

ZORNIO CAMPAIGN COVID-19 PANDEMIC RESPONSE

STATEMENT OF PROBLEM:

The novel identification of a seventh coronavirus in December of 2019 in Wuhan, China has sent shockwaves through international medical communities. Now publicly identified as COVID-19 (SARS-CoV-2 in scientific literature) the virus causes mild to severe respiratory illness in humans (5). With well over 500,000 confirmed cases and over 21,000 deaths globally in mere months (6, 10), scientists and public health experts have acknowledged the virus can no longer be contained and are therefore turning to measures to slow transmission rates to reduce deaths.

WHY DO WE NEED TO SLOW DOWN COVID-19?

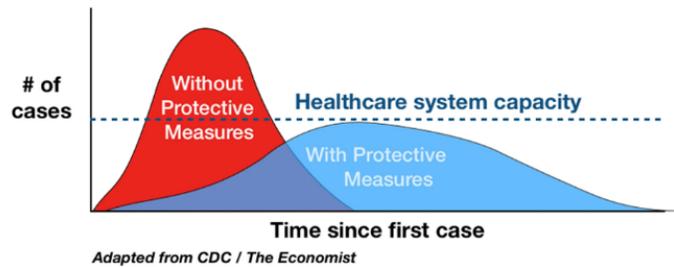
As COVID-19 is a new virus much research is still underway. However, what we are learning from initial studies reveals high potential for rapid transmission (especially due to a high rate of asymptomatic carriers coupled with latency of symptom onset) and a high rate of hospitalization. One report estimates ~14% are severe cases which require hospitalization (2), while other reports demonstrate up to 20.3% of cases (3), many of which will require live-saving mechanical assistance (e.g. ventilation) and intensive care unit (ICU) stays. Unfortunately, this potent combination results in COVID-19 placing great strain on healthcare systems which is causing death rates to increase dramatically. For example, Italy’s death rate has soared to a staggering 7.2% of cases due in part to a lack of live-saving resources (4). In mere weeks the country has reported over 7,500 deaths. Other studies demonstrate up to 13.9% death rates for patients with polymorbidities within confirmed and recovered cases. (3) At the current pace of COVID-19, experts estimate U.S. death tolls could approximate 195,000 people by the end of this year alone (uncertainty rate of 80% leading to as “few” as 19,000 and up to 1.2 million deaths in America by end of year). (1)

As evidenced above, COVID-19 is primarily a capacity and resource problem. In the United States there are estimated to be fewer than 100,000 ICU beds and 160,000 ventilators nationwide, with stockpiles estimated to be <20,000 (7, 8, 11 seen at right). Here in Colorado alone we could be as many as 7,000 ventilators short (9). With a population of over 325 million in America, a “moderate” outbreak in the U.S. (some slowing of transmission) might require as many as 64,000 ventilators, while a more extreme outbreak (no slowing of transmission) could require up to ~800,000 ventilators, far exceeding capacity. Patients without ventilators are at extremely high risk of death, and if no action is taken to slow down the spread of COVID-19 even a best-case scenario is debilitating to our healthcare system and could be responsible for adding tens to hundreds of thousands of additional deaths. Moreover, not only would this far exceed our hospital and device capacities for COVID-19 response, but hospitals overwhelmed

Total Number of All U.S. Hospitals	6,146
Number of U.S. Community ¹ Hospitals	5,198
Number of Nongovernment Not-for-Profit Community Hospitals	2,937
Number of Investor-Owned (For-Profit) Community Hospitals	1,256
Number of State and Local Government Community Hospitals	903
Number of Federal Government Hospitals	259
Number of Nonmedical Psychiatric Hospitals	616
Other ² Hospitals	103
Total Staffed Beds in All U.S. Hospitals	924,107
Staffed Beds in Community ¹ Hospitals	792,417
Intensive Care Beds ³ in Community Hospitals	
Medical-Surgical Intensive Care ³ Beds in Community Hospitals	46,823
Critical Intensive Care ³ Beds in Community Hospitals	14,439
Neurological Intensive Care ³ Beds in Community Hospitals	22,860
Pediatric Intensive Care ³ Beds in Community Hospitals	5,131
Burn Care ³ Beds in Community Hospitals	1,198
Other Intensive Care ³ Beds in Community Hospitals	7,253
Total Admissions in All U.S. Hospitals	38,263,949
Admissions in Community ¹ Hospitals	34,251,159

by COVID-19 would be rendered unable to manage ongoing care capacities further increasing health impacts and ultimately death rates for Americans. In summary, current models predict that without significant measures to slow the spread of COVID-19, up to 1.2 million Americans could die from the disease this year alone, largely due to overwhelmed healthcare systems and therefore insufficient equipment and life-saving care.(1)

