



TRENDS-in-MEDICINE

BULLETIN: UPDATE ON CORONAVIRUS 3/28

March 28, 2020
by Lynne Peterson

Be careful, be safe, and be well.

There continues to be an overwhelming amount of news related to the SARS-CoV-2 virus and the disease it causes. Here are the latest highlights. Our charts have been moved to Page 7-8, and the two charts on Page 8 should help track whether the curve is flattening.

Tidbits

■ The world

- **British** Prime Minister Boris Johnson tested positive for Covid-19.
- **China.**
 - ✓ Plans to lift the lockdown on **Wuhan** on April 8.
 - ✓ Temporarily suspended foreign nationals with valid visas and residence permits from entering the country in an effort to prevent a new outbreak of coronavirus.
- **Iceland.** Amgen/deCODE has been offering free coronavirus tests to all Icelanders (sick or not) and they found that, of all the people tested, 737 (6.3%) were positive, and 15 (2%) of the positives were hospitalized with 2 people (13% of the hospitalization) in an ICU.

■ U.S.

- **Stimulus.** The U.S. Congress passed, and President Trump signed, a **\$2.2 trillion economic stimulus/relief bill**. The Senate vote was 96-0, and the House approved it by a voice vote. Besides providing relief for small businesses, the unemployed, and some large businesses, the legislation has some more **obscure provisions** affecting healthcare:
 - ✓ A provision that would create an over-the-counter (OTC) drug user fee system and grant exclusivity for certain OTC medicines.
 - ✓ Requires drug manufacturers to submit more information when there is an interruption in supply, including information about active pharmaceutical ingredients (APIs). Manufacturers also are required to have contingency plans to ensure a back-up supply of products.
 - ✓ Clarifies that during a public health emergency, device manufacturers are required to submit information about any shortage or device component shortage when asked for that information by the FDA.
 - ✓ Asks the National Academies to study the manufacturing supply chain for drugs and medical devices and make recommendations to Congress.

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- **Recession.** The chairman of the Federal Reserve Jerome Powell said, “We may well be in a **recession**...but there is nothing fundamentally wrong with our economy.”
- **Unemployment claims** – mostly due to the coronavirus – hit a record high, 3.28 million, up from 282,000 the previous week, a 12-fold increase.
- **Navy hospital ships.** The USNS Mercy arrived in Los Angeles harbor, and the USNS Comfort is on the way from Norfolk to New York City.
- **Another cruise ship problem.** Four elderly passengers died and at least 138 are possibly infected (sick) on Holland America’s MS Zaandam – which has 1,243 passengers and 586 crew members. It was making its way to Fort Lauderdale after getting re-provisioned in Chile. It was initially refused transit through the Panama Canal but now is being allow to pass through. Healthy passengers were transferred to another ship, the MS Rotterdam.

■ President Trump

- Finally invoked the Defense Production Act (DPA), ordering General Motors and Ventec Life Systems to make ventilators. He accused GM of “wasting time,” adding “Pride became a big issue. We didn’t want to play games with them.” However, he said he *could* back off the DPA order if GM gets with the program. He said there are also two other unnamed companies that are not playing nice, so he *may* need to use the DPA to force them to produce needed items. White House Trade Adviser Peter Navarro was made the DPA Policy Coordinator.
- Said the U.S. will produce/procure 100,000 additional ventilators to combat Covid-19 over the next 100 days. If more ventilators are produced than needed in the U.S., they will be sent to other countries that need them, and he said the U.K. has already asked for some.
- Sent a letter to state governors, saying the administration is developing “guidelines” for lifting social distancing restrictions, based on expanded testing capability. The guidelines would **categorize counties** as high, medium, or low risk.
- Signed an executive order activating the ready reserve component of the armed forces, allowing the mobilization of medical disaster personnel. He said, “We have a lot of retirees. They are coming back in.”
- Threatened to **quarantine** New York, New Jersey, and Connecticut, not allowing people to leave except truck drivers. However, hours later he backed off that idea. Instead, the Centers for Disease Control and Prevention (CDC) issued a strong travel advisory that discourages people in the tristate area from traveling domestically. This does not apply to people employed in critical infrastructure industries.

