COVID-19 Science and Medicine Updates

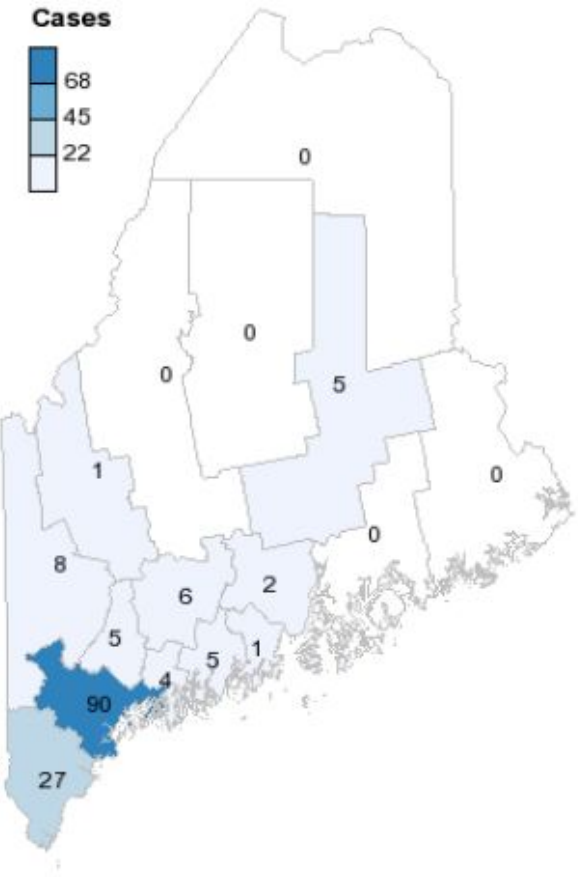
compiled by University of Maine faculty and students

Maine Updates:

As of Mar 26, Maine has 155 confirmed cases and 3394 negative tests

https://www.maine.gov/dhhs/mecdc/infectious-disease/epi/airborne/coronavirus.shtml

– View a Map of Confirmed Cases by County



View a larger map in a new window

County	Cases
Androscoggin	5
Aroostook	0
Cumberland	90
Franklin	1
Hancock	0
Kennebec	6
Knox	1
Lincoln	5
Oxford	8
Penobscot	5
Piscataquis	0
Sagadahoc	4
Somerset	0
Waldo	2
Washington	0
York	27
Unknown	1
Total	155

Mills Administration takes steps to support nursing homes

https://www.maine.gov/dhhs/press-release.shtml?id=2289648

Mills acts to promote access to healthcare

https://www.maine.gov/dhhs/press-release.shtml?id=2275693

Other Research and Medical News:

Which groups are more at risk for COVID-19?

- According to the CDC, there are various factors that may influence the severity of symptoms in patients with COVID-19, with older age and serious underlying medical conditions having the greatest risk. *It should be noted that globally, fatalities and complications have been observed in all age groups.*
- Some conditions include:
    - Chronic lung disease or moderate to severe asthma
    - Serious heart conditions
    - Immunocompromised individuals (including but not limited to: cancer treatment, bone marrow or organ transplantation, immune deficiencies, poorly controlled HIV or AIDS, prolonged use of corticosteroids or other immune weakening medications)
    - Severe obesity at any age (BMI >40)
    - Diabetes
    - Renal failure
    - Liver disease
    - Potentially pregnant women
        - Current data have not yet indicated an increased risk of COVID-19 for pregnant women, but in general pregnancy affects immunity and increases susceptibility to viral illnesses
    - https://www.cdc.gov/coronavirus/2019-ncov/specific-groups/high-risk-complications.html
- In a recent meta-analysis of various databases (Ma et al, 2020 - preprint), a total of 30 studies including 53,000 patients with COVID-19 were analyzed to identify risk factors. The total amount of cases that were characterized as severe was 20.2% and the total incidence of mortality was 3.1%. However, when removing cases within the Wuhan subgroup these rates lowered to 10.9% of cases being severe and 0.2% of cases resulting in death. Individuals at greater risk of having severe illness from COVID-19 infection include:
    - Old age (≥50 years old)
    - Smokers
    - Males
    - Any comorbidity with an underlying medical condition, especially:
        - Chronic kidney disease
        - Chronic obstructive pulmonary disease (COPD)
        - Cerebrovascular disease
        - Tumor
        - Diabetes
        - Hypertension
        - Cardiovascular disease

