

COVID-19 Update for Primary Care 3/26/20

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Disclosures

Consultant/ Speakers bureaus	No Disclosures
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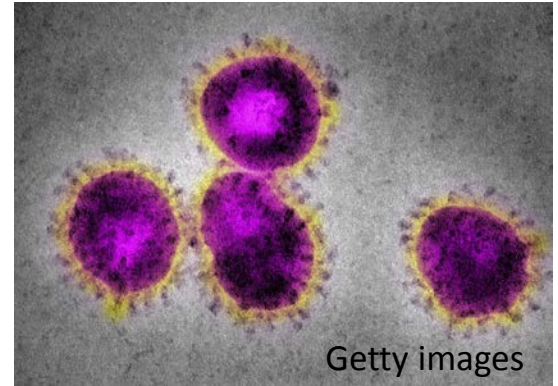
Other: in past 12 mo I have performed HCV slide editing for Clinical Care Options LLC

Objectives

- 1) Review coronavirus biology, including modes of transmission.
- 2) Review clinical presentation and epidemiology of SARS-CoV-2.
- 3) Review safety issues and infection prevention in the outpatient setting during community spread of SARS-CoV-2.

Coronaviruses

- Enveloped RNA viruses
- Significant pathogen in humans and animals
- Evolve rapidly through mutation and recombination
- Host specific, but able to jump species barriers



Non-human Coronaviruses

- Chickens: bronchitis, nephrosis
- Piglets: gastroenteritis, encephalitis
- Turkeys: enteritis
- Dogs: enteritis
- Cats: peritonitis
- Calves: enteritis
- Mice: hepatitis, encephalitis
- Rats: pneumonitis, sialodacryoadenitis
- Whales: pneumonia, hepatitis
- Bats: ? – *many species isolated, unknown pathogenicity*

The “Common Cold”

5 June 1965

BRITISH
MEDICAL JOURNAL

1467

Cultivation of a Novel Type of Common-cold Virus in Organ Cultures

D. A. J. TYRRELL,* M.D., F.R.C.P. ; M. L. BYNOE,* M.B., D.T.M.&H., D.OBST.R.C.O.G.

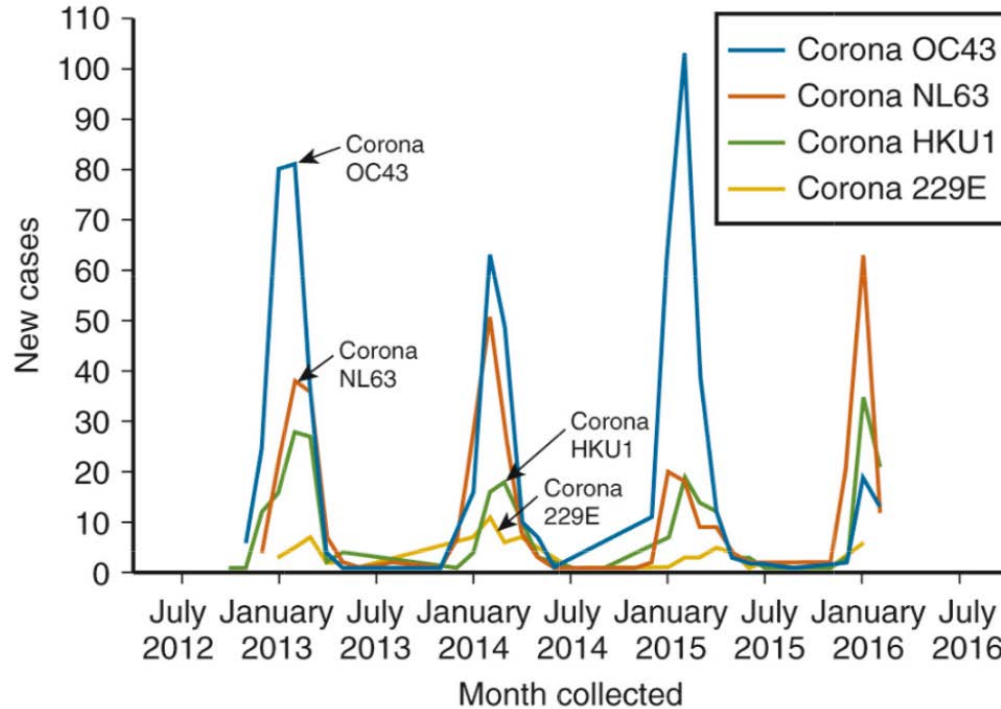
Brit. med. J., 1965, 1, 1467-1470

In recent years it has become evident that the common cold and similar minor upper respiratory diseases are due to infection with viruses belonging to a number of different groups, including adenoviruses, myxoviruses—such as the influenza, para-influenza, and respiratory syncytial viruses—enteroviruses, and rhinoviruses. When tests adequate to detect all these are used a virus or a β -haemolytic streptococcus can be isolated from about one-third of patients suffering from colds and related diseases (Working Party, 1965). The failures might occur because no virus or bacteria were present in the specimen

cold in 1960 (Kendall *et al.*, 1962). Further infectious secretions were obtained from volunteers who developed colds after intranasal inoculation of the original specimen. In this way three serial passages of the cold-producing agent were made in man, and it was concluded that it must be self-propagating. In over 20 experiments washings were tested by inoculation into a variety of test systems for known viruses. These are outlined in Table I, and should have revealed the presence of influenza A, B, or C, para-influenza 1, 2, 3, or 4, respiratory syncytial viruses, herpes simplex virus, and adenoviruses, enteroviruses,

Human Seasonal Coronaviruses

- Coronaviruses 229E, OC43, NL63, and HKU1
= community acquired respiratory coronaviruses
 - Worldwide distribution
 - Can be seen year-round, but highest rates in temperate climates in midwinter to early spring
 - Individual species predominate for 1 or more years, followed by 1 or more years of lower activity, but all 4 may circulate simultaneously



Distribution of human coronavirus types in respiratory specimens from symptomatic inpatient and outpatient pediatric patients at Seattle Childrens (FilmArray data); provided by J. Stapp. (Fig. 188.2, Feigin and Cherry's, 8th ed., p. 1848)

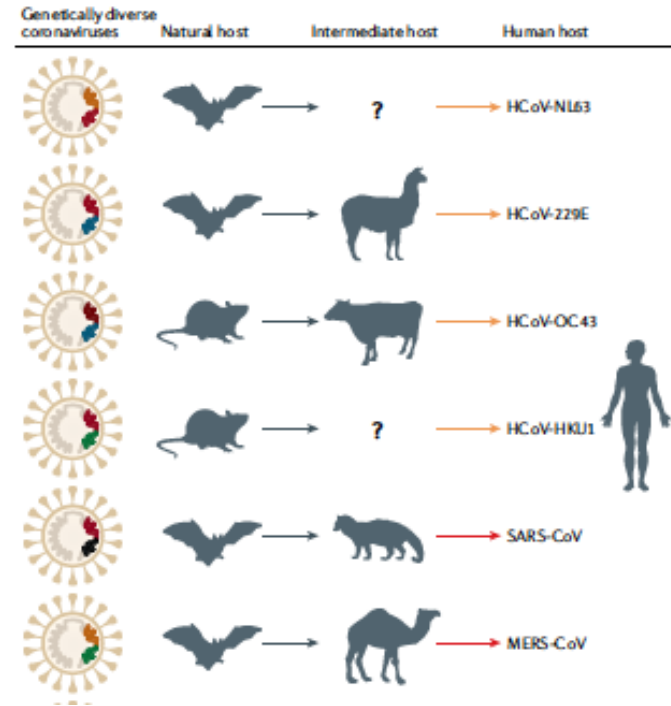
Seasonal Coronaviruses

- First infection with all four HCoV usually in first 6 years of life
- Antibody to OC43 and NL63 appear earlier and more frequently than antibody to 229E and HKU1
- Asymptomatic and symptomatic infections occur at all ages
- Seroprevalence studies in adults approaches 90-100% (60-90% for individual strains)