■ The states

• Florida

- ✓ **Price gouging.** Gov. Ron DeSantis wants an investigation into Larkin Community Hospital’s private lab in Hialeah for allegedly charging \$150 for drive-through Covid-19 coronavirus testing. The hospital CEO called it a “misunderstanding.”
 - ✓ **Out-of-state travelers.** Gov. DeSantis said the highway police will be stopping and screening people entering Florida on Interstate 95 and at a second checkpoint on Interstate 10 west of Pensacola. Motorists from the New York tristate area or from Louisiana will be told they need to quarantine for 14 days. He also is having the Florida National Guard meet flights from New York to warn passengers they need to quarantine themselves for 14 days.
 - **Kentucky** – A hospital, St. Claire HealthCare, actually furloughed 300 employees because its revenue is down. *Guess Kentucky isn’t worried about being prepared for Covid-19 since they only have 394 cases and 8 deaths so far.*
 - **Louisiana** is a new hotspot. Lt. Gen. Russel Honoré (Ret), who was the commander of Joint Task Force Katrina responsible for coordinating military relief efforts for Hurricane Katrina–affected areas across the Gulf Coast,
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said the healthcare system in New Orleans is in terrible shape and that nurses have been threatened with being fired if they report personal protective equipment (PPE) supply shortages.

- **New York**

- ✓ **Hospitals.** Gov. Andrew Cuomo said he plans to build another 4 temporary hospitals, each with 1,000 beds. They are also looking at taking over college dorms, hotels, and nursing homes.
- ✓ **Nursing homes.** New York mandated that nursing homes take Covid-19 patients discharged from hospitals.
- ✓ **Pharmacies.** Gov. Cuomo asked pharmacies to cooperate by doing free home delivery, “I understand it’s a hardship on the pharmacies to provide home delivery. I’m asking them to do it free of charge, but it will make a very big difference.”
- ✓ **Schools.** New York City Mayor Bill de Blasio said he’s hoping to reopen New York City public schools April 20. However, Gov. Cuomo said the 14-day school closure ends on April 1, but he believes the schools should remain closed.
- ✓ **Treatment.** About 1,100 tests of hydroxychloroquine + azithromycin are being administered, and they are waiting to see the results.
- ✓ **Volunteers.** More than 62,000 retired healthcare workers have volunteered to help. Gov. Cuomo cautioned, “This is not going to be a short deployment. This is going to be weeks and weeks and weeks.”
- ✓ **Patients.** Gov. Cuomo said on March 27 that 20% of Covid-19 patients are hospitalized. As of that date, 6,000 New Yorkers had been hospitalized for Covid-19, and 1,500 of those (25%) were in the intensive care unit (ICU), which means on a ventilator. He also said that Covid-19 patients are often requiring longer-than-typical ventilation – up to 21 days. He added, “The longer you are on a ventilator, the less likely you will come off that ventilator. That is not just true with this virus; it is true with every illness.”

Speculation: Given that the typical fatality rate for ventilator patients is $\geq 30\%$, that means no less than 450 of ventilator patients can be expected to die, which is 7.5% of hospitalized patients! So, as you watch hospitalization rates, given these statistics, you would assume 25% are on a ventilator and 7.5% of hospitalized patients are likely to die. If New York needed all 140,000 beds at once, this would translate to 10,500 deaths, and that wouldn’t take into account casualties before and after that peak (beds that are filled with new patients).

Consider these calculations, for every 1,000 patients confirmed to have Covid-19:

800 are not hospitalized

200 are hospitalized

50 of hospitalized patients go to the ICU

15 of ICU patients are expected to die (1.5% of all diagnosed, 7.5% of all hospitalized patients)

If these numbers hold, and New York fills 140,000 beds, as many as 10,500 people could die.

- **FDA**

- Reported that so-far at least 16 SARS-CoV-2 tests have been granted emergency use authorization (EUA), and the Agency has heard from >190 test developers planning to submit applications for a test.
- Issued an EUA that allows modifications to anesthesia gas machines that allow them to be converted to ventilators.
- Added hydroxychloroquine and chloroquine to the list of drugs that can be compounded.
- Issued an EUA that allows the modification of other breathing machines – e.g., anesthesia gas machines, positive pressure breathing devices – as well as ventilator tubing connectors accessories – to be modified for use in the U.S. as ventilators. The Agency also lifted regulations that will allow a ventilator to be modified to treat two patients at once. And the FDA is allowing certain ventilators and respirators marketed in Europe but not approved in the U.S. to be used here.

