

## Critically Thinking About Covid-19 – Part II: June 26, 2020

Dr. Christopher DiCarlo

Over two months have now passed since my first commentary on the Covid –19 pandemic. And in that short time period, a lot has happened. When considering information and evidence regarding a novel new virus like Sars CoV – 2, we must constantly remember our knowledge limitations. And so it is always worth repeating and remembering what we might call Rumsfeld’s Rule:

*“There are known knowns. There are things we know that we know. There are known unknowns. That is to say, there are things that we now know we don't know. But there are also unknown unknowns. There are things we do not know we don't know.”<sup>1</sup>*

So at this point in time, what do we *know*, and what do we know we *don't know* about this particular virus?

### **Name Origin:**

In case you’re wondering, there are very specific reasons why this particular novel corona virus is called Covid – 19. According to the Center for Disease Control:

On February 11, 2020 the World Health Organization announced an official name for the disease that is causing the 2019 novel coronavirus outbreak, first identified in Wuhan China. The new name of this disease is coronavirus disease 2019, abbreviated as COVID-19. In COVID-19, ‘CO’ stands for ‘corona,’ ‘VI’ for ‘virus,’ and ‘D’ for disease.<sup>2</sup>

In April 16, 2020, Whitehouse counsellor, Kellyanne Conway said: “Some of the scientists and doctors say that there could be other strains later on, that this could come back in the fall in a limited way. This is COVID-19, not COVID-1, folks,” Conway said. “You would think that people charged with the World Health Organization facts and figures would be on top of that.”<sup>3</sup> In response to this startling statement of ignorance, Congressman Bobby Rush stated the following:

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<sup>1</sup> <https://academic.oup.com/jxb/article/60/3/712/453685>

<sup>2</sup> <https://www.cdc.gov/coronavirus/2019-ncov/faq.html>

<sup>3</sup> <https://www.bostonglobe.com/2020/04/16/nation/this-is-covid-19-not-covid-1-folks-kellyanne-conway-mistakenly-suggests-name-virus-means-multiple-versions/>

Dear Kellyanne, you seem to be confused, so let me break it down for you:

CO: Corona

VI: Virus

D: Disease

- : that's a hyphen

19: 2019, the year the virus was discovered (no, there haven't been 19 corona viruses).

Do better.<sup>4</sup>

President Trump, on the other hand, has called Covid-19 many different things from the China virus, to the Wuhan virus, and on June 24<sup>th</sup>:

President Donald Trump seemed confused about the origin of the "19" in COVID-19 during his rally in Phoenix on Tuesday night as he riffed on various names for the novel coronavirus. "I could give you 19 or 20 names for that, right," Trump told the student attendees, who were gathered for a rally organized by Students for Trump. He went on to give several examples including "kung flu," a racist term targeting China, where the virus was first identified, that perhaps received the loudest cheer from the crowd. He continued: "I said, 'What's the 19?' COVID-19, some people can't explain what the 19, give me, COVID-19, I said, 'That's an odd name.'"<sup>5</sup>

No, it's not an odd name. It's a perfectly rational, sane, and scientifically accurate term for a novel new virus. Enough said; moving on.

### **Origins:**

From the World Health Organization (WHO) we find that the virus originally developed in Wuhan, China sometime in December, 2019 (perhaps earlier). In their findings, the WHO states the following:

While some of the earliest known cases had a link to a wholesale food market in Wuhan, some did not. Many of the initial patients were either

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<sup>4</sup> Ibid.

<sup>5</sup> <https://www.businessinsider.com/whats-19-trump-confused-over-covid-19-name-skips-mask-2020-6>

stall owners, market employees, or regular visitors to this market. Environmental samples taken from this market in December 2019 tested positive for SARS-CoV-2, further suggesting that the market in Wuhan City was the source of this outbreak or played a role in the initial amplification of the outbreak. The market was closed on 1 January 2020.<sup>6</sup>

Since then, scientists have determined that the virus has an ecological origin in bat populations which rules out conspiracy theories that it was man-made or intentionally constructed in a laboratory.

Many researchers have been able to look at the genomic features of SARS-CoV-2 and have found that evidence does not support that SARS-CoV-2 is a laboratory construct. If it were a constructed virus, its genomic sequence would show a mix of known elements. This is not the case.<sup>7</sup>

Some readers will remember the Severe Acute Respiratory Syndrome (SARS) outbreak of 2003. This was another coronavirus called SARS-CoV-1, and it too, found its origins in bats. But these viruses did not directly infect humans from bats but first infected other animals.

For example, SARS-CoV-1 infected civet cats and then humans, while the virus causing the Middle East Respiratory Syndrome (MERS-CoV) is found in dromedary camels, and has continued to infect humans since 2012.<sup>8</sup>

Currently, scientists are not sure what animal the bats infected which then transmitted the SARS-CoV-2 virus to humans. Some have proposed that it may be pangolins. For those of you who may have seen the movie *Contagion*, you will recall that the novel new virus in the movie developed when a bat dropped an uneaten piece of fruit into a pig pen which was then consumed by a young pig which then infected a chef who was Patient Zero who then passed it on throughout much of the human population worldwide.

