

Editorial

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Since January of 2020, the medical and public health worlds have been transfixed by the SARS-CoV2 virus and the COVID-19 pandemic it generated. This all-consuming focus on the medical, public health and socio-economic impacts of the pandemic has resulted in a plethora of scientific articles submitted to medical and public health publications and by December 2020 the number of new manuscripts approached 200000 by 1 estimate.¹ This has had a profound impact, both on individual journals, many of which (to include DMPHP) have seen submission increases of over 80 percent, and medical publishing as well, having to cope with an ever-changing environment of open access, preprints and outdated business and subscription models. Of the unwanted side-effects of this phenomenon is the ability to find support for virtually any theory, finding or recommendation somewhere in the published literature. This has, predictably, helped to propel the many contradictory, often divisive and acrid reactions to many of the interventions intended to prevent and or mitigate the course of the pandemic. The result has been a mishmash of official mitigation and containment policies across and within countries which, in retrospect, may have had a greater negative impact on global public health than the virus itself. The purpose of this editorial is to look back over the past year and attempt to draw lessons and make recommendations to help inform how we might move beyond the current pandemic and better prepare for, and respond to, the next such event. As a framework, we will use the salient observations from the series of editorials we published over the course of the Pandemic and will use reported numbers and logic to support conclusions and recommendations. Citations provided in the original editorials are not repeated here.

“A Tale of Two Epidemics,”² was written during the first week of March, 2020 when some 200000 cases, and approximately 4500 deaths had been reported from over 100 countries with an overall global population attack rate of 0.8 percent and a mortality rate of 0.02 percent; hardly comparable to the corresponding rates of 30 percent and 2.5 percent, respectively, for the 1918 Influenza pandemic to which it was being frequently compared. Many of the hallmarks of COVID-19 were already recognized and well established. Most importantly, the causative agent was a true Trojan horse that spread primarily via respiratory droplets. The virus was widely distributed and well established in terms of sustained community transmission in many countries across the globe. In terms of severity and lethality, COVID-19 was clearly a disease of the elderly and those with chronic conditions—otherwise healthy individuals under 60, though not immune, were at minimal risk of a fatal outcome. The most dangerous settings, in terms of risk, were observed to be in-door gatherings involving groups of people congregating for any length of time. Unfortunately, as the virus spread, a second epidemic could be identified. This was an epidemic of fear and anxiety that was daily exacerbated by the media through sensationalized and tabloid level reporting. From the beginning, the media controlled the narrative and molded public opinion and could well have mediated this second epidemic but seemed more focused on the pursuit of goals other than the public good.

“From Epidemic to Pandemic,”³ was prepared in the weeks following the World Health Organization’s declaration on March 11, 2020 that COVID-19 was now considered to be a Pandemic with some 140000 cases and almost 5000 deaths having been reported worldwide, in stark contrast to the almost 120000000 cases and over 2500000 deaths reported a year later. In the US, we went from 1300 cases and 40 reported deaths to almost 30000000 cases and over 500000 deaths over the same timeframe. We addressed several issues, the most important of which bear revisiting: (1) as the pandemic progressed, a plethora of predictive epidemiological models (built on multiple guesstimates for critical parameters, such as infectivity and susceptibility that we had woefully little information on) were published with some worst-case mortality estimates in the 100s of 1000000s and other outputs that were more speculative than scientific. Unfortunately, the media seized on these worst-case numbers and used them as fodder to effectively feed and nurture the panic and fear they had already sown; (2) a second problem was the COVID-19 case definition, or lack of 1. Defining a medical case based on a positive lab value irrespective of the presence of symptoms or degree of severity does not provide enough information to assess the medical impact of the disease, especially when 50 percent or more of positives are non-symptomatic and 80 - 90 percent of symptomatic cases do not require hospitalization; (3) many of the containment and mitigation strategies employed were quite draconian in nature, and across the US, schools were closed, communities locked-down and non-essential businesses shuttered, based on an assumption that we would lessen the medical impact by “flattening the curve” and therefore save lives; and (4) the overall public health impacts on the population through lost wages, deferred and missed medical interventions,

pervasive mental health issues and lost educational years were not taken into account. Many would even argue that the cumulative health impacts secondary to the interventions might well exceed the direct medical consequences of COVID-19. This is especially tragic when 1 considers that those most negatively and disproportionately impacted secondary to these social determinants of health are those socio-economically marginalized who already suffer poorer health outcomes, possibly having reversed much of our progress towards achieving health equity.

