COVID-19 Science and Medicine Updates

Compiled by University of Maine faculty and students

Maine Updates – May 14, 2020
From Maine CDC:
https://www.maine.gov/dhhs/mecdc/infectious-disease/epi/airborne/coronavirus.shtml

Data updated May 13, 2020 at 12:30PM
Total Cases: 1515
Confirmed cases: 1372
Probably cases: 143
Recovered: 943
Hospitalized: 204
Deaths: 66
Negative test results, updated May 13, 2020 (now published weekly): 33,035

Maine/Penobscot County Data from Maine CDC:
Cases: 90
Recovered: 75
Hospitalizations: 17
Deaths: 0

Online Dashboard Links:

Desktop version:

https://arcg.is/1Knarr

Mobile version:

https://arcg.is/5qGGr

News from Maine:

Governor Mills Extends State of Emergency Until June 11

- does not affect the Governor's Executive Orders or Restarting Maine's Economy Plan
  https://www.maine.gov/governor/mills/news/governor-mills-extends-state-civil-emergency-maine-continues-combat-covid-19-2020-05-13

Maine is the only state not calculating positive test rate daily - Portland Press Herald

- Maine's "positivity rate" is only calculated weekly
- Maine CDC director Dr. Nirav Shah is quoted as saying: "This metric I go back to a lot, which is the positivity rate, seems to be holding steady if not trending in the right direction," Shah said. "If the positivity rate stays the same even if we triple the amount of testing (or) if it goes way up even as we triple (the) tests … that tells us a different epidemiological story."

  https://www.pressherald.com/2020/05/13/maine-is-the-only-state-not-calculating-positive-test-rate-daily/

Other COVID-19 News:

Mysterious inflammatory condition affecting young children with COVID-19

- As published this week in the Journal of the American Medical Association (JAMA), and reported on by the NY Times, a cross-sectional study of 46 North American pediatric intensive care units (PICUs) in March and April 2020 showed significant disease burden in children, thought still less frequent than seen in adults. Comorbidities existing in children prior to COVID-19 illness did correlate with severity of illness in the hospital.
- In the JAMA study, no children displayed a newly observed condition called pediatric multisystem inflammatory syndrome, which develops weeks after the initial coronavirus infection. New York's Governor has reported 3 child deaths from this condition, and the Lancet has reported one such death in New England.

https://www.nytimes.com/2020/05/11/health/coronavirus-children-icu.html?smtyp=cur&smid=fb-nytscience

https://jamanetwork.com/journals/jamapediatrics/fullarticle/2766037

How SARS-CoV-2 may move through the air

- Research is still ongoing to investigate how SARS-CoV-2 virus particles (virions) travel in the air as droplets versus smaller aerosols that may travel further than 6ft, and how issues like building ventilation and duration of exposure to droplets/aerosols from coughing, sneezing, breathing or talking may impact someone's risk of getting COVID-19
- Below are some reliable resources to read more about this ongoing research, from Scientific American and an infectious disease researcher, Prof Erin Bromage, at UMass Dartmouth:

https://www.scientificamerican.com/article/how-coronavirus-spreads-through-the-air-what-we-know-so-far1/

https://www.erinbromage.com/post/the-risks-know-them-avoid-them

The Mental Health Toll of COVID-19 Lockdown

- The National Institutes of Health is providing a spotlight for the mental health toll of COVID-19 lockdowns, not just on healthcare workers, but the general public: https://www.nimh.nih.gov/health/education-awareness/shareable-resources-on-coping-with-covid-19.shtml
- These resources include graphics and social media messages to raise awareness of the stress associated with COVID-19, as well as coping strategies
- Advice includes:
    - Taking a break from the news
    - Focusing on the facts
    - Taking care of your own health (physical and mental)
    - Talking to children about COVID-19
    - How to recognize symptoms of anxiety
    - What to do if someone needs help
- The Atlantic writes about how "Quarantine Fatigue is Real", and the risks of becoming lax about COVID-prevention procedures at this stage of the pandemic.

  https://www.theatlantic.com/ideas/archive/2020/05/quarantine-fatigue-real-and-shaming-people-wont-help/611482/

- Julia Marcus writes: "…most public-health experts agree that a premature return to the old version of normalcy would be disastrous. States continue to lack the capacity for widespread coronavirus testing or contact tracing. A vaccine is months or even years away. New cases continue to rise, with thousands of people dying each day, and those numbers will inevitably increase if communities go back to business as usual."