■ **Blood supply.** *Is the blood supply safe?* The FDA doesn't appear worried, but apparently no one has checked that yet. Here is the FDA's response to that question: "Coronaviruses are generally thought to be spread from person-to-person through respiratory droplets. Respiratory viruses are not known to be transmitted by blood transfusion. Currently there is no evidence to support transfusion-transmission of Covid-19."

"Blood donors must be healthy and feel well on the day of donation. Routine blood donor screening measures that are already in place...should prevent individuals with respiratory infections from donating blood. For example, blood donors must be in good health and have a normal temperature on the day of donation and may only be collected from individuals if they meet the donor eligibility requirements and found suitable..."

"Donors are instructed to contact the donor center if they become ill after donation, so that their blood or plasma will not be used. Even when a donor develops Covid-19 after donation, however, there have been no cases of Covid-19 linked to donor blood or products made from blood."

"At this time, the FDA does not recommend using laboratory tests to screen blood. Someone who has symptoms of Covid-19, including fever, cough, and shortness of breath, is not healthy enough to donate blood. Standard screening processes already in place will mean that someone with these symptoms will not be allowed to donate."

"Based on the limited information available at this time, we suggest individuals refrain from donating blood at least 28 days after resolution of symptoms after a diagnosis of Covid-19 or 28 days after the date of departure from an outbreak area or the last possible close contact exposure to a person with Covid-19."

■ **Diagnosis**

- A study published in *JAMA Pediatrics* found that of 33 **newborns** born to mothers with confirmed Covid-19, 3 were diagnosed with the infection. Previous studies have shown pregnant women don't pass Covid-19 to their fetus, so the transmission is occurring shortly after birth.
- **Apple**, in partnership with the White House Coronavirus Task Force and the U.S. Department of Health and Human Services (HHS)/CDC released an app and a website that guides Americans through a series of questions about their health and risk factors to determine if they should seek care for Covid-19.
- **CDC**. The CDC launched an online bot, **Clara**, to help people who think they may have Covid-19 decide whether to seek medical care. The Coronavirus Self-Checker asks questions to establish the user's level of illness and their location.
- **Gastrointestinal symptoms**. A study found that digestive issues can be an early symptom of Covid-19.
- **Smell**. Loss of sense of smell has been identified as a symptom of Covid-19, and it may occur in up to half of patients.

■ **Insurance**

- A study by FAIR Health estimated that the impact of the coronavirus epidemic to the U.S. healthcare system will range from a low of \$362 billion to as high as \$1.45 trillion.
 - A report by Covered California warns that insurance rates for 2021 could increase substantially, up 4% to as much as 40%. The one-year projected costs for testing, treatment, and care of Covid-19 patients is \$34 billion to \$251 billion, and insurers will need to adjust for that and plan for more expenses in 2021.
 - The Centers for Medicare and Medicaid Services (CMS) granted six states – Colorado, Hawaii, Idaho, Maryland, Massachusetts, and New York – **Medicaid waivers** to respond to coronavirus.
 - The American Medical Association announced new CPT guidance on properly reporting medical services provided to Covid-19 patients.
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- **Origin of Covid-19.** National Institutes of Health director Francis Collins, MD, PhD, writing in an NIH blog, described a genomic study, published in *Nature Medicine*, that points to a natural origin for Covid-19. The researchers found that SARS-CoV-2 has a “special ability” to bind to a specific protein on human cells, angiotensin converting enzyme (ACE2), and does that just as well as does SARS-CoV-1, “The researchers said this provides strong evidence that the new virus was not the product of purposeful manipulation in a lab. In fact, any bioengineer trying to design a coronavirus that threatened human health probably would never have chosen this particular conformation for a spike protein.” And he said the researchers found additional evidence that the coronavirus that causes Covid-19 “almost certainly originated in nature.”