With “Lockdown or Lockup” from the end of April,⁴ we further explored the relative costs of different public health interventions versus the benefits achieved from their implementation. It became obvious that because of the absence of standards for, and common definitions of specific interventions across and within countries, valid conclusions could not be drawn. However, comparing the epidemiologic curves for the 48 countries reporting 5000 or more cases as of 28 April, 2020 demonstrated no consistent pattern that would support very costly extreme measures (stay at home mandates, and school and non-essential business closures) over far less expensive measures such as social distancing and masking. The cumulative costs secondary to the extreme measures taken will unfortunately, not be fully recognized until the pandemic has long subsided. In closing we concluded, ‘We are gaining the knowledge and tools to both better protect our medical delivery systems and begin to repair our socio-economic damage. These do not have to be competing priorities; we can address both and maximize lives saved. An important first step is to accept the fact that this is not deciding between lives versus dollars, it is about maximizing a state of physical, mental and social well-being for all.’

“Reflections⁵,” prepared in mid-May, the US had by then recorded over 1500000 COVID cases and approximately 100000 associated deaths. We reflected on the declaration of a pandemic from 3 perspectives: (1) the criteria used by WHO in reaching such a declaration, are not as objective as might be expected. The main considerations are geographic spread and the number of individuals who are infected, but are ill defined and lack specificity in terms of defining trigger points. With Covid-19, the geographic spread criterion would certainly have been met but given the global attack and mortality rates at the time of the COVID-19 declaration, 1 could legitimately question its necessity; (2) this is important because “pandemic” has become a hyper-emotionally charged word that can have profound impacts on the global economy and the socio-political systems within countries. Additionally, it is used dichotomously and does not allow for any gradation or judgment as to overall severity for a particular outbreak. With other disasters such as hurricanes and earthquakes we have developed scales and categories to better define severity and risk as well as our response to a given event. We should give serious consideration for doing the same with pandemics; (3) as a preliminary example of such a scale, we looked at global mortality rates and total deaths for COVID-19 as well as several recognized historical pandemics. Total deaths were represented in proportionate circles, with that representing the plague of 1350 being over 10 times the diameter of that for COVID-19 which is but a fifth of that for the 1918 Flu. If these circles are rate adjusted for global population, the differences are geometrically increased. In closing the editorial, we noted that, ‘None of this is meant to diminish the impact of COVID-19 on 1000s of Americans. It is a virulent and deadly disease that can be horrific for those afflicted and their loved ones, and it has had devastating impacts on health care systems and medical personnel. The purpose of presenting these numbers is to temper harmful levels of fear and to put COVID-19 into a more balanced perspective regarding individual and community risks, so that we can better

mitigate its medical consequences while preserving our socio-economic infrastructure.’

In “Yin and Yang and Herd Immunity,” by the end of June, over 10000000 cases with some 500000 deaths had been reported from over 200 countries across the globe.⁶ Our editorial at that time discussed the Chinese construct of dualism (Yin and Yang), in which contrary forces may be complementary, as an analogy for optimally reducing the medical impact of COVID-19 while simultaneously limiting the negative socio-economic effects. The Great Chinese Famine of 1959 - 1962, which resulted in the estimated deaths of 10s of 1000000s, was briefly examined to demonstrate the disastrous effects of counterproductive interventions coupled with an abuse of power at all levels of government and fueled by misleading data, and falsified and contrived official reports. The COVID-19 response in the US was likewise marred with conspiracy theories, counterproductive interventions, sensationalized and misleading headlines, uninformed decision-making, and most of all, political posturing at the expense of public health. As with the Great Famine, measuring the full impact of COVID-19 is obfuscated by the misuse of numbers and reports. Principal among these is the reporting of PCR positives as cases which, of course, falsely magnifies the true medical impact of COVID-19, as does reporting raw numbers without adjustment for disease severity and pertinent demographics such as age and ethnicity. We proposed several approaches to help alleviate the population anxiety levels by providing informed and consistent health communication, reporting COVID-19 hospitalizations, with demographics, as the best measure for the medical impact of the pandemic risk assessment, targeting interventions to risk profiles at the community level, and empowering public health and medical officials, as opposed to politicians, to take the necessary actions to protect the total health of our population. We also went on to address Herd Immunity which we will defer consideration of to the closing discussion.

