



## *Notes on the Pandemic #6*

April 26, 2020

**Dear DCI Community,**

In prior “*Notes on the Pandemic*” I have discussed the variegated nature of COVID, its clinical presentation, regional and global variances, differences in outcomes and impact on healthcare providers, facilities and systems. As of April 22<sup>nd</sup>, the number of new cases in Santa Clara County appears to be flattening although not yet declining. Testing for SARS-CoV2 by Stanford Medicine faculty demonstrate that of approximately 4000 healthcare workers, 2.6% of symptomatic individuals tested positive as did 0.4% of those who were asymptomatic. Recent antibody testing in 2600 asymptomatic healthcare workers shows that 3% are positive for Immunoglobulin (IgG), which is consistent with prior data showing that less than 5% of individuals tested by Stanford show evidence of having or having had COVID-19. The overall prevalence of COVID is less than other parts of California and the rest of the US. That said, you have likely seen the recent announcement that two Santa Clara County residents who died in early to mid-February tested positive for SARS-CoV2. In neither case was there evidence of travel and it is assumed that these infections were community acquired and suggests that the coronavirus was in the community longer than previously suspected. Clearly we still have much to learn about the epidemiology of COVID-19.

To that regard, the first large case series of sequentially hospitalized patients with confirmed COVID-19 was published on April 22<sup>nd</sup> in *JAMA* in an original investigation entitled “*Presenting Characteristics, Comorbidities, and Outcomes Among 5700 Patients Hospitalized with COVID-19 in the New York City Area.*” In this report Salfiya Richardson and colleagues describe 5700 patients ranging from newborn to 107 years (the median was 63 years) who were admitted to 12 hospitals affiliated with Hofstra/Northwell Health, the largest academic health system in New York, serving 11 million individuals in Long Island, Westchester County and New York City. Because these were all hospitalized patients, they represented a high-risk group to start with. I couldn’t find the number of patients in Northwell Health who had tested positive in order to determine the percentage who required hospitalization. Recognizing the importance of co-morbidities on outcome, in this case series the most common comorbidities were hypertension (56.5%), obesity (41.7%), and diabetes (33.8%). Overall this level of comorbidities is high and corresponds to a 53% estimated ten-year survival. During hospitalization, 14.2% of these patients received treatment in an ICU bed, and 12.2% required mechanical ventilation. At the time of this report, mortality rates for those who received mechanical ventilation was 88.1%. Of note, the mortality rates for patients between 18-65 who did not receive mechanical ventilation was 19.8 % and was 26.6% for those older than 65 years of age. There were no deaths in

individuals less than 18 years. Because follow-up is still short, other changes in outcome, including mortality, could take place over time.

A journalistic summary of the more ravaging effects of SARS-CoV2 on those who experience a serious outcome was reported by Meredith Wadman and colleagues in the April 17<sup>th</sup> *Science* (<https://www.sciencemag.org/news/2020/04/how-does-coronavirus-kill-clinicians-trace-ferocious-rampage-through-body-brain-toes#>) adds additional insights into evolving clinical patterns associated with COVID. Indeed, over the past several weeks front line health care providers have increasingly commented on previously unrecognized or unknown features of COVID-19. In an opinion piece in the April 20<sup>th</sup>, *New York Times* (see: <https://www.nytimes.com/2020/04/20/opinion/coronavirus-testing-pneumonia.html?smid=em-share>), Dr. Richard Levitan recounted “*what I learned during 10 days of treating Covid pneumonia at Bellevue Hospital.*” A notable observation is that a number of patients did not report respiratory problems even though they had diffuse pneumonia radiographically and strikingly low oxygen saturation or so called “silent hypoxia.” Patients compensate for this by breathing faster (one of the major clinical findings in the Richardson study described above) which in about 20% of the patients progresses to a more severe and potentially deadlier phase of lung injury which may be related (as noted in prior *Notes on the Pandemic*) to an hyperinflammatory “cytokine” storm that is often referred to as acute respiratory distress syndrome (ARDS).