### **Ethical Dilemma 1:**

For over two decades my colleagues and I have been contacting Chinese and Canadian politicians in an effort to stop or at least curb the way in which such 'wet markets' operate in China. Aside from the different types of animals which are being

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<sup>6</sup> <https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200423-sitrep-94-covid-19.pdf>

<sup>7</sup> Ibid.

<sup>8</sup> Ibid.

offered at these markets and the manner in which they are treated, we have tried to bring attention to the fact that the history of agriculture in general is the central reason why such viruses are transmitted to humans in the first place.

**Aside:** In case you're wondering, it was due to our ancestral domestication of animals around ten thousand years ago that has led to all of our seasonal colds and flus. If we were still nomadic, the rate of such maladies would hardly exist. But once humans and animals are in close contact, the likelihood of novel new viruses crossing over into human populations increases dramatically. Because of our close proximities to domesticated and wild animals, we need to become far more conscious of what's called 'microbial ecology' – that is, the relationships of multi-species pathogens at the very tiny level of causation i.e. at the level of bacteria and viruses. We must become 'germ-aware' not germ-a-phobic of how such pathogens arise and infect the human population. We are constantly in an arms race against mutating pathogens. And if we can understand them better and stay ahead of them, we win. Otherwise, the outcome can be catastrophic.

The ethical question that emerges from our understanding of the origin of this (and other) virus is whether or not one country has the right to tell another what they can and cannot eat – even if such practices pose world-wide catastrophic effects to other countries.

### **Controlling the Spread of the Disease**

As we saw in my first paper, what makes the spread of this virus particularly difficult to contain is that a significantly large percentage of those infected with it, show no symptoms. This characteristic – the fact that carriers can be **asymptomatic** – is *the* single greatest reason we are all living under the conditions we now find ourselves.

We also noted that a global viral pandemic will *always* follow this exact pattern of reaction:

#### ***Testing, Isolation, Anti-virals, and Vaccine (or TIAV)***

To return to our acronym – **TIAV**, let's now look at each element in light of current information:

## **Testing:**

Basically, there are two types of tests available for Covid19: Molecular and Antibody.

*Molecular Tests* are also called nucleic acid detection/amplification tests and are also known as genetic, RNA (recombinant nucleic acid), or PCR (polymerase chain reaction<sup>9</sup>) tests.

*Antibody Tests* - also known as serology (or blood) tests.

## **Molecular Tests:**

In Molecular Testing, nucleic acid amplification (RNA) testing requires respiratory samples from the patient because SARS-CoV-2 is a respiratory virus. And so nasopharyngeal swabs are most commonly used. And for those who have had one, the swab is shoved way – way, up the nose. Just ask Drake: “But yo, that test is uncomfortable though, they put that Q-tip all the way inside your thoughts!”<sup>10</sup> Yes, Mr. Drake is quite right. In order to assure that a sample contains the virus, a swab must reach a person’s nasopharyngeal region (where your respiratory tract meets your throat). This is where the virus first attaches and begins replicating. So there might be some slight discomfort or, as Morpheus told Neo in *The Matrix*: “This might feel a little weird.” But then it’s over and you can wait a few days for your results.

The next part gets a little complicated:

Samples are then processed and tested for SARS-CoV-2 RNA. The test includes extraction of RNA from the patient specimen, conversion to DNA and PCR amplification with SARS-CoV-2-specific primers.<sup>11</sup>

This ‘nucleic acid amplification’ reveals whether or not a patient is actively infected with SARS-CoV-2 by detecting the presence of characteristic sequences of SARS-CoV-2 genetic material (RNA) in respiratory samples of patients.

Molecular tests can yield a false negative result if the level of viral RNA in a particular sample is too low for detection, and results can be skewed if steps are not taken to ensure that the tests are performing properly in the first place. The American Society for Microbiology has developed step-by-step verification procedures to help labs develop efficient and effective

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<sup>9</sup> PCR is a laboratory technique which can make many copies of a specific segment of DNA. It is a very precise technique and can be used to amplify, or copy, a specific DNA target from a mixture of DNA molecules. This helps to determine if specific pathogens (like viruses) are present.

<sup>10</sup> [https://www.huffingtonpost.ca/entry/drake-covid-19-test\\_ca\\_5e7678a5c5b6f5b7c5455933](https://www.huffingtonpost.ca/entry/drake-covid-19-test_ca_5e7678a5c5b6f5b7c5455933)

<sup>11</sup> <https://asm.org/Articles/2020/April/COVID-19-Testing-FAQs>

verification protocols for commercial EUA [Emergency Use Authorization] COVID-19 diagnostic tests. These procedures will help ensure that data is accurate.<sup>12</sup>

So if you have been tested for Covid-19, this is the type of test that will tell you if you are currently infected.

