COVID-19 Pandemic ChABSA and AMHP Cyber Chapter Webinar March 10, 2020

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COVID-19 (aka 2019 n-CoV, SARS-2)







Novel Coronavirus SARS-CoV-2 This scanning electron microscope image shows SARS-CoV-2 (round magenta objects) emerging from the surface of cells cultured in the lab. SARS-CoV-2, also known as 2019-mCoV, is the virus that causes COVID-19. The virus shown was isolated from a patient in the U.S. NEWD-RHC

Global Spread of COVID-19 (2-26-20)

Figure 1. Countries, territories or areas with reported confirmed cases of COVID-19, 26 February 2020



¹Novel, C.P.E.R.E., 2020. The epidemiological characteristics of an outbreak of 2019 novel coronavirus diseases (COVID-19) in China. Zhonghua liu xing bing xue za zhi = Zhonghua liuxingbingxue zazhi, 41(2), p.145.

Department of Health and Human Service Response

- Screening at US airports in Chicago, NY, Atlanta, SF and LA
- Nonessential travel warning issued
- Screening of person under investigation (PUI) thru State Health Department with samples run by CDC
- Screening close contacts of cases (contact investigation)
- Ramp up of test kits by CDC (reagent fiasco)
- Accelerated Vaccine and Drug Development

PANDEMIC INFLUENZA

IMPLEMENTATION PLAN



HOMELAND SECURITY COUNCIL

COVID-19 TEST KITS



MD Hospitals Response: Specimen Collection

State Epidemiologist:

- **Maryland Department of Health**
- 410-767-6700 during working hours

Or

410-795-7365 after working hours

Holy Cross Hospital (Silver Spring) is the identified Assessment Hospital for Montgomery County. Currently, all Montgomery county PUI are triaged and tested in the ER.

Hospitals Response

Broadened EMR form to triage in ER for PUI using CDC case definition

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CDI CDC 2019-0CeV ID:1 Name Approved, (2009) 2003 3222 Non-A/10/2020 Human Infection with 2019 Novel Coronavirus Person Under Investigation (PUI) and Case Report Form Symptoms, clinical course, past medical history and social history Collected from (check eli that apply) [] Patient interview [] Medical record review During this illness, did the patient experience any of the following symptoms? Symptom Present Ives Divo Unit Feiger >300.4F (39C)+ YES NO. VES NO. VES NO. VES NO. VES NO. Unk Unk Subjective hover (feft feveril) Onlifs Muscle aches Imysigia Unk Unk Unk Runny nose intrinombeau Sore throat Ves No Cough (new orset or worsening of phronic cough) Ves No Shortness of breath (dyspree) Neuses or vomiting Yes No Yes No Heedache Abdominal pain E Ves Diarthea (23 loose/looser than normal stools/24hr period Other, specify: Yes 🔛 No 🔂 Unknown Pro-existing medical constitions? Tes No Chronic Lung Disease (asthma/emphysema/CDPO) Tres DNo **Diabetes Mellitus** Linkingwei Cardiovascular disease Ives 140 Unimoiun Chronic Renat Oxease Thes The Chronic Uver disease Tes No mmunocompromised Condition Ves. Neurologic/heurodevelopmental BNS IIT YES, specifyi Unichment UPYES, specify) Other chronic diseases Tes ElNo Tes No Dinknown If female, currently pregnant Current smoker Former smoker Specimens for COVID-19 Testing **Hespiratory Diagnostic Testing** Pos Neg Fend Not done Specimen Test Specimes. Date Sent to State Lab CDC Type - 60 Collected Texted NP Syst Influenza rapid Ag CLA CLB CP Sweb Influence PCR DADE Sputture! RSV H. metapneumovirus Other Parainfluenza (1-4) Specify: Approvend Rhinosinus/interiivinus - 11 Caronavirus (OC43, 229E, HILU1, NL63) M preumoniae C. preumoniae Other, Specify Additional State/Jocal Speciment Dy Rath opportunities of the categories of information is constanted by average 20 information per sequence designed by the total for averaging because on a second period of the total of gathering and management (but data second and har priving and meaning the approxime of theoremics, its agreent way not candid in spream, and a private to not explored to required to a reflective of information when a stepping a control y skill DMI metric factor. Sort concretely expeding the tector explores in any other speed of the only the other tector of t

Case Definition

Fever and symptoms of lower respiratory illness (e.g., cough, difficulty breathing)	and	In the last 14 days before symptom onset, a history of travel from China . – <i>or</i> – In the last 14 days before symptom onset, close contact with a person who is under investigation for 2019-nCoV while that person was ill.
Fever or symptoms of lower respiratory illness (e.g., cough, difficulty breathing)	and	In the last 14 days, close contact with an ill laboratory-confirmed 2019-nCoV patient.