What is the natural origin? There’s no answer yet, but there are currently two possibilities: (1) It evolved in bats (or pangolins), the spike proteins mutated to bind to molecules similar in structure to the human ACE2 protein, enabling it to infect human cells. (2) It crossed from animals to humans before becoming capable of causing human disease, and then gradually evolved over years or decades.

■ Testing

- **Abbott’s ID NOW COVID-19**, a test in a small, portable lab-in-a box that can produce a positive Covid-19 result in just 5 minutes and a negative one in <15 minutes, was granted an EUA by the FDA. The company said it can produce 50,000 devices/day, maybe starting next week – with plans to produce 5 million by the end of April. The test uses a mouth swab to test for RNA. The test runs on Abbott’s ID NOW hardware, which is already widely available in doctor’s offices, urgent care clinics, emergency rooms, and other medical facilities.
- **CT imaging.** Experts on an American Roentgen Ray Society webinar said that CT scans of Covid-19 patients have a lot of similarities to patients with EVALI (e-cigarette and vaping associated lung injury), particularly organizing pneumonia. Both conditions can have ground glass opacity on CT, but this tends to be bilateral and peripheral in Covid-19 patients. An expert said the key role of CT in Covid-19 is not diagnosis but to monitor for potential complications and disease progression.
- **Other new tests approved or granted EUA include:**
 - ✓ **BioMérieux’s BioFire COVID-19 test** can detect SARS-CoV-2 within 45 minutes.
 - ✓ **DiaCarta’s QuantiVirus SARS-CoV-2 test**, which does not cross-react to other coronaviruses and has 100% specificity and 96% sensitivity, was granted a CE Mark. It is under review by the FDA.
 - ✓ **Fosun Pharmaceutical/Fosun Long March Medical Science’s SARS-CoV-2 detection kit** was granted emergency approval by China’s National Medical Products Administration. The kit can process 96 samples in two hours.
 - ✓ **Henry Schein’s Standard Q COVID-19 IgM/IgG Rapid Test**, an antibody point-of-care test, can deliver results in 15 minutes from a pinprick of blood with no instrumentation required. The company expects to have several hundred thousand tests available by the end of this month, with increased availability in April. This may be particularly useful in determining if people have recovered from the virus.
 - ✓ **Thermo Fisher Scientific’s Covid-19 test** was granted expanded EUA by the FDA and a CE Mark by the European Medicines Agency (EMA).

■ Transmission

- **Aerosolization.** A study, in pre-print form, by University of Nebraska researchers found that viral aerosol particles are produced by individuals with Covid-19, even when they don’t cough. This suggests that the virus is getting airborne just by breathing.
 - **Duration of transmission.** A study, published in the *American Journal of Respiratory and Critical Care Medicine*, found that half the Covid-19 patients with mild disease still had the virus – and shed it – **after** their symptoms disappear.
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- **Food.** According to the FDA, there is no evidence of food or food packaging being associated with the transmission of the coronavirus.
- **Tears.** A prospective study done in Singapore, published in the journal *Ophthalmology*, found that patients with Covid-19 could, technically, transmit SARS-CoV-2 through their tears, but that probability is low. The researchers did not find any evidence of viral shedding in tears taken at various time points over the course of patients' disease in Covid-19-positive patients.

■ Treatment

- **Do not resuscitate (DNR)** – Ambassador Deborah Birx, MD, the White House Coronavirus Response Coordinator, took offense at any policy that denied patients and their families the decision on DNR, saying, “There is no situation in the U.S. right now that warrants that kind of discussion.”
- **Colchicine** – This gout drug, an anti-inflammatory, is being tested in a 6,000-patient study (COLCORONA) at the Montreal Heart Institute to see if it can stop the cytokine storm that Covid-19 patients experience.
- **Convalescent plasma** – New York reportedly is working with an unidentified pharmaceutical company to test this treatment.