However, the antibody test is, in many ways, just as important because it informs scientists about who has been infected by the virus. This type of test allows us to better understand the extent to which a population has been infected.

### **Antibody Tests:**

Antibodies are naturally occurring proteins produced by our immune systems which respond to various types of pathogens or infections. When pathogens (disease causing organisms) enter our bodies, antibodies attach themselves to antigens on their surfaces. When the antibody attaches to or 'binds' to an antigen, its sole purpose is to disable, stop, or 'kill' the pathogen through various means.

With antibody testing, scientists can determine if SARS-CoV-2-specific antigens are mixed with a person's blood. If so, the two will bind to one another, resulting in a color change that marks the test positive. In this way, scientists can measure the amount of antibodies produced in response to the SARS-CoV-2 infection and does not test for the presence of the virus itself. Such a test, therefore, does not indicate if a person is currently infected – rather, it measures if they *have been* infected.

### **Important Findings and Caveats:**

Antibody testing reveals if a patient has been exposed to the virus but does not tell whether an active infection occurred, or whether the antibodies produced are the kind that can prevent another infection. Furthermore, it does not reveal how long protective immunity to SARS-CoV-2 infection will last if developed. If we can determine those things, they will help inform decisions about the safety of returning to normal activities.<sup>13</sup>

There are several concerns regarding antibody testing. For example, such tests may yield a false negative result if the test is conducted too early and antibodies have not yet developed. As well, they can produce false positives if antibodies to coronaviruses other than COVID-19 are present (e.g., SARS-CoV and MERS-CoV). It is vitally important

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<sup>12</sup> Ibid.

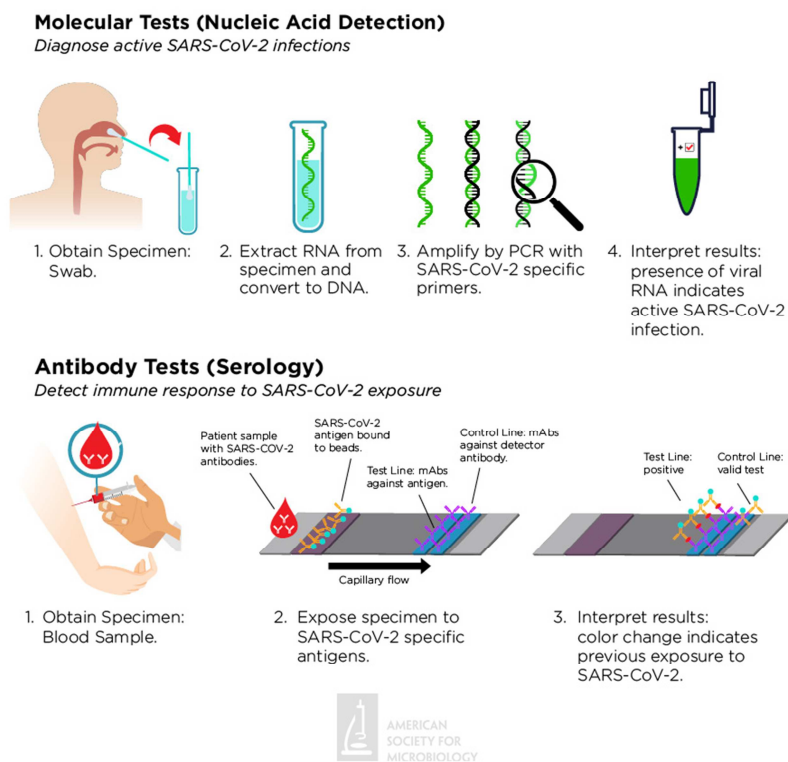
<sup>13</sup> Ibid.

that such serology tests are carefully designed to determine specifically for the SARS-CoV-2 virus.

The value of such serological testing is to provide an understanding of the infection rates of the larger populations. This will assist in surveillance and tracking in an effort to control the spread of the virus.

Here is a good depiction of the two types of tests from the American Society for Microbiology:

### Comparison of COVID-19 Molecular and Antibody Tests<sup>14</sup>



Currently, the number one problem with Molecular Tests which diagnose active Covid-19 infections is the **time delay** in getting results. When the tests first began in March, it took Ontarians up to five days to get their results. Since then, the time to receive results has improved but it still takes anywhere from 2-3 days. And this is problematic for a number of reasons.

First, there is considerable stress produced in waiting for the results while being barricaded away from family members somewhere in a home, apartment, etc. And second, people can be negative during a test, and then contract Covid-19 between the

<sup>14</sup> Ibid.

test time and the day they receive their results. If the test comes back negative, but they have since become infected, they may unknowingly infect others. We have to decrease the response time for Covid-19 testing. Luckily, there are plenty of companies working on this right now.

