

Week In Review  
Covid-19 Scientific News  
April 13-17, 2020

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**Latest articles:**

**Clinical Information**

[Baseline Characteristics and Outcomes of 1591 Patients Infected With SARS-CoV-2 Admitted to ICUs of the Lombardy Region, Italy.](#) Grasselli, G et al. *JAMA*. April 06, 2020. doi:10.1001/jama.2020.5394

- In this retrospective case series, patients admitted to the ICU in Lombardy, Italy with confirmed SARS-CoV-2 infections had a median age was 63 years and 709 of 1043 patients had at least one comorbidity. Older patients (n = 795,  $\geq 64$  years) had a mortality rate higher than younger patients (n = 795,  $\leq 63$  years) (difference 21%, [95% CI, 17%-26%];  $p < .001$ ) with an overall reported mortality of 26%.

[Clinical characteristics of 113 deceased patients with coronavirus disease 2019: retrospective study.](#) MJ 2020; 368 doi: <https://doi.org/10.1136/bmj.m1091> (Published 26 March 2020)

- Data collected in a hospital in Wuhan, China showed COVID-19 risk factors which contribute to fatality include: advanced age ( $>60$ ), male sex, comorbidities especially hypertension and cardiovascular disease.

[Compassionate Use of Remdesivir for Patients with Severe Covid-19.](#) Grein, J. et al. *New England Journal of Medicine*. April 10, 2020. DOI: 10.1056/NEJMoa2007016

- Clinical improvement (Improved O<sub>2</sub> support requirements) was observed in 36 of 53 patients (68%). By 28 days of follow-up, 84% (95% confidence interval [CI], 70 to 99) had clinical improvement. There was 13% mortality in this cohort study which is relatively low given reported mortality rates of up to 22% in hospitalized patients in China and in other studies.

[Gastrointestinal symptoms of 95 cases with SARS-CoV-2 infection.](#) Lin, L. et al. *BMJ*. April 2, 2020. doi:10.1136/gutjnl-2020-321013.

- 58 out of 95 patients with confirmed SARS-CoV-2 infection had GI symptoms (diarrhea being the most common) with 11 out of 58 presenting GI symptoms upon. The presence of GI symptoms does not appear to alter outcomes.

[Factors associated with hospitalization and critical illness among 4,103 patients with COVID-19 disease in New York City.](#) Petrilli et al. April 11, 2020. <https://doi.org/10.1101/2020.04.08.20057794>

- Among patients with COVID-19, the strongest hospitalization risks were age  $\geq 75$  years, age 65-74, BMI  $> 40$ , and heart failure. Strongest critical illness risks were admission oxygen saturation  $< 88\%$ , d-dimer  $> 2500$ , ferritin  $> 2500$ , and C-reactive protein (CRP)  $> 200$ .

[Incidence of thrombotic complications in critically ill ICU patients with COVID-19](#). Klok et al. *Thrombosis Research*. April 10, 2020. <https://doi.org/10.1016/j.thromres.2020.04.013>

- This study found a 31% incidence of thrombotic complications in ICU patients with COVID-19 infection from three Dutch hospitals. These findings support the idea of COVID-19 associated coagulopathy.

[Intensive care management of coronavirus disease 2019 \(COVID-19\): challenges and recommendations](#). Phua, J et al. *Lancet*. April 6, 2020. [https://doi.org/10.1016/S2213-2600\(20\)30161-2](https://doi.org/10.1016/S2213-2600(20)30161-2)

- This review outlines the challenges that ICUs might face during this pandemic and how can they navigate these issues. The paper includes a useful table of potential therapies and also covers infection control as well as respiratory management and other topics.

[Neurologic Manifestations of Hospitalized Patients With Coronavirus Disease 2019 in Wuhan, China](#). Mao, L. et al. (2020). *JAMA Neurology*. doi: 10.1001/jamaneurol.2020.1127.

- Of a subset of patients hospitalized in Wuhan, China for COVID-19, 36.4% had at least one neurological symptom such as dizziness, headache, impaired consciousness loss of taste and smell and skeletal muscle damage. Patients with severe pneumonia were more likely than those with moderate pneumonia to display neurological symptoms including acute cerebrovascular event, impaired consciousness and skeletal muscle injury.