■ Medical supplies

- The FDA eased regulations on the importation of PPE.
- **Masks.** David Wells, an engineer with Lighthouse Worldwide Solutions who specializes in submicron analysis, did a study of N95 and standard surgical masks. He had some surprising findings: N95 masks are not as good at keeping small particles (including viruses) out as people might think, and surgical masks can be even more effective than an N95 mask – but only if the way they are worn is modified. His studies found that cutting the over-the-ear straps, connecting the strap ends to elastic bands, and positioning the new straps differently can provide very good protection with these masks. Without the modification, they offer very little protection. Here is a YouTube video explaining all this: It's long, but it is detailed and interesting.

[www.youtube.com/watch?v=5B8zZo__-](https://www.youtube.com/watch?v=5B8zZo__-hM&feature=youtu.be&fbclid=IwAR3FpQ2mtUqBVHqXTEZAI43UlszSIG-pmSCcHFRkHRjbrmcx-bZMRlwEonI)

[hM&feature=youtu.be&fbclid=IwAR3FpQ2mtUqBVHqXTEZAI43UlszSIG-pmSCcHFRkHRjbrmcx-bZMRlwEonI](https://www.youtube.com/watch?v=5B8zZo__-hM&feature=youtu.be&fbclid=IwAR3FpQ2mtUqBVHqXTEZAI43UlszSIG-pmSCcHFRkHRjbrmcx-bZMRlwEonI)

- A survey of 213 U.S. mayors from 41 states and Puerto Rico found that a shortage of test kits, masks, face masks, and ventilators, and other PPE is widespread. The president of the U.S. Conference of Mayors (USCM) said, “While cities are doing everything they can, we need support from our state and federal leaders. This survey confirms what mayors already know to be true: we need adequate resources to end this pandemic.” The survey found:
 - ✓ 91.5% of the cities do not have an adequate supply of face masks for their first responders.
 - ✓ 88.2% do not have an adequate supply of PPE other than face masks to protect first responders.
 - ✓ 92.1% do not have an adequate supply of test kits.
 - ✓ 85% do not have an adequate supply of ventilators.
 - ✓ 62.4% have not received emergency equipment or supplies from their state government.
 - ✓ Of those receiving help from their state, 84.6% (66) say it is not adequate to meet their needs.

■ Nursing homes/skilled nursing facilities (SNFs)/assisted living facilities (ALFs)

- New York mandated that nursing homes take Covid-19 patients discharged from hospitals who need that level of care for their convalescence. This comes two weeks after the state banned visitors to nursing homes.
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- The CDC will not release the list of 147 nursing homes across 27 states that have been hit by Covid-19. At least 19 of these are in Florida, but Florida officials have also refused to identify those facilities.
- At one New Jersey nursing home, 24 of the 94 residents are positive for the virus, and all of the others are assumed to be infected.
- A single Ft. Lauderdale SNF has had 6 Covid-19 deaths.
- Deaths in Florida are projected to double every 4 days.
- Enforcement of violations of stay-at-home orders is ramping up. Violators can be jailed up to 60 days or fined \$500.
- A study at a long-term SNF found that testing only symptomatic patients misses a lot of coronavirus positive patients – about half of the asymptomatic patients tested had positive results. The study concluded that once a facility has a confirmed Covid-19 case, all residents should be cared for using CDC-recommended PPE, with considerations for extended use or reuse of PPE as needed.

■ Vaccines

- Anthony Fauci, MD, director of the National Institute of Allergy and Infectious Diseases (NIAID), said the U.S. can't wait for proof that a vaccine works to start scaling up production, so promising vaccines need to be produced *ahead* of the results of the clinical trial, "One of the things we are going to do, that has been a stumbling block for development of previous vaccines – even before you know something works, you have to start producing it...We are working with a variety of companies to take that risk."