Coronaviruses

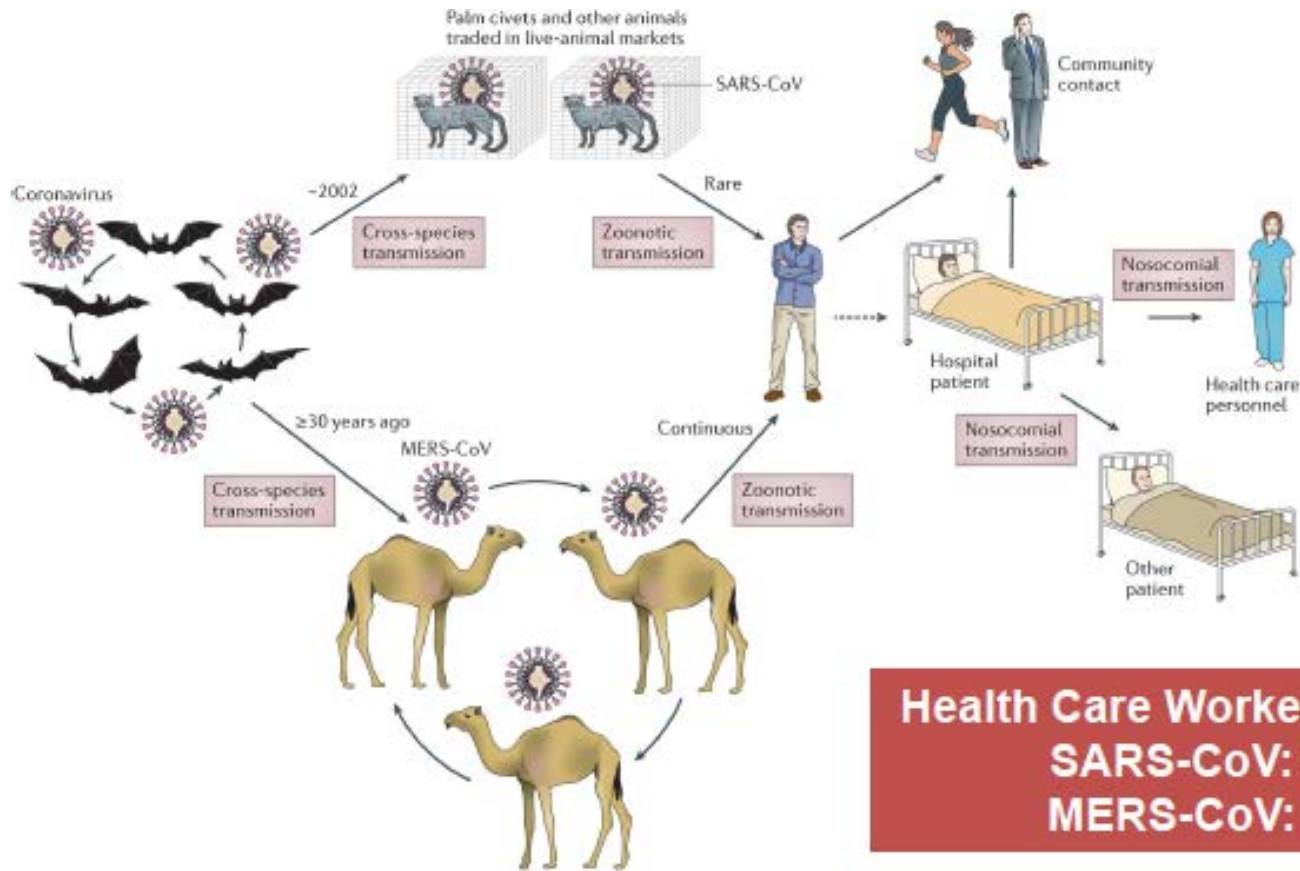
- 229E (alpha CoV)
- OC43 (beta CoV)
- HKU1 (beta CoV)
- NL63 (alpha CoV)

- SARS-CoV (beta CoV, emerged in 2002)
- MERS-CoV (beta CoV, emerged in 2012)



SARS 2002-2003

- SARS-CoV disproportionately affected adults
 - children milder disease and no deaths
 - 12 pregnant women; no vertical transmission
- Fever, myalgia, headache, malaise, chills
 - followed 5-7 days later with nonproductive cough and dyspnea
- ~25% watery diarrhea, 20% respiratory failure
- Most had progressive unilateral or bilateral ill-defined infiltrates on chest imaging; frequent pneumothoraces
- Most deaths during 3rd week of illness
 - case fatality rate **10%** but almost 50% in persons > 60 yo