There is however disagreement about whether hyperinflammation in the lungs is what leads to the clinical deterioration since data is also emerging that heart damage may be another contributor with both a cardiomyopathy (by which the pumping function of the heart is severely compromised) and which can also be accompanied by arrhythmias. In addition, data has also emerged from some investigators that blood vessel obstruction, either because of the virus itself and/or because COVID also can play a role because of alternations in the blood clotting system and the formation of blood clots. In addition, other organ systems also appear to be impacted during COVID, including the brain (especially with strokes), kidneys, GI tract, making this a multisystem disease with features that are unique and not yet understood or explicated.

Recent observations also suggest that part of the multiorgan damage results from SARS-CoV2 impact on endothelial cells (these are the inner lining cells of blood vessels and other organs) because of the attachment of the virus to the so called ACE2 (angiotensin converting enzyme 2 receptor) which can be found in some of the organs being impacted (specifically the heart, lungs, kidney and intestine) as well as inner lining of blood vessels as recently reported by Z Varga in the April 17<sup>th</sup> *Lancet Online*. Of concern, there are COVID patients, including young adults, who are presenting with strokes further underscoring that in some cases, the manifestations of COVID transcend it being a respiratory infection to one in which multiple body organs are impacted.

While all of these observations certainly raise concern, anxiety and fear, the majority of individuals infected by SARS-CoV2 will recover with minimal to no consequences. While the risk is not binary, the highest risk group for adverse or fatal outcome has remained older individuals and those with co-morbidities, especially hypertension, obesity and diabetes and in

individuals who are smokers. These risk stratifications will impact how re-entry is orchestrated and this will have implications for DCI.

### **The Question of Returning**

As the COVID-19 pandemic continues to march through California, the US and world, the question on everyone's mind is when will we return to work, school, community and life as we knew it? Further is the question of what will life be like in the months and years ahead? How will our communities be changed and if forms of social distancing are sustained, how will we engage with the commercial, social and related services and entities, including going to stores, movies, theaters, restaurants, social and sports events, or visiting one's doctor? In tandem how will institutions be changed? Will colleges and universities turn to a greater or lesser degree of online offerings, will meetings and conferences that we previously traveled to become more Zoom-based, will workplaces become more virtual and will our visits to doctors become more telemedicine compared to in-person visits? And in each of these cases and countless others, how will this impact our sense of community and, as a consequence, loneliness? On a more immediate and practical level for our DCI community, what will our summer look like and will there be classes in the fall quarter – or winter quarter?

This needs to be framed against the economic toll that has and will continue to unfold, which also has implications for higher education, healthcare and life more broadly. As of April 23<sup>rd</sup>, more than 26 million people have requested unemployment insurance and short and long-term impact on the economy is extraordinary for small and large businesses and for our own education and healthcare sectors. The currently projected deficit is now \$3.7 trillion for fiscal year 2020. More than 41% of small businesses have laid off workers and as unemployment rises, the impact on our still largely employee-based health care system will be notable. The need to reduce elective procedures and surgeries to preserve bed and ICU capacity for COVID has taken a significant financial toll on virtually every hospital and medical center in the US. Coupled with this has been the dramatic shift to the use of telemedicine, which has been ramped up with startling speed and success at medical centers across the nation. While these changes are currently COVID-related, they and many other factors, will surely change how medical care is delivered and paid for in the future. So too is the economic impact on colleges and universities, many losing current and potential future income from tuition, room and board, rentals, endowment and a plethora of other sources. Education and healthcare share in common fixed overhead, including personnel and facilities, and that will result in changes in how, when and where services are delivered. We are at the beginning of these transitions, but it is important to recognize that it is unlikely that institutions and workplaces will simply return to their prior practices when the pandemic ultimately ends. We will all be different.

Of interest, the “*Graphic Detail*” section of the April 18<sup>th</sup> issue of *The Economist* highlighted the intersection of COVID-19 and the internet, noting that a survey from MIT has shown that 34% of Americans have relocated from prior urban work clusters to more distributed spaces as evidenced by a decrease in internet use in city centers as offices have emptied and home offices become more dominant. Not only is the location of work changing, so too are its boundaries – between day and night or weekdays and weekends – as immediate accessibility as

blurred prior social connections. I have certainly noted that in my own professional and personal life.