In “Are we Waiting for Godot- A Metaphor for COVID-19,”⁷ we used Samuel Becket’s play, a representative work of The Theatre of the Absurd to draw parallels to some of the paradoxical, often dystopic approaches taken in our responses to the current pandemic. This is most evident in the fact that by the end of July, the US reported almost 5000000 cumulative cases and over 150000 deaths, alarming numbers indeed. However, these translated into overall population rates of 1.3 percent and 0.045 percent respectively, not as alarming from an epidemiological, population perspective. Further, at that time we were seeing case rates increasing 4-fold while mortality rates rose at a much more moderate rate of 10 percent from early June. An analysis of this phenomenon further demonstrates why measuring the health impact of COVID-19 by “cases” as defined by a positive PCR lab test approaches the absurd because: (1) approximately 50 percent of test positives are asymptomatic; (2) of all clinical cases, 80 percent or so are mild; (3) with the greatly increased number of tests being conducted a higher ratio of asymptomatic positives will be identified; and (4) any test, even a highly sensitive and specific 1, will identify a significant number of false positives if the prevalence of the agent is less than 5 percent. Further compounding this was the dramatic shift seen in the average age of test positives which had decreased from the mid-fifties to the mid-30s. Further complicating things was the looming presidential elections. COVID-19 was essentially weaponized by the mainstream media and responsible reporting gave way to tabloid sensationalism and respected newspapers read more like editorial digests presenting what they wanted us to hear instead of what we needed to know. However, even more dystopic

was the level of systemic child abuse we were subjecting our youths to. The full impact of the collective educational, economic, social, psychological, and physical damage to these children is yet to be tabulated but the sum-total of healthy life-years in terms of morbidity and pre-mature mortality for this population will more than likely far exceed that caused directly by the virus. The fact that this harm is inflicted on those virtually immune to serious medical outcomes secondary to COVID-19 is a self-inflicted tragedy.

In “Waiting for Godot – Epilogue,” a follow-up editorial to the Godot piece in early September, we updated many of the areas previously addressed.⁸ Of these, 2 discussions of note were: (1) the further development of a rudimentary pandemic index comparing population mortalities for several historical events and COVID-19 on a scale of 1 to 10. Compared to the Great Plague which was scored a 10 and the swine flu a 1, COVID-19 was estimated to be a 2 or 3; and (2) it is worth revisiting the well-regarded work and policies of the Health Commissioner of New York City, Royal Copeland, during the 1918 influenza pandemic, especially as to school closures. To quote Copeland, “New York is a great cosmopolitan city and in some homes there is careless disregard for modern sanitation. In schools the children are under the constant guardianship of the medical inspectors. This work is part of our system of disease control. If the schools were closed, at least 1000000 would be sent to their homes and become 1000000 possibilities for the disease. Furthermore, there would be nobody to take special notice of their condition.” The hallmark of the 1918 NYC response was that health decisions rested in large part with the public health authorities and not with elected officials pursuing political agendas at the expense of public health as is too often the case today.