Efforts made to slow transmission rates are referred to as “flattening the curve” (12, graphic at right). This speaks to how, without slowing transmission of COVID-19, the initial peak of cases is very high and far exceeds our medical capacities which, as outlined above, could result in tens to hundreds of thousands of



increased deaths in America alone. However, with measures to slow transmission the cases can be reduced and spread out over the course of a longer time period, freeing up resources and decreasing strain on hospitals and the healthcare system at large, ultimately reducing death rates. It is critical to note that such “flattening of the curve” does not mean COVID-19 goes away, instead the goal is to spread infection rates over a longer period of time to address the capacity and resource problem. Inherently, this implies a longer time period of infection to achieve improved outcomes. Given this, policy measures should take into account an extended timeline for impact of slowing transmission measures of one year or more as multiple waves of infection are anticipated by most experts (1).

SUMMARY OF GOALS:

Overall goals of policy makers to address COVID-19 should therefore be, 1) work to significantly slow the spread of transmission of COVID-19 domestically and internationally to reduce strain on healthcare systems and therefore lower death rates, 2) rise to meet the growing resource problem with public-private partnerships to meet demands as needed to fight the pandemic, including PPE, ventilators, ICU beds and more, 3) mitigate economic and other impacts caused by the severe measures required to slow the transmission of COVID-19 both in immediate and longer term, and 4) improve our preparedness plans for future outbreaks and pandemic response to reduce impacts in the long term.

CHALLENGES:

Addressing COVID-19 in the United States (and internationally) comes with a series of unique challenges at present, not the least of which is that the U.S. is not adequately equipped for pandemic preparedness due to the Trump administration’s systematic dismantling and defunding of the Center for Disease Control and Prevention (CDC), National Security Council (NSC), the Assistant Secretary for Preparedness and Response (ASPR) and more. Additionally,

the U.S. lacks fundamental healthcare infrastructure compared to other developed countries, resulting in ~30 million uninsured Americans and millions more underinsured with reduction of care access increasing economic burdens on vast majorities of the population. The U.S. also does not have guaranteed paid sick leave, forcing sick persons to continue working to maintain economic stability thereby increasing transmission, and of course, the U.S. currently has a dramatic wealth gap which again exacerbates economic challenges for those not at the top economically. Lastly, the U.S. has a high rate of polymorbidities due to lifestyle and lack of preventative healthcare, which we are finding leads to higher death rates in COVID-19.

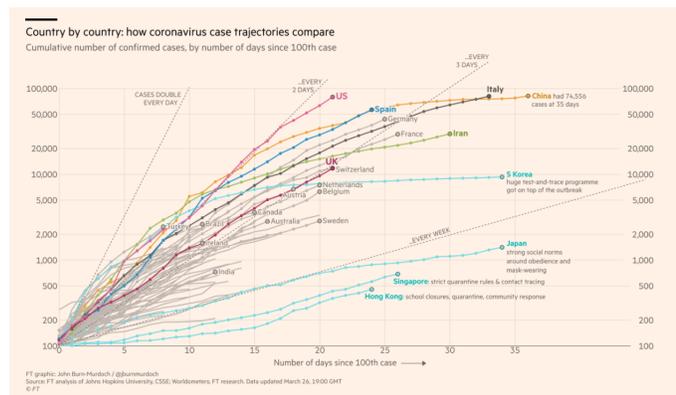
Most importantly, the current administration has refused to adhere to evidence-driven protocols and expert-driven response, making a strong and rapid response to COVID-19 extremely challenging (9). The impacts of such decisions are already exemplified by the U.S. now demonstrating one of the most dramatic exponential growth curves (graph by <https://www.ft.com/coronavirus-latest?fbclid=IwAR2ejhe9DF31MbUIPI1AgThEPTIjeCrW8Jlp7fJhv5MUmlmAF1J1XDtnEME>), outpacing even Italy and China, despite having arguably more

time to prepare. At present, our cases are doubling nearly every two days. This lack of federal cooperation has slowed the U.S. response and placed us on a worsened path for the foreseeable future, extending both the health and economic impacts on Americans, and has heavily placed the burden of response on local and state governments as well as scientific and technological communities.

