

COVID-19: Beyond Washing Your Hands and Social Distancing

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Abstract- A pandemic due to the outbreak of the COVID-19 virus was declared as of March 2020. The authors provide perspective towards preventing and/or mitigating the impact of contracting the virus known as COVID-19. The authors posit straightforward strategies that an individual could implement that may decrease the likelihood of developing COVID-19, help lessen the severity of the symptoms related to the COVID-19 and potentially mitigate the transmission of the virus. The authors consider their comments as food for thought and not as professional medical advice. If you believe you have contracted the COVID-19 virus seek the advice of your healthcare provider.

Keywords- *Pandemic, Corona, Mitigation, Ventilators, WHO*

I. INTRODUCTION

The World Health Organization (WHO) declared a pandemic due to the outbreak of the COVID-19 virus as of March 2020 [1]. The reported mortality due to the COVID-19 virus varies depending on the country but was reported by the WHO on 3rd March 2020 to average roughly 3.4% globally [2]. This figure was calculated as the proportion of current worldwide cases (then 90,893) to total deaths (then 3,110). Although these numbers have met with considerable skepticism in terms of accuracy, caution should also be advised in terms of their interpretation. At any snapshot in time some of the current cases would most likely eventually also become deceased, therefore calculating a mortality based on active cases vs. total deaths is a flawed methodology, deflating the reported death rate. As the growth in current cases has been exponential, this method exponentially deflates the apparent death rate. An alternative, using the ratio of total deaths to the sum of total deaths and recovered cases (i.e. resolved cases) also has flaws.



Figure 1. Global Map as of April 1, 2020. Source: Centers for Disease Control and Prevention [5].

It may for example take more days to be diagnosed as a recovered case than deceased, additionally there would be recoveries from undiagnosed cases. Both of these factors would inflate the mortality rate. For example using recent Spanish figures (deaths 10,935 and recoveries 30,513) [3] this gives a mortality of 26.38%. This larger value would also be increased slightly by the possibility of reinfection and subsequent death of recovered cases. While it is not clear what proportion of patients are dying because of the COVID-19 virus or dying with the COVID-19 as a co-morbidity, the cases of infected individuals will soon surpass the US hospital capacity (i.e. ICU beds, ventilators, and general hospital beds) to treat patients [4]. The scenario of the number of COVID-19 patients exceeding hospital capacity is currently playing out around the world, where additional hospitals are being built. In New York a US Navy Hospital ship has been dispatched to assist the local health care community [5].

The Centers for Disease Control and Prevention (CDC) has recommended hand washing (soap and water \geq 20 seconds or hand sanitizer with \geq 60% alcohol) and social distancing (\approx 2 meters) as mechanisms to avoid contracting or spreading the COVID-19 virus [6]. Hopefully these CDC suggestions will help level of the spike in COVID-19 infected patients, some of whom will need hospitalization. Hospitalized COVID-19 infected patients who don't respond well to remediation treatments are often intubated with a ventilator to maintain pulmonary function [6]. The mortality rate of patients with COVID-19 whom are placed on invasive mechanical ventilation has been reported as high as 86% [7]. Further, high secondary infection rates due to ventilator intubation have been well established in other patient populations [8,9].

Identifying counter measures to prevent contracting the COVID-19 and/or remediation of the symptoms for the purpose of avoiding hospitalization is paramount. As such, this paper provides a list of counter measures that one might consider based upon our collective perspective. The comments to follow are not to be confused with professional medical advice but rather to be considered as an augment to what you are likely hearing from the broadcast media, the CDC or the WHO.

- If you start to feel symptoms such as those listed by the WHO and the CDC [1,6] assume you have the COVID-19 virus and start a home-based remediation plan in consultation with your health care provider. Telemedicine consultations are affordable and widely available through most health care providers or urgent care centers. Your health care provider will determine if an actual COVID-19 test is necessary. Likewise, it might be appropriate to speak with your healthcare provider regarding the use of hydroxychloroquine as a remediation or prophylactic against the COVID-19 infection. Hydroxychloroquine is a commonly used malaria treatment and is being used on an off label approved basis by the FDA for the treatment of the COVID-19 infection (US Food and Drug Administration: www.fda.gov/media/136534/download).
- Some individuals are considered as at risk of developing severe illness due to the COVID-19 virus (i.e. older persons, pre-existing conditions such as high blood pressure, heart disease, lung disease, cancer or diabetes) [1,6]. There is also non-peer reviewed anecdotal evidence that blood type may play a role in COVID-19 infection risk, with less apparent risk for blood type O [10]. If you are in one of these categories you might consider reaching out to your healthcare provider and discussing the use of hydroxychloroquine as a prophylactic against the COVID-19 infection. If you happen to be a person with a lung disease be sure to have your Rx medications refilled and readily available.
- If you are experiencing the symptoms associated with the COVID-19 you will likely need access to some of the following: a decongestant, a cough suppressant, an expectorant, a pain medication, and a means to keep your airways open (i.e. albuterol inhaler). This is where your health care provided needs to be proactive so you can stop the COVID-19 infection on the front line. One of the