- However, she notes: "Some people are seeking human contact outside of their households because of intense loneliness, anxiety, or a desire for pleasure. for some people, the low risk of coronavirus transmission in these settings may be outweighed by the health benefits of human connection, exercise, and being outdoors. We can also acknowledge that some people can't comply with public-health guidance because of structural factors, including systemic racism, that render physical distancing a privilege."

Debunking the Pseudoscience in "Plandemic"

- While this 'documentary', "Plandemic: The Hidden Agenda Behind COVID-19" has now been taken down from platforms like You Tube, you still may hear friends and family reference the many conspiracy theory points this video makes, most of which are rooted in false information and pseudoscience.
- The video features Dr. Judy Mikovits, a former scientist whose work has been widely discredited, and even accused of fraud.
- Numerous scientific entities have provided guides to debunking these dangerously inaccurate claims, a few are here:

  https://www.nbcnews.com/tech/tech-news/plandemic-goes-viral-those-targeted-discredited-scientist-s-crusade-warn-n1202361

https://www.medrxiv.org/content/10.1101/2020.05.06.20092999v1

https://www.poynter.org/fact-checking/2020/plandemic-video-fact-check/

Update on vaccines for SARS-CoV-2 and COVID-19

- There are currently over 100 vaccines in development for prevention of SARS-CoV-2 infection and subsequent development of COVID-19.
- The majority of these vaccines are in the preclinical stage of development. Following the preclinical research and development phase, vaccine clinical trials are conducted within the following stages:
    - Phase 1 - safety analysis of the vaccine to test for dosing, side effects, and adverse events
    - Phase 2 - efficacy of the vaccine to test for production of antibodies to the SARS-CoV-2 and continued safety monitoring
    - Phase 3 - large-scale, double-blind, randomized trial to test whether the vaccine protects against infection
- Four vaccines in development in the United States or Europe are in human clinical trials, and all vaccines currently in trials rely on the vaccine platform of a viral vector-based vaccine or nucleic acid (DNA or RNA) to deliver the "instructions" for the cell to produce the spike protein that protrudes from the surface of the SARS-CoV-2 virion. Once the cell produces the spike protein based on the "instructions," the immune system will generate antibodies to the spike protein to protect the body from infection by SARS-CoV-2. If infection is prevented, individuals will not develop COVID-19, so a vaccine will serve as the best form of protection.
    - ChAdOx1 nCoV-19 is a viral vector-based vaccine developed by the Jenner Institute (Oxford University). The developers partnered with AstraZeneca for global development and distribution. The company has stated there will be "...a few million doses of the vaccine by September if proven effective."
        - Phase 1 trial complete
        - Phase 2 trial started in March
        - Phase 3 trial set to begin in May
    - mRNA-1273 is a RNA-based vaccine developed by Moderna (Cambridge, MA). Moderna partnered with Lonza forming a 10-year agreement and also has the sponsorship of Biomedical Advanced Research and Development Authority (BARDA), who pledge $483m to help with vaccine development. The company partnership plans to provide up to 1 billion doses per year.
        - Phase 1 trial complete
        - Phase 2 trial approved on May 6, beginning soon
        - Phase 3 trial set to begin in summer
    - INO-4800 is a DNA-based vaccine developed by Inovio (Plymouth Meeting, PA). Inovio partnered with Richter-Helm Biologics and has indicated potential availability by the end of the year.
        - Phase 1 trial started in April
        - Phase 2 trial set to begin in summer
        - Phase 3 trial set to begin in fall

- BNT162 Program is a RNA vaccine developed by BioNTech who partnered with Pfizer. The company has indicated accelerated approval starting in the fall.
    - A compressed Phase 1/2 trial started in April-May
    - Phase 3 TBD

Sources:

https://milkeninstitute.org/covid-19-tracker

Thanh Le T, Andreadakis Z, Kumar A, Gómez Román R, Tollefsen S, Saville M, Mayhew S. 1 The COVID-19 vaccine development landscape. Nat Rev Drug Discov. 2020 May;19(5):305-306.