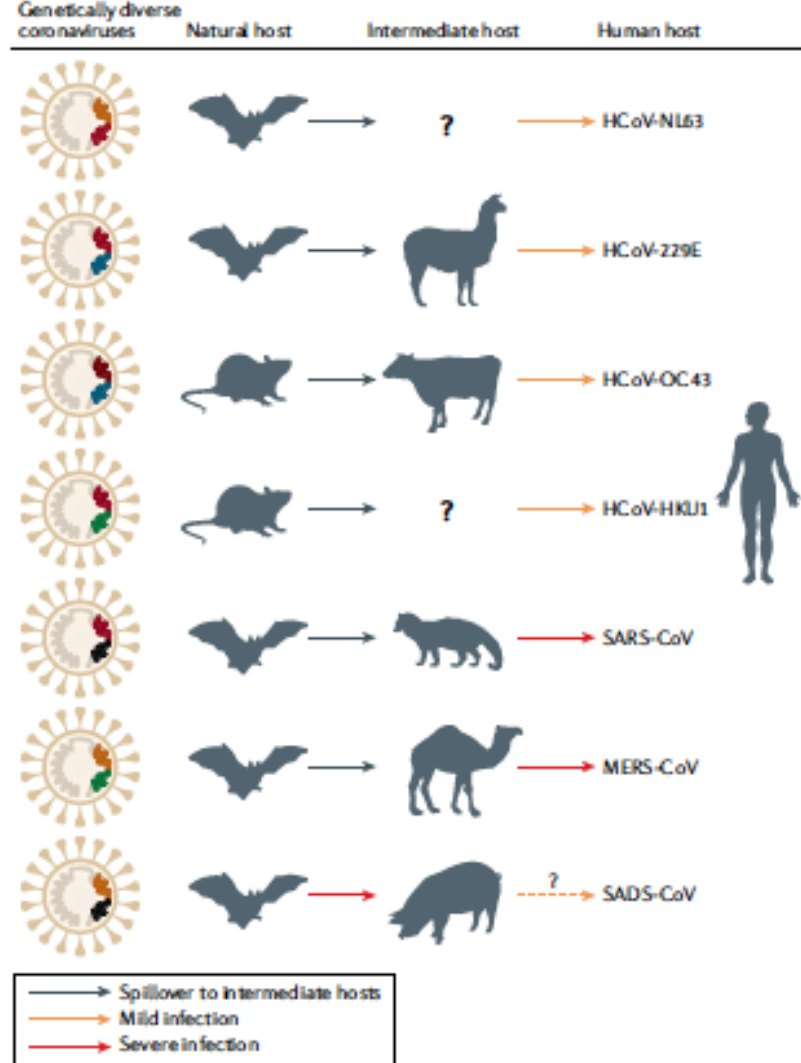


Health Care Worker Infections
SARS-CoV: 23%
MERS-CoV: 10%

Coronaviruses

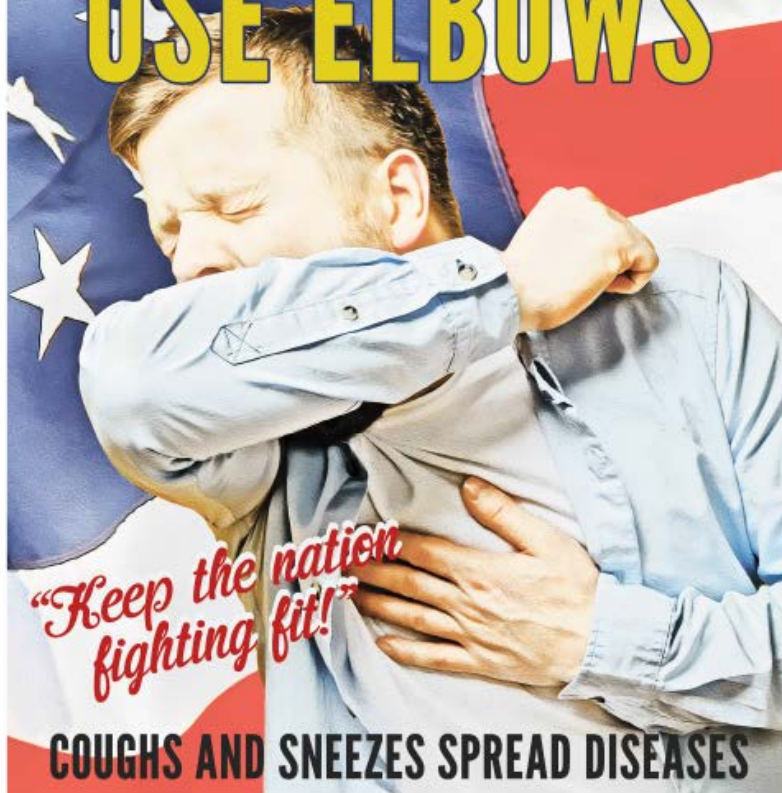
- 229E (alpha CoV)
- OC43 (beta CoV)
- HKU1 (beta CoV)
- NL63 (alpha CoV)

- SARS-CoV (beta CoV, emerged in 2002)
- MERS-CoV (beta CoV, emerged in 2012)



COVID
(SARS)

**GOOD FELLOWS
USE ELBOWS**



*“Keep the nation
fighting fit!”*

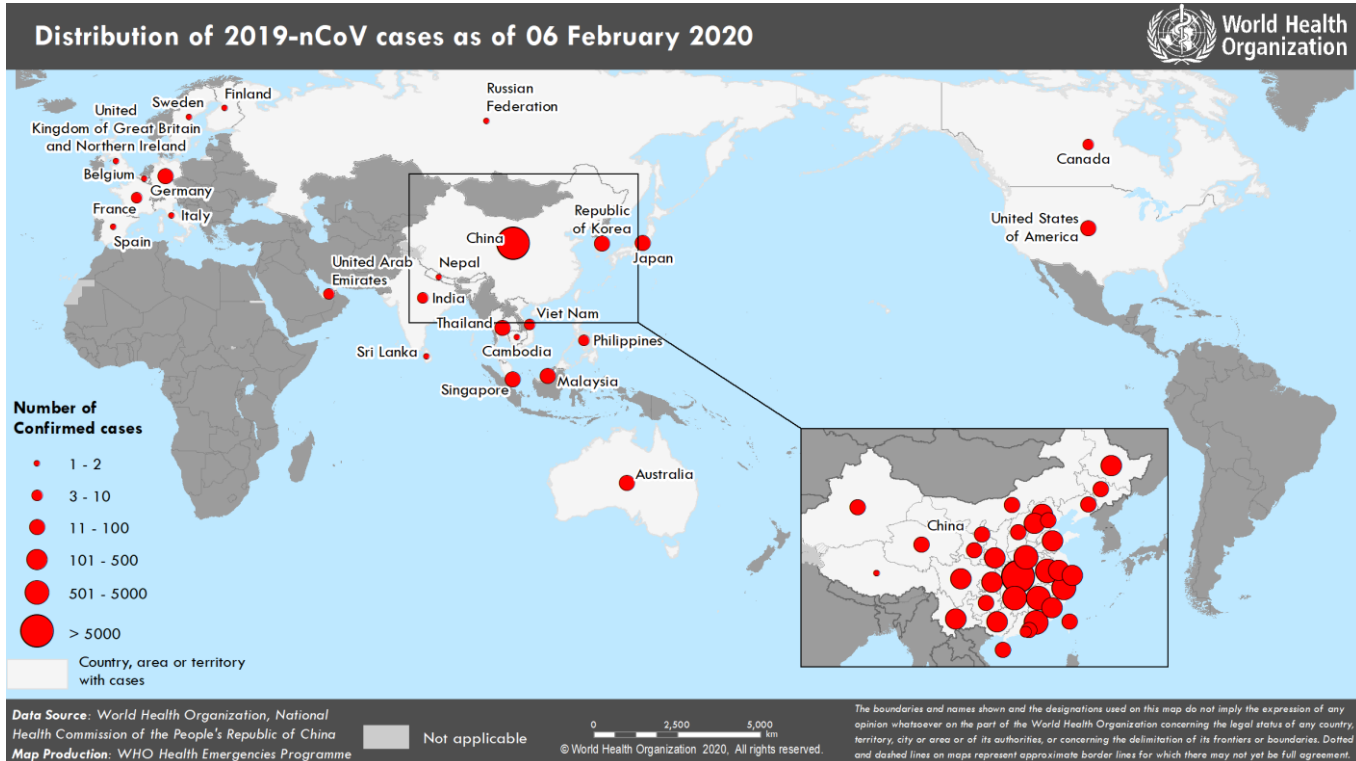
COUGHS AND SNEEZES SPREAD DISEASES

Brought to you by The DUKE CANNON SUPPLY CO. Commission for Proper Hygiene.