Internet consumption has also changed since mid-March, with work and education showing the largest increase, some with increased evidence of productivity. One decreased area of internet usage is online dating, but I will defer commenting on that. What happens from here once social distancing is relaxed is also of interest. According to a survey by the research firm March Gartner, when 317 executives were queried about whether they would return to the office, or stay online, 10 % indicated that they would not return to the traditional workplace. This is just one minor illustration of the many changes that will occur across society.

As noted, the question of when we can return is being approached in highly different ways across the US and around the world. There remains the concern that with re-entry, rebound infection will take place (as has been seen in China, Singapore, South Korea and Europe) although with testing and contact tracing and data driven quarantine, transmission can be contained. SARS-CoV2 is more transmissible than influenza but much less than measles, which spreads by aerosolization whereas COVID19 is most always the consequence of air droplet transmission.

On April 22<sup>nd</sup>, Governor Gavin Newsom updated the six steps that are required for reopening. They include:

- Expand testing and doing contact tracing for those who test positive
- Being able to protect California's most vulnerable populations, including seniors, homeless individuals and those with compromised immunity
- Ensuring medical facilities are equipped to handle potential surges
- Working with research hospitals and other research partners to pursue therapies for the virus
- Making sure businesses, schools, and other public spaces can continue physical distancing
- Being able to return to more strict measures, as needed

While the Governor and his advisory team and the county public health leaders will shape the reentry for California, many of the steps noted above are generalizable. In the April 17<sup>th</sup> on-line issue of *JAMA*, Rochelle Walensky from the MGH-Harvard and Carlos del Rio from Emory addressed “*From Mitigation to Containment of the COVID-19 Pandemic. Putting the SARS-CoV2 Genie Back in the Bottle.*” As I have noted above, and in prior *Notes on the Pandemic*, the impact of COVID-19 has been quite different across the US. Walensky noted that as of April 13<sup>th</sup> the epidemic disproportionately impacted New York City, which accounted for 40% of the cases with more than 1100 infections per 100,000 population compared to areas in Texas where it was 45 cases per 100,000. This helps explain why early serological studies of antibody measures across 19 counties in New York show a preliminary finding of 14% of 3000 New York residents having been infected with SARS-CoV2, as compared 3% of 2600 healthcare workers at Stanford. These data are an early glimpse of seroprevalence but in both cases demonstrate that the majority of individuals have yet to be infected with SARS-CoV2, which, of course, means that a large portion of the US population will remain vulnerable to future infection. With the

currently assume  $R_0$  of SARS-CoV2 (the number of cases and infected person will cause during their infectious period) is estimated at 2-2.5, it would require 55-70% of the population to be seropositive in order to provide herd immunity. Clearly that is a long way off – which makes the need for effective vaccine ever more important (see *Notes on the Pandemic #5* for a discussion on immunization). And if you are interested, the *New York Times* provides a very informative tracker of the coronavirus across the US (see: [https://www.nytimes.com/interactive/2020/04/03/upshot/coronavirus-metro-area-tracker.html?campaign\\_id=154&emc=edit\\_cb\\_20200424&instance\\_id=17944&nl=coronavirus-briefing&regi\\_id=38476646&segment\\_id=25937&te=1&user\\_id=d2525f54e6b19beddb5274e13364706](https://www.nytimes.com/interactive/2020/04/03/upshot/coronavirus-metro-area-tracker.html?campaign_id=154&emc=edit_cb_20200424&instance_id=17944&nl=coronavirus-briefing&regi_id=38476646&segment_id=25937&te=1&user_id=d2525f54e6b19beddb5274e13364706))

Walensky and del Rio also underscore some additional factors that will be necessary to get back to normalcy including limiting density, especially large events and gathering (which would include a number of athletic, arts, conference events that would normally occur at Stanford), and in particular congregate living arrangements in dorms and cafeterias as well as seating and gatherings in classroom and lecture settings.