[Pharmacologic Treatments for Coronavirus Disease 2019 \(COVID-19\): A Review](#). JAMA. Published online April 13, 2020. doi:10.1001/jama.2020.6019

- CDC and WHO announced that there is no current evidence to recommend any specific anti-COVID-19 treatment for patients with confirmed COVID-19. A few pharmacological treatment options are used in supportive care based on patients characteristics.

[Treatment of 5 critically ill patients with COVID-19 with convalescent plasma](#). Shen, Chenguang, et al. *JAMA*. March 27, 2020. doi: 10.1001/jama.2020.4783.

- Five critically ill patients hospitalized for COVID-19 in Wuhan, China who had previously received experimental antiviral treatment were given convalescent plasma. While there were no study controls, all patients displayed decreased viral load, decreased SOFA scores, increased PAO<sub>2</sub>/FIO<sub>2</sub>, decreased body temperature and decreased inflammatory markers. By publication date, 3 of the patients were extubated and discharged and one was transitioned from ECMO to ventilator.

[A Trial of Lopinavir–Ritonavir in Adults Hospitalized with Severe Covid-19](#). Cao, B et al. *NEJM*. March 18, 2020. DOI: 10.1056/NEJMoa2001282.

- No statistically or clinically significant difference was found for time to improvement or mortality rate between control and treatment groups. Overall study mortality rate was much higher than average mortality rate among hospitalized COVID patients, suggesting additional investigation would be needed to assess efficacy in moderate severity COVID cases.

### **Public Health/Epidemiology**

[Assessment of N95 respirator decontamination and re-use for SARS-CoV-2](https://doi.org/10.1101/2020.04.11.20062018). Fischer et al. medRxiv. Preprint. April 15, 2020. <https://doi.org/10.1101/2020.04.11.20062018>

- Vaporized hydrogen peroxide can effectively decontaminate N95 masks of SARS-CoV-2 in 10 minutes and masks maintain filtering integrity for up to 3 uses. Ethanol spray caused prohibitive mask damage, while UV and heat could be utilized for 2 mask uses. This study is not peer reviewed.

[Estimates of the severity of coronavirus disease 2019: a model-based analysis](https://doi.org/10.1016/S1473-3099(20)30243-7). Verity et al. March 30, 2020. *Lancet*. DOI:[https://doi.org/10.1016/S1473-3099\(20\)30243-7](https://doi.org/10.1016/S1473-3099(20)30243-7)

- Time of onset to death and onset to hospital discharge were 17.8 days (95% CI 16.9-19.2) and 24.7 days (95% CI 22.9-28.1), respectively. Overall fatality rate corrected for censorship and under ascertainment found to be 1.38% (95% CI, 1.23-1.53) increasing to 6.4% (95% CI, 5.7-7.2) in those >60 yo and 13.4% (95% CI, 11.2-15.9) in those > 80yo.

[Respiratory virus shedding in exhaled breath and efficacy of face masks](https://doi.org/10.1038/s41591-020-0843-2). Leung, N. H et al. *Nature Medicine*. April 3, 2020. <https://doi.org/10.1038/s41591-020-0843-2>

- Non-significant (p=0.07) reduction in coronavirus (multiple strains) respiratory droplets by wearing a mask, and significant reduction p=0.02) in covid 19 aerosols with mask. surgical face masks could prevent transmission of coronaviruses and influenza viruses

[Temporal dynamics in viral shedding and transmissibility of COVID-19](https://doi.org/10.1038/s41591-020-0869-5). He, X et al. April 15, 2020. *Nat Med*. <https://doi.org/10.1038/s41591-020-0869-5>

- Infectivity start and peak infectivity were found to be 2.3 days (95% CI, 0.8-3.0) and 0.7 days (95% CI, -0.2-2.0) before symptom onset, respectively. Estimated 44% of transmission occurs when patients are still asymptomatic.