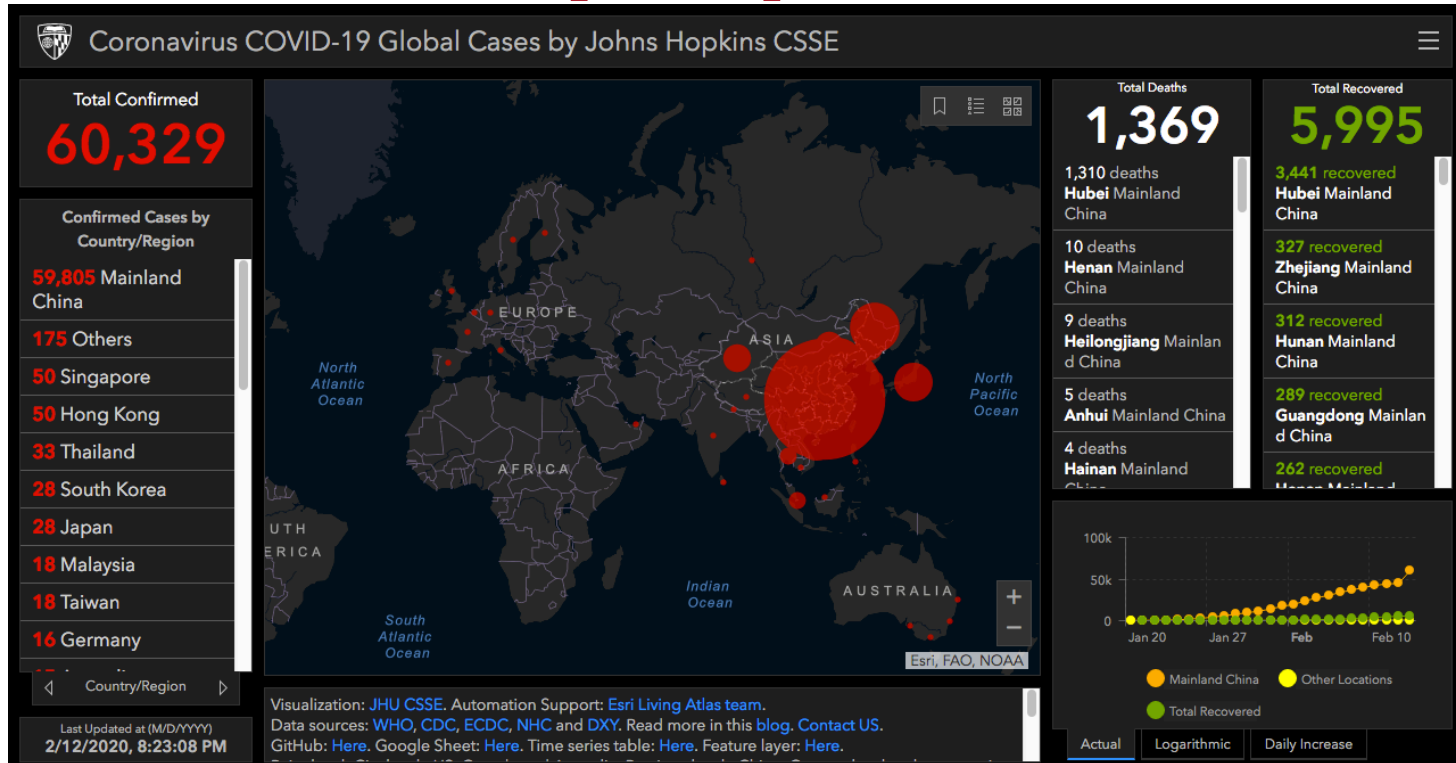
SARS-CoV-2

- Initially described as 2019-novel coronavirus (2019-nCoV)
- Renamed SARS-CoV-2 due to closest genetic similarity as SARS
- Shares same receptor: ACE2
- Intermediate host unknown (NOT pangolins)
- Efficient human-to-human transmission

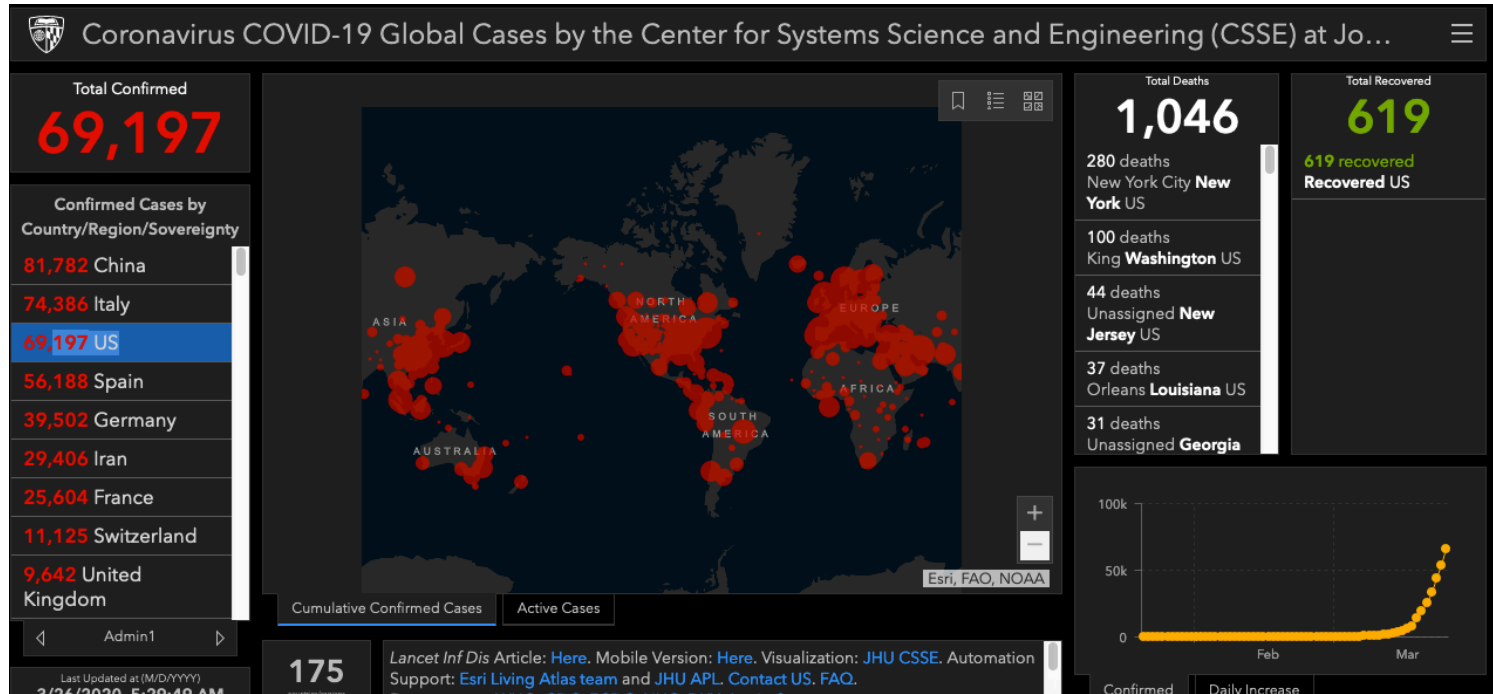
Grand Rounds: 2/7/20



Leadership Update: 2/13/20

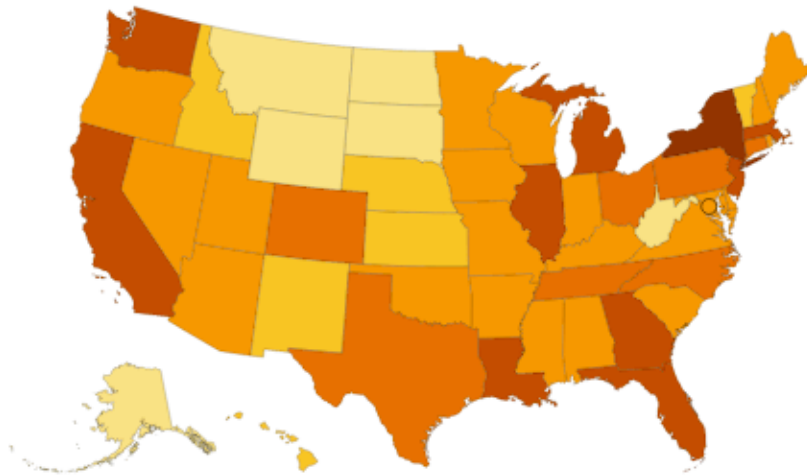


US Data 3/26/20



3/25 noon

States Reporting Cases of COVID-19 to CDC*



Territories AS GU MH FM MP PW PR VI



Reported Cases

(last updated March 25, 2020)

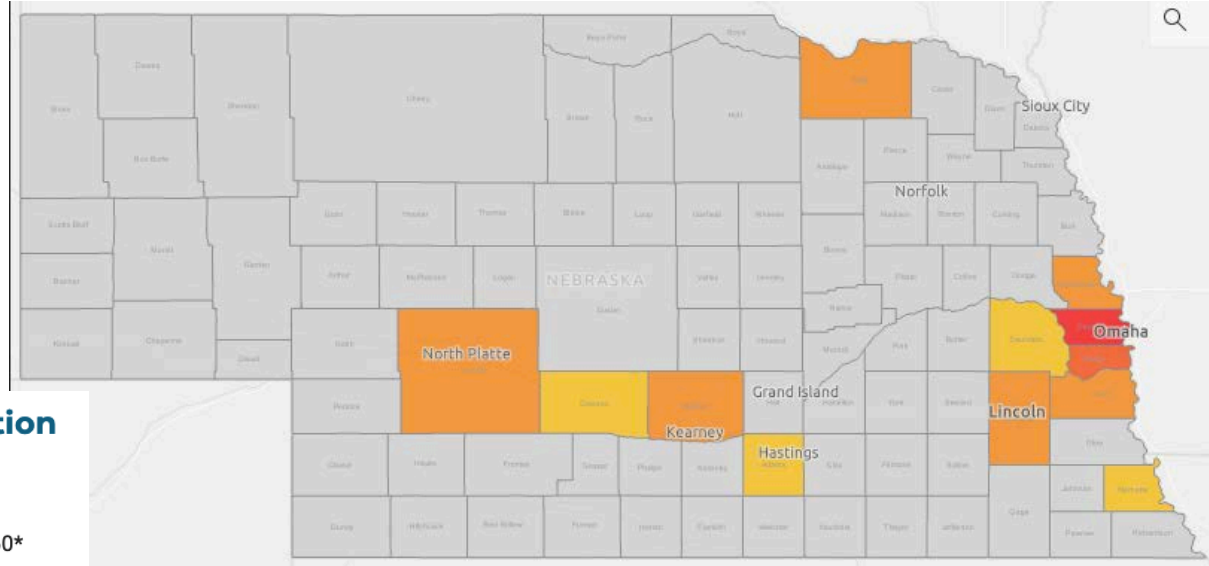
- None
- 6 to 50
- 51 to 100
- 101 to 500
- 501 to 1000
- 1001 to 5000
- 5001 or more

3/25 pm

Nebraska Case Information

- Total number of cases – 68
- Cases that tested negative – 1,460*
 - *Numbers now include negative results from NPHL and commercial labs

Both state and local health departments are testing and publicly reporting their cases. In the event of a discrepancy between DHHS cases and cases reported by local public health officials, data reported by the local health department should be considered the most up to date.



