Critically Thinking About Covid-19 – Part I: April 16, 2020

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Introduction

There is perhaps no greater time in history to think critically than during a world crisis. But what is 'Critical Thinking'? And why is it important; especially now? Many CEOs, politicians, world leaders, and educators champion its importance, but very few know what it actually is. So allow me to be clear: Critical Thinking is comprised of a set of tools or skill set that teaches us *how* to carefully, reflectively, and analytically interpret, understand, and act on information.

There really are better and
worse ways to think about information

Critical Thinking allows us to distinguish between fake news and reliably-attained, evidence-based information; and then to make valid inferences or conclusions based on that information. Although the Critical Thinking skill set can point us in a direction regarding *what* to think, it is primarily a set of guidelines initially assisting us in *how* to think about information.

The ABC's of Critical Thinking

These guidelines include tools for the responsible collection of data and information which can be stated in the form of convincing *arguments*. They also include a greater capacity to acknowledge *biases* – both within ourselves – and within others, which may affect the way in which information is presented or interpreted. As well, Critical Thinking tools train us to understand the *context* in which information is housed so that it is reflected faithfully and without the omission of important back-story elements. Critical Thinking skills also allow us to better understand how *evidence* plays a key role in supporting arguments. And finally, one of the most important tools in the Critical Thinking skill set is the ability to recognize and call out errors of reasoning known as *fallacies*. When political leaders favour personal biases which contradict scientific evidence,

we should recognize these fallacies for what they are – irrelevant, unfounded, emotional, self-serving, and often, dangerous.

How to Critically Think About Covid-19

Having acknowledged the importance of the Critical Thinking skill set, *how* should we be thinking about information regarding Covid-19? First and foremost, we need to start with information that has been attained responsibly and reliably. We need to familiarize ourselves with relevant contextual and background information that is evidence-based rather than simply based on opinion.

Although no news service can be completely free of bias or vested interest, there are many reliable resources available to choose from including:

BBC News, ABC, NPR, The Economist, The Wall Street Journal, Google News, NBC, The Guardian, CNN, PBS, NASA, Scientific American, Popular Science, Real Clear Science, Discovery, Nautilus, and National Geographic.

There are various other online resources that one might find useful to fact-check or further research information regarding a particular issue: Snopes, Pressbook: Web Literacy, Politifact, Factcheck.org, Washington Post Fact Checker, Truth Be Told, NPR Fact-Check, Lie Detector (Univision, Spanish language), Hoax Slayer, Climate Feedback, SciCheck, Quote Investigator, FactsCan (Canada), El Polígrafo (Mexico), The Hound (Mexico), Guardian Reality Check (United Kingdom), BBC Reality Check (United Kingdom), Full Fact (United Kingdom), mediabiasfactcheck.com, civilination.org, domainbigdata.com, and newswise.ca.

This list is not meant to be exhaustive of the resources available; rather, it illustrates some of the helpful and trusted sites that one may access in determining the reliability and truthfulness of information.

When it comes to knowledge – that is *knowing* what is true from what is mere speculation, our epistemic states of being could not have been summed up better than, believe it or not, Donald Rumsfeld. As Defense

Secretary for George W. Bush, Rumsfeld summed up all possible epistemic states regarding any object of knowledge. He said:

> *"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."*[1]

Even though he was wrongly ridiculed for making these statements, his pithy depiction of epistemic brevity captures brilliantly what we should be asking ourselves with every issue we face. We should always begin with *what we know*, then proceed to consider what we know we are ignorant of i.e. *reflective ignorance*, and finally, we should be cognizant of the fact that our level of ignorance extends more deeply to the point of oblivion i.e. *blind ignorance* or not even being aware of what we don't know. This is a healthy way to approach knowledge acquisition while working through uncertainty.

In regards to the latter epistemic state, David C. Logan pointed out that:

> Much scientific research is based on investigating known unknowns. In other words, scientists develop a hypothesis to be tested, and then in an ideal situation experiments are best designed to test the null hypothesis. At the outset the researcher does not know whether or not the results will support the null hypothesis. However, it is common for the researcher to believe that the result that will be obtained will be within a range of known possibilities. Occasionally, however, the result is completely unexpected—it was an unknown unknown.[2]

Sometimes referred to as 'serendipity', every now and again, scientists discover something completely novel that they never anticipated. This leads to the discovery of an *unknown unknown*. But let's start at the beginning: what do we currently know about this particular virus?

Currently, we now know that Covid-19 is a novel new form of Corona virus which has passed from one animal species (probably bats) to another, and is using human beings as hosts which has unfortunately spread itself around the world due, in large part, to air travel. We first learned of its origins stemming from Wuhan, China. For various reasons – due both to human ignorance and political bureaucracies – the virus was not contained at its point of origin and has spread rapidly through populations causing a global pandemic.[3]

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.