Kim, Y.C. et al. COVID-19 vaccines: breaking record times to first-in-human trials. *npj Vaccines* 5, 34 (2020). https://doi.org/10.1038/s41541-020-0188-3.

Callaway E. Nature. The race for coronavirus vaccines: a graphical guide. 2020 Apr;580(7805):576-577. doi: 10.1038/d41586-020-01221-y. https://www.nature.com/articles/d41586-020-01221-y

https://www.modernatx.com/

https://investors.modernatx.com/news-releases/news-release-details/moderna-reports-first-quarter-2020-financial-results-and

https://www.inovio.com/

https://www.fiercebiotech.com/biotech/barda-promises-moderna-up-to-483m-to-shepherd-covid-19-vaccine-to-approval

Evidence-based practices for business reopening

- Cleaning procedures for businesses, per CDC (5/7/20) https://www.cdc.gov/coronavirus/2019-ncov/community/reopen-guidance.html say the following:
- Employees should frequently wash hands with soap and water, use hand sanitizer when washing is not an option.
- Coronavirus on objects will become deactivated within hours to days. Exposure to sunlight and heat will deactivate coronavirus faster.
- Clean surfaces using soap and water, and then use disinfectant. EPA approved disinfectants are listed here: https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2
- For outdoor surfaces like sidewalks or in parks, disinfectant use is not effective in reducing spread of coronavirus and should be saved for outdoor hard surfaces that are touched by hand frequently like tables.
- No current evidence suggests that coronavirus can spread through water in pools and hot tubs. Proper maintenance with chlorine should kill the virus.
- In order to maintain healthy business operations, the businesses should adopt the following practices: establish social distancing practices, implement flexible

sick leave and supportive policies and practices (symptomatic workers should stay home and self-isolate), protect workers that are vulnerable, make sure new policies are communicated clearly and through multiple sources, and determine how you will adjust if absenteeism spikes (5/5/20). https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-business-response.html

- Frequently asked questions about business operations during the COVID-19 pandemic can be found here: https://www.cdc.gov/coronavirus/2019-ncov/community/general-business-faq.html

Impact of Opening Businesses on COVID Rates?

- California is recommending restaurants screen guests for symptoms once they reopen, as well as having servers wear masks and provide diners disposable menus (https://www.kpbs.org/news/2020/may/12/coronavirus-san-diego-live-updates-covid-19/).
- Wuhan, China, lifted its 76-day lockdown on April 8. For 35 days there have been no new cases, but over the weekend, 6 new cases were reported (https://www.cbsnews.com/news/coronavirus-china-south-korea-second-wave-fears/).
- As of May 12, 2020, about 80,000 people in the U.S. have died from Covid-19, which still leaves most of the U.S. population uninfected and susceptible. Dr Anothony Fauci says that as businesses start to reopen, come fall it is almost inevitable that the number of cases will skyrocket. Dr. Greg Poland at the Mayo Clinic explains that this second wave could come just in time for flu season, which would make diagnoses much more confusing and difficult, as a handful of the symptoms overlap (https://www.cnn.com/2020/05/02/health/coronavirus-second-wave-fall-season/index.html).
- Mike Osterholm, director of Center for Infectious Disease Research and Policy (CIDRAP) at the University of Minnesota, told CNN that this virus isn't going away any time soon and will continue to spread until it infects at least 60-70% of the populationhttps://www.cnn.com/2020/04/30/health/report-covid-two-more-years/index.html).
- In recent weeks, other places around the world have seen dramatic increases as well. Since March 17, the number of cases in Singapore has exploded from 266 to over 25,000 (https://coronavirus.jhu.edu/map.html).
- Bob Bednarcyzk, assistant professor of global health and epidemiology at the Rollins School of Public Health at Emory University in Atlanta remarks that Japan had controlled the outbreak relatively well by keeping things shut down. After opening the economy back up, the number of cases began to surge and the country was back on lockdown after 26 days (https://www.npr.org/2020/05/09/853052174/public-health-experts-say-many-states-are-opening-too-soon-to-do-so-safely).
- Caitlin Rivers from Johns Hopkins Center for Health Security says that no state meets all of the criteria for reopening -- such criteria include a 14-day decline in cases, having enough tests available for diagnosis, effective preparations and levels of personal protective equipment for workers in the healthcare field, and having the ability to trace where the virus came from and where it's going (https://www.npr.org/2020/05/09/853052174/public-health-experts-say-many-states-are-opening-too-soon-to-do-so-safely).