A focus on vulnerable populations is noted in the steps outlined by Governor Newsome as well as by Walensky and del Rio. We are all aware of the co-morbidity and age risk factors but additional concerns about employees in various service and related jobs also requires attention. Outside of the university, this issue is dramatically and sadly revealed in nursing homes and senior living facilities. Across the US some 1.3 million seniors reside in one of these facilities that range from independent living to assisted living to skilled nursing. To date there have been more than 7000 deaths in senior living facilities, especially in skilled nursing. In data presented at a National Academy sponsored Roundtable on “*Keeping Nursing Home Residents and Staff Safe in the Era of COVID-19*” on April 22<sup>nd</sup>, a number of tragic situations were described in which nearly all of the residents in a number of facilities across the US had become infected and many died. This happened despite policies of keeping residents isolated in their rooms and it is presumed that the source of infection was from asymptomatic or minimally symptomatic employees, many who were in short supply, resulting in some of these nursing homes becoming literal accelerators of disease. As reported in a number of facilities with high infection and mortality, the lack of training of employees coupled with the lack of protective equipment (masks, gloves) promoted infection between staff and patients. This was driven home with the announcement (<https://news.stanford.edu/2020/04/21/donald-kennedy-stanfords-eighth-president-dead-88/>) that Donald Kennedy, Stanford’s eight president, succumbed to COVID-19 at age 88 while a resident at the Gordon Manor residential care facility in Redwood City. Going forward the sad lessons learned from these experiences will hopefully promote better policies for the future. Given the fact that over the next decade(s) the number of individuals over 65 as well as individuals in their 80s, 90s and even beyond will continue to rise, the risk for adverse outcomes will increase unless more effective public health policies are established in nursing homes and senior housing facilities. This is feasible and necessary, since future epidemics, whether with coronaviruses, influenza or other emerging infections, is inevitable.

For the general population, the ability to achieve the California and ultimately state and federal guidelines for reopening will depend on public health practices that have been presented in prior *Notes on the Pandemic* and that you have been reading in other sources. It is clear that

given the variegated penetrance of COVID19, different regions of the country will need to follow different timelines with shared practices. Testing is essential and this requires accessible rapid assays that specifically detect the presence of virus and of virus specific antibody. Regular screening for fever and COVID symptoms, as well as monitoring of asymptomatic and presymptomatic people will be needed to monitor potentially infected individuals. Workers to carry out contact tracing, which can be coupled with monitoring technology, as was effectively employed in countries that have registered more successful mitigation (e.g., Taiwan, South Korea, Singapore) is also essential. These practices protect individual and the public health and also help to assure that critical medical facilities are not overwhelmed. That was in fact the driver for the “flatten the curve” policy that led to the blunt instrument of sheltering in place and even lockdowns, to avoid the kind of crises that occurred in some countries like Italy and Spain or in parts of the US like NYC where population density coupled with more prevalent exponential growth of the infection led to hospital bed and ICU needs that exceeded extant capacity. The impact on individuals and the health care provider community when this happens is tragic and had riveted our attention. Thankfully in California and especially in the Bay Area, the prompt and more rigorous public health steps that were taken reduced number of COVID-19 cases and its related mortality is less than was originally projected. Currently California stands 30<sup>th</sup> among the US States in overall mortality per 100,000 individuals.

An effective vaccine (see *Notes on the Pandemic #5*) or effective therapies (see below) could change the relative risk ratio and the policies related to re-entry. But it is unlikely that either of those will be available for many months or even a year or more. Hence the current dilemma and the need to seek solutions that assume both continued presence of SARS-CoV2 or the possibility of a resurgence/recurrence of infection in the winter of 2020 and into 2021.

While I am not engaged in setting policy at Stanford (except for our DCI Community), I do want to raise an observation that I think needs consideration. As noted, current shelter in place does protect individuals but was driven by the goal of maintaining capacity of hospitals and the care provider community. That goal is now being achieved (and it has not been an issue at Stanford). Going forward there is a risk of conflating public health strategies with individual expectations. Using technology, testing, tracing and personal care coupled with public health standards can move us forward.