    - https://www.medrxiv.org/content/10.1101/2020.03.17.20037572v1.full.pdf
- The study also found that symptom onst to hospital/treatment admission time closely correlated with severity and fatality rates, suggesting that minimizing the time from symptom onset to treatment may minimize severity of symptoms and outcome (Ma et al, 2020 - preprint).
- A recent study found that in patients diagnosed with COVID-19, there was a higher prevalence of individuals with type A blood compared to non-A blood groups. They also found that there were less individuals with type O blood compared to non-O blood groups (Zhao *et al.*, 2020 - MedRxiv preprint). This suggests that individuals with type A blood are more susceptible to infection whereas individuals with type O blood have a lower chance of getting infected, which has been seen with other coronavirus infections due to the presence of antibodies in individuals with type O blood that hinder the ability of cells expressing the SARS-CoV S protein to adhere to receptors in other cells (Guillon *et al*., 2008). *However, these data should be interpreted with care, since the blood type correlation may not indeed be causative, and may actually represent a potential genetic predisposition that is currently being investigated.*
    - Patients from three hospitals in Wuhan and Shenzhen, China (N=1775)
    - https://www.medrxiv.org/content/10.1101/2020.03.11.20031096v1.full.pdf+html

What do do if someone in your house has COVID (suspected or confirmed). How to self-isolate in the same home

https://www.cdc.gov/coronavirus/2019-ncov/if-you-are-sick/care-for-someone.html

- Most people who get COVID-19 will only have mild illness and should recover at home
- If you are caring for someone at home, monitor for emergency signs, prevent the spread of germs, treat symptoms, and carefully consider when to end home isolation
    - Get medical attention immediately if these emergency warning signs develop:
        - Trouble breathing
        - Persistent pain or pressure in the chest
        - New confusion or inability to arouse
        - Bluish lips or face
    - If you have a home pulse oximeter, you can monitor blood oxygen levels
    - This list is not all inclusive, consult your medical provider for any other symptoms that are severe or concerning
    - Calling your doctor or medical center is recommended, before going in.
    - Older adults and people with certain serious underlying medical conditions putting them at higher risk for developing serious complications from COVID-19 illness should seek care as soon as symptoms start
- Have the sick individual stay in one room, away from other people, including yourself, as much as possible
    - Have them use a separate bathroom if possible
    - Avoid sharing personal household items (dishes, towels, bedding, etc)

    - Have them wear a facemask when they are around people, including you, if a facemask is available
    - If they are unable to wear a facemask, you should wear one while in the same room with them, if a facemask is available
- Wash your hands often with soap and water for at least 20 seconds, especially after interacting with the sick person
    - If soap and water are not readily available, use a hand sanitizer that contains at least 60% alcohol
- Avoid touching your face
- Every day, clean all surfaces that are touched often with household cleaning sprays or wipes (counters, tabletops, doorknobs, light switches)
- Wash laundry thoroughly. If laundry is soiled, wear disposable gloves and keep the soiled items away from your body while laundering. Wash your hands immediately after removing gloves.
- Avoid having any unnecessary visitors
- Providing symptom treatment:
    - Make sure the sick person drinks lots of fluids to stay hydrated
    - Make sure they get enough rest at home
    - Over-the-counter medicines may help with symptoms (consult with your healthcare provider)
    - For most people, symptoms last a few days and get better after a week
- When to end home isolation:
    - ***If the individual with COVID-19 is not able to have a test*** to determine if they are still contagious, they can leave home after these three things have happened:
        - They have had no fever for at least 72 hours *without the use of medicine that reduces fevers*
          AND
        - Other symptoms have improved (example: cough or shortness of breath has improved)
          AND
        - At least 7 days have passed since their symptoms first appeared
    - ***If they will be tested*** to determine if they are still contagious, they can leave home after these three things have happened:
        - They no longer have a fever *without the use of medicine that reduces fevers*
          AND
        - Other symptoms have improved
          AND
        - They received two negative tests in a row, 24 hours apart. Their doctor will follow CDC guidelines.