Given these challenges, the actions

recommended below for federal

implementation should be considered as actionable by entities other than the federal government whenever feasible (e.g. outbreak sourcing and tracking or equipment sourcing may fall to state governments or tech communities in lieu of federal support).



IMMEDIATE ACTIONS:

1. ORGANIZATION STRUCTURE: Vice President Mike Pence should be removed as charge and a Directorate for Global Health Security and Biodefense as part of the National Security Council (NSC) should be re-established. This is no longer a weeks to months issue, this will be a months to years event requiring ongoing monitoring and assessment. Established leaders in pandemic response should be supported by experts in epidemiology, virology, global health and economic policy and more. These should be the experts interfacing with the public regarding COVID-19 updates, including regular public briefings from the status of the outbreak directly from the Center for Disease Control and Prevention (CDC) and the Surgeon General, without interference from the White House.

2. SLOWING TRANSMISSION:

- a. A nationwide 14-day national Stay At Home (SAH) order. State governments have overridden stay-at-home city ordinances. Therefore, measures to ensure physical distancing must not be left to local governments, but rather be a federal mandate.
- b. Immediate funds to hospitals to meet needs.
- c. Temporary restrictions for all non-essential travel. (NOTE: This may assist with redistribution efforts as seen in 2.e. by securing a significant enough delay of resource needs in regions not yet affected)
- d. Rapid expansion of free testing capacities, inclusive of partnerships with industries, hospitals, laboratories and more. Focus on developing mobile and at-home testing is ideal. Once enough tests are available, particular efforts should apply to ongoing testing of all essential workers so as to further rapidly reduce transmission. A significant portion of COVID-19 cases are asymptomatic or mild causing many to be unaware they are infected, increasing transmission. Testing asymptomatic persons and following isolation protocols has been related to the slowing of spread of the disease in South Korea (4), as well as contact tracing efforts in Germany, both nations having been able to significantly reduce death rates as associated with COVID-19.
- e. Per above, patient contact tracing with isolation, and robust databases to monitor transmission in order to monitor developing hot spots for rapid response and containment. Use of advancing technologies like smart thermometers, contact mapping, diagnostic advances and mathematical modeling can serve to enhance efforts. To ensure adequate quarantines, efforts should be made to temporarily provide paid-for quarantine rooms using closed hotels, motels, etc. to isolate those unable to quarantine at home due to roommate, family, homelessness, work or other circumstances.
- f. Invokement of the Defense Production Act for necessary emergency resources such as PPE and ventilators -- this need is so timely and critical it absolutely should not be left to business or states to address, though they are rising to the challenge in many cases. This can also include facilitating tech communities to leverage open source designs to match needs by providing start up capital and purchase contracts. National database of emergency resources such as PPE, ventilators and more for rapid resource procurement and distribution/redistribution as possible. For areas that have not yet been hit, it could be possible with national SAH orders to reallocate a portion of resources from those care facilities to regions harder hit.
- g. For essential services that must remain open, careful attention and implementation of protocols to reduce pathogen spread should be instituted. Examples include providing temporary mobile hand washing stations placed at entrances (e.g. grocery stores and banks), clear guidelines to maximize social distancing protocols for both workers and patrons during operations, as well as additional cleaning steps that can be taken to reduce transmission on hard surfaces like doorknobs and cash registers. These should relate to standard contact, droplet, and airborne precautions. (2) Further, until testing is available for all essential employees, ongoing requirements of temperature monitoring per employee could help indicate and quickly remove asymptomatic yet positive COVID-19 infections from the essential workforce. (10)