Now that we are faced with the extremely daunting tasks of avoiding or containing further infections while trying to develop ways to destroy or prevent further spreading of this pathogen, a global viral pandemic will *always* follow this exact pattern of reaction:

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

If you can remember the acronym **TIAV**, you will forever remember the order in which humans will *always* react to viral pandemics. Let's look at each element of the acronym.

Testing

Due to the fact that we know carriers of Covid-19 can be *asymptomatic*, it has become vitally important to develop accurate tests which determine infections in real time. In various parts of the world, testing for signs of infection require people to wait for their results over a five day period. It doesn't take much critical thinking to realize that this is far too long a time period if we wish to know accurate numbers of infections in real time. For example, based on such a system, person A could be tested on one day and produce a negative result, and then contract the virus between the test

date and the result date thereby making the results of the test extremely ineffectual and potentially dangerous.

Luckily, there are new tests being developed and used to quicken the results. In Canada, the company *Spartan Bioscience*[4] is producing millions of units to quicken the diagnosis time of testing. But not all countries have such tests; and some tests may not be as accurate as others. So in case you're wondering why some countries – like Singapore and South Korea – seem to be ahead of other countries in 'flattening the curve' of their outbreaks, it's because they conduct massive testing which provide results much more quickly. This allows officials to more accurately know and track those who are infected and those who are not. This, in turn, can allow for greater autonomy or social movement within various communities.

At this point in time, we know that *Spartan Bioscience* has developed portable DNA testing devices which were recently approved by *Health Canada*. These devices can apparently provide accurate tests for Covid-19 in less than an hour.[5]

By using Critical Thinking, we can now state that, as a conditional, *if Spartan Bioscience* (or any similar companies producing fast results) can produce millions of these 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. But – and this is a very big but – we can *only* increase human mobility *if* we have such accurate testing capabilities. Otherwise, isolation alone becomes our greatest defense.

Isolation

Without such quick and accurate testing, our greatest defense against such a pathogen is isolation. By keeping populations isolated, we can slow the transmission of the virus and limit the increase of infections which will, in turn, ease the burden on hospitals faced with increasing numbers of advanced or critical cases. Trying to isolate massive populations, however,

is not an easy task; and our current world population does not have much experience in doing so. There are many people – from essential services, to the homeless, to those who simply ignore the dangers of infection – who are susceptible to contracting the virus.

Autonomy vs. Paternalism

This raises the very interesting philosophical and political issues of *autonomy versus paternalism*. In other words, how much freedom should individuals have versus the State's right to act like a parent and restrict their freedom? In Wuhan, China, and other countries around the world, strict isolation was enforced. However, in the US, individual states have controlled the amount of autonomy individuals have.

The most important inference to make here is that without accurate testing with real time results, isolation is our *only* tool by which to lower the rate of infection and 'flatten the curve'. By using Critical Thinking, we can logically infer, then, that once a faster type of testing is available, we will begin to see a lesser need for isolation and a gradual loosening of travel restrictions on citizens.

By using the skill set of Critical Thinking, we can now infer that, at this point in the pandemic, there are three – *and only three* – reasons for easing isolation restrictions:

Testing: By conducting massive and accurate testing in real time to track infection populations.

Anti-Virals: The development of novel drugs which either cure outright or severely limit the damaging health effects to those who contract the virus.

Vaccine: The development of a novel vaccine which will prevent people from becoming infected by the virus.[6]

It logically follows that the first wave of attack against the virus will be the development of accurate and effective tests. As mentioned above, this will allow epidemiologists to more accurately determined and track rates of

infections and where those infections are occurring within a given population. This will then provide a more accurate picture of how and when personal isolation can gradually and strategically be lifted.

Anti-Virals

The next advancement in the war against Covid-19 will be the development of novel anti-viral medications. Currently, there are hundreds of trials being conducted worldwide to determine which drugs – or combinations of drugs – are effective in fighting this particular strain of Corona virus. Naturally, the world wants a cure as soon as possible. But we must be careful and vigilant in knowing which drugs work and especially, which ones do not. President Trump has been championing Hydroxychloroquine (a malaria drug) to combat the virus. But studies have demonstrated[7] that it is not very effective and can actually have harmful side effects to patients – especially those with underlying heart conditions.

Japan's Prime Minister, Shinzo Abe, has stated that research is being conducted on Avigan (or favipiravir), an antiviral drug developed by a domestic firm (Fuji Film) that has been effective in treating COVID-19 patients.[8] He has even gone so far as to give Fuji Film the go ahead to produce millions of pills. The problem, however, is that there is no definitive knowledge of its effectiveness and there are some bad side effects – including birth defects.

