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May 18, 2020

**Future Care Bulletin Covid-19 Number 12**

Dear Future Care Clients,

Please review prior bulletins.

The global case count (as of May 18, 13:43 MT): **4,833,249** infections; **317,218** deaths (6.6%); **1,871,806** recovered (38.7%).

The following are the 25 countries with the highest case counts as of May 18, 13:43 GMT.

Country	Infected	Deaths	Recovered	Infected per million	Deaths per million
USA	1,529,144	90,996	346,389	4,623	275
Russia	290,678	2,722	70,209	1,992	19
Spain	277,719	27,650	195,945	5,940	591
Brazil	243,968	16,196	94,122	1,149	76
UK	243,695	34,636	0 ^	3,592	511
Italy	225,435	31,908	125,176	3,728	528
France	179,569	28,108	61,213	2,752	431
Germany	176,807	8,054	154,600	2,111	96
Turkey	149,435	4,140	109,962	1,774	49
Iran	122,492	7,057	95,661	1,461	84
India	96,492	3,041	36,824	70	2
Peru	92,273	2,648	28,621	2,803	80
China	82,954	4,634	78,238	58	3
Canada	77,002	5,782	38,550	2,042	153
Saudi Arabia	57,345	320	28,748	1,650	9
Belgium	55,559	9,080	14,657	4,796	784
Mexico	49,219	5,177	33,329	382	40
Netherlands	44,141	5,694	0 ^	2,577	332
Chile	43,781	450	19,213	2,293	24
Pakistan	42,125	903	11,922	191	4
Qatar	33,969	15	4,899	11,816	5
Ecuador	33,182	2,736	3,433	1,884	155
Switzerland	30,597	1,883	27,500	3,538	218
Belarus	30,572	171	10,130	3,235	18
Sweden	30,377	3,698	4,971	3,010	366

Reference: <https://epidemic-stats.com/>

**Testing Update** – the ability to use tests in algorithms to make decisions regarding crew movement seems to be a priority amongst owners and operators so I will take some time to discuss the current availability and technology and make some recommendations.

### **Immunoassay antibody testing**

While we had great hope for immunoassays as a screening tool – as the theory of the science is good – it has not worked out well. It is to understand its limitations and use test results as just one piece of data to inform decision making. The first tests were released without any US Federal Drug Administration (“FDA”) review based upon the manufacturer’s assurances. Many were poorly made and inaccurate. **False negatives** are very problematic. Therefore, using these tests to diagnose or screen are problematic. Everyone mounts a different antibody response and may not be positive until as late as 10-14 days into the illness. Others mount an IgM response by day 5. In sick individuals, the median time to IgM detection appears to be 5 days after symptom onset. The median time to IgG detection was 14 days after symptom onset. A study in 285 patients with confirmed COVID-19 showed that 100% of patients developed IgG antibodies within 19 days of symptom onset. Asymptomatic carriers, which is what we are really looking for in our crew, may mount low antibody responses. *The only effective way to increase the yield from the tests to make them useful in any screening algorithm would be to retest anyone with a negative test seven (7) days later with a reliable test with at least an FDA Emergency Use Authorization (“EUA”) approval.* All manufacturers are now required to submit an application for an EUA. Tests must be authorized to remain on the market, and it will take the FDA time to go through each test, even for just an EUA. From the FDA: “Flexibility never meant we would allow fraud. We unfortunately see unscrupulous actors marketing fraudulent test kits and using the pandemic as an opportunity to take advantage of Americans’ anxiety. Some test developers have falsely claimed their serological tests are FDA approved or authorized. Others have falsely claimed that their tests can diagnose COVID-19 or that they are for at-home testing, which would fall outside of the policies outlined in our March 16 guidance, as well as the updated guidance. Also, since that time, the FDA has become aware that a concerning number of commercial serology tests are being promoted inappropriately, including for diagnostic use, or are performing poorly based on an independent evaluation by the NIH.”

In addition, if the crew member comes from a location with a low prevalence of virus, the totally rare and random **false positive** we see with any test may have a higher statistical chance of occurring. All tests can provide at least some false results. It is inherent in any test.

Utilization of immunoassays at the recovery end requires an understanding of the IgM and IgG curves previously distributed. The rise and fall of IgM and especially the rise in IgG are variable from the time of illness and depend on many factors including how ill the patient may have been. Again, a positive IgG indicates exposure, but it will be months before we are able to start to determine if the presence of IgG truly confers immunity and for how long. Right now, the best use is to identify individuals who are good candidates to donate plasma for investigational studies to see if plasma with antibodies has a beneficial effect on critically ill Covid-19 patients. The ability of detected antibodies to neutralize the virus and confer immunity remains unclear.