https://www.cdc.gov/coronavirus/2019-nCoV/clinical-criteria.html

Epidemiology of COVID-19

- Patterned from SARS and MERS
- Close contacts
- Coughing, sneezing

Nosocomial Transmission

Virus	Nosocomial Transmission	Case Fatality rate	Pandemic	Noscomial cases per report
2019-nCoV	Yes	Unknown	Unknown	15
SARS-CoV	58% cases from nosocomial transmission	9.5%	Yes	128
MERS-CoV	70% cases from nosocomial transmission	34.4%	No	186

Close Contact

Defined as:

- a) being within approximately 6 feet (2 meters), or within the room or care area, of a 2019-nCoV case for a prolonged period of time while not wearing recommended personal protective equipment (PPE) (e.g., gowns, gloves, NIOSH-certified disposable N95 respirator or PAPR, eye protection); close contact can include caring for, living with, visiting, or sharing a health care waiting area or room with a 2019-nCoV case
- <u>or</u>
- b) having direct contact with infectious secretions of a 2019-nCoV case (e.g., being coughed on) while not wearing recommended PPE.
 Note: Length of exposure has not been determined by CDC as of this time.

Infection Prevention and Control Steps

- 1. Put a surgical mask on the PUI
- 2. Place patient in a private room with the door closed, ideally an airborne infection isolation room if available.
- 3. Health care providers entering the room of a PUI should use:

Standard precautions Contact precautions DROPLET precautions (incl. eye protection)



Personal Protective Equipment

Respiratory and contact isolation

- Eye protection
- N95 mask or PAPR
- Gown and Gloves









		Pathogen						
Precaution		No pathogen identified no risk factor for ARD of potential concern	Bacterial ARD ^h	Para- influenza, RSV & adenovirus	Influenza virus with sustained human-to- human trans- mission ^c	New influenza virus with no sustained human-to- human-to- human trans- mission ^d	SARS	Novel organisms
Hand hygiene ^l		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gloves		R/A [®]	R/A ⁸	Yes	R/A [#]	Yes	Yes	Yes
Gown ¹¹		R/A [®]	R/A ⁸	Yes	R/A®	Yes	Yes	Yes
Eye protection		R/A)	R/A	R/A	R/A	Yes	Yes	Yes
Medical mask on HCWs and caregivers		Yes	R/A ⁱ	Yes	Yes	Yes ¹	Yesk	Not routinely [#]
Particulate respirator on HCWs and caregivers	for room entry	No	Na	No	No	Nat routinely	Not routinely	Yes
	within 1m of patient	No	No	No	No	Not routinely	Not routinely	Yes
	for aerosol- generating procedures	Yes	Not routinely ^m	Not routinely ^m	Yes	Yes	Yes	Yes
Medical mask on patient when outside isolation areas		Yes	Yes	Yes®	Yes	Yes	Yes	Yes
Single room		Yes, if available	No	Yes, if available ⁹	Yes, if available ^p	Yes	Yes	Not routinely*
Airborne Precaution room ⁴		No	No	No	No	Not routinely	Not routinely	Yes
Summary of infection control precautions for routine patient care, excluding aerosol- generating procedures		Standard Proplet Precautions	Standard Precautions	Standard + Droplet + Contact Precautions	Standard + Droplet Precautions	Standard + Droplet + Contact Precautions	Standard + Droplet + Contact Precautions	Standard Airborne' Contact Precautions

R/A - Risk Assessment

COVID-19 Q & A – What is it?

WHO wanted to avoid stigmatizing a country or particular group, so it chose a name on 2-11-2020 that did not refer to a geographical location, animals, an individual or a group of people. COVID-19 (<u>CoronaVirus Disease – 2019</u>)

- Examples of enveloped (lipid coated) ss RNA viruses
- Coronavirus (SARS & MERS)
- H1N1 (Spanish flu)
- HIV
- Ebola
- Rhabdovirus (rabies)
- <u>Herpes</u>
- Hepatitis C



COVID-19 Q & A – COVID vs SARS vs MERS

- SARS (Severe Acute Respiratory Syndrome
- 2002-2003
- 8,100 cases; 800 deaths; <u>CFR 10% (initially CFR 75%); spread to 17 Countries</u>
- MERS (Middle East Respiratory Syndrome)
- 2012 to Present
- 2494 Cases; 850 deaths; CFR 34%; spread to 27 Countries
- COVID-19
- 2019 to Present
- 105,000 Cases; 21,000 hospitalizations (20%); 3600 deaths; <u>CFR 3.4%;</u> spread to 95 Counties
- Seasonal Influenza
- Since Spanish Flu 1914
- 34 Million Cases, 350,000 hospitalizations (1%); 20,000 deaths; CFR 0.5%; USA (2019-2020 season)

