Overview

1. WHAT IS COVID-19?
   Basic information about the coronavirus and the disease it causes

2. HOW DO I PROTECT MYSELF & MY COMMUNITY?
   A primer in pandemic biosafety

3. HOW DO I LEARN MORE ABOUT COVID-19?
   Tips on how to be an informed consumer of scientific information
What is COVID-19?

An infectious disease caused by novel coronavirus SARS-CoV-2
SARS-CoV-2 has a $R_0$ of less than 3

- $R_0$ is an estimate of the average number of people an infected person infects
- Current publications put SARS-CoV-2 $R_0$ between 0.25-3, with several estimating it near 2.3

Key Points:
* Most people who come in contact with a COVID-19 patient won’t get sick.
* The ill population may at least double every generation
How does SARS-CoV-2 enter the body?

**Mucus Membranes**
Mucus membranes, like your eyes, nose, and mouth can be routes of entry for the virus, especially if you touch or rub them with a contaminated hand.

**Inhalation of respiratory droplets**
If someone nearby is infected with SARS-CoV-2 and coughs, they will generate small drops of fluid that contain the virus; if these land in our nose or mouth you may become infected.

**Skin is not crossed**
Your skin is an effective barrier against SARS-CoV-2. However, if you get the virus on your hands and then touch your mouth, nose or eyes you could infect yourself. So, wash your hands!
How does SARS-CoV-2 primarily spread?

Someone with COVID-19 coughs

Respiratory droplets containing the virus fly through the air

The droplets land in the mouth of a nearby person and she becomes infected.
SARS-CoV-2 may also spread through contamination on surfaces

Someone with COVID-19 coughs

Respiratory droplets containing the virus land on his hand

He touches a metal doorknob, and the virus transfers. Surfaces can remain dangerously contaminated for days.

A co-worker opens the same door, on the way to lunch, transferring the virus to her hand.

She does not wash her hands and becomes infected.
Symptoms of COVID-19

Fever 88%
Fatigue 38%
Muscle or joint pain 15%
Headache 14%
Chills 11%
Nausea/vomiting 5%
Diarrhea 4%

Dry Cough 68%
Coughing up thick mucus 33%
Shortness of breath 19%
Sore throat 14%
Nasal congestion 5%
Coughing up blood 1%
Eye inflammation 1%

“Older people [60+], and those with pre-existing medical conditions (such as cardiovascular disease, chronic respiratory disease or diabetes) are at risk for severe disease”

Lancet Article: Risk factors for mortality of adult inpatients with COVID-19 in China

• Top tier, peer-reviewed medical journal article (Zhou 2020)
• Developed several logistic regression models using hospitalized patient data to explore the relationship between different risk factors and mortality
  • Univariable models looked at one variable at a time
  • One multivariable model looked at lymphocyte count, d-dimer, SOFA score, coronary heart disease, and age together
Lancet Article: Risk factors for mortality of adult inpatients with COVID-19 in China

These models examined effect of risk factors on likelihood for patient survival/death

- Model results presented as odds ratios (OR)
  - OR > 1 indicates a positive relationship between variable and death (increased likelihood of death)
  - OR < 1 indicates negative relationship (decreased likelihood of death)
- 95% confidence intervals
  - Greater range of numbers indicates greater uncertainty in OR estimate
  - If 1 is included in the range, then the effect is not statistically significantly different from 1
- Statistical significance thresholds: p < 0.05

<table>
<thead>
<tr>
<th>Demographics and clinical characteristics</th>
<th>Univariable OR (95% CI)</th>
<th>p value</th>
<th>Multivariable OR (95% CI)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, years*</td>
<td>1.14 (1.09-1.18)</td>
<td>&lt;0.0001</td>
<td>1.10 (1.03-1.17)</td>
<td>0.0043</td>
</tr>
<tr>
<td>Female sex (vs male)</td>
<td>0.61 (0.31-1.20)</td>
<td>0.15</td>
<td></td>
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<tr>
<td>Current smoker (vs non-smoker)</td>
<td>2.23 (0.65-7.63)</td>
<td>0.20</td>
<td></td>
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<tr>
<td>Comorbidity present (vs not present)</td>
<td></td>
<td></td>
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<tr>
<td>Chronic obstructive lung disease</td>
<td>5.40 (0.96-30.40)</td>
<td>0.056</td>
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<tr>
<td>Coronary heart disease</td>
<td>21.40 (4.64-98.76)</td>
<td>&lt;0.0001</td>
<td>2.14 (0.26-17.79)</td>
<td>0.48</td>
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<td>Diabetes</td>
<td>2.85 (1.35-6.05)</td>
<td>0.0062</td>
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<tr>
<td>Hypertension</td>
<td>3.05 (1.57-5.92)</td>
<td>0.0010</td>
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</tbody>
</table>
How do I protect myself and my community?
Don’t overwhelm the healthcare system

Capacity of healthcare system determined by trained personnel, hospital beds, ICUs, respirators

- Development of pandemic without measures to slow infection rate
- Therapeutics (developed) and approved
- Vaccine developed and approved
- A dynamic property that changes over the course of the pandemic
Everyone should:

**Wash your hands**
- When you arrive at work or home, and before you eat.

**Don’t touch your face**
- Your eyes, nose and mouth are the areas vulnerable to introduction of the virus.

**Regularly clean common areas**
- Clean and disinfect common areas at least daily following cdc.gov guides

**Practice social distancing**
- When advised by authorities, practice social distancing.
In an office, you should:

Make & follow a Workplace Plan

- Review NIEHS COVID-19 training tool and make a workplace plan

Put space between co-workers

- Make meetings virtual, or leave 6 feet between co-workers, including in meetings.

