Preparing for the COVID-19 Pandemic

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*worldwide spread of a new disease that affects large numbers of people*
COVID-19 (COronaVirus Infectious Disease 2019)

- Coronaviruses are a large family of viruses that can infect many animals
  - Named for the crown-like spikes on surface
- COVID-19 is a new coronavirus infection
  - Discovered in December 2019 in Wuhan, China
- Coronavirus family includes viruses that cause the common cold, as well as SARS and MERS
  - Although most COVID-19 infections are mild, severe pneumonia and even death can occur
- Natural host for many coronaviruses are bats
- Because COVID-19 is new, a lot is not known
Seven Human Coronaviruses (HCoVs)

- **Common HCoVs:**
  - HCoV-229E (alpha)
  - HCoV-OC43 (alpha)
  - HCoV-NL63 (beta)
  - HCoV-HKU1 (beta)

- **Other HCoVs:**
  - SARS-CoV (beta)
  - MERS-CoV (beta)
  - COVID-19* (beta)

*Coronavirus Disease - 2019*
Current Status of the COVID-19 Outbreak

• Global case numbers: > 200,000 cases; > 100 countries & > 8,000 deaths
  • https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6

• US case numbers: > 7,200 cases and 117 deaths (but significant under testing)

• Georgia Cases: 197 cases and 3 deaths
COVID-19 Cases in US as of March 18, 2020


Source: C.D.C., state and local health agencies, hospitals.
CoVID-19 in Georgia

Cumulative Diagnoses

Current Status

Diagnosed
UNDIAGNOSED


2010 0210 0210 1215 1320 3435 475 611 517 922 1311 194 263 389 52127 76104 1795

CoVID-19 in Georgia
COVID-19 Transmission

• Respiratory secretions - main mode of transmission
  • Spread through respiratory droplets in the air and that land on surfaces
  • Transmission from people before onset of symptoms or without symptoms possible but contribution off these infections appears to be small

• Stool – unlikely to be a source

• Perinatal – no transmission observed

Signs and Symptoms of COVID-19

• No particular signs and symptoms can discriminated COVID-19 from other respiratory infections such as influenza.
Clinical Course of COVID-19

- Incubation period is ~5 days (range = 2 – 14 days)
- ~80% have mild illness (~80%)
  - fever (83 – 98%)
  - cough (76 – 82%)
  - myalgia or fatigue (11 – 44%)
- ~30% of hospitalized patients required intensive care
  - 5-10% require mechanical ventilation
- No approved medication
  - NIH clinical trials have started
- Supportive care has been very successful for most patients
COVID-19 Mortality

COVID-19 mortality rate by age

Coronavirus mortality rate based on pre-existing conditions

## How does COVID-19 Compare to Influenza

<table>
<thead>
<tr>
<th></th>
<th>Influenza</th>
<th>COVID-19</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biology</strong></td>
<td>Enveloped RNA virus</td>
<td>Enveloped RNA virus</td>
</tr>
<tr>
<td></td>
<td>Common in many bird/animal species</td>
<td>Common in many animal species</td>
</tr>
<tr>
<td><strong>Symptoms</strong></td>
<td>Fever, cough, body aches</td>
<td>Fever, cough, body aches</td>
</tr>
<tr>
<td></td>
<td>Mild-severe</td>
<td>Mild-severe, pneumonia more common</td>
</tr>
<tr>
<td><strong>Transmission</strong></td>
<td>Droplets/contact</td>
<td>Droplets/contact, maybe airborne</td>
</tr>
<tr>
<td><strong>Incubation</strong></td>
<td>2-5 days</td>
<td>Usually about 5 days, range 1-14</td>
</tr>
<tr>
<td><strong>When does infection occur</strong></td>
<td>Seasonal, fall-winter</td>
<td>Unknown</td>
</tr>
<tr>
<td><strong>How contagious</strong></td>
<td>Each case causes 1.3 others on average</td>
<td>Uncertain but likely more than flu</td>
</tr>
<tr>
<td><strong>Who is most at risk</strong></td>
<td>Elderly, chronically ill and pregnant women</td>
<td>Elderly and chronically ill, men in China</td>
</tr>
<tr>
<td><strong>Treatment</strong></td>
<td>Antivirals helpful if started early</td>
<td>No</td>
</tr>
<tr>
<td><strong>Vaccine</strong></td>
<td>Yes! Moderately effective</td>
<td>No</td>
</tr>
<tr>
<td><strong>Number of infections</strong></td>
<td>About 1 billion annually worldwide</td>
<td>125,000 cases as of March 10, 2020</td>
</tr>
<tr>
<td></td>
<td>20-50 million in US each year</td>
<td></td>
</tr>
<tr>
<td><strong>Deaths</strong></td>
<td>300,000-600,000 annually worldwide</td>
<td>4,600 so far worldwide</td>
</tr>
</tbody>
</table>
Testing for COVID-19