On the Government of Canada's website page: 'Testing devices for COVID-19: List of applications under evaluation'<sup>15</sup>, states that there are 43 companies that have developed fast-resulting tests: 16 DNA and 27 Serological. But there is a problem. Before such tests can be used, they need to be examined and approved by Health Canada, the FDA, etc., for Emergency Use Authorization (EUA). So if you go to the website, you will find that the status for all 43 testing devices is largely "Under Review" (or "Awaiting Response from Manufacturer").

To date, I have contacted 4 of the 16 companies working on DNA or diagnostic tests (3 Canadian, 1 UK): *Spartan Bioscience*, *Precision Biomonitoring*, *Hyris Global Diagnostics*, and the *Centre for Biodiversity Genomics* (CBD). Spartan Bioscience released their devices over a month ago, but they were recalled due to issues with their swabs and so will be re-releasing their revised units shortly. When I spoke with Federico Baldo (Business Developer) at *Hyris Global Diagnostics*, he said that they "...expect to be close to getting approved but unfortunately with these matters you can never know for sure." He also added that he would be pleased to inform me when they received approval from Health Canada. And in speaking with the Director of the Centre for Biodiversity Genomics, Dr. Paul Hebert, I learned that his team has developed a rapid results-producing and inexpensive Covid-19 test. Currently, the average cost for a Covid-19 test is around \$40.00/test. Dr. Hebert's team can produce a better, faster test for \$1.00/test. When I spoke to Dr. Hebert recently he told me that his team's progress has been impeded by university regulations. When I first spoke with the CEO of *Precision Biomonitoring*, Dr. Mario Thomas told me that his company was simply waiting for approval from *Health Canada* which he then described as "imminent". When I questioned him about the device's accuracy, he stated: "We know our system works very well...in blind testing it had an accuracy rating of over 98%." During the very last stages of revising this paper, Dr. Thomas contacted me to inform me that his company had received approval from Health Canada.<sup>16</sup> This is extremely encouraging news because, if successful, such devices could drastically reduce the number of infections within a given population. This is exactly the type of testing that is needed at this point in the pandemic. Let's just hope there are many more such testing units produced to be massively distributed around the world and especially, to those places hardest hit.

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<sup>15</sup> <https://www.canada.ca/en/health-canada/services/drugs-health-products/covid19-industry/medical-devices/testing/applications.html>

<sup>16</sup> <https://www.newswire.ca/news-releases/health-canada-authorizes-precision-biomonitoring-to-import-and-sell-biomeme-s-sars-cov-2-real-time-rt-pcr-test-in-response-to-covid-19-869985862.html>



## **Ethical Dilemma 2:**

During a pandemic, when perhaps hundreds of thousands of lives are at stake, what should be the protocol for monitoring and considering new technologies? For example, what is the hold up with Health Canada? We all want to be assured that tests are accurate and reliable. But at the same time, we want to save lives. What is the ethical balance between the two? For every day delayed, thousands of lives are lost. But we can't risk making the situation worse by rushing approval for devices that may be inaccurate.

In my next entry, I will definitely be contacting officials at Health Canada to learn more about their policies and procedures during a pandemic.

### **What is Still Needed: Rapid Response Testing**

As I mentioned in Part I, the Holy Grail of testing for Covid-19 would be a fast and accurate home test that anyone could use. Right now, this doesn't exist. But there are some companies working on making this a reality. For instance, in South Africa, Canary Health Technologies has produced a proto-type breathalyzer that is currently undergoing test trials.<sup>17</sup>



If such testing units were to become widely available for public/private use, this would be a game-changer in a significant way. Governments could ease travel restrictions considerably; people could meet in larger gatherings; sporting events could return to some semblance of normalcy, etc. However, at this point in time, such devices simply do not exist. And there is a big gamble in developing such testing units. If, for example, these units took longer to perfect than a vaccine, then a lot of money in research and development will be wasted. However, if a vaccine is months or even years away, then such a device would be extremely effective in easing quarantine or travel restrictions.

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<sup>17</sup> [https://www.the-scientist.com/news-opinion/in-south-africa-covid-19-breath-test-trial-set-for-june-67631?utm\\_campaign=TS\\_OTC\\_2020&utm\\_medium=email&\\_hsmi=89795891&\\_hsenc=p2ANqtz--HvBYXCH3NS4mcSlww-QaBFGQDbG1270hcvlF1ESIR1GOfCHWo8LNX8vFiyCkRgFQbdufomZwpUyAv1l3plEgdkrAJkg&utm\\_content=89795891&utm\\_source=hs\\_email](https://www.the-scientist.com/news-opinion/in-south-africa-covid-19-breath-test-trial-set-for-june-67631?utm_campaign=TS_OTC_2020&utm_medium=email&_hsmi=89795891&_hsenc=p2ANqtz--HvBYXCH3NS4mcSlww-QaBFGQDbG1270hcvlF1ESIR1GOfCHWo8LNX8vFiyCkRgFQbdufomZwpUyAv1l3plEgdkrAJkg&utm_content=89795891&utm_source=hs_email)

