COVID-19: Where do we go from here?

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Outline

• Current epidemiological picture
  • Internationally, nationally, and in Oklahoma
• Transmission routes
• Prevention measures
• Diagnostic testing
• Public health infrastructure
Current Epidemiological Picture
International, US, and Oklahoma
# Current Epidemiological Picture (Aug 27, 2020)

<table>
<thead>
<tr>
<th></th>
<th>Oklahoma</th>
<th>USA</th>
<th>Globally</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Cases</td>
<td>55,550</td>
<td>6,015,317</td>
<td>24,466,049</td>
</tr>
<tr>
<td>Number of Deaths</td>
<td>778</td>
<td>183,959</td>
<td>832,242</td>
</tr>
<tr>
<td>Cumulative Incidence Rate (per million)</td>
<td>14,039</td>
<td>18,173</td>
<td>3,139</td>
</tr>
<tr>
<td>Case Fatality Rate Percent</td>
<td>1.4%</td>
<td>3.1%</td>
<td>3.4%</td>
</tr>
<tr>
<td>Death Rate (per million)</td>
<td>197</td>
<td>555</td>
<td>107</td>
</tr>
<tr>
<td>Hospitalization rate (per million)</td>
<td>1,082</td>
<td>1,517</td>
<td>?</td>
</tr>
</tbody>
</table>
Epidemic Curve

Daily New Cases in the United States

Regionally in OK: https://coronavirus.health.ok.gov/
Epidemic Curve of COVID-19 in Oklahoma by Week of Report

- $R_0 = 3.8$
- $R_1 < 1.0$
- $R_2 \approx 1.3$
- $R_3 = 1.0$
- $R_4 < 1.0$
Distribution of Deaths from COVID-19 in Oklahoma: Aug 27, 2020 (Trend lines use a 7 day period moving average)
COVID-19 Excess Mortality from All Causes
(08/19/2020)

Select a jurisdiction:
United States

+ indicates observed count above threshold
g Predicted number of deaths from all causes
- threshold for excess deaths

Weekly number of deaths (from all causes)

https://www.cdc.gov/nchs/nvss/vsrr/covid19/excess_deaths.htm
Age-adjusted COVID-19-associated hospitalization rates by race and ethnicity

COVID-NET, MARCH 1 - AUGUST 8, 2020

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

PERCENT OF CASES EVER HOSPITALIZED (by date of report)

<table>
<thead>
<tr>
<th>Event Description</th>
<th>N</th>
<th>Median</th>
<th>10th to 90th Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time from Symptom Onset to Test (Specimen Collection)</td>
<td>22,882</td>
<td>3 days</td>
<td>0-10 days</td>
</tr>
<tr>
<td>Time from Symptom Onset to Hospitalization</td>
<td>2,614</td>
<td>6 days</td>
<td>0-14 days</td>
</tr>
<tr>
<td>Length of Hospitalization Discharged Alive</td>
<td>2,051</td>
<td>5 days</td>
<td>1-15 days</td>
</tr>
<tr>
<td>Length of Hospitalization Deceased</td>
<td>520</td>
<td>9 days</td>
<td>2-24.5 days</td>
</tr>
<tr>
<td>Time from Symptom Onset to Death</td>
<td>432</td>
<td>14 days</td>
<td>5-33 days</td>
</tr>
</tbody>
</table>

*Data as of August 20, 2020.
1. Limited to cases with a known date of symptom onset.
2. Limited to cases with a known date of a test (specimen collection) on or after the date of symptom onset.
3. Limited to cases with a known hospital admission date on or after the date of symptom onset.
4. Limited to cases with a known admission and discharge date from the hospital.
5. Limited to cases who are deceased.
Transmission Route
Transmission Routes

**Common**

- Person-to-person
  - Respiratory droplet (>5 μm)
  - Droplet nuclei/aerosol (≤ 5 μm)
    - Healthcare aerosol-generating procedures: good evidence
    - Non-healthcare settings: possible but poor evidence

**Less Common**

- Fomite/contamination
- Fecal/oral
- Mother-to-child (vertical)
- Bloodborne
Prevention Measures
What protects against COVID-19 infection or transmission?

**Intervention**

<table>
<thead>
<tr>
<th>Without intervention</th>
<th>With intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical distancing</td>
<td></td>
</tr>
<tr>
<td><strong>Face masks</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Eye protection</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Chance of infection or transmission**

- **Physical distancing**
  - Less than 1m distancing: 12.8%
  - 1m or more distancing: 2.6%
  - Certainty of evidence: Moderate*

- **Face masks**
  - Without masks or respirators: 17.4%
  - With masks or respirators: 3.1%
  - Certainty of evidence: Low*

- **Eye protection**
  - Without eye protection: 16.0%
  - With eye protection: 5.5%
  - Certainty of evidence: Low*

*See the paper below for full explorations of certainty and why these categories are used. Moderate certainty: we are moderately confident in the effect estimate; the true effect is probably close to the estimate, but it is possibly substantially different. Low certainty: our confidence in the effect estimate is limited; the true effect could be substantially different from the estimate of the effect.

Even when properly used and combined, none of these interventions offers complete protection and other basic protective measures (such as hand hygiene) are essential to reduce transmission.

Do Masks Work?

Two hair stylists with COVID-19 spent at least 15 minutes with 139 clients. Everyone wore face coverings, no clients are known to be infected.*

Wear cloth face coverings consistently and correctly to slow the spread of COVID-19.

*No clients reported symptoms; all 67 customers tested had negative tests.

CDC.GOV
bit.ly/MMWR71420
Diagnostic Testing
Testing for COVID-19

Diagnostic
• PCR/molecular
  • Gold standard
  • Point-of-care
    • Abbott ID Now
• Antigen
  • Point-of-care

Antibody
• ELISA
  • CLIA certified
  • Lateral flow/point-of-care
    • Not CLIA certified

• Positive Predictive Value
• Negative Predictive Value
Positive tests as a percent of total tests
Public Health Infrastructure
COVID-19’s Impact on Public Health Infrastructure

Pre-COVID

• Communicable disease nurses in each county health department conducted case and contact tracing

• PHIDDO is a 20-year old disease surveillance database

• Lab results are submitted via fax, electronically, flat file, etc.

COVID

• Call center designed to conduct case and contact tracing for whole state

• Replace PHIDDO with 1) Google MTX and 2) NBS

• Require lab testing in uniform flat file format
Public Health Infrastructure Impact on COVID-19

• Delays
  • Laboratory results
  • Case investigation
  • Contact tracing

• Over-extended workforce
  • Cross-training of existing workforce
  • Hiring of new employees

• Lack of clarity
  • Infected population
  • High risk settings for transmission
Summary

• SARS-CoV-2/COVID-19 has affected countries and states differently
  • Prevention and mitigation efforts have been effective, particularly in areas with robust public health infrastructure

• Although substantial progress achieved in treating COVID-19 patients, COVID-19 continues to cause severe illness with substantial morbidity and mortality
  • Racial minorities are at increased risk of worse outcomes

• Continue social-distancing and mask-wearing efforts as an effective measure to prevent person-to-person transmission

• Testing key components of response effort
Resources

• OSDH Coronavirus Homepage
  • https://coronavirus.health.ok.gov/

• OCCHD
  • https://www.occhd.org/COVID-19

• THD
  • https://www.tulsa-health.org/COVID19

• Weekly Epidemiological Summary

• Daily Executive Report
  • https://coronavirus.health.ok.gov/executive-order-reports
Dr. Drevets’ Presentation