However, having said that, having a returning crew member who is 11-14 days post illness with a positive IgG immunoassay can be reassuring to the ship owner, especially if combined with a negative nasal swab. This may be the crew member who deals with authorities and ports of call

and gets off the ship for any vital meetings. These crew must still take all necessary precautions and follow all recommendations as we do not know if they can be re-infected or serve as viral carriers.

### **Molecular Testing**

In a patient with a COVID-19 infection, genetic material from the virus that causes COVID-19, is detectable in specimens taken from the upper and lower airways at some points in the infection and in variable quantities through a technique called reverse transcription polymerase chain reaction, or RT-PCR, where genetic material from a sample is copied and then compared to the genetic sequence of the virus. The samples are typically collected from the nasopharynx or, in hospitals, from deep in the lungs. Laboratories and companies have been concentrating on developing technologies to run greater quantities of tests over a shorter period of time for tests sent to labs, to develop point-of-care testing on smaller machines, and to develop the ability to obtain swabs at home and from saliva instead of deep in the back of the nasopharynx.

There are over 30 companies have been issued authorization by the FDA to distribute these tests, and over 110 additional companies have notified FDA they have begun testing patients with their internally validated tests and will be submitting authorization requests.

Nasopharyngeal testing is done by inserting a 6-inch long swab into the back of the nasal passage through one nostril and rotating the swab several times for 15 seconds. This process is then repeated through the other nostril. The swab is then inserted into a container with liquid medium and sent to a lab for testing. All other molecular testing must be judged against this method for accuracy.

Abbott Laboratories announced a point-of-care swab test that can deliver results in as little as 5 minutes. There has recently been some data released questioning the accuracy of the test, but Abbott is standing by its data – research on accuracy continues. This is the best solution at the moment for testing small groups, like an entire crew or office, at the same time.

### **Obtaining your own swab/saliva**

The FDA authorized the first at-home collection molecular test, called Pixel by LabCorp, on April 20- it is a collection kit and must still be sent to the lab. They claim that you only need to go as far as the nostril, instead of deeper into the nasal passage and the data seems good, but I personally have my doubts as to the viral detection only from the nostril vs. at least as deep as the middle of the nasal passage.

Hims and Vault Health are now offering at-home collection tests online using a saliva test developed by Rutgers' RUCDR Infinite Biologics. Test kits include a collection device to collect your saliva (instead of deep nose or throat swabs) and the sample is then mailed to the lab for processing.

As of now, you must qualify for testing based on certain criteria like your location, symptoms, potential exposure, and risk. Vault Health's test, also requires a video consultation with a practitioner to supervise sample collection. All of this may change as more experience is gained with these tests.

At-home collection tests can help expand testing, reduce the demand for personal protective equipment (PPE), and minimize frontline healthcare worker exposure. There is NO test where you both collect and perform the test at home.

Current representative testing turnaround times

- Abbott: as little as 5 minutes (*plan on 15 per test*)
- Mesa Biotech: as little as 30 minutes
- Cepheid: as little as 45 minutes
- Pixel (nasal swab): 1–2 days from when sample is received
- Hims (saliva): 3–5 days from when sample is shipped
- Vault Health (saliva): 2–3 days from when sample is received

The tests properly collected are reasonably accurate with very few false positive in good quality tests. Some of the earlier tests cross reacted with other coronaviruses. False negatives can result from poor testing technique or early in the infection meaning that the virus was not found in the sample **above the limit of detection**, but you still have low levels in the body that will increase as the infection proceeds. Additionally, at this time, the FDA advises anyone who tests negative with the saliva-based test to confirm the results with a second testing method.

The best opportunity for shipowners is to find reliable nasopharyngeal testing in one of two scenarios:

- Crewmember is tested upon arriving at port and boards after negative test result – self-quarantining from the time of testing until boarding.
- Crewmember collects good specimen at home and submits it, leaving for ship after negative test results and drives to ship with no other contacts other than those he/she has been living with (if you follow current FDA guidelines with saliva testing and it is negative, you would get another test – it all depends on your risk tolerance.
- If the crewmember flies to the ship, they should wear a facemask in public at all times until they can be swabbed again in port 5-7 days after arrival.

Despite the widespread use of molecular testing swabs – a single swab does not definitively rule out Covid-19 infection.

### **Where are We Headed?**

I think it is important for the shipowner to evaluate what are the possibilities as we move forward. First, there are areas around the globe that are behind the US and Europe and have not yet worked through the initial pandemic peak and are having various degrees of success flattening the curve. The ship owner must carefully monitor the situation in any port being visited – both from the perspective of risks to the crew in that port and how travel to a port in a country with high prevalence will be viewed by any subsequent ports.

Second, the pandemic is not going away anytime soon. Herd immunity through vaccination and the virus working its way through the populations is likely a two year journey depending on the success of social distancing and the effectiveness, timing and logistical deployment of any vaccine.