The single greatest need at this point in the pandemic continues to be rapid, accurate, testing capabilities. Otherwise, isolation alone, would once again become our greatest defense. However, not everyone seems to be onboard with the value of testing. On June 21, 2020, in a less-than-half filled auditorium in Tulsa, Oklahoma, the President of the United States, Donald Trump, said the following:

“When you do testing to that extent, you’re going to find more people, you’re going to find more cases,” Trump said. “So I said to my people, ‘Slow the testing down, please.’ They test and they test.”<sup>18</sup>

In what appears to be a direct flouting of consistency and logic, some members of Trump’s administration claimed it was said tongue-in-cheek while the President followed up by saying: “I don’t kid. Let me just tell you, let me make it clear.”<sup>19</sup> Whether or not he was kidding, it was a ridiculous thing to say and undermines what every health official in the world has been calling for: massive increases in testing.

By using Critical Thinking, we can now state that, as a conditional, *if* any company could produce millions of fast and accurate devices for use around the world, *then* it logically follows that we will be better enabled to determine positive and negative cases and track infection rates much more accurately. This, in turn, will allow for the greater mobility of human populations.

### **Isolation:**

Although isolation restrictions have eased in various places around the world, cases continue to rise in places like the US, India, Brazil, and others. Ontario has recently entered Stage II of reopening<sup>20</sup> which allows various businesses to re-open, and gatherings of 10 people or less. Some believe this decision may be premature. Time will tell. What is important to consider at this point is how well people will remain vigilant in physical distancing and wearing masks.

In the US, a movement has begun which identifies the wearing of a mask as an impingement on human rights. As much as the Democrats and Republicans have been polarized on important issues, one more issue which has been added to the list is the wearing of masks for personal and public protection. Many on the left tend to side more with the expertise of scientists, public health doctors, etc., while many on the right tend to be somewhat suspicious of science and view the wearing of a mask as not only unnecessary but as a symbol of oppression. The evidence speaks for itself:

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<sup>18</sup> <https://khn.org/morning-breakout/joking-or-not-trumps-slow-the-testing-down-statement-stands-out-from-tulsa-rally/>

<sup>19</sup> <https://www.cnn.com/2020/06/22/politics/donald-trump-testing-slow-down-response/index.html>

<sup>20</sup> <https://www.ontario.ca/page/reopening-ontario>

Though masks alone will not completely halt the spread of the virus, recent research has shown that wearing them is the most efficient way to stop its transmission. [Dr. Anthony] Fauci, at a recent talk, said everyone should wear a mask in public and it “should not be a political issue. It is purely a public health issue.”<sup>21</sup>

Although this again appears to be another case of autonomy vs. paternalism i.e. how much freedom should the public have vs. how much control should the government exercise over them, whatever one’s political stripe, remember: Nature always wins. And the greatest defense we have against this virus right now is, and always will be, scientific knowledge.

### **Ethical Dilemma 3:**

With Stage 2 of the Province of Ontario’s ‘Reopening’, what are the legal and moral ramifications for employers asking their employees to return to work? We were all informed at the start of the pandemic that nobody would lose their job as a result of self-isolating at home. But now that travel and activity restrictions have eased, what happens if someone still feels uneasy about returning to work? What measures are being taken to assure their safety? According to the Ontario Government’s report: *A Framework for Reopening our Province*:

Keeping workplaces, employees and the general public safe as Ontario gradually reopens is essential for making the reopening of the province a success. That is why we are providing people, businesses and communities with the guidelines they need to prepare for Stage 2. The government and its health and safety association partners have released more than 100 health and safety guidance [documents](#) for multiple sectors, as well as a guidance [document](#) for essential workplaces. These documents, available at [Ontario.ca/covidsafety](https://ontario.ca/covidsafety), will cover businesses able to open in Stage 2. More guidance will be available as Ontario continues to move through the next stages of reopening and recovery. To reopen safely, employers must review the workplace health and safety guidance and ensure that appropriate measures are in place. Employers must also meet all existing occupational health and safety requirements.<sup>22</sup>

So these touch on the legal aspects regarding easing restrictions and gradually returning to work. But what about the moral/ethical considerations? What if someone is immuno-compromised? Or suffers from anxiety? Or simply doesn’t feel safe in such a

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<sup>21</sup> <https://www.theguardian.com/world/2020/jun/29/face-masks-us-politics-coronavirus>

<sup>22</sup> <https://files.ontario.ca/mof-framework-reopening-province-stage-2-en-2020-06-08.pdf>

workplace environment? What will be the new set of guidelines or policies and procedures for returning to work as we progress through the rest of this pandemic? Again, there are no easy answers, but just a few of the pressing questions we should start thinking about now.