COVID-19 Q & A – How Virulent is COVID-19

- While the range of symptoms for the 2 viruses is similar, the fraction with severe disease appears to be different.
- For COVID-19 patients appear to have mild or asymptomatic infection 80% of the time, but severe and critical infection appears higher than influenza infection; 15% are severe (requiring oxygen), and 5% are critical infections (requiring ventilation).
- For influenza, the most at-risk population for severe influenza infection are children, pregnant women, elderly, those with underlying chronic medical conditions and those who are immunosuppressed.
- For COVID-19, our current understanding is that older age and underlying conditions increase the risk for severe infection.
- Crude Mortality Ratio (the number of reported deaths divided by the reported cases) for COVID-19 appears higher (3—5%) than for Seasonal influenza (usually < 0.1%).
- While the true mortality(the number of reported deaths divided by the number of infections) of COVID-19 is still unclear but will likely be lower. However, mortality is also determined by access to and quality of health care.



Coronavirus disease 2019 (COVID-19) Situation Report – 37

Globally 81 109 confirmed (871 new)

China 78 191 confirmed (412 new) 2718 deaths (52 new)

Outside of China 2918 confirmed (459 new) 37 countries (4 new) 44 deaths (10 new) 3.5% CFR

1.5% CFR

Global number of deaths from influenza pandemics

Estimates from different research publications for 4 pandemics.



Our World in Data

COVID-19 Q & A – COVID vs "Flu" vs "Cold"

The Reproductive number (number of secondary infections generated from one infected individual) a very context- and time-specific, making direct comparisons more difficult.

COVID-19 virus reproductive number is felt to be between 2 and 2.5 compared to 1.24 for influenza

Children are important drivers for influenza virus transmission in the Community compared to COVID-19 virus, where initial data indicate that children (0-19) are less affected than adults

Furthermore, preliminary data from household transmission studies in China suggest that children are infected by adults, rather than vice versa for influenza.

Reproductive Number for COVID-19







Smallpox







European Hand Washing Rates, 2015



COVID-19 Q & A –Clinical Presentation COVID-19 vs "Flu" vs "Common Cold"

- Similar disease presentation
- Note: Common cold presents with coryza (i.e. no stuffy nose, runny nose, sneezing, and post-nasal drip) in contrast to Influenza and COVID-19
- Both cause respiratory disease, which presents as a wide range of illness from asymptomatic or mild through to severe disease and death.
- Both viruses are transmitted <u>primarily by droplets</u> but contact with contaminated surfaces also plays role in transmission.
- Therefore, the similar public health measures (.e. hand hygiene and good respiratory etiquette (coughing into your elbow or into a tissue and immediately disposing of the tissue) can prevent infection.

Clinical Features

- Fever
- Cough
- Myalgia/fatigue
- Severe Dyspnea

- 30% patients in study with ARDS
- 15% died
- 16 HCW infected



ARDS=Acute respiratory disease syndrome

*Median time from onset of symptoms, including fever (in 98% of patients), cough (75%), myalgia or fatigue (44%), and others.

THE LANCET

https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30183-5/fulltext

COVID-19 Radiographic features



COVID-19 Q & A – Incubation Period

- Influenza has a shorter median incubation period (the time from infection to appearance of symptoms) ranging 1-4 days (average 2 days) compared with COVID-19 (3 to 14 days)
- Influenza has a shorter serial interval (the time between successive cases) of 3 days compared to COVID-19 virus (5-6 days). This means that influenza can spread is faster than COVID-19.
- However, Influenza generally shed virus in the first 3-5 days of illness (beginning 1 day before onset of symptoms and for 5-7 days after becoming sick) where as
- COVID-19 patients can shed virus 24-48 hours prior to appearance of symptoms. At present, this does not appear to be a major driver of transmission for COVID-19.

COVID-19 Q & A – Environmental Persistence?

- The analysis of 22 studies reveals that human coronaviruses such as Severe Acute Respiratory Syndrome (SARS) coronavirus, Middle East Respiratory Syndrome (MERS) coronavirus or endemic human coronaviruses (HCoV) can persist on inanimate surfaces like metal, glass or plastic for up to 9 days.
- This new virus is not heat-resistant and will be killed by a temperature of just 26/27 degrees. It hates the Sun. Heat and humidity play a factor in how far the virus can travel and persist outside the body
- G. Kampf, D. Todt, S. Pfaender, E. Steinmann, Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents; <u>J Hosp</u> <u>Infect</u>. 2020 Mar;104(3):246-251. doi: 10.1016/j.jhin.2020.01.022. Epub 2020 Feb 6. <u>https://www.ncbi.nlm.nih.gov/pubmed/32035997</u>

COVID-19 Q & A – Which Disinfectants Work?