**Scenario 1:** This first wave is followed by a series of repetitive smaller waves that occur through the summer and consistently over a 1- to 2-year period, gradually diminishing sometime in 2021 or early 2022 with variations based on geography, population density and further mitigation efforts. Periodic reinstatement and relaxation of mitigation measures might be sporadically necessary.

**Scenario 2:** The first wave is followed by a larger wave in the late fall or winter of 2020 and one or more smaller subsequent waves in 2021. This would require the reinstatement of mitigation measures to drive down spread of infection and prevent healthcare systems from being overwhelmed. This is the pattern seen in the 1918-19 pandemic. The 1957-58 pandemic followed a similar pattern. The 2009-10 pandemic also followed a pattern of a spring wave followed by a larger fall wave. This would be the pattern most concerning for the economy with the possibility of another period of shutdown.

**Scenario 3:** The first wave is followed by continuing and ongoing transmission and case occurrence, but without a clear wave pattern, not requiring the reinstatement of mitigation measures, although cases and deaths continue to occur. This pattern has not been seen before but is possible with current and future measures taken.

There will be at least another 18 to 24 months of significant cases, with hot spots popping up periodically in diverse geographic areas. It is likely the virus will then continue to circulate in and may synchronize to a seasonal pattern with diminished severity over time, as with other less pathogenic coronaviruses and past pandemic influenza viruses.

### **Transmission Update**

The most recent estimate of the reproductive number,  $R_0$ , (number of expected secondary cases arising from a single individual) has increased to 4.7-6.6. This is quite high and demonstrates how communicable the virus is and the need for masks. This is a significant increase from prior  $R_0$  estimates of approximately 2 to 3. It demonstrates how one individual at a large social gathering can become a "superinfector".

### **Masks**

Masks should be taken off without touching the outside of the mask. If the outside of the mask is touched, wash hands or use hand sanitizer. Put the mask back on without touching the outside front. Unless you have access to a new mask every day, the best strategy would be to have three masks and use one per day, cycling every three days. If you have access, the simple face masks are best replaced every 4 hours as they become moist. If you are using material face coverings that can be washed – that is the best strategy and to have three or more – rotating their use and washing regularly. Note again that if your hands touch the outside of any mask, they are potentially contaminated and should be washed or sanitized with alcohol-based hand sanitizer.

The strategy of using masks is that everyone working, living or socializing within 6 feet of others wear a mask and the EVERYONE wears a mask. Coughing or sneezing or otherwise projecting viruses will be caught in the mask as it is close to the face. If someone is asymptomatic and coughs or sneezes, virus will spread out to at least 6 feet, if not further – up to 12 – and can get around any face mask or face covering you are wearing. All symptomatic crew should immediately isolate. Crew working outside at consistent distances of > 12 feet do not need a mask. Certain crew may

not be able to perform exertional work assignments while wearing a mask – they should attempt to perform these assignments while maintaining social distancing to the best of their ability.

### **Shore Leave**

We have been working with the concept of screening crew and trying to place and maintain an infection free cohort of crew onboard any ship. We have even recommended entire crew changes/rotation or cohorting previously infected crew onboard the same ship. Once a crew cohort has been together for 11-14 days and no one is sick, the ship can be viewed as virus free although good cleaning and sanitation and personal hygiene practices should continue. Strict social isolation is no longer necessary. The key to this logistical plan to keep the ship virus free includes the crew not exiting the ship and visitors, vendors, guests, officials being screened and isolated from the crew.

Crew contact in port, especially without mask and proper hand-hygiene through gloves, hand washing and hand sanitizer and not touching one's face breaks down the efforts to create a virus free crew able to work and socialize amongst themselves and puts you directly back to square one. The former scenario also allows the crew members to return to their families with a far lower concern about bringing the virus home and does not require any self-quarantine for those crew returning home, unless they have been on commercial flights and public transportation.

While it should be avoided, it is recognized that certain situations will require crew to go ashore or that recreational shore leave will be required or felt by the ship owner-operator to be in the best interest of the crew or company. While this is certainly not optimal, it should be done wisely. The crew should not be permitted at large social gathering of more than 10 people. They should wear masks when on shore to confer some protection and remain greater than 6 feet from any non-crew member. They should have small bottles of hand-sanitizer in their pockets. They should wash hands, shower, discard/change mask and change clothes upon return to the ship. Early reporting of any symptoms is critical.

Thank you.  
Stay safe.

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For additional information please contact [physicians@futurecareinc.com](mailto:physicians@futurecareinc.com). To refer a specific crewmember medical incident please continue to email our Contact Center at [<firstresponse@futurecareinc.com>](mailto:firstresponse@futurecareinc.com) .