The numbers...

- SARS-CoV: ~10% CFR, 20-30% required mechanical ventilation
 - MERS-CoV: ~36% CFR, 50-80% required mechanical ventilation
 - Seasonal influenza: <0.1% CFR
 - Pandemic influenza 1918: 2.5% CFR
 - Pandemic influenza 2009 H1N1: 0.001-0.01%
- SARS-CoV-2 ESTIMATES
 - WHO estimate 3.4%
 - Current estimates 0.5-2.0%
 - Italy 6.6%
 - China 3.9%
 - South Korea 0.8%

Pediatric COVID-19

- Initial reports -> few pediatric cases
 - Adult predominance similar to reports with SARS and MERS
 - ?exposure
 - ?different physiology (ACE2 levels, immune response)
- Less severe overall; more asymptomatic or milder respiratory symptoms, URI
 - LA teen – may not have had COVID
- Does NOT mean may not become severe pneumonia/ARDS
- No clear vertical transmission
- High viral loads in asymptomatic and symptomatic children

SARS-CoV-2 Transmission

- Respiratory droplets
 - Not clear that small droplets or aerosol important
- Fomite?
 - Be wary of how measured: was infectious virus detected?
- Fecal-oral?
- Perinatal/congenital: not detected in amniotic fluid, cord blood, NP swabs of infants of infected mothers, breastmilk

Active monitoring study

MMWR

- First 10 COVID-19 patients identified in US
 - 445 close contacts (19 household contacts)
- 54 (12%) developed symptoms; 2 tested positive
 - 0.45% overall secondary attack rate
 - 10.5% secondary attack rate among household contacts

SYMPTOMS OF CORONAVIRUS DISEASE 2019

Patients with COVID-19 have experienced mild to severe respiratory illness.

Symptoms* can include

FEVER



COUGH



*Symptoms may appear 2-14 days after exposure.

SHORTNESS OF BREATH



Seek medical advice if you develop symptoms, and have been in close contact with a person known to have COVID-19 or if you live in or have recently been in an area with ongoing spread of COVID-19.



cdc.gov/COVID19-symptoms

Initial Case Presentations

Huang et al (1/24/20 Lancet):

- 41 patients with lab confirmed 2019-nCoV infection admitted by 1/2/20
- Patients with severe disease developed ARDS, as quickly as 2 days from admission
- 6 (15%) died
- Fever, cough, ground glass opacities on CT

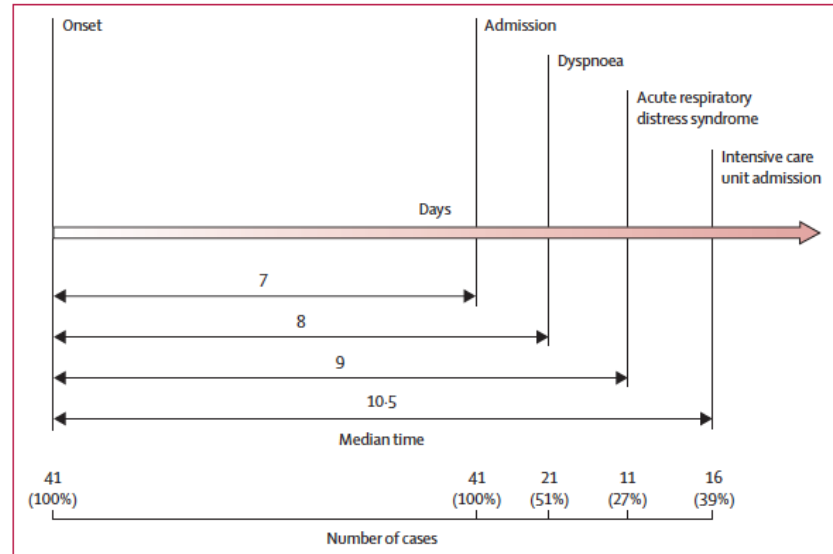
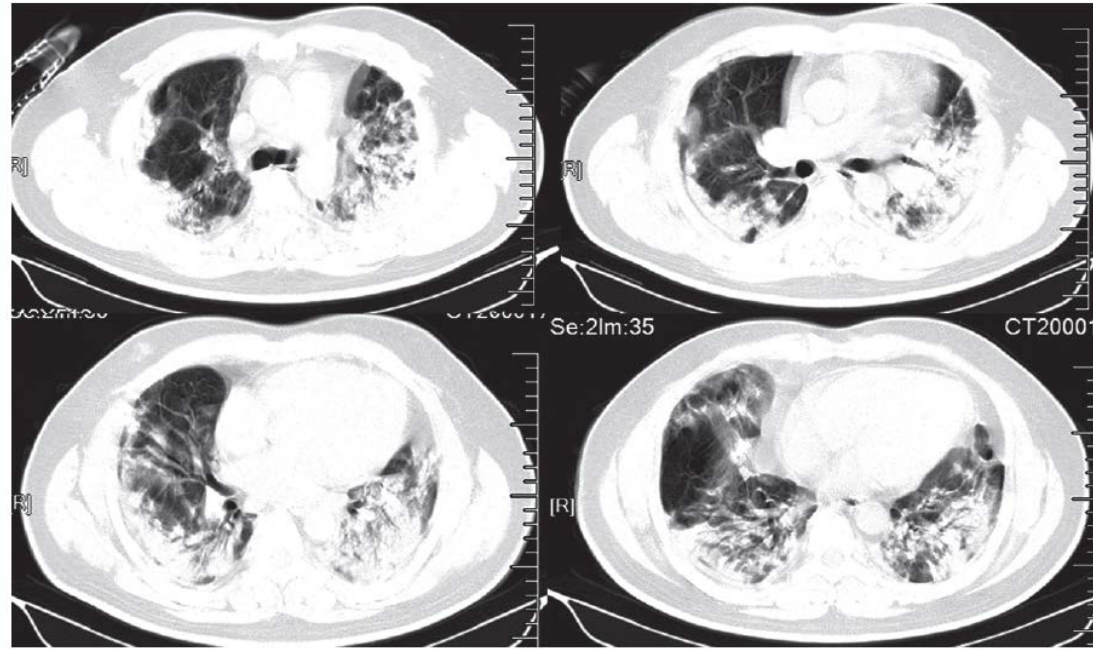
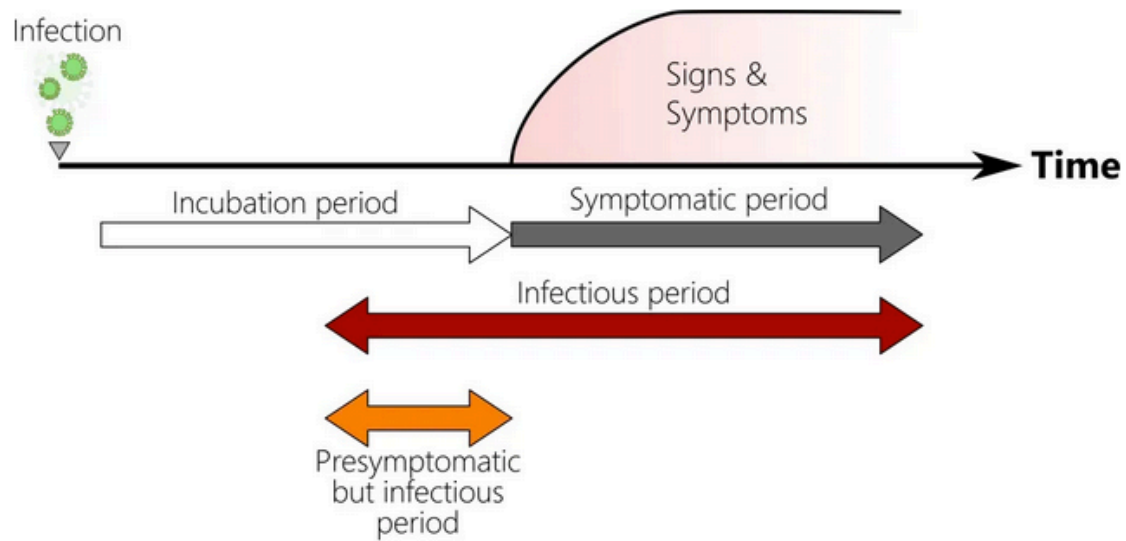