Of course we should never lose sight of the impact of disease on individuals as was sensitively done in a *New York Times* commemoration entitled *Those We've Lost* (<https://www.nytimes.com/interactive/2020/obituaries/people-died-coronavirus-obituaries.html?action=click&module=Editors%20Picks&pgtype=Homepage>). Each story is tragic and sad in its own unique way and reminds me of similar stories told in my own professional career about children who succumbed to cancer, AIDS and other catastrophic disease. Certainly our efforts on behalf of each individual is important but that stands distinct from our public health approach. As I have noted previously, each year the US witnesses 12,000 to over 60,000 deaths from influenza each year. As of April 25<sup>th</sup>, the death toll from COVID is 47,590 and is rising by approximately 2000 per day and will not likely reach its peak for months. And while sheltering in place will help reduce infection and death, that is not a sustainable policy and is not one we would employ for other infections, including influenza. So it is a matter of balancing the public health concerns against individual risk and choice. As shelter in place

policies are relaxed, relative risk for individuals will continue to be important. Not surprisingly, older individuals or those with co-morbidities or who are immunosuppressed, will be expected to sustain relative isolation for a longer period and even when policies are further relaxed, individuals will choose different personal approaches. This too has implications for institutions like Stanford, where many faculty are older and thus in higher risk groups. And it has implications for our DCI community, that also has some older individuals. These realities and concerns will factor into recommendations about when DCI will resume on-campus activities that will be informed by both Stanford policies and DCI specific ones. Lots to think about but we have the knowledge and tools to move forward as long as we employ them thoughtfully and appropriately.

### **Fear, Blame and Politics**

In the midst of the current pandemic it has been disheartening to witness the rapid emergence of blame about who is responsible for this devastating infection. Labeling SARS-CoV2 as a “Chinese virus,” or embracing that as part of a political strategy, is flawed and unfortunate. But it is not new. Sadly, Samuel Cohen details some of this in *Pandemics: waves of disease, waves of hate from the Plague of Athens to AIDS* that was published in ***Historical Research*** in 2012. Not surprisingly, pandemics evoke fear and societal discord. For example, in 2005 John Barry documented in *The Great Influenza: The Story of the Deadliest Pandemic in History* that the influx of migrant workers from Europe spread racial and class tensions evidenced by race riots in St Louis, a general strike in Seattle and a rise in terrorism between 1918-20 that, in some reports, was similar to some of the terrors associated with the Black Plague. Indeed, in the 14<sup>th</sup> century, the Black Death was considered a punishment from God, and such blaming has happened countless times over history, often singling out certain populations, especially Jews, for blame. Between 1347-51 the consequences of the Black Death lead to the murder of the Catalans in Sicily and to pogroms in down the Rhineland and into Spain, where Jews were convicted of poisoning wells. Recounting of blaming can be found in Greek literature from Homer to Sophocles and in literature including Giovanni Boccaccio’s “*The Decameron*” in the 14<sup>th</sup> century or in the 18<sup>th</sup> century Daniel Defoe’s still relevant “*A Journal of the Plague Year*” (which is worth reading).

In other occasions the blaming has racial or other discriminatory underpinnings. This was sadly witnessed by the now well-known Tuskegee study that left 400 black men with syphilis untreated for decades so that the “natural history” of disease could be observed in a population with “innate racial weakness” – clearly driven by racial bias. Similarly, and sadly, when the new disease that eventually become known as HIV/AIDS was first being described it was initially referred to by as GRID (the gay-related immunodeficiency disease) or 4-H (homosexuals, heroin users, hemophiliacs and Haitians) or just the gay plague. Since I was involved from the outset in this new infection, particularly with children, I had a front row seat to the fear and discrimination that resulted from some healthcare professionals, schools, the courts, communities and the slow response from the pharmaceutical industry and regulatory agencies, including the FDA, and national leaders to what was admittedly a new and frightening disease.