In the light of the comparable genetic characteristics with SARS-CoV and MERS-CoV suggest that 2019-nCoV may likely susceptible to disinfectants with proven activity against enveloped viruses, including:

- sodium hypochlorite (bleach) (e.g. 1,000 ppm (0.1%) for general surface disinfection and 10,000 ppm (1%) for disinfection of blood spills),
- 62-71% ethanol,
- 0.5% hydrogen peroxide,
- quaternary ammonium compounds and
- phenolic compounds, if used according to manufacturer's recommendations.
- Other biocidal agents can be less effective
 - 0.05-0.2% benzalkonium chloride or
 - 0.02% chlorhexidine digluconate.
- G. Kampf, D. Todt, S. Pfaender, E. Steinmann, Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents; <u>J Hosp Infect.</u> 2020 Mar;104(3):246-251. doi: 10.1016/j.jhin.2020.01.022. Epub 2020 Feb 6. <u>https://www.ncbi.nlm.nih.gov/pubmed/32035997</u>

How to Make Strong (0.5%) Chlorine Solution from Liquid Bleach

Use strong (0.5%) chlorine solution to clean and disinfect surfaces, objects, and body fluid spills. Make new strong (0.5%) chlorine solution every day. Throw away any leftover solution from the day before.



COVID-19 Q & A – Method of Transmission

- Droplet and Contact
- Possible fecal oral
- Possibly consumptions of reservoir host (Bat, Civet Camel, etc.)
- Prevention
 - Cough Etiquette and use a mask ("Droplet precaution")
 - Wash your hands (an unnatural human act)
 - Avoid touching your face (Note: humans touch their face about 20 x/hour)
 - Health Care workers require more stringent PPE due to potential to develop aerosols

COVID-19 Q & A – Expectation of this becoming Seasonal

Seasonal Flu

- Usually starts to circulate during the winter time in each Hemisphere

• COVID-19

 Coronaviruses (SARS, MERS, Coronaviruses) do not transmit efficiently in high humidity environments

– Survival of Coronavirus is reduced at higher temperature

That said, it is expected to decline during the summer months (less community spread) but due to its Reproductive number, is likely to return in the Fall.

Treatments : Virally Targeted Agents

- Ribavirin (a guanine derivative nucleoside analogue approved for treating HCV (with interferon alfa-2a and -2b) and respiratory syncytial virus (RSV)I (SE: severe anemia)
- Remdesivir (GS-5734) is a phosphoramidate prodrug of an adenine derivative with a chemical structure similar to that of tenofovir alafenamide, an approved HIV reverse transcriptase inhibitor.
- Favipiravir is an experimental Japanese Protease Inhibitor Influenza drug
- Kaletra (dual PI: Lopinavir and ritonavir) inhibit HIV "aspartic" protease but may inhibit the "3-chymotrypsin-like" protease of SARS and MERS
- Hydroxychloroquine (Plaquenil) (an immune modulator shows inhibitory effects against COVID-19.
- Note: Kaletra (dual PI) and Plaquenil from Spain and Austria in critically ill patients
- Disulfiram, an approved drug to treat alcohol dependence, has been reported to inhibit the papain-like protease of MERS and SARS in cell culture.
- Angiotensin Converting Enzyme (ACE) Inhibitors used in treatment of hypertension may block the target of COVID-19 in the lungs bronchial cells

Treatments: Host Targeted Agents

- Interferon alfa-2a and -2b, approved for the treatment of HBV and HCV (with ribavirin), can stimulate innate antiviral responses in patients infected with 2019-nCoV,
- Small-molecule agents:
- Hydroxychloroquine (Plaquenil) and Chloroquine are immune modulators that shows inhibitory effects against COVID-19. Kaletra (dual PI) and Plaquenil used Spain/Austria
- Disulfiram, an approved drug to treat alcohol dependence, has been reported to inhibit the papain-like protease of MERS and SARS in cell culture.
- Angiotensin Converting Enzyme (ACE) Inhibitors used in treatment of hypertension may block the target of COVID-19 in the lungs bronchial cells
- Vaccine Therapies:
- There are currently no licensed vaccines or therapeutics for COVID-19; There are currently 20 vaccines in development in the USA and Worldwide.
- Note: While the influenza vaccine is not effective against COVID-19 virus, it is highly recommended to get vaccinated each year to prevent influenza infection.