Figure 2: Timeline of 2019-nCoV cases after onset of illness

A



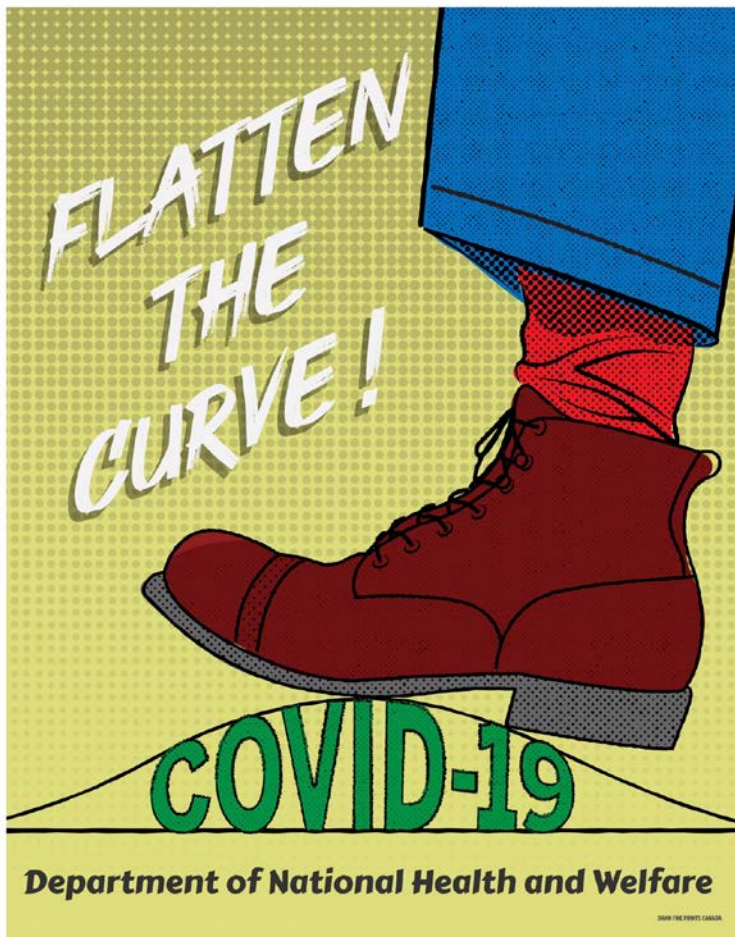
Transverse chest CT images from a 40-year-old man showing bilateral multiple lobular and subsegmental areas of consolidation on day 8 after symptom onset. [Huang, Lancet 2020.]



Ian M Mackay for virologydownunder.com
Created: 10MAR2020

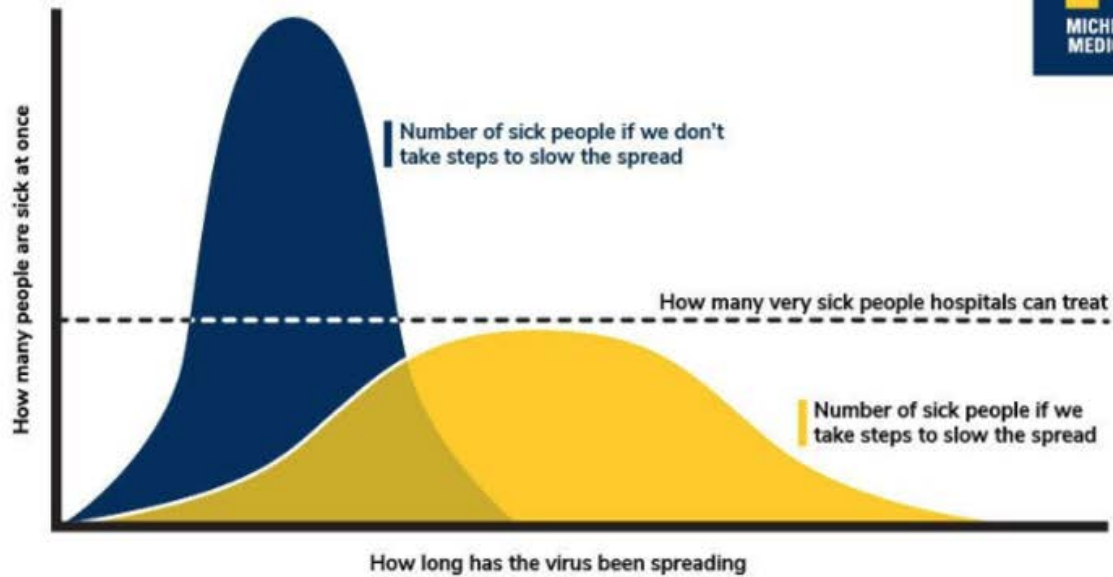
The time when an infected person can spread infectious virus and infect others before they develop signs and symptoms of their own illness is called the presymptomatic period; it's also part of the infectious period. For SARS-CoV-2 the presymptomatic period is estimated to be 24 hours,

So What Do We Do?



Department of National Health and Welfare

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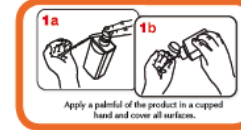
Adapted from the CDC



The Math Behind Social Distancing



How to handrub? WITH ALCOHOL-BASED FORMULATION



How to handwash? WITH SOAP AND WATER



Pre-Visit Considerations

- Limit number of people coming to the office
 - Consider how necessary visit is
 - Separate times? Well in AM/sick in PM then clean
 - Telemedicine?
 - Telephone triage
 - Screening with appointment reminder*
 - Screening at entry point*
 - Limit number of people with patient (ideally ONE parent)

SCREENING:

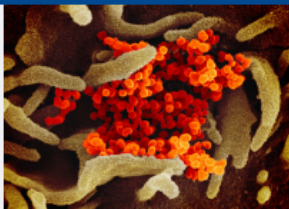
Respiratory symptoms, fever, cough, SOB

Exposure to known or suspected COVID-19 patient/PUI

Travel outside the state to high risk area***

AAP Guidance: Telehealth Payer Policy in Response to COVID-19

As the US health care system responds to the COVID-19 crisis, the need for expanded use of appropriate telehealth care has become critically important. To facilitate and expedite the uptake and spread of telehealth care while retaining appropriate linkages to the pediatric medical home, payers (private payers as well as state Medicaid/Children's Health Insurance Programs (CHIP) and their contracted managed care organizations (MCOs)) should take steps now to reduce or eliminate barriers to its expanded use.



The AAP is working at all levels to strongly advocate for changes that will eliminate burdens on pediatricians seeking to begin or expand use of telehealth care. While we continue to push for federal solutions, states and payers can act now on policy changes that will alleviate barriers to expanded telehealth care use. Your state-level advocacy is needed now and can make a big difference!