An interesting **Arts and Medicine** article by Walter Dehority entitled “*Infectious Disease Outbreaks, Pandemics and Hollywood – Hope and Fear Across a Century of Cinema*” was published in the **JAMA Online** on April 24<sup>th</sup>. Through a process of review, the author selected 80 culturally relevantly films and characterized them by themes, some of which evolved over time. The author detailed these themes and representative films in a table based on the frequency, that I will summarize as follows.

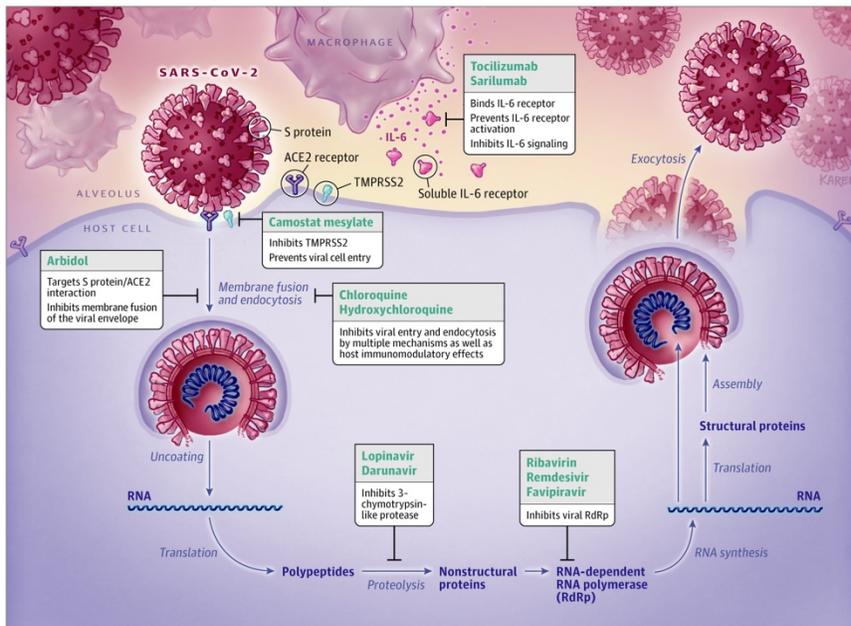
<b>Theme (Number of Films)</b>	<b>Notable Examples (and year)</b>	<b>Author Comments</b>
<b>Dehumanization (29)</b>	<i>Resident Evil Series</i> (2002, 2004, 2007, 2010, 2012, 2016) <i>Dawn of the Dead</i> (2004) <i>World War Z</i> (2013)	“Most commonly ‘living dead’ as manifestation of infection. The infected are often viewed as objects underserving of sympathy and as recipients and perpetrators of violence.”
<b>Biowarfare (28)</b>	<i>The Omega Man</i> (1971) <i>Inferno</i> (2016) <i>Fast and Furious Presents Hobbs and Shaw</i> (2019)	“Frequently apocalyptic with post-pandemic change in social order. Also represented by threat of biowarfare, often by terrorists or criminal organizations.”
<b>Failed Leadership (20)</b>	<i>The Crazies</i> (1973, 2010) <i>28 Weeks Later</i> (2007) <i>Doomsday</i> (2008)	“Government often turns against its own citizens in attempts to destroy infected populations and contain an outbreak.”
<b>Stigmatization of the other (19)</b>	<i>The Seventh Seal</i> (1957) <i>Longtime Companion</i> (1989) <i>Philadelphia</i> (1993)	“Prominent in HIV and plague films; portrayed as stigmatization or ostracism of the infected, often out of fear of infection and ignorance.”
<b>Social Class Disparities (18)</b>	<i>Masque of the Red Death</i> (1964) <i>The Pied Piper</i> (1972) <i>Contagion</i> (2011)	“Elites unsuccessfully try to self-quarantine; some groups receive privileged access to protections unavailable to others.”
<b>Selfless Physician (16)</b>	<i>Arrowsmith</i> (1931) <i>The Green Light</i> (1937) <i>The Rains Came</i> (1939)	“Emphasizes the sacrifice of typically male physicians.”