Economic Impact of Prior World Epidemics



That said, when past outbreaks erupted, they were more geographically contained. Furthermore, while China was also hit hard during the SARS epidemic, in 2003 the country accounted for only 4% of global GDP; today that number is closer to 16%.

Economic Impact of COVID-19 in CHINA Demonstrated by Satellite Pollution Production 2-25-20



A map shows the sharp decline in emissions over China between early January and late February as parts of the country went on lockdown in an attempt to contain the COVID-19 coronavirus. (Image: © NASA Earth Observatory)

FAQs about Biosafety (Handling of COVID-19)

https://www.cdc.gov/coronavirus/2019-ncov/lab/biosafety-faqs.html

- How should the laboratory perform a risk assessment to identify and mitigate risks?
- Are certified Class II biological safety cabinets (BSCs) required to process COVID-19 specimens? Should laboratory staff put procedures in place to minimize personnel exposure if there is no certified Class II BSC
- What biosafety level is recommended for handling clinical specimens from suspected COVID-19 PUIs?
- What disinfectant should personnel use to decontaminate work surfaces?
- How should personnel remove biohazardous waste from the laboratory or testing area for decontamination and disposal? Does an autoclave need to be available in the facility?
- How should staff members transport clinical specimens from suspected COVID-19 PUIs within a facility?
- What are Standard Precautions?
- What are infectious aerosols and droplets?
- What procedures can generate aerosols and droplets?

FAQs on about Biosafety (Shipping Specimens of COVID-19) https://www.cdc.gov/coronavirus/2019-ncov/lab/biosafety-faqs.html

- Do people packing specimens for transport need to be trained and competent?
- What specific packaging should personnel use when shipping clinical specimens from suspected COVID-19 PUIs
- At what temperature should specimens be shipped?
- What information is required on the outer package for shipment of specimens with ice packs?
- What information is required on the outer packages for shipment of specimens with dry ice?
- What information is required on an overpack if used for specimen shipment?
- Is a shipper's declaration required? What documentation is required for shipment? What if specimens are shipped on dry ice?
- Is a Responsible Person required on the shipping paperwork?
- Once packaging of the samples is complete should staff members decontaminate the work area?

References

- G. Kampf, D. Todt, S. Pfaender, E. Steinmann, Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents; <u>J Hosp Infect.</u> 2020 Mar;104(3):246-251. doi: 10.1016/j.jhin.2020.01.022. Epub 2020 Feb 6.
 - https://www.ncbi.nlm.nih.gov/pubmed/32035997
- Infection prevention and control of epidemic- and pandemic-prone acute respiratory diseases in health care WHO Interim Guidelines June 2007
 - <u>https://www.who.int/csr/resources/publications/WHO_CDS_EPR_2007_6/en/</u>
 - <u>https://apps.who.int/iris/bitstream/handle/10665/69707/WHO_CDS_EPR_2007.6_eng.pdf;jsessionid=8FDAB_0F90007F9831F1382029F8E3288?sequence=1</u>
- Laboratory biosafety guidance related to the novel coronavirus (2019-nCoV) Interim Guidance, 2-12-20
 - <u>https://www.who.int/docs/default-source/coronaviruse/laboratory-biosafety-novel-coronavirus-version-1-</u>
 <u>1.pdf?sfvrsn=912a9847_2</u>
- Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings (2007)
 - https://www.cdc.gov/infectioncontrol/pdf/guidelines/isolation-guidelines-H.pdf
- Environmental Cleaning and Disinfection Recommendations; Interim Recommendations for US Households with Suspected/Confirmed Coronavirus Disease 2019
 - <u>https://www.cdc.gov/coronavirus/2019-ncov/community/home/cleaning-disinfection.html</u>

References

- Webpage on Infection Prevention: https://www.cdc.gov/coronavirus/2019-ncov/infection-control.htm
- Reference Document regarding COVID-19: https://www.cdc.gov/coronavirus/2019-ncov/index.htm
- Maryland Health Department COVID-19:

https://phpa.health.maryland.gov/Pages/Novel-coronavirus.aspx

- Documents
 - Pui-form.doc
 - Clinician Letter 2019-01-21
- Clinical details: Lancet, NEJM

https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30183-5/fulltext https://www.nejm.org/doi/full/10.1056/NEJMoa2001017?query=featured_home http://weekly.chinacdc.cn/en/article/id/e3c63ca9-dedb-4fb6-9c1c-d057adb77b57

The End