Worldwide Covid-19 Statistics												
Country	As of March 18			As of March 25 (1 week)			As of March 27			As of March 28		
	Cases	Deaths	Fatality rate	Cases	Deaths	Fatality rate	Cases	Deaths	Fatality rate	Cases	Deaths	Fatality rate
Worldwide	217,242	8,704	4.0%	470,973	21,287	4.5%	590,594	26,943	4.6%	665,616	30,857	4.6%
U.S.	9,249	145	1.6%	68,960	1,041	1.5%	100,717	1,544	1.5%	124,686	2,192	1.8%
Italy	35,713	2,978	8.3%	74,386	7,503	10.1%	86,498	9,134	10.6%	92,472	10,023	10.6%
China	81,137	3,130	3.9%	81,667	3,285	4.0%	81,897	3,296	4.0%	82,061	3,304	4.0%
Spain	13,176	638	4.8%	49,515	3,647	7.4%	64,285	4,940	7.7%	73,235	5,982	8.2%
Germany	12,327	28	0.2%	37,323	206	0.6%	50,871	342	0.7%	57,695	433	0.8%
Iran	17,061	1,135	6.7%	27,017	2,077	7.7%	32,332	2,378	7.4%	35,408	2,517	7.1%
U.K.	>2,600	104	4.0%	9,640	466	4.8%	14,743	761	5.2%	17,315	1,021	5.9%

Source: <https://coronavirus.jhu.edu/map.html>

U.S. Covid-19 Statistics												
State	As of March 18			As of March 25			As of March 27			As of March 28		
	Cases	Deaths	Fatality rate	Cases	Deaths	Fatality rate	Cases	Deaths	Fatality rate	Cases	Deaths	Fatality rate
New York *	2,382	12	0.05%	30,811	285	0.9%	44,635	519	1.2%	52,318	728	1.4%
New Jersey	427	5	1.2%	4,402	62	1.2%	8,825	108	1.2%	11,124	140	1.3%
Washington	1,012	52	5.1%	2,469	123	5.0%	3,207	147	4.6%	3,723	175	4.7%
California	611	13	2.1%	2,102	40	1.9%	3,879	78	2.0%	4,643	101	2.2%
Michigan	80	0	0	2,294	43	1.3%	3,657	92	2.5%	3,657	92	2.5%
Illinois	289	1	0.3%	1,884	19	1.0%	3,026	34	1.1%	3,491	47	1.3%
Florida	314	7	2.2%	1,682	22	1.3%	2,765	34	1.2%	3,763	54	1.4%
Louisiana	240	6	2.5%	1,795	65	3.3%	2,746	119	4.3%	3,315	137	4.1%
Massachusetts	256	0	0	1,838	15	0.7%	3,240	35	1.1%	4,257	44	1.0%

Source: <https://covidtracking.com/data/> * New York state dropped from ~58% of U.S. cases on March 25 to 42% on March 28

Watching for When the Coronavirus Curve Flattens (Additional cases each day, not total cases) *						
Location	March 23	March 24	March 25	March 26	March 27	March 28
Worldwide	45,321	36,289	53,391	60,711	58,910	75,022
U.S.	13,056	7,328	14,912	16,545	15,212	23,969
China	107	77	76	115	1115	164
Iran	1,411	1,762	2,206	2,389	2,926	3,076
Italy	4,789	5,249	5,210	6,203	5,909	5,974
Spain	6,368	4,749	9,630	8,271	6,499	8,950
New York	6,521	6,976	5,146	6,447	7,377	7,683

* This is the metric that Dr. Birx said to watch.

Death Toll Increases (Additional deaths, not total deaths)						
Location	March 23	March 24	March 25	March 26	March 27	March 28
Worldwide	1,940	2,040	2,664	3,217	2,889	3,914
China	107	7	4	6	5	8
Italy	601	743	683	712	919	889
Spain	539	497	839	718	575	1,042
U.S.	193	93	328	248	255	648
New York	43	53	75	100	134	209

Unanswered questions *(Items will remain on this list until answered.)*

- ? People who get mild Covid-19 and recover continue to shed virus for at least 8 days after symptoms resolve. Is that virus capable of infecting other people? Should those people be quarantined longer?
- ? If doctors and nurses are not being routinely (maybe daily) tested for coronavirus, then could they be positive and spreading the disease?
- ? What do we know about Covid-19 patients who are put on a ventilator and recover? Is it a functional recovery?
- ? Are there long-term effects from getting Covid-19, even mild Covid-19? Will there be long-lasting lung abnormalities or pulmonary fibrosis?
- ? Can people get Covid-19 more than once? There are still conflicting reports on this.
- ? New York City projections: The projection numbers just don't seem to add. Why? (See Coronavirus Update for March 24 for details.)