- h. Immediately deploy measures to increase front line healthcare worker reserves by leveraging military, reserve, nursing & medical students and more. Note, as there are documented increased risks for patients with comorbidities and those over ~60 years old, screening should apply and leveraging retired workforces should be avoided as much as possible. Waivers should not be granted except in dire circumstances due to the increased likelihood of hospitalization thereby furthering exacerbation of scarce resources. (Currently an estimated 1 in 10 cases of COVID-19 are healthcare workers)
 - i. Immediately increase ICU bed capacity, ideally with negative pressure isolation (2), and temporarily postpone all elective surgeries along with a 12-week delay for non-essential in-person check-ups (many could be moved to telemedicine as possible).
 - j. Strong efforts toward accurate and timely public communication on COVID-19 via SMS delivery and free public service videos to explain why such extreme measures are being taken, and what people can do to help reduce the spread of pathogens.
 - k. Creation/expansion of free mental health digital programs that include individual and family therapy, exercise videos, mindfulness techniques, and more through a series of freely available videos to help manage the mental health impacts of SAH measures.
 - l. Efforts to reduce pathogen transmission post-mortem by providing appropriate PPE and guidelines for body removal/transport specialists and mortuary workers. Postponement of funerals gatherings will be necessary, in addition to rapid expansion of safe morgue storage capacities.
 - m. Invest heavily in research for COVID-19 to accelerate the development of vaccines and treatments and to increase overall understanding to best mitigate transmission to handle subsequent waves in the coming months and possibly years.
 - n. Work internationally with key organizations (e.g. World Health Organization) and leaders to come to mutual agreements on COVID-19. Global issues require global solutions and cooperation.
3. EASING ECONOMIC BURDEN:
- a. Amend the Project BioShield Act to explicitly state a COVID-19 vaccine will be eligible for inclusion in our Strategic National Stockpile of biological countermeasures. It is likely that such a vaccine would already be eligible for inclusion, but the additional confidence of a guaranteed market will help speed development of a vaccine and other treatments.
 - b. Mandate all front line workers should receive hazard pay and paid sick leave.
 - c. Expanded unemployment services, inclusive of freelance and gig employees.
 - d. Ensure food/water/electricity/internet/phones etc. are all basic necessities that remain on regardless of payment.
 - e. Close schools with careful attention to meals and childcare; assistance for transition online; secure students and teachers with laptop and internet access.
 - f. Support for initial components of H.R. 748 (116). NOTE: In some case we would like to continue or extend as needed:
 - i. One-time payment of \$1200 to all adults making less than \$75,000/yr and \$500 per child, with incremental decreases in payment for those earning above that amount.

- ii. Suspension of payments for student loans until September 30th (would prefer this eliminate, not suspend)
- iii. Increase unemployment benefits by \$600/wk for four months, plus expansion of unemployment eligibility to self-employed (gig) and part-time workers.
- iv. Eligibility for unemployment benefits for those who have been forced to leave work to care for a family member (due to school closures, illness, etc.), have been advised to self-quarantine, or whose communities are enforcing stay-at-home orders (we would want to ensure this includes freelance and gig employees).
- v. Creation of \$100 billion health emergency fund, with \$65 billion going directly to hospitals.
- vi. Eliminates \$8 billion in medicare payment cuts to hospitals, and increases reimbursements for care of Medicare patients with COVID-19 by 20%.
- vii. 60 extension for payments on federally-backed mortgage loans, as well as barring any landlords holding federally-backed mortgage loans from evicting or charging fees for failure to pay rent for 120 days.
- viii. \$450 million toward the Emergency Food Assistance Program (would prefer to see expansion of qualifications as well)

4. LONGER-TERM ACTIONS:

- a. Continue to expand upon the Directorate for Global Health Security and Biodefense within the National Security Council (NSC) to prepare for future outbreaks.
- b. Defend the ACA while simultaneously working to achieve truly comprehensive and universal single-payer healthcare in the United States. This would help reduce economic burdens on Americans, improve health outcomes, and permit easier scalability in times of need. Expansion of age brackets and qualifications for medicare and medicaid programs coupled with a public option insurance are quick first steps to address the fall-out of high unemployment.
- c. A commitment of focus on global public health must be part of pandemic response preparedness in the future. Every nation must be ready and equipped to respond quickly to future outbreaks so as to reduce the likelihood of pandemics. This means that we need small or under-resourced nations to be part of the solution in the future.
- d. Restore the funds for pandemic response to the CDC that were cut by 80% under the Trump administration.
- e. Congress should fund the HHS Office of the Assistant Secretary for Preparedness and Response (ASPR) which serves as the bulwark between hospitals and health departments versus pandemic threats; last year HHS requested \$2.58 billion, yet Congress did not renew funding.
- f. Preparedness plans for interim and future should address business surge capacity plans for critical emergency supplies, using models self-implemented by companies like 3M. However, we cannot afford to leave this to business goodwill or we risk the same

types of shortages we are currently facing, making federal partnership and oversight part of the solution.