By this point in the pandemic, I sincerely thought we would have had better, more rapid, and more accurate widespread testing available. I am disappointed that people continue to suffer and lives are being lost because we do not have these services up and running throughout the world. Hopefully, once Health Canada gives the 'green light' to some of the proposed testing devices, we can generate the much-needed testing at the facilities which require it the most: hospitals/clinics, retirement communities, prisons/penitentiaries, supply chains, food services, etc. Until then, unfortunately, all we can do is wait.

### **Anti-Virals:**

In my last paper, I had mentioned several developments involving anti-viral medications. Since then, we have discovered that President Trump has been taking the anti-malarial drug: hydroxychloroquine as a prophylactic i.e. preventive measure, to avoid contracting Covid-19. Although studies have indicated that there is no evidence that such a drug has a preventative effect on this particular strain of the coronavirus, when asked why he was taking the drug (along with zinc), Mr. Trump responded with the apparent argument: "I'm not gonna get hurt by it...Here's my evidence: 'What do you have to lose?'" All of Mr. Trump's evidence is based on a rhetorical question regarding harm. In other words, he's making us infer his conclusion which is: "He has nothing to lose." Not only is this a false premise, for he could possibly lose his life due to heart or other complications, it is simply a factually false statement. If there was an award for an argument's failure to satisfy any and all logical criteria, Mr. Trump would be the grand master in this case.

### **Ethical Dilemma 4:**

What if, based on Donald Trump's beliefs and actions that hydroxychloroquine should be taken because people have "nothing to lose", some of his followers copied his behaviour and became seriously ill or died? For example, if people believe that hydroxychloroquine<sup>23</sup> should be taken to ward off Covid-19 and as a result of side effects, die, should there be any legal or moral recourse against the President for spreading false and highly dangerous information? To consider this in some context, Trump's actions were so stunning, that Fox's own Neil Cavuto put out an Emergency Fox News Alert saying: "If you are in a risky population here, and you are taking this as

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<sup>23</sup> <https://theintercept.com/2020/05/19/alarm-confusion-fox-news-trump-says-takes-hydroxychloroquine/>

a preventative treatment ... it will kill you. I cannot stress enough. This will kill you."<sup>24</sup> So if the President's actions and/or advice e.g. injecting bleach or shining UV radiating into one's body, harms another person, is he morally blamable? Legally culpable? Both? Neither?

Although there is no compelling evidence that hydroxychloroquine successfully prevents people from contracting the Covid-19 corona virus,<sup>25</sup> a recent major study in support of these findings was pulled from the leading science journal, *The Lancet*:

The online medical journal *The Lancet* has apologized to readers after retracting a study that said the anti-malarial drug hydroxychloroquine did not help to curb COVID-19 and might cause death in patients. The study was withdrawn because the company that provided data would not provide full access to the information for a third-party peer review, saying to do so would violate client agreements and confidentiality requirements, *The Lancet* said in a statement. "Based on this development, we can no longer vouch for the veracity of the primary data sources. Due to this unfortunate development, the authors request that the paper be retracted," *The Lancet* said in a statement. The study was published May 22, with researchers from Brigham and Women's Hospital in Boston using data and analysis provided by *Surgisphere* Corporation. The study was massive, with information coming from 671 hospitals around the world and the medical records of 96,000 patients.<sup>26</sup>

It was concluded in the study that researchers found that hydroxychloroquine not only didn't help prevent or ease the effects of Covid-19, it actually caused heart problems and increased the likelihood of death. This led the WHO and other agencies to stop research into its efficacy.

Keep in mind that the results of the study are not in question; simply the protection of private information of those in the study has stopped third parties from confirming or falsifying the findings of the study. In science, this is the responsible thing to do; even if it raises doubts or questions regarding the truthfulness of the study.

There has, however, been some encouraging news in the development of antivirals. In the last paper, I mentioned that the drug, Remdesivir, had passed various randomized placebo controlled trials with 1090 test subjects which demonstrate "...a clear-cut

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<sup>24</sup> Ibid.

<sup>25</sup> <https://www.cebm.net/covid-19/hydroxychloroquine-for-covid-19-what-do-the-clinical-trials-tell-us/>

<sup>26</sup> <https://www.webmd.com/lung/news/20200605/lancet-retracts-hydroxychloroquine-study>

significant, positive effect in diminishing the time to recovery”.<sup>27</sup> Since then, remdesivir has become a much-needed drug in reducing inflammation in patients suffering from Covid-19. Such a drug can reduce a patient’s time in ICU by up to five days and has quickly become a very popular drug world-wide; so popular, that Mr. Trump decided to buy up the world’s entire supply:

The US has bought up virtually all the stocks for the next three months of one of the two drugs proven to work against Covid-19, leaving none for the UK, Europe or most of the rest of the world. Experts and campaigners are alarmed both by the US unilateral action on remdesivir and the wider implications, for instance in the event of a vaccine becoming available. The Trump administration has already shown that it is prepared to outbid and out-manoeuvre all other countries to secure the medical supplies it needs for the US. “They’ve got access to most of the drug supply [of remdesivir], so there’s nothing for Europe,” said Dr. Andrew Hill, senior visiting research fellow at Liverpool University.<sup>28</sup>

The Trump administration has purchased more than 500,000 doses of remdesivir from the manufacturer Gilead, which accounts for all of their production for July and 90% of their production for August and September. The patent for the drug is held by Gilead which means that no other manufacturer in the world can produce it.