primary reason patients end up in a hospital is because their breathing is impaired, the same reason they could end up intubated with a ventilator. Make sure to speak to your healthcare provider regarding the potential use of an albuterol inhaler (or similar) to keep your airways open and keep inflammation in the lungs under control. Allowing inflammation in the lungs to progress will likely end in a trip to the hospital or worse.

- You have to be able to sleep to allow your immune system to function optimally. You're not going to be able to sleep if you're coughing. Elevating your upper torso while in bed (i.e., head-of bed elevation, 30^o) will likely help abate coughing to a degree. With that said an over the counter cough suppressant may help. Once again, here is where your health care provider can assist, ask for an antitussive that has codeine for the purpose of cough suppression at night.
- During the day when you are awake would be a good time to use an expectorant to help empty the respiratory regions of accumulated phlegm. If you use an expectorant at night it may be counterproductive to easing a cough, which in turn may lead to lost sleep.
- Most products like Nyquil or Dayquil contain acetaminophen as a pain reliever and fever reducer. A fever is one the primary mechanisms that helps eliminate bacterial or viral infections in the body [11], so speak to your health care provider regarding the use of acetaminophen in this regard. Further, acetaminophen use has been linked to severe liver damage [12], make sure to mention if you have compromised liver function when you discuss acetaminophen use with your healthcare provider.
- You need to stay hydrated and maintain a sound diet details of which are described elsewhere [13]. However, in times of illness as in physical activity, metabolism rises thus requiring an elevation in fuel sources. When feeling ill, there is the tendency to not eat which decreases our cells ability to fight infection as fuel sources are diminished.
- Attempt to engage in light exercise like walking (~20 to 60 minutes per day). Physical activity leads to increased circulation of white blood cells, which are the immune systems weapon against infection [14].
- In addition to handwashing and social distancing, wearing of a mask has become common practice worldwide. Ideally, a N-95 mask or equivalent should be worn, if such a mask is not available, placing a barrier between your nose and mouth and the outside world is an additional strategy that can be used to help thwart potential infection and as of 4.4.2020 is now advised by the CDC [6]. Substituting contact lenses for glasses may reduce the probability of touching eyes and thus reduce the chance of infection. Similarly glasses can help reduce the probability of transmission through the eyes. Some evidence supports the likelihood of transmission through the eyes [15] so wearing of protective eyewear should also be adopted. It should be noted that whilst use of personal protective

equipment is advised (i.e. N-95 mask), this should not be utilized if there is a shortage of equipment and it is used at the expense of supplying higher risk individuals, such as older individuals, those with decreased immunity, frontline medical personal or other staff with considerably higher risk of infection.

- Recent research has suggested the COVID-19 virus can survive for a long time on many different types of surface. Research has shown viable virus detected on stainless steel and plastic for up to 72 hours, though in this particular study the virus did not last on cardboard for more than 24 hours [16]. Wiping counter tops, door handles and grocery cart handles before touching these surfaces can help decrease viral spread. A key to remember is not to touch your face after contacting a surface. Commercial anti-viral wipes and sprays as outlined by the CDC will be effective in this regard [17]. Likewise, a 1/3 cup bleach per gallon of water is also effective as a disinfectant [17].
- Online delivery is becoming the norm and most items arrive at your doorstep in a cardboard box. In transit, the cardboard box can pass through the hands of dozens of people and contact hundreds of surfaces on its way to your home. A suggestion based on the above research would be to leave the box in your garage away from human contact for at least 24 hours prior to opening.
- Since the research indicates that the virus can survive on metal and plastic for up to 72 hours, caution should be used when shopping. Individuals who wear gloves protect themselves against the virus on their skin however hypothetically if you touch something with the gloves, you can potentially spread the virus from item to item that you come in contact with just as you could with your hands. Caution would suggest before you open your car door and load all your groceries in the vehicle or touch a steering wheel with those gloves, that you remove them and/or sanitize them with hand sanitizer. It should be noted that most personal protective equipment is designed to be single use only.
- Using bleach wipes to wipe down your plastic container after you have arrived home would also be a preventative measure to help prevent COVID-19 spread. Plastic milk containers for example could potentially carry the virus from the cart through your hands to the car and into your home.
- In short, although the research is in its juvenile stages at this point, we must all assume the worse and that transmission can occur in many ways. Thus, we need to take countermeasures to protect ourselves when we make contact with any object or surface. The shear speed at which the virus has spread globally suggests there are several means of transmission yet to be verified and/or identified

II. SUMMARY

Preventative and therapeutic measures are required to both flatten the COVID-19 infection curve and minimize the death rate associated with this highly infective respiratory illness. Good personal hygiene and self-distancing are effective measures to minimize risk and early intervention with your health care provider are prudent to maximize survival. This article expanded on preventative and therapeutic measures suggested by the WHO and CDC. Our goal was to provide additional information that may help individuals strategically fight the COVID-19 pandemic on a personal level. With that said, if you believe you have contracted the COVID-19 virus seek the advice of your healthcare provider as soon as possible.