In “From COVID-19 to COVID-20: 1 Virus – 2 Diseases,”⁹ written at the end of September we considered reasons why a name change for COVID-19 might be in order. Not least among these was moving away from a term which many have become hypersensitized to. However, more importantly, is that the focus early on was with controlling a novel pathogen through containment and mitigation efforts, whereas, by early October, over 99 percent of US counties had reported cases indicating that these efforts were largely ineffective. COVID-19 was not going to be eradicated, it had by then, joined the host of other diseases that we must cope with on a chronic basis. Additionally, given the full scope of the medical and public health impacts associated with SARS-CoV-2, we must realize that we are dealing with much more than an infectious disease. This is most evident in the evolution of our appreciation for those most at risk. Early on the salient risk factors of age and co-morbidities were clearly defined. As the pandemic matured it became all too obvious that in addition to these specific risk factors, there were others such as occupation, education, income, and a host of other social determinants of health that significantly and negatively impacted our most vulnerable populations, and which are only partially susceptible to medical interventions. What began as an infectious disease has evolved into a complex public health crisis that can only be addressed by integrated, all-sector interventions. This type of construct was advanced in the work of Merrill Singer who coined the term “syndemic” to define it. We closed the editorial with these words, “This concept clearly applies to COVID-19 today, which we can no longer consider a single biological disease entity but 1 that significantly overlaps and interacts with other disease conditions, as well as concurrent public health crises defined more by the socioeconomic determinants of health rather than by pathophysiological changes. The expansion of this model to include the unwanted side

effects of our interventions can also give us a framework to better assess and measure the direct and indirect impacts of the COVID-19 pandemic. We are all familiar with individual iatrogenic effects that may result from medical interventions, but we have tended to ignore or minimize the population iatrogenic effects secondary to extreme public health interventions.’

For yesterday, March 21, 39505 new cases (positive lab test) of COVID-19 were reported along with 455 deaths and some 40976 hospitalized as compared to the corresponding peak numbers of 300519 cases, 4518 deaths and 141480 hospitalized in early January, 2021.¹⁰ There has been some concern that the new case rate of decline has plateaued somewhat over the past several weeks but this is to be expected as restrictions are relaxed and there is an increase in person-to-person contacts; the more important metric, mortality has continued its downward trend and should continue to do so as more and more of the higher risk are taken out of the susceptible pool (see below). This is certainly heartening and if the trend continues, which it should, we need to seriously think about when we officially go from a pandemic to an endemic state, especially in those countries where transmission has been effectively suppressed. However, before discussing this further we should review the role of Herd Immunity (HI) in the context of where we are today and, hopefully, we can dispel some of the many mis-conceptions attendant to it. Some basics are: (1) HI is not dichotomous, it is a continuous variable that rises and falls over time with population immunity; (2) population HI too often assumes homogeneity across different demographic groups—assuming all are at equal risk. Our experience with COVID-19 clearly shows this to be invalid and as estimated HI levels need to be considered in vaccine allocation, we need to set different goals to target those at greatest risk; and (3) HI is better thought of as the percent of non-susceptible individuals {vaccinated + previously infected + relatively immune (such as children vs. the elderly in COVID-19)} in the population, and as the percentage goes up the rate of transmission goes down eventually reaching seasonal levels of CORONA virus transmission.

As of March 22, 2021, almost 25 percent of the US population has received at least 1 dose of a COVID-19 vaccine including 69 percent of those over 65 years of age.¹¹ Additionally, another 10 percent of the total population has tested positive up to now, and upwards of 20 percent may have been infected but non-detected.^{12,13} From these numbers alone you cannot determine the degree of overall population immunity, but a reasonable estimate would put it between 40 percent and 50 percent. More importantly, the higher levels of previous infection and vaccination in the highest risk group for severe disease and lethality, the elderly, should significantly decrease the overall clinical impact of the pandemic and get us back to the “old normal” earlier than expected. This brings us back to a critical question - when does a pandemic end? This issue came up as the 2009 H1N1 pandemic wound down and on August 10, 2010 the WHO announced that it was effectively ended. The decision was based on the fact that in most countries, outbreaks were no longer occurring, and that influenza was transitioning towards seasonal patterns of transmission. The WHO went on to note that H1N1 viruses would continue to circulate for years to come – the virus had not disappeared.¹⁴ As the SARS-CoV-2 virus wanes in the US we need to establish some metrics to acknowledge when we transition from the pandemic to the endemic phase. Impeding this consideration at the present time is our seeming unrelenting negativity, in spite of our progress, and the current focus on “variants” and the fear of another surge. This is somewhat perplexing as genetic variants are constantly