- Testing by detecting RNA of virus
  - Nasopharyngeal swab and Throat swab
  - Lower respiratory sample if possible
- Until recently only available at CDC
- Now available in most state laboratories (GA DPH now has it)
- Commercial lab (Quest, LabCorp, ViraCor) are now available
- Laboratory Developed Test being developed by many including Emory
- Time from sample acquisition to test result is still longer than desired
- Still needed: ability to obtain testing without coming to hospital or busy clinic
Unkn0wns about COVID-19

• How contagious is the virus and exactly how is it transmitted
• Optimal personal protective equipment
• How long will the pandemic last
• Effect treatments
• When a vaccine will be available

• One thing we can say for sure – expect recommendations to change as we learn more and as the situation evolves
National Preparedness
Identify, Isolate and Inform
Preparedness and Response Framework for Pandemics

- Find cases (has been a challenge with limited testing)
- Isolate
- Contact tracing with quarantine
- Don’t look for all cases
- Stay home when ill
- Social separation

# Quarantine vs. Isolation

<table>
<thead>
<tr>
<th>Quarantine</th>
<th>Isolation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• To separate and restrict the movement of <strong>well</strong> persons who may have</td>
<td>• To separate <strong>ill</strong> persons who have a communicable disease from those who do not have that</td>
</tr>
<tr>
<td>been exposed to a communicable disease</td>
<td>disease</td>
</tr>
<tr>
<td>• Monitor to see if they become ill</td>
<td>• Restrictions the movement of ill persons to help stop the spread of certain diseases</td>
</tr>
<tr>
<td>• These people may have been exposed to a disease and do not know it, or</td>
<td>• Example: Isolation for patients with infectious tuberculosis</td>
</tr>
<tr>
<td>they may have the disease but do not show symptoms.</td>
<td></td>
</tr>
<tr>
<td>• Quarantine can also help limit the spread of communicable disease.</td>
<td></td>
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</tbody>
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Travel Restrictions

Risk Assessment Level for COVID-19
- Widespread sustained (ongoing) transmission and restrictions on entry to the United States
- Widespread sustained (ongoing) transmission
- Sustained (ongoing) community transmission
- Risk of limited community transmission
Healthcare, School, Business and Personal Preparedness
Preparing your healthcare system

- Review your facility emergency plan
- Create an emergency contact list
- Communicate about COVID19 with staff and patients
- Protect your workforce
  - Screen patients and visitors for symptoms of acute respiratory illness
- Ensure proper use of Personal Protective Equipment (PPE)
- Conduct an inventory of available PPE
- Encourage sick employees to stay home
- Separate patients with respiratory symptoms so they are not waiting with other patients
- Consider strategies for patients to stay home

American Hospital Association “Best Guess” for COVID-19 over next 2 months in US

COVID-19:
• 96,000,000 infections
• 4,800,000 hospitalizations
• 1,900,000 ICU admissions
• 480,000 deaths

Influenza in 2019-2020:
• 35,000,000 infections
• 490,600 hospitalizations
• 49,000 ICU admissions
• 34,200 deaths

“Prepare for the worst and hope for the best”
## COVID19 estimates vs Flu in Atlanta
(if no aggressive interventions are done)