- A team at Imperial College London modelled the impact of travel and economic increase in six Chinese provinces. These provinces went under strict lockdown until their new cases per day were near zero, and then they started to open. The analysis concluded that infection rates could stay low upon reopening, after strict guidelines are first taken to lower them (3/30/20). https://www.nature.com/articles/d41586-020-00938-0
- However, since that study, China has renewed lockdown restrictions in several areas where clusters of new cases appeared (5/12/20) https://www.businessinsider.com/china-renews-lockdowns-after-coronavirus-reported-in-wuhan-and-shulan-2020-5
- Places with low population density are starting to reopen their economy. These policies may have a knock-on effect and worsen the situation in places of high population density, epidemiologists say. People from big cities might go to more rural areas where infection rates are low, thus increasing the risk of spread in both places (4/30/20). https://www.statnews.com/2020/04/30/reopening-some-states-heightens-risk-others/

SPECIAL: Workplace Considerations for Reducing Spread of SARS-CoV-2

2-page infographic posted at:

https://umaine.edu/coronavirus/umaine-science-and-medicine-updates/

RESOURCES AND RECOMMENDED READINGS:

Clinical and Administrative Guidance on COVID-19 shared by UW Hospitals:
As an early hot-spot in the US, Washington has been providing leadership and guidance around handling clinical cases of COVID-19. Documents are shared at this site, and constantly updated:
https://covid-19.uwmedicine.org/Pages/default.aspx

UMaine's Fogler Library COVID-19 Lib Guide:
https://libguides.library.umaine.edu/coronavirus/maine

Calculate your Pandemic Footprint, based on your behaviors:
https://www.pandemic-footprint.com/

NIH is Enrolling for a New Study to Quantify Undetected Cases of Coronavirus
Blood samples from healthy volunteers are needed, learn more here:
https://www.niaid.nih.gov/news-events/nih-begins-study-quantify-undetected-cases-coronavirus-infection

Maine Small Business Resources during COVID
http://www.mainestreamfinance.org/covid-19-updates/small-business-updates-and-resources-during-covid-19-outbreak/

COVID-19 Literature Searches MLA Net (Medical Library Association)
https://www.mlanet.org/page/covid-19-literature-searching

CDC Research Guide
https://www.cdc.gov/library/researchguides/2019novelcoronavirus/databasesjournals.html

LitCOVID:
https://www.ncbi.nlm.nih.gov/research/coronavirus/

Nature – Pick of the papers (COVID)
https://www.nature.com/articles/d41586-020-00502-w

Mayo Clinic
https://news.mayocliniclabs.com/covid19/

Norwegian evidence map may be one of the world's most systematic overviews of research on COVID-19

https://sciencenorway.no/epidemic-virus/norwegian-evidence-map-may-be-one-of-the-worlds-most-systematic-overviews-of-research-on-covid-19/1676520

Reputable Online Resources with COVID-19 Data:

IHME Health Data and Projections:
https://covid19.healthdata.org/united-states-of-america
https://covid19.healthdata.org/united-states-of-america/maine

- *Now including more data for Maine!*

Johns Hopkins
https://coronavirus.jhu.edu/map.html

Comparison of COVID testing results, false positive and false negative rates across platforms:
https://covidtestingproject.org/

COVID-19 Projections Using Machine Learning. Taking a data-driven approach rooted in epidemiology to forecast infections, deaths, and recovery timelines of the COVID-19 / coronavirus epidemic in the US and around the world
https://covid19-projections.com/about/

COVID-19 Simulator
https://www.covid19sim.org/

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