### **Ethical Dilemma 5:**

During situations like pandemics, to what extent should a major drug manufacturer prioritize who should receive their product or sell to the highest bidder? It costs billions to develop medications. So why should a company lose money by fairly distributing its product when they stand to make far more money for their stakeholders? And is there any ethical obligation for lessening restrictions on their patent of the drug so that it may be produced in other countries? On the one hand, a drug company is in business to make money. On the other hand, they are involved in a humanitarian enterprise. There are no easy answers or solutions but when one country buys up an entire supply of a life-saving drug to the exclusion of all other countries, it does trigger our ‘fairness detectors’ and makes us wonder if such an act is ethically justifiable.

At this point in time, we have seen another drug make its way into the antiviral arsenal and it’s called dexamethasone.

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<sup>27</sup> <https://twitter.com/NBCNews/status/1255541788154224641>

<sup>28</sup> <https://www.theguardian.com/us-news/2020/jun/30/us-buys-up-world-stock-of-key-covid-19-drug>

Dexamethasone, a cheap, widely-available steroid, is the latest drug touted by experts in the UK as a possible treatment for COVID-19, with evidence suggesting that it can successfully reduce deaths from the virus by up to one third in severely-ill patients. After researchers at the University of Oxford announced the headline results on Tuesday - with the full results to be released later this month - the British government immediately authorised its use in treating coronavirus patients. It's not the first time during the coronavirus pandemic - which has killed 438,000 people worldwide - that a drug has been touted as a treatment for COVID-19, famously by the U.S. President Donald Trump, who controversially tweeted that he was taking the anti-malarial drug hydroxychloroquine. Interestingly, it was the same researchers at Oxford that proved hydroxychloroquine did not work that suggested that dexamethasone could.<sup>29</sup>

Although it is still fairly early in the pandemic, some scientists have said that this new treatment might be a game-changer in the treatment of those who have been most severely affected by the virus. By my next installment, we should know better as to the efficacy of this particular antiviral treatment.

### **Vaccines:**

Since my first paper, there has been quite a bit of research and development of vaccines for Covid-19. Although there is a rigorous 3-phase procedure for developing and testing vaccines, scientists and healthcare experts are confident that one will be ready within the next six months:

COVID-19 vaccine candidates will enter late-stage clinical studies by the end of the month, with others beginning in August, September and October, the U.S. government's top infectious diseases expert said on Thursday. The news comes as Moderna Inc, which is at the forefront of the country's vaccine development efforts, reiterated earlier in the day that a late-stage trial with 30,000 volunteers would begin this month. "We may be able to at least know whether we are dealing with a safe and effective vaccine by the early winter, late winter, (or) beginning of 2021," Dr. Anthony Fauci, head of the National Institute of Allergy and Infectious Diseases, said in an interview to JAMA Network. Earlier on Thursday, Dr. Francis Collins, the director of the U.S. National Institutes of Health, said

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<sup>29</sup> <https://www.euronews.com/2020/06/17/what-is-dexamethasone-the-new-drug-being-used-to-treat-covid-19>



the Trump administration's vaccine-acceleration program could generate a safe and effective COVID-19 vaccine by year-end.<sup>30</sup>

But developing a vaccine for such a novel new virus like SARS-CoV-2 is not an easy task. And it takes time. Because we now live in what I have been calling the Age of Immediacy where information and options are available in seconds, the world has gotten in the habit of expecting medical breakthroughs to function like Amazon i.e. same-day shipping. But scientific research does not work this way. It takes time because we want to do things properly and safely. I am not sure who the above-mentioned 30,000 volunteers will be. But I do know that there is already a movement underway which brings together volunteers who wish to sacrifice their own bodies in an effort to speed up the testing trials of new vaccines. Known as '1 Day Sooner'<sup>31</sup> the movement is comprised of volunteers who want to engage in what's called Human Challenge Testing which bypasses current ethical standards and safety measures in order to help with the development of a new vaccine. They believe that if they can help develop a vaccine one day sooner than it normally would have been, they will have saved thousands of lives. It is indeed a noble movement. But it leads to some ethical considerations:

#### **Ethical Dilemma 6:**

Should people be allowed to offer their bodies as 'guinea pigs' to be subjected to vaccination trials for Covid-19? Such trials would involve the injection of vaccines and then the infection of the SARS-CoV-2 virus in an effort to determine efficacy. It raises questions again of paternalism vs. autonomy i.e. who has the right to say what people do with their own bodies? If I could sell some of my organs to make money in some parts of the world, why can't I offer my body as a trial host to speed up the development of a new vaccine?