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</tr>
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<tbody>
<tr>
<td>Cases *</td>
<td>1,380,265</td>
<td>53,087</td>
<td>106,174</td>
<td>1,380,265</td>
<td></td>
</tr>
<tr>
<td>Medical Visits **</td>
<td>648,725</td>
<td>5,309</td>
<td>31,852</td>
<td>690,132</td>
<td></td>
</tr>
<tr>
<td>Hospitalizations ***</td>
<td>24,845</td>
<td>2,654</td>
<td>10,617</td>
<td>276,053</td>
<td></td>
</tr>
<tr>
<td>ICU Beds****</td>
<td>8,282</td>
<td>1,327</td>
<td>5,309</td>
<td>138,026</td>
<td></td>
</tr>
<tr>
<td>Deaths *****</td>
<td>1,380</td>
<td>1,540</td>
<td>265</td>
<td>1,062</td>
<td>27,605</td>
</tr>
<tr>
<td>Deaths among 65+ population #</td>
<td>1,035</td>
<td>212</td>
<td>849</td>
<td>22,084</td>
<td></td>
</tr>
</tbody>
</table>
1. Face Shield
2. N95 Respirator
3. Isolation Gown
4. One pair of gloves

https://youtu.be/bG6zISnenPg
Preparing your business and employees

• Empower employees to stay home when sick
  • Remote work and communication solutions
  • Review human resources policies, workplace and leave flexibilities
  • Review pay and benefits available to encourage appropriate sick leave

• Encourage good hand hygiene
  • Alcohol based hand sanitizer at high touch areas (water/coffee dispensers)

• Prepare for wide-spread outbreaks
  • Social distancing (school/daycare closures, restriction on gatherings)
  • Travel restrictions from government or other agencies
  • Absenteeism
  • Develop Enterprise-wide Bio-preparedness (Pandemic) Plans

Preparing your school or university

• Emphasize preventive actions for students and staff
  • Staying home when sick
  • Hand and respiratory hygiene

• Review and prepare with student and occupational health

• Information-sharing systems with staff, students, and partners.

• Review emergency operations plans in case of outbreak on campus
  • Prepare for temporary class suspension and event/activity cancellation
    • Use of virtual classrooms?
  • Prepare for on campus quarantine

• Ensure availability of nutrition and medication

• Ensure continuity of education and research

Preparing your family and your home

• Re-enforce prevention
  • Hand and respiratory hygiene
  • Vaccinations
  • Appropriate cleaning of high touch areas
  • Avoid sick individuals if possible

• Develop a family preparedness plan
  • Prepare to stay at home if sick
  • Prepare for social distancing (school closures, work closures, etc)
  • Separate room for family member who is sick
  • Have medications and other needs ready
  • Supply of “chicken soup”
Non-pharmacologic measures

- Border screenings/closures
  - Little value at this point

- Mass gatherings
  - Important to prevent them – may have significant impact on conferences and sporting event
    - In Atlanta the NCAA Basketball final 4 and the Decennial Conference in Infection Prevention

- Public transportation
  - Potential place for spread

- School closures
  - Have to be implemented early to have impact

- Isolation of infected
  - Critically important, need testing to identify those infected!
Goals of Mitigation Strategies

• Minimizing morbidity
• “Flattening” the epidemic curve to avoid overwhelming healthcare services
• Keeping impact on economy manageable
• Slowing progression of epidemic to allow for vaccine and other treatment development

Adapted from CDC / The Economist
Social Distancing

“To limit the spread in the community we need to spread the community”
Social Distancing and Personal Hygiene

- Stay home if sick
- Notify MD office before visit
- Limit movement
- Limit visitors
- At least 2 weeks supply of medications and food
- Early
  - Stay home if sick
  - Hand hygiene
- Mild-moderate
  - Reduce large gatherings
  - Reduce mixing
  - Consider distance learning
- Substantial
  - Distance learning
  - Closure
- Early
  - Stay home if sick
  - Hand hygiene
  - Telework
- Mild-moderate
  - Reduce meetings
  - Stagger schedules
  - Limit travel
- Substantial
  - Telework
  - Cancel travel and conferences

https://www.cdc.gov/nonpharmaceutical-interventions/index.html
Prevention advice you can use:

- **Hygiene**: Wash your hands often with soap and water or alcohol-based solutions.
- **Coughs and sneezes**: Cover your nose and mouth by putting them into your elbow or with a single-use handkerchief.
- **Distance**: Avoid contact with people when they sneeze, cough or have a fever.
- **Cleaning**: Do not share food, cutlery or other objects without washing them properly.
- **Masks**: Masks are not recommended if there are no symptoms.
What about masks?

- **Surgical mask:**
  - Meant to protect the environment from the wearer (designed to keep the surgeon’s respiratory pathogens away from a patient)
  - Does a good job of trapping large droplets and some aerosols

- **Respirator (N95 Mask):**
  - Fits tighter to the face and is meant to help protect the wearer from inhaling droplets in the environment
Questions?