First, I have to confess that I have seen very few of these films and have little intention to do so. Not surprisingly it is notable to see how many of the themes in these films match literature over the centuries – or just human behavior, for better or worse. Apparently within a month of COVID-19, *Contagion* was among the top 10 downloaded movies. And there is little doubt that in future (when crews can reassemble) that there will be movies about COVID-19 – and we can already predict who will be some of the heroes and demons.

While it is worth recalling that some current behaviors are not new, it is sad to witness, again, their recurrence. We would hope for better enlightenment – and hopefully we can help to foster that. I am also reminded that Albert Camus, the author of the existential and timeless treatise *“The Plague,”* also wrote that *“In the midst of strife, I found there was, within me an invincible love. In the midst of tears, I found there was, within me, an invincible smile. In the midst of chaos, I found there was within me, an invincible calm. In the midst of winter, I finally learned that within me, there lay, and invincible summer. And, that makes me happy. For it says, that no matter how hard the world pushes against me, within me, there’s something stronger...”*

### What is Happening Regarding Treatment?

In *Notes on the Pandemic #4* and earlier editions I commented on efforts to development effective therapies for COVID-19. In the April 13<sup>th</sup> *JAMA Online*, J Sanders and colleagues published *“Pharmacologic Treatments for Coronavirus Disease 2019 (COVID19). A Review*



This illustration describes the lifecycle of SARS-CoV2 that was published in the review by J Saunders and shows the various points in the life cycle that could be susceptible targets for therapeutic intervention. Importantly, each of these are subjects of investigation, some using “repurposed drugs” and others new investigational agents. The pace of the current global research and collaboration is in many ways unprecedented. But it is important to keep perspective. For example, the use of hydroxychloroquine for treatment or prevention that was

promoted by some as a game-changer, albeit with little supporting data, has recently been shown by J Margagnoli in a preliminary and not yet peer-reviewed release published MedRXiv (<https://www.medrxiv.org/content/10.1101/2020.04.16.20065920v2>) that in a retrospective analysis of 368 patients, there was no evidence that hydroxychloroquine, either with or without azithromycin, reduced the risk of mechanical investigation in patients hospitalized with COVID-19. Further there was an increased overall mortality in patients treated with hydroxychloroquine alone prompting the authors to note that *“These findings highlight the importance of awaiting the results of ongoing prospective, randomized, controlled studies before widespread adoption of these drugs.”*

A different repurposed drug, Remdesivir, is also being pursued in a number of clinical trials but awaits more definitive data. While still anecdotal, the report by J Grein *“Compassionate Use of Remdesivir for Patients with Covid-19* that was published in the April 10<sup>th</sup> *New England Journal of Medicine*, observed a 36% improvement in oxygen support in 61 patients with O2 saturations below 94% in which 55% received some form of mechanical ventilation. The authors are appropriately cautious, but this provides some hope – although it will require the results of current studies to validate the value of this and other drugs.

A reliable source of information can be found in the *NIH COVID-19 Treatment Guidelines* (see: <https://covid19treatmentguidelines.nih.gov/therapeutic-options-under-investigation/>). I am attaching below the latest information posted on this site which conveys the current state of affairs – despite the comments from some physicians and government leaders.

*“At present, no drug has been proven to be safe and effective for treating COVID-19. There are no Food and Drug Administration (FDA)-approved drugs specifically to treat patients with COVID-19. Although reports have appeared in the medical literature and the lay press claiming successful treatment of patients with COVID-19 with a variety of agents, definitive clinical trial data are needed to identify optimal treatments for this disease. Recommended clinical management of patients with COVID-19 includes infection prevention and control measures and supportive care, including supplemental oxygen and mechanical ventilatory support when indicated. As in the management of any disease, treatment decisions ultimately reside with the patient and their health care provider.*

*Antivirals:*

- *There are insufficient clinical data to recommend either for or against using **chloroquine** or **hydroxychloroquine** for the treatment of COVID-19 (AIII).*
  - *If chloroquine or hydroxychloroquine is used, clinicians should monitor the patient for adverse effects, especially prolonged QTc interval (AIII).*
- *There are insufficient clinical data to recommend either for or against using the investigational antiviral drug **remdesivir** for the treatment of COVID-19 (AIII).*
  - *Remdesivir as a treatment for COVID-19 is currently being investigated in clinical trials and is also available through expanded access and compassionate use mechanisms for certain patient populations.*