III. CONFLICTS

The authors have no conflicts of interest regarding their comments.

REFERENCES

- [1] World Health Organization. Coronavirus disease (COVID-19) Pandemic. <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>. Downloaded: 4.2.20
- [2] WHO Director-General's opening remarks at the media briefing on COVID-19 - 3 March 2020. <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19-3-March-2020>. Downloaded: 4.2.20.
- [3] Instituto de Salud Carlos III (ND). Situación de COVID-19 en España. <https://covid19.isciii.es/>. Down loaded: 4.4.20.
- [4] New COVID-19 Forecasts: US Hospitals Could Be Overwhelmed in the Second Week of April by Demand for ICU Beds, and US Deaths Could Total 81,000 by July (2020, March). Institute for Health Metrics and Evaluation. <http://www.healthdata.org/news-release/new-covid-19-forecasts-us-hospitals-could-be-overwhelmed-second-week-april-demand-icu>. Down loaded: 4.2.20.
- [5] USNEWS (2020, March). Navy Hospital Ship Deployed to New York to Help Hospitals. <https://www.usnews.com/news/best-states/new-york/articles/2020-03-18/new-york-emergency-rooms-brace-for-surge-of-virus-patients> Down loaded: 4.2.20.
- [6] Centers for Disease Control and Prevention. Coronavirus Disease 2019 (COVID-19). <https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/world-map.html>. Down loaded: 4.2.20.
- [7] Namendys-Silva, S. A. (2020). Respiratory support for patients with COVID-19 infection. *The Lancet Respiratory Medicine*, 8(4), PE 18.
- [8] Pugin J, Auckenthaler R, Lew DP, Suter PM. Oropharyngeal Decontamination Decreases Incidence of Ventilator-Associated Pneumonia: A Randomized, Placebo-Controlled, Double-blind Clinical Trial. *JAMA*. 1991;265(20):2704–2710. doi:10.1001/jama.1991.03460200084041.
- [9] Muscedere, J. G., Martin, C. M., & Heyland, D. K. (2008). The impact of ventilator-associated pneumonia on the Canadian health care system. *Journal of Critical Care*, 23(1), 5-10.

- [10] Zhao, J., Yang, Y., Huang, H. P., Li, D., Gu, D. F., Lu, X. F., ... & He, Y. J. (2020). Relationship between the ABO Blood Group and the COVID-19 Susceptibility. *medRxiv*.
<https://www.medrxiv.org/content/10.1101/2020.03.11.20031096v2>.
 Down loaded: 4.4.20.
- [11] Eccles, R. (2005). Understanding the symptoms of the common cold and influenza. *The Lancet infectious diseases*, 5(11), 718-725.
- [12] US Food and Drug Administration (2009). Acetaminophen: Avoiding Liver Injury.
<https://www.fda.gov/consumers/consumer-updates/acetaminophen-avoiding-liver-injury>. Down loaded: 4.2.20.
- [13] U.S. Department of Health and Human Services and the U.S. Department of Agriculture (2015). 2015-2020 Dietary Guidelines. <https://health.gov/our-work/food-nutrition/2015-2020-dietary-guidelines>. Down loaded: 4.2.20.
- [14] U.S. National Library of Medicine (ND). Exercise and immunity. <https://medlineplus.gov/ency/article/007165.htm>. Down loaded: 4.2.20.
- [15] Lu, C. W., Liu, X. F., & Jia, Z. F. (2020). 2019-nCoV transmission through the ocular surface must not be ignored. *The Lancet*, 395(10224), e39.
- [16] Van Doremalen, N., Bushmaker, T., Morris, D. H., Holbrook, M. G., Gamble, A., Williamson, B. N., ... & Lloyd-Smith, J. O. (2020). Aerosol and surface stability of SARS-CoV-2 as compared with SARS-CoV-1. *New England Journal of Medicine*.
- [17] Centers for Disease Control and Prevention (2020, April). Cleaning and Disinfection for Community Facilities.
<https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/cleaning-disinfection.html>.
 Downloaded: 4.3.20.

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