The questions and answers below are intended to guide pediatricians and AAP chapters in assessing payers' telehealth coverage and, together, advocating for changes in policy. It is important to understand the specifics of carrier coverage for telehealth care—pediatricians and chapters should review state laws, payer contracts, carrier notifications for updates in telehealth coverage, billing requirements, and payment policies.

With respect to state laws, states are rapidly issuing new telehealth care guidance in response to the COVID-19 crisis—the AAP is cataloging this new state-by-state guidance [here](#). Additional information about existing state telehealth regulation can be found in the Center for Connected Health Policy Compendium, [State Telehealth Laws & Reimbursement Policies, Fall 2019](#), or via state-specific information accessible at this [map](#). The Academy will continue to update our resources with new state COVID-19 telehealth guidance/announcements as they become available.

AAP Guidance Checklist: Telehealth Policy in Response to COVID-19

To summarize this guidance, during this time of crisis Medicaid and all payers should:

- Cover all modalities of telehealth care.** This includes live video, store-and-forward, remote patient monitoring, telephone care (phone only), electronic consults, virtual check ins, and e-visits.
- Allow for the home as an originating (patient) and distant (provider) site.**
- Waive any geographic restrictions.**
- Provide telehealth care for new and established patients.**
- Ensure coverage of both COVID-19 related services and other services.** During this time of crisis, all types of clinically appropriate services should be allowed to be treated via telehealth care.
- Ensure access to all licensed clinicians available to treat via telehealth as long as the services provided are clinically appropriate.** Children must have access to all services they need during this crisis.
- Not default to existing telehealth care vendor contracts but ensure coverage to the pediatric medical home as well as pediatric medical subspecialists and surgical specialists.**
- Follow the March 17 HHS OIG guidance and subsequent**

Entering the office

- Re-screen!
- Engineering precautions
- Maintain distance between patients and staff
- Clear barriers if able
- Hand sanitizer and masks available



If a potential case is identified at entry at Children's

Follow these steps:

- The patient and all persons with the patient must put on surgical masks immediately.
- The patient and all persons with the patient will be moved to a closed room away from high traffic.
- Infection Prevention and the House Supervisor must be paged by calling the hospital operator.

Infection Prevention, Infectious Disease and our Highly Infectious Disease response teams are working closely with Douglas County Public Health and the CDC to ensure the best and safest care for any patients infected.

For urgent assistance, please contact Infection Prevention through the hospital operator (402-955-5400).

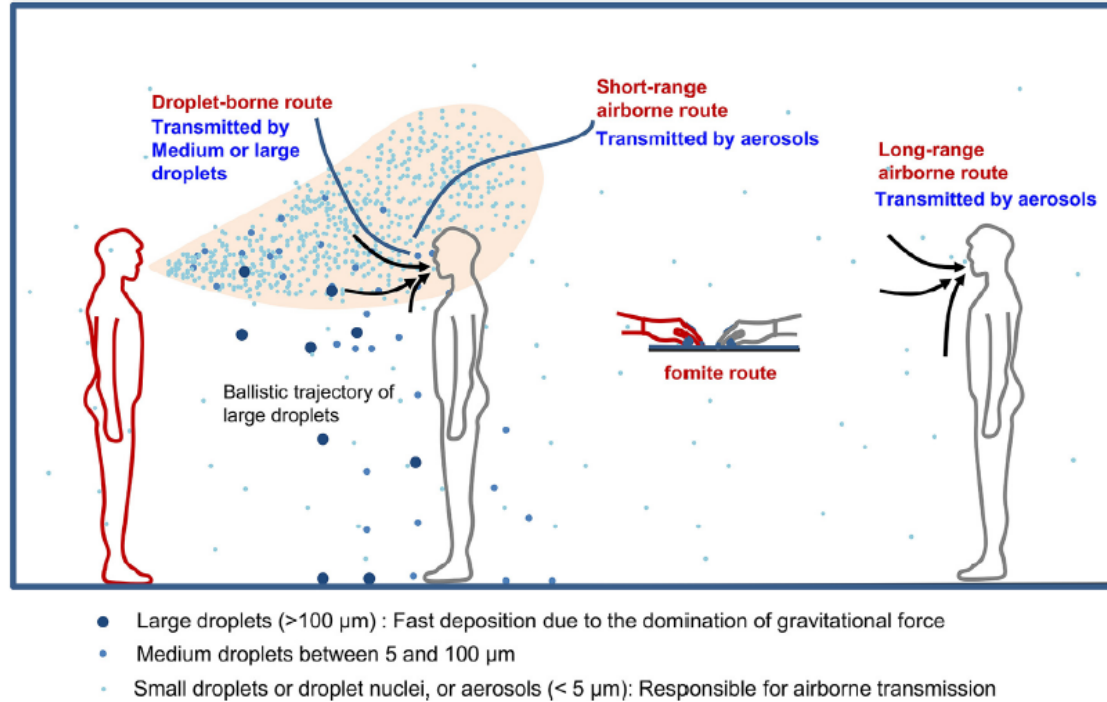


Fig 4. Illustration of different transmission routes. Small droplets ($<5 \mu\text{m}$), sometimes called aerosols, are responsible for the short-range airborne route, long-range airborne route, and indirect contact route; large droplets are responsible for the direct spray route and indirect contact route.

Patient in a room...

- Most sites will not have negative pressure or AIIR rooms
 - We are using IF available
- Place patient (and family) in room with DOOR CLOSED and MASKS ON patient/family if tolerated
 - Offer tissues if patient can't wear mask and request hand hygiene
- Can you call from outside the room?
- If likely COVID patient: droplet/contact precautions
 - Mask, eye protection, gown, gloves if examining
 - N95 only if AEROSOL GENERATING PROCEDURE
- Limit number of staff in room, maintain distance except for necessary care
- Contact your health department or CDC if necessary
 - CDC COVID 24hr hotline 770-488-7100

Testing?

- For ill appearing children, recommend having done by ED/hospital rather than in office
- If well, may be able to refer to testing site for NP swab if available
 - Children's can support in Respiratory Acute Care site
- If RVP/RPP obtained in office:
 - Does not require N95 use
 - Can use same swab for both RVP and COVID PCR testing

RVP TESTING



Most respiratory viral infections in healthy children and adults usually cause very mild symptoms and go away without treatment.

Your health care provider has ordered a Respiratory Viral Panel (RVP) test.

WHAT DO THE RESULTS MEAN?

You will be contacted with the test results within 2-3 days.

The result of the RVP test may be negative. If the test is positive this may indicate a specific respiratory virus.

MEANING OF NEGATIVE TEST RESULTS

If the result of the RVP test is negative:

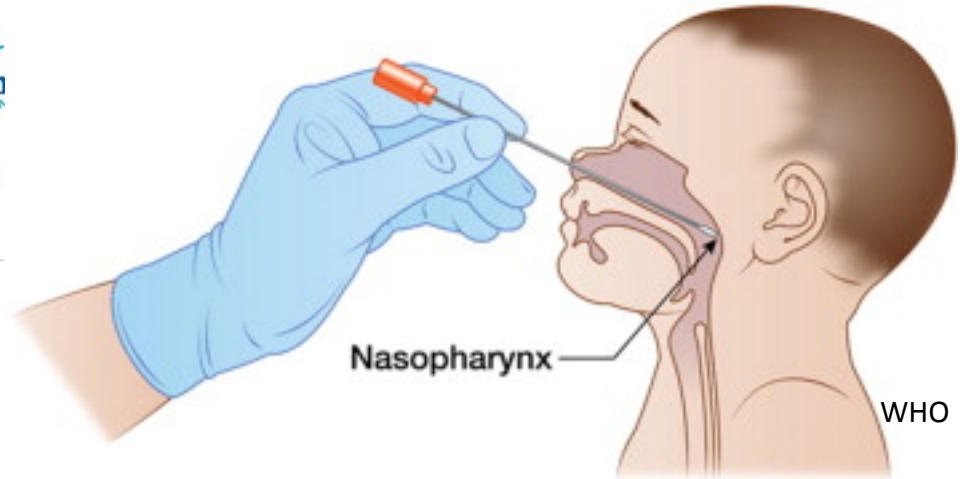
- It does not mean your child does not have COVID – 19.
- The secretions collected from the test did not find any of the viruses on the test panel.
- After further review of symptoms or exposure, the sample may be sent for more testing to specifically look for the COVID – 19 virus. You will be notified if this testing is done.