- g. Preparation for extended social distancing measures and multiple surges of COVID-19 throughout the next year and possibly longer until SAH orders and distancing measures are relieved. Americans should prepare for large gatherings and events to be virtual and more.
- h. Achieving universal broadband access as well as ensuring device access will be critical moving forward for both COVID-19 and many other 21st Century needs.
- i. Promote and reimburse for telehealth services wherever possible to avoid spread of disease among patients and health care providers.

SUMMARY:

These are but a handful of considerations that should have either already been implemented or should be implemented now/soon. For questions or comments please visit our website zornio2020.com for more information.

REFERENCES:

1. McAndrew, T. "COVID19-Expert Forecast-Survey5-20200316.pdf" (Mar 18, 2020) University of Massachusetts Amherst <http://works.bepress.com/mcandrew/2/>
2. Bouadma, L., Lescure, F., Lucet, J. *et al.* Severe SARS-CoV-2 infections: practical considerations and management strategy for intensivists. *Intensive Care Med* (2020). <https://doi-org.aurarialibrary.idm.oclc.org/10.1007/s00134-020-05967-x>
3. Rodriguez-Morales, A., Cordona-Ospina, J.A., *et al.* Clinical, laboratory and imaging features of COVID-19: A systematic review and meta-analysis. *Travel Medicine and Infectious Disease* (Mar 13, 2020). <https://doi.org/10.1016/j.tmaid.2020.101623>
4. Onder, G., Rezza, G. *et al.* Case-Fatality Rate and Characteristics of Patients Dying in Relation to COVID-19 in Italy. *JAMA* (Mar 23, 2020). doi:10.1001/jama.2020.4683
5. Coronavirus Disease 2019 (COVID-19), Center for Disease Control and Prevention (Mar 26, 2020). <https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/cases-in-us.html>
6. Coronavirus COVID-19 Global Cases by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU) https://coronavirus.jhu.edu/map.html?fbclid=IwAR2rW7cBIZ1RR7wngVssSOZR62JyER1F_ghhFOX5-Y56snLwv9NrTijNoBE
7. Fryer Biggs, Z. *et al.* "The Government's Secret Ventilator Stockpile is Nowhere Near Enough to fight Coronavirus", Center for Public Integrity (Mar 23, 2020) <https://publicintegrity.org/health/coronavirus-and-inequality/the-governments-secret-ventilator-stockpile-is-nowhere-near-enough-to-fight-the-coronavirus/>
8. Alltucker, K., Penzenstadler, N. "Too many coronavirus patients, too few ventilators: Outlook in US could get bad, quickly", USA TODAY (Mar 18, 2020) <https://www.usatoday.com/story/news/health/2020/03/18/coronavirus-ventilators-us-hospitals-johns-hopkins-mayo-clinic/5032523002/>
9. Miller, B. "'Furious' at federal lag in COVID-19 response, Colorado governor announces new restrictions & task force", Denver 7 (Mar 22, 2020) <https://www.thedenverchannel.com/news/coronavirus/furious-at-federal-lag-in-covid-19-response-colorado-governor-announces-new-restrictions-task-force>
10. Coronavirus Disease 2019 (COVID-19) Situation Report - 65, World Health Organization (Mar 25, 2020). https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200325-sitrep-65-covid-19.pdf?sfvrsn=2b74edd8_2
11. Fast Facts on US Hospitals, American Hospital Association. (2020) <https://www.aha.org/statistics/fast-facts-us-hospitals>
12. Roberts, S. Flattening the Coronavirus Curve. *The New York Times* (Mar 11, 2020) <https://www.nytimes.com/2020/03/11/science/coronavirus-curve-mitigation-infection.html?referringSource=articleShare&fbclid=IwAR2sXieE16pKaByp4EcSNdOwGutxoINN18GYoCjqPFaw4QDRtq960v-mYQQ>