As much as we emotionally want to bring help to those suffering – and about to suffer – from the virus, the skill set of Critical Thinking trains us to 'step back' from our emotions to carefully and more reflectively consider how we should proceed. And this means that, at this point in the battle, any drug or vaccine development must go through stringent testing. In my latest book, I state that there are several phases for determining a drug or vaccine's effectiveness, or efficacy, which must be carried out before such treatments ever make it to world-wide distribution and use:

Phase I: First of all, studies are initially conducted to learn about the dosages required to produce a response in the human body and about how

the human body processes the drug and to learn whether the drug produces toxic or harmful effects and at what dosages.

Phase II: Second, a drug under consideration will be tested on a group of patients who have a specific disease. At this point, the drug is not a treatment *per se* but rather is the object of study to determine any benefits, side effects, and so on. If there are no benefits, the study stops. If there are benefits, researchers move on to Phase III.

Phase III: Finally, at this point, the intent of the drug experiment is to introduce a lasting beneficial change in the patients participating in the study with the intent to prevent or reverse the progression of the disease. There is a specific strategy involved in treatment experiments with patient participants at this stage.

For vaccine research, there are often Phase IV trials which occur after successful development at the prior three phases. This phase utilizes post-market surveillance studies to consider any and all potential adverse events with regular reports by the manufacturer to the Vaccine Adverse Event Reporting System (VAERS) [9] to quickly and effectively identify potential problems after use in the population begins.

During the various Phases of drug research, scientists are utilizing the Controlled Clinical Trial. Clinical research on drugs or surgical treatments are undertaken in order to provide answers to specific questions such as these:

- Will this treatment prevent or remedy a particular disease?
- Will this treatment do more good than harm to patients with this particular disease?
- Will this treatment do more good than available alternative treatments?

The central idea behind controlled clinical trials is to reduce bias in order to maintain objective, reliable observations. If scientists are not careful, their own biases can skew their understanding, rendering research useless thereby creating a false belief that ineffective or harmful treatments are

therapeutic when in fact, they are not. The purpose for establishing a clinical trial is to determine the effectiveness of a therapeutic treatment. The word ‘trial’ indicates that there is a comparison between two or more potential outcomes.

Sometimes the outcomes compared are null, or to consider the option of having no therapeutic treatment. At other times, trials may involve comparisons between current and newly developed treatments. In the case of the latter, the goal of the trial is to determine which treatment is superior to another in, say, safety or effectiveness. The word ‘controlled’ refers to the comparative null set or group that receives no therapeutic treatment. It is often the case that a control group will receive a placebo rather than the actual treatment in order to compare the outcomes or effects of the study group. So there are often two groups that have a particular ailment. One group will be given a new therapeutic treatment, while the other group will be given either a placebo or competing drug.

The most important aspect of such studies is that they are *blinded*. This is a creative and novel use of what we might call ‘enforced ignorance’. Researchers deliberately single-blind or double-blind their experiments in order to maintain objectivity when compiling and later reading data.

Controlled clinical trials in which the patients do not know what group they are in are known as single-blinded studies. However, when neither the patients nor the administrators of the test know which group they are in, the study is said to be double-blinded. The purpose of blinding a clinical trial is to limit bias on the part of the administrators. In other words, if neither the administrators of the test nor the subjects know who is in which group, this will ensure greater objectivity in determining the effectiveness of the treatment. Only the lead researcher knows who is in the control group and who is in the test group. By blinding the administrators and the subjects of the trial, the lead researcher can prevent bias on two levels: at the level of the participants and at the level of the administrators.

Vaccines

Currently, throughout the world, there are hundreds of drug and vaccine trials being carried out.[10] The greatest obstacle in determining what potential treatments are safe and effective is *time*. Right now, the world just wants to get back to normal. However, scientists cannot simply speed up the process of trials because, in so doing, they may approve a drug or vaccine which either doesn't provide results or perhaps can even make things worse.[11]

Since vaccines take much longer to develop, we can logically infer that an anti-viral treatment will likely be developed sooner than a vaccine. Should a successful antiviral treatment develop over the next few months, it will help to flatten the curve considerably. It will also provide hope for those who suffer most from the harmful effects of the virus. This, in turn, will help buy some time for those front-line staff and ICU hospital workers until a vaccine can be developed.

