed to complete coursework or course projects (skip response if N/A): 29%
- Access to opportunities outside the classroom (e.g. internships, events, etc.) (skip response if N/A): 22%

Best Practices

- Give yourself and your students sufficient margin to cope with inefficiencies, technical glitches, and unexpected disruptions.
- Remain active and tend to your mental and physical health.
- Create boundaries for social media consumption to avoid information overload.
- Maintain connections with friends and colleagues.
- Consider some of the surprises that have enriched you, and will continue to do so.
Crisis

Danger

Opportunity