evolving as the virus competes to propagate. A small number of the variants have raised concern because of possible increased infectiousness and/or lethality, but, to date, existing vaccines continue to be effective against them.¹⁵ A vaccine resistant variant may well evolve and need to be addressed at some point in time, but if we are going to extend the pandemic phase with every new variant, we will be in permanent PPE.

The single greatest factor in replacing pessimism with optimism is, of course the increasing availability of effective vaccines. By the end of December, shipments had begun across the US and officials had a chance to target limited supplies to those at highest risk of a negative clinical outcome, but, in too many instances, let that opportunity slip by. We could do a discourse on the many reasons for this but 2 reasons stand out: (1) we shifted goals from the initial focus on saving lives to addressing societal ills that a vaccine would do little to ameliorate; and (2) continuing to measure the medical impact of the pandemic in terms of “cases” primarily defined by a positive lab test. From the onset of the pandemic, the sentinel risk factor has been recognized as age, especially for those 65 and older who have accounted for 80 percent of deaths, the logical target group for an effective vaccine. Unfortunately, when dealing with a potentially lethal infectious disease and a limited supply of an effective medical intervention it is not difficult to justify its allocation to just about any sub-group through an exercise in ethical gymnastics. However, given the clearly defined risk factor, age, that cuts equitably across all socio-economic groups it is difficult to understand the justification of allocating by other factors if indeed the primary objective is, as it should be, to save lives. To date, we have administered over 80000000 doses in the US, more than enough to have protected the approximately 50000000 seniors over 65 of all ethnic and racial backgrounds. We should note that after a rough start to the vaccination program regarding prioritization of seniors, we are now making excellent progress and have now vaccinated almost 70 percent.¹¹ A logical corollary to this is that the continuing use of “cases” to define the impact of the pandemic becomes increasingly fallacious as the ratio of clinically significant events to total test positives becomes smaller and smaller.

Continuing this line of reasoning, we should consider the global situation as well. Of a global population of almost 8 billion, there are an estimated 703000000 (roughly 10 percent) aged 65 and over. To date almost 500000000 doses of vaccine have been administered across 128 countries; if targeted to those 65 and older, over 50 percent could potentially have already been vaccinated and the global medical impact of the pandemic would be significantly reduced.¹⁶ This approach is further enhanced by looking at the promising results coming out of Great Britain, specifically targeting the elderly, and using a single jab while delaying the second dose for up to 12 weeks.¹⁷ Given the concerns with variants we might even consider using the second dose as a “booster” modified to target those that are most worrisome. More pressing, from a Global Health Security and humanitarian perspective, is the issue of ethically justifying the vaccination of extremely low risk groups in some countries at the expense of 1000000s at much greater risk in others. The US has a rare opportunity to reburnish its image on the world stage by taking the lead in a vaccine diplomacy initiative that would truly represent our professed ideals, especially regarding the value of individual life. Such an initiative, to be successfully carried out, however, requires defining the goals of

national and global vaccination programs. In the US we are officially being told that life will not return to normal until 75 percent – 85 percent of our population is fully vaccinated.¹⁶ This hyper-inflated figure discounts the population immunity level we have already reached through the previously infected, and relatively immune, but most importantly, perpetuates the unwarranted state of anxiety and fear that we have experienced over the past year. At the Global level, attaining such a goal will take years by which time the virus may well have mutated to a vaccine-resistant strain and we will, indeed, be inviting new pandemic waves. Rather, with the setting of more realistic, science based goals, we have reasons to be optimistic. We are not there yet, we must continue to be vigilant and cautious, but we are well on our way; Godot is in sight.

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