### **Basic Research**

“Antibody Points to Possible Weak Spot on Novel Coronavirus” Collins, F. *NIH Director’s Blog*. April 14, 2020. <https://directorsblog.nih.gov/2020/04/14/antibody-points-to-possible-weak-spot-on-novel-coronavirus/>

- Dr. Francis Collins reviews a recent paper from *Science* detailing the crystal structure of antibody CR3022 from a person who recovered from SARS in 2004. There is some cross-reactivity with CR3022 binding to a spike protein of the novel coronavirus (SARS-CoV-2) that is usually hidden until the virus changes conformation to enter the cell, which makes it a potential target for treatments and/or vaccines.

[Inhibition of SARS-CoV-2 infections in engineered human tissues using clinical-grade soluble human ACE2](#). Monteil, Vanessa, et al. Cell. Pre-proof. DOI: 10.1016/j.cell.2020.04.004

- ACE2 is a key receptor for SARS-CoV-2 entry into the cell and also plays a role in decreasing lung inflammation. This study showed that administering clinical grade human recombinant soluble ACE2 inhibits viral entry into host cells in both cell culture and human-derived capillary and kidney organoids, but did not test efficacy in lung or heart organoids.

From UNC: [An orally bioavailable broad-spectrum antiviral inhibits SARS-CoV-2 in human airway epithelial cell cultures and multiple coronaviruses in mice](#). Sheahan, T. P. et al. *Science*. April 6, 2020. DOI: 10.1126/scitranslmed.abb5883.

- The ribonucleoside analog  $\beta$ -D-N4-hydroxycytidine (NHC, EIDD-1931) effectively inhibits SARS-CoV-2, MERS-CoV, SARS-CoV, and related Bat-CoVs in vitro. NHC also effectively inhibits a coronavirus bearing resistance mutations to the nucleoside analog inhibitor remdesivir in vitro. In mice infected with SARS-CoV or MERS-CoV, both prophylactic and therapeutic administration of EIDD-2801, decreased pulmonary hemorrhage, reduced virus titer and body weight loss.

From other sources:

**From UpToDate:**

April 14 [updates](#)

- The WHO recommends BCG vaccination not be used for prevention or lessening the severity of COVID-19, pending further data

April 15 [updates](#) on face coverings

- CDC recommendations of face covers – reminding physicians to encourage people to continue social distancing and hand hygiene even when wearing a mask

**From CDC:**

April 7th: Ambulatory Care Setting recommendations ([here](#)):

- Outlines need for increased use of telehealth and virtual visits to slow spread of COVID 19 in the ambulatory setting and amongst providers.

April 13: Healthcare Provider and Facility Operational Considerations for Non-US Settings ([Here](#))

- Infection prevention techniques and triage operation procedures in non-US settings are outlined

April 14: Groups at Higher Risk for Severe Illness ([Here](#))

- Identify risk factors for COVID-19 patients for severe illness and how to reduce their risk of contracting the virus

**From WHO:**

April 14<sup>th</sup> update [here](#)

(“Coronavirus disease 2019 (COVID-19): Epidemiology, virology, clinical features, diagnosis, and prevention” updated on 4/14)

April 15<sup>th</sup> update [here](#)

- There is no evidence that oral poliovirus vaccine protects people against infection with COVID-19 virus. A clinical trial is planned in the USA, and WHO will evaluate the evidence when it is available.

April 16th update [here](#)

- No new countries/territories/regions in the last 24 hours
- Released update to COVID-dashboard link here to increase data sharing
- Drinking alcohol does not protect against COVID-19 and restrictions to reduce harm caused by alcohol should be continued
- Oxygen therapy is important for management of patients
- In India, national polio surveillance network to help with COVID-19 response

**From Johns Hopkins:** *latest figures, any news, link to website*

National Plan for Contact Tracing ([here](#)):

- Goal is to improve contact tracing capacity in order to relax population level mitigation efforts. Calls for approximately 100,000 additional personal to work force (would mean 1575-8500 new tracers in NC). Cost estimates of \$3.6 billion.

April 13 Global update [here](#)

Cases/Deaths: World/US/NC/Orange County (April 17 12:30pm)

- Number Updates (cases/deaths)
  - World: 2,188,194/147,632
  - US: 662,045/28,998
  - NC: 5,639/150
  - Orange County: 172/2