- *Except in the context of a clinical trial, the COVID-19 Treatment Guidelines Panel (the Panel) **recommends against** the use of the following drugs for the treatment of COVID-19:*
  - *The combination of **hydroxychloroquine plus azithromycin (AIII)** because of the potential for toxicities.*
  - ***Lopinavir/ritonavir (AI)** or other **HIV protease inhibitors (AIII)** because of unfavorable pharmacodynamics and negative clinical trial data.*

**Host Modifiers/Immune-Based Therapy:**

- *There are insufficient clinical data to recommend either for or against the use of **convalescent plasma** or **hyperimmune immunoglobulin** for the treatment of COVID-19 (AIII).*
- *There are insufficient clinical data to recommend either for or against the use of the following agents for the treatment of COVID-19 (AIII):*
  - ***Interleukin-6 inhibitors** (e.g., sarilumab, siltuximab, tocilizumab)*
  - ***Interleukin-1 inhibitors** (e.g., anakinra)*
- *Except in the context of a clinical trial, the Panel **recommends against** the use of other immunomodulators, such as:*
  - ***Interferons (AIII)**, because of lack of efficacy in treatment of severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) and toxicity.*
  - ***Janus kinase inhibitors** (e.g., baricitinib) (AIII), because of their broad immunosuppressive effect.*

Hopefully, valid data will emerge from current and future clinical trials. And I think enough has been said about sunlight, ultraviolet light and disinfectants!

**Some Updates About DCI**

I am happy to report that despite all that has been unfolding, next month we will be announcing the exceptional group of Fellows and Partners who comprise the DCI 2020 class. We are still hoping and planning that they will join us on campus for the fall quarter. But should that not be feasible, we will plan to welcome them in the winter quarter, which is something we have prior experience in doing.

I also am appreciative of all of the adaptations that our 2019 Class is making to the unwelcome reality that has impacted their DCI experience. While they are immersed in online classes and the other activities that DCI normally sponsors (Faculty Fellow Dialogues, Life Transformation Reflections, Colloquia and Community Dinners) all of these are also happening online. I am deeply appreciative to Stanford faculty who continue to produce these programs. But it is abundantly clear that despite the power of online communications, there is simply no substitute for the personal connections that DCI has fostered over the years. While it is a challenge, we will continue to work with our DCI 2019 class to find ways to overcome some of these limitations in the future.

I am also pleased to share some good news with you. Thanks to the efforts of [Susan Golden, DCI'16](#), director of [Stanford dciX](#), the dciX program has been selected to work with a new [Future of Longevity Accelerator in partnership with Pivotal Ventures and Techstars](#). This accelerator will assist startups focused on innovative and creative caregiving solutions to address the unmet needs of individuals providing and receiving elder care.

Based in Washington DC, the accelerator will accept 10 startups annually to help them gain traction and accelerate their businesses through investment, hands on mentorship, and programming. Each year, DCI fellows will be selected to serve as Mentors and Advisors to companies that participate in the accelerator. This will be a new Intergenerational Engagement initiative for dciX, as well as enhanced focus for the Longevity Innovations Special Interest Group.

In addition, under Susan Golden's leadership as a Lead Mentor for the Accelerator, dciX will also develop a Landscape of Caregiving Innovations Report that can help innovators and entrepreneurs learn from the successes and failures of companies that focus on solutions for Caregiving. A group of innovation-oriented DCI Fellows/Partners will be invited to serve on a review panel to analyze and assess the strengths of how companies are tackling these issues.

These collaborative opportunities uniquely draw on both the professional and personal experiences of many DCI Fellows. If you are interested in participating as a mentor to the accelerator or as a member of the review panel and/or if you know of a company interested in applying to participate in the accelerator, please contact [Susan Golden](#) for more information and next steps.

So despite the many challenges we all face today, the resilience and creative of our DCI Community remains something to celebrate.



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