Keep doors open

- Keep office doors open if possible, to minimize touch points.

Telework

- If possible, arrange for staff to work from home.
Biosafety in common areas

The Disinfection Check List

- Faucets
- Shared containers
- Tables
- Counters
- Chairs
- Cabinets
- Doors
- Remote Controls
- The Coffee Maker
- Shared equipment
- White Board Markers
- Etc.

Clean up your own dishes

Maintain social distance
Other work place considerations:

Wear recommended PPE

Some professions will require masks or gloves, depending on job exposures.

More frequently clean & disinfect

If you have high consumer traffic, you should increase cleaning frequency.

More frequent hand hygiene

If your job involves lots of close contact, refresh your training on hand hygiene.

Skip hand shakes & card exchange

If you still attend meetings, greet others without physical contact.
Handwashing can be fun

Lord of The Rings
One Ring Chant

Vietnam’s COVID-19
Handwashing Dance

Nine Atlanta
Rap Songs

Happy Birthday,
Twice

Vietnam produced a video
that teaches how to stay
safe from COVID-19, but
also the basics of
handwashing.

Atlanta magazine found
nine songs choruses that
meet the 20 second
requirement, including “No
Scrubs”

The classic…sing happy
birthday twice.

Brought to you by: Audible’s
Facebook Account
If you are feeling ill, you should:

**Isolate yourself**

Stay home if you are feeling sick.

**Cough into a tissue or your elbow**

Cover your mouth with a tissue and then dispose of it, or cough into your elbow.

**Wear a face mask**

If you must go out in public, for example to the doctor, wear a mask.

**Call a doctor first**

Before visiting a healthcare facility, call ahead for medical advice.
How do you wear a face mask?

• The WHO has a great set of resources for that including infographics and youtube videos

• Only wear a face mask if:
  • You need it for PPE
  • You are ill
  • You are a caregiver for someone with COVID-19

• Don’t wear it if you don’t need it
  • Research suggests wearing a mask increases face touching, which could increase your risk of exposure

Image WHO.INT
Information changes everyday.

How do I learn more?
Select the best data sources

**Strong Data Sources**
- CDC
- NIAID, NIEHS & NIH
- WHO
- Your State and Local Public Health Department
- Your Physician’s Office
- Peer-review Journals

**Poor Data Sources**
- Facebook
- Reddit
- Twitter
- Your neighbor (unless they are an infectious disease doctor)
- Mass media
Articles | Critically evaluate all your sources

- Who wrote the article?
- Where is it posted?
- Does the author cite reliable data sources?
- Was it peer-reviewed?
  - Was it published in a scientific journal?
  - Did it cite a scientific journal?
- Do they have a perspective or agenda?
- When was this published?
Journal article: Surface Stability of SARS-Cov-2

• Still undergoing peer review, but preliminary findings are important

• Viable virus could be detected in:
  • aerosols up to 3 hours* post aerosolization
  • up to 4 hours on copper
  • up to 24 hours on cardboard
  • up to 48-72* hours on plastic and stainless steel

*In these cases the limit indicates the maximum time measured in the experiment (not max survival)
Images | Critically evaluate all your sources

- Are all the parts of the figure labeled?
- What units/scales are used?
  - Do those make sense?
- Does the image impart useful information?

N.J. coronavirus cases by county

Map: NJ Advance Media • Source: N.J. Department of Health
• Created with Datawrapper

Image https://www.reddit.com/r/dataisugly/
Graphs | Critically evaluate all your sources

- Do the things being compared make sense?
- Does the y-axis go to zero?
- If there are two graphs, do they use the same scale?
- Did they use a log scale in any part of the figure?

Image: https://www.reddit.com/r/dataisugly/
WHAT IS COVID-19?
A novel coronavirus SARS-CoV-2 causing a global pandemic in 2020

HOW DO I PROTECT MYSELF & MY COMMUNITY?
Follow biosafety principals outlined in this presentation to help decrease acceleration of the COVID-19 outbreak.

HOW DO I LEARN MORE ABOUT COVID-19?
Use reliable sources, such as government website and peer reviewed literature to stay up to date on the latest recommendations.
THANK YOU!

QUESTIONS? COMMENTS?

You can reach me at margaret@gryphonscientific.com