Although the WHO does not sanction the wishes of such 1 Day Sooner volunteers, it did make a statement saying that if such testing were to be allowed, subjects would have to be healthy, between the ages of 18 and 30, use a safe dose of the virus i.e. one which causes illness but not severe disease, and test in secure facilities to avoid infecting others. To date, there has been no official approval of such Human Challenge Testing because as the WHO notes, there is no "escape treatment" which could rescue any test subjects if they became severely infected i.e. no one yet knows what a "safe dose" of the virus is.

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<sup>30</sup> <https://www.theglobeandmail.com/world/article-covid-19-vaccines-to-enter-late-stage-trial-by-end-of-july-dr/>

<sup>31</sup> <https://1daysooner.org/>



With 38 vaccine trials currently underway around the world<sup>32</sup>, we have little choice but to wait and hope. Many experts in the field of immunology believe that it's not so much a matter of 'if' but 'when' such a vaccine will be available but currently can give no definitive estimated time of arrival. In March, Dr. Anthony Fauci stated that it would take a year to 18 months before a vaccine was available. Although we may see one developed before then, Fauci and Dr. Francis Collins (Director of the National Institutes of Health) recently stated in the journal *Science* that perhaps multiple vaccines may be needed in order to inoculate billions of people worldwide.<sup>33</sup> We must also anticipate the possibility that even if a vaccine is developed and distributed worldwide, it is unlikely to be 100% effective. To put things into perspective the MMR (measles, mumps and rubella) vaccine is 97% effective in prevention and our seasonal flu shots come in at around 60% effective. Nonetheless, such a vaccine, combined with other protective measures e.g. physical distancing, mask-wearing, hand-washing, etc., should prove largely effective in defeating the virus throughout the world.

### **Recommendations – What Needs to be Done Now:**

What the world needs right now is the development and distribution of hundreds of thousands of portable, fast, and accurate testing devices throughout the world – especially those countries most affected. Within our own province and country, all hospitals, retirement homes, police, ambulance, and fire stations, all supply side and food distributors and processors, migrant workers, borders, airports, bus stations, etc., must be equipped with such devices as soon as they become approved.

**REMEMBER:** This virus spreads largely because of people who are *asymptomatic* – which represents anywhere from around 20% to 50% of the population. And the only way to determine who has the virus is through proper testing. People who feel well, but are infected, run the risk of infecting hundreds of others. Until we have the appropriate number and types of testing devices in place, we have no choice but to rigorously practice physical distancing, isolation, and wearing masks.

### **Caveats:**

I am deeply concerned that many countries around the world – especially in the northern hemisphere – are lifting isolation restrictions too much and too quickly. This will invariably lead to the spiking of cases in specific parts of the world. We are unfortunately seeing this occur in many states in America.<sup>34</sup> When the warm weather and sunshine of the summer arrives, many people are naturally drawn to the outdoors. Psychologically, we subconsciously think that the summer is not a time of the year to be

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<sup>32</sup> <https://www.raps.org/news-and-articles/news-articles/2020/3/covid-19-vaccine-tracker>

<sup>33</sup> <https://science.sciencemag.org/content/368/6494/948>

<sup>34</sup> <https://www.nytimes.com/2020/06/25/world/coronavirus-updates.html>

sick. And we've heard that the Covid-19 virus doesn't survive as well in warmer weather. Combine this with the fact that many people are facing what has been called 'quarantine fatigue'<sup>35</sup> along with the recent #BLM protests, and you have the perfect storm of causalities which will, unfortunately, lead to a considerable spike in cases.

### **Ethical Dilemma 7:**

With the recent death of George Floyd, many people around the world took to the streets to protest against black racism and injustice. While the world applauds the right to assembly and protest, we must also keep in mind that this (or any) virus doesn't care about human rights. It doesn't care about anything. It's simply a small, replicating, machine which needs biological hosts to reproduce. No matter how noble our causes, SARS-CoV-2 doesn't care one bit about our politics. And so we are left with another ethical consideration regarding the delicate balancing act of allowing massive assemblies of people vs. the avoidance of physical contact. Once again, this is another example of autonomy vs. paternalism. That is, we want people to be free to demonstrate their rights and to be able to assemble and protest. But in so doing, how many more lives might be lost due to the spreading of this virus? How do we balance the right to peaceful assembly with the various pandemic conditions placed on physical distancing?

### **Conclusion:**

Let's never forget that now, more than ever, it is time to use our prefrontal cortexes rather than our limbic systems. During these stressful and difficult times, we need to think critically, not emotionally, about our next steps. And we must be vigilant in using Critical Thinking and Ethical and Scientific Reasoning in meeting and resolving our challenges. For these are the systems of thought that will save lives and get us through this pandemic. Let us not forget this when we get to the other side.

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<sup>35</sup> <https://www.theatlantic.com/ideas/archive/2020/05/quarantine-fatigue-real-and-shaming-people-wont-help/611482/>