Unless and Until – The New Normal

One final aspect to consider: unless and until a safe and effective vaccine is developed, the world will be forced to live according to a new 'normal'. Travel restrictions can conceivably be loosened with proper testing and anti-viral drugs. However, we will not get back to a pre-Covid-19 existence until *all* humans can be protected from the virus. And Critical Thinking allows us to infer that there are limited ways that this can happen: either the virus will be eradicated naturally from the world – as we saw with SARS and MERS; or there will be global inoculations through vaccinations to prevent the contraction and spread of the virus – or perhaps, a combination of both will occur simultaneously.

Recommendations – What Needs to be Done *Now*:

Accurate testing and tracking in real time needs to be set up as soon as possible at all of the following locations:

- Hospitals/Clinics

- Retirement Communities
- Prisons/Penitentiaries
- Supply Chains
- Food Services
- Financial Services
- Telecommunications and IT infrastructure/service providers
- Emergency Responders
- Military
- Maintenance
- Transportation services
- Manufacturing
- Agriculture and food production
- Construction
- Resources and Energy
- Community Services
- Research Institutions

At each one of these facilities (and more), testing must be done consistently so that identification of infection can be accurately determined, tracked, and controlled. Without such testing, easing isolation restrictions will undoubtedly lead to a second or third wave of infection rates.

When you read or watch a media report claiming that a country is taking precautions by taking peoples' temperatures, red flags and alarms should go off in our heads. And this is because a large percentage of people who are infected with the virus are *asymptomatic* – they experience and display absolutely no overt effects from virus – like fevers, body aches, tiredness, etc. Therefore, using our Critical Thinking skills, we can logically infer that testing for physical symptoms will only do a partial job of identifying and tracking viral infections. So if we simply let all people without symptoms move about within a given society, we will continue to see a surge or increase of affected cases. This is why accurate testing in real time must be done excessively and redundantly. Without a vaccine, it is literally the *only* way we can be sure of infection rates. And we should not limit isolation *unless* and *until* we can test at this level.

Conclusions and Caveats:

One final aspect to consider is *human population behaviour* once isolation restrictions have been lifted. Currently, some people – particularly in the US, but there have been some Canadians – who have begun picketing in protest of the 'lock-down'.[12] They are demanding that the travel bans and home isolation orders be lifted so they can return to their 'normal' lives.

There are obvious and great problems with these gatherings. Such gatherings will only worsen the spread of the virus which will inevitably and ironically, lengthen the time people have to self-isolate. Part of the reasoning behind such gatherings is that the virus is no more deadly than the common seasonal flu; and that we should just let it 'run its course'. This is sadly misguided. What we do know is that Covid-19 kills, on average, ten times as many victims as regular flu strains. So it definitely is more dangerous.

Alone and Isolated

And finally, what many do not realize is the horrific way in which this particular virus takes lives. Because of the nature of the disease – its transmission, the likelihood for contagion, its pathology, etc. – those who suffer worst from the virus, usually die alone and isolation. And because of our current state of world-wide self-isolation, funerals and burials have been restricted which has severely affected the grieving process for millions of people worldwide. The long term effects this will have on loved ones will be felt strongly and for years to come. So we should be preparing our mental health experts to anticipate an increase in therapeutic need when the world emerges eventually and successfully from this pandemic.

Now, more than ever, it is a time to use our prefrontal cortexes rather than our limbic systems. During world crises, we need to think critically, not emotionally, about our next steps. It is my great hope, that when this world, our country, and our neighbourhoods return back to some level of normalcy, we will not forget how this happened or how we overcame it. We must continue to strive to put Critical Thinking at the forefront of our

education and political systems at all levels. These are the skills needed at any given time in our lives. But they are most needed when we commonly face a world-wide crisis.

Endnotes

[1] https://academic.oup.com/jxb/article/60/3/712/453685
[2] Ibid.
[3] To track its global spread, see: https://coronavirus.jhu.edu/map.html
[4] https://www.spartanbio.com/
[5] At the time of publication, I had attempted to contact the COO and CEO of Spartan Bioscience to determine their productivity and efficacy of such units.
[6] There is a potential fourth possibility wherein the virus dies out of existence similar to SARS, but we are nowhere near that possibility a this point in time.
[7] https://www.cebm.net/covid-19/hydroxychloroquine-for-covid-19-what-do-the-clinical-trials-tell-us/
[8] https://www.cnn.com/videos/health/2020/04/12/japan-coronavirus-anti-flu-drug-abe-ripley-dnt-vpx.cnn
[9] https://www.cdc.gov/vaccinesafety/ensuringsafety/monitoring/vaers/index.html
[10] https://www.visualcapitalist.com/every-vaccine-treatment-covid-19-so-far/
[11] For an excellent account on the current process, see: https://en.wikipedia.org/wiki/COVID-19_drug_development
[12] https://www.theguardian.com/world/2020/apr/17/far-right-coronavirus-protests-restrictions