How to clean and disinfect your home during the COVID-19 Pandemic

- CDC reports that take-out/delivery food and packages delivered to your door carry a low risk of transmission of COVID-19
- Disinfect your home carefull, as some household cleaners can combine to create toxic products.
    - **To make a bleach solution**, mix:
        - 5 tablespoons (1/3rd cup) bleach per gallon of water
          OR
        - 4 teaspoons bleach per quart of water
    - **Alcohol solutions with at least 70% alcohol.**

https://health.clevelandclinic.org/tips-for-keeping-your-home-clean-in-the-time-of-covid-19/?utm_medium=social&utm_source=facebook&utm_campaign=cc+posts

https://www.cdc.gov/coronavirus/2019-ncov/prepare/disinfecting-your-home.html

How the Pandemic Will End

- Excellent journalistic coverage of projections about the COVID-19 pandemic in the Atlantic, by science writer Ed Yong. This piece was included in the daily news briefing of the world's top scientific journal, Nature.

https://www.theatlantic.com/health/archive/2020/03/how-will-coronavirus-end/608719/

N95, N99, homemade cloth masks and other masks - which are most safe?

- There are critical shortages of N95 respirator masks, and other protective equipment like gloves and gowns, nation-wide. Healthcare workers are the first line of defense against the spread of COVID-19, and its lethality, and efforts are underway to produce more masks and collect mask donations to provide to local hospitals and healthcare workers. *If you have N95 masks at home that you can donate, find a local group who is organizing these efforts. You can leave donations in your doorstep to be picked up.*
- N95 respirators filter out at least 95% of very small (0.3 micron) particles. N95s are capable of filtering out all types of particles, including bacteria and viruses. (By contrast, N99 masks filter out at least 99% of these particles).
- Due to mask shortages, volunteers are sewing cloth masks for donation. While these masks are likely not efficient enough to be used in clinical settings, they may be useful for home use or for grocery shopping and other unavoidable public trips
- Research has demonstrated the following:
    - All types of masks reduced aerosol exposure, relatively stable over time, unaffected by duration of wear or type of activity, but with a high degree of individual variation.
    - Personal respirators were more efficient than surgical masks, which were more efficient than home-made masks.

    - Regardless of mask type, children were less well protected.
    - cloth masks are only marginally beneficial in protecting individuals from particles<2.5 μm compared to N95 masks. COVID-19 is
    - Unlike NIOSH-approved N95s, surgical facemasks are loose-fitting and provide only barrier protection against droplets, including large respiratory particles. COVID-19 does travel in droplets (>5uM)
- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2440799/
- https://www.nature.com/articles/jes201642?draft=collection

CDC recommendations for Personal Protective Equipment (PPE), including gowns, gloves, respirators:
https://www.cdc.gov/coronavirus/2019-ncov/hcp/respirator-use-faq.html

A new type of test could show prior COVID-19 exposure, immunity:

- Current RNA-based qPCR tests (that measure the gene expression of the COVID-19 virus from a nasal swab) only work for patients with current infections, and currently supplies and reagents are limiting to be able to run these tests in enough patients.
- An alternative test, that can detect the immune response by measuring antibodies to COVID-1 in the blood, is being produced by academic and commercial labs currently. The hope is that this test will show both current and previous exposure to the virus, and may help predict who is immune. This is particularly important to determine if healthcare workers can return to work without risk of infection.
- However, this test (a serological ELISA) would require the addition of a neutralization assay to determine if an individual is immune, and positive antibody tests may induce a false sense of security when immunity may not be present.
- Other limitations of these type of tests is that researchers do not yet know the length of time that COVID-19 immunity lasts, if present. If it is like other more mild coronaviruses, it may be less than a year before you can be reinfected. This is similar to cold and flu, which is why we need a flu vaccine each year. In addition, not all individuals may develop immunity from a previous COVID-19 illness, and exposure to high levels of virus may prompt re-infection.
- *More research is needed before these findings can be conclusive.*

https://www.reuters.com/article/us-health-coronavirus-immune-test-insigh-idUSKBN21C1KK

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