MEANING OF POSITIVE TEST RESULTS

If the result of the RVP test is positive:

It is most likely that your child has a viral infection.

Your health care provider will discuss your results, treatment options and if necessary, the need for more tests.



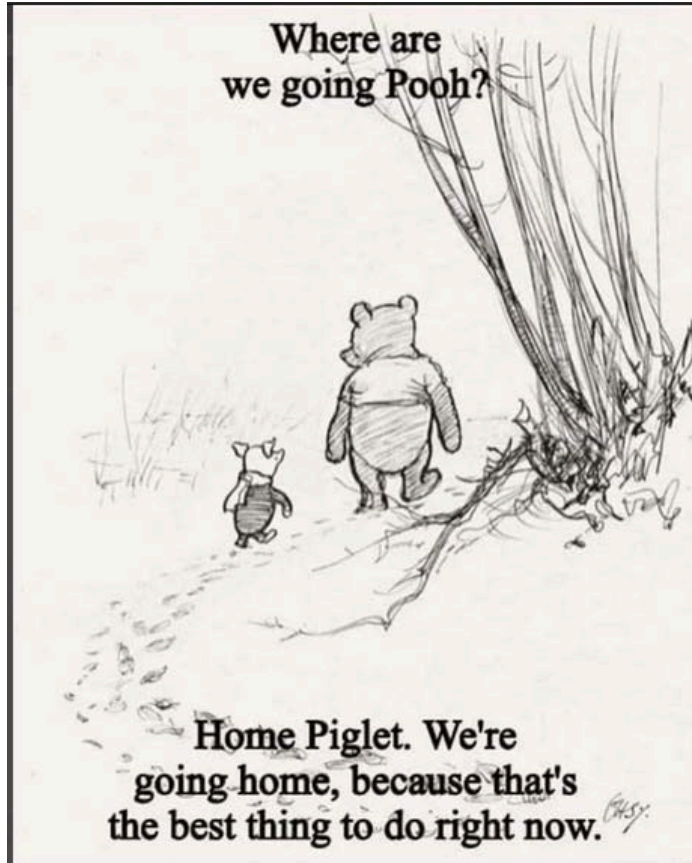
Testing

- PCR:
 - Used by health department, CDC
 - NOT crossreactive with endemic coronaviruses
 - Detects viral genetic material, not necessarily infectious virus
- Serology:
 - May not be positive until day 5 of symptoms/day 10-11 from infection
 - Same caveats as other antibody-based diagnostics

End of Visit?

OK for home?

Where are
we going Pooh?



Home Piglet. We're
going home, because that's
the best thing to do right now.

EH:SY

[Rochelle Walensky, MD, MPH](#)
[@RWalensky](#)

COVID-19

Parent/Guardian Communication

If your child is confirmed to have COVID-19, your child's health care provider will call the local or state health department. The local or state health department will reach out to you with instructions on self-monitoring and other appropriate instructions.

If your child is awaiting COVID-19 test results, your child's health care provider will call you with the results.

Follow the steps below to help prevent the disease from spreading to people in your home and community.

Stay home, except to get medical care

You should restrict activities outside of your home, except for getting necessary medical care. Do not go to work, school or public areas. Avoid using public transportation, ride-sharing services or taxis.

Separate your family from other people and animals in your home as much as possible

People: The person with the virus should stay in a specific room and away from other people in your home. Also, they should use a separate bathroom if possible.

Animals: Do not handle pets or other animals while sick. This includes petting, snuggling, being kissed or licked and sharing food.

Cover your coughs and sneezes

Teach your child to cover their mouth and nose with a tissue when they cough or sneeze. Throw used tissues in a lined trash can; immediately have them cleanse their hands following these instructions:

Clean your child's hands often

Wash your child's hands often with soap and water for

Avoid sharing personal household items

You should not share dishes, drinking glasses, cups, eating utensils, towels or bedding with other people or pets in your home. After using these items, they should be washed thoroughly with soap and water.

Clean all "high-touch" surfaces every day

High-touch surfaces include counters, tabletops, door-knobs, bathroom fixtures, toilets, phones, keyboards, tablets and bedside tables. Also, clean any surfaces that may have blood, stool or body fluids on them. Use a household cleaning spray or wipe, according to the label instructions. Labels contain instructions for safe and effective use of the cleaning product, including precautions you should take when applying the product, such as wearing gloves and making sure you have good ventilation while using the product.

Monitor your child's symptoms

Call your doctor right away if your child's illness gets worse. Before seeking care, call your health care provider and tell them that your child has, or is being evaluated for, COVID-19. Put a facemask on yourself and your child before you enter the facility. These steps will help the health care provider's office keep other people in the office or waiting room from getting infected or exposed.

Does my child need to wear a facemask?

The CDC only recommends facemasks for people who have symptoms of COVID-19, not for people who are healthy. Health care workers and anyone taking care of someone with COVID-19 should wear facemasks. If your child has symptoms of COVID-19 and has to visit a medical facility, they will be asked to wear a facemask

COVID-19



Talking to your child about COVID-19

Simple Reassurance

Remind children that researchers and doctors are learning as much as they can, as quickly as they can, about the virus and are taking steps to keep everyone safe.

Give them Control

It's also a great time to remind your children of what they can do to help -- washing their hands often, coughing into a tissue or their sleeve and getting enough sleep.

Watch for signs of anxiety

Children may not have the words to express their worry, but you may see signs of it. They may get cranky, be more clingy, have trouble sleeping or seem distracted. Keep the reassurance going and try to stick to your normal routines.

Monitor their media

Keep young children away from frightening images they may see on TV, social media, computers, etc. For older children, talk together about what they are hearing on the news and correct any misinformation or rumors you may hear.

If RVP Positive and COVID-19 not sent:

If patient was never tested for COVID-19 but has an alternate diagnosis (e.g., tested positive for influenza), criteria follow-up should be based on that diagnosis.

For more information, visit:

[cdc.gov/COVID19](https://www.cdc.gov/COVID19)
[healthychildren.org](https://www.healthychildren.org)

HOME SUPPORTIVE CARE



FAMILY/PATIENT

HOME SUPPORTIVE CARE

- Use hand sanitizer with at least 60 percent alcohol content.
- Wash your hands with soap and warm water for at least 20 seconds.
- Avoid touching your face.
- Clean and disinfect often, especially highly used surfaces.
- Avoid crowds.
- Avoid non-essential travel, including planes and cruises.
- Avoid contact with sick people.

WARNING SIGNS

WHEN TO TAKE YOUR CHILD TO THE EMERGENCY DEPARTMENT

- Increasing difficulty breathing or shortness of breath
- Bluish tint to the face or skin
- Sudden worsening of symptoms
- Dehydration
- New confusion or inability to arouse



Cleaning Agents effective against 2019 nCoV

Must meet EPA guidelines to make claims against emerging viral pathogens



PDI Sani-Cloth Bleach



OxyCide
Used by EVS for Terminal Clean

Room turn around

- Duration of time room should stay out of use by unmasked persons depends on several factors
- Type of room, air exchange rate
- Length of time patient in room
- Coughing
- Aerosol generating procedure

- If low risk, then per CDC may clear air in “minutes”
- If higher risk, recommended to follow TB guidelines (may be 2 hours)

A few links

Johns Hopkins dashboard

<https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6>

AAP guidance for COVID-19

<https://services.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/>

AAP guidance for practice management

<https://services.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/pediatric-practice-management-tips-during/>

CDC guidance on PPE conservation

<https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/index.html>

CDC Interim Guidance on exposed HCWs

<https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-risk-assessment-hcp.html>

