

Not all heroes wear PPE: masking our unmasked heroes

By: Eman Hijab

He has a cough. An ominous silence ensued on the phone as I processed all of my fears, anxiety, and concerns. My brother, a third year internal medicine resident, has a cough. I hung up the phone with my mother knowing it was pointless to worry until the results of his COVID19 test would come back two days later, and yet my mind couldn't help but lead me into the darkness of the daunting, unknown *what ifs*. Forty-eight hours is a long time to reflect and during this time, I had many unanswered questions about how healthcare was being run in our country. Why is it that our healthcare workers, like my brother, are in a position where with each shift they take on the frontlines, they are risking the promise of returning home safely to their loved ones? If our best chance of beating a pandemic is by using the skills of our healthcare workforce, does it make sense that we have left them unprotected and vulnerable at this time? There's a lot we can learn from countries who have been successful, like Taiwan, or who are struggling, like Italy, when it comes to controlling the COVID infection. The first steps towards improving healthcare delivery in such pandemics comes with protecting the lives of healthcare workers while also allocating resources towards protecting high risk individuals. First, personal protective equipment (PPE) and virus testing production needs to be ramped up by employing companies to do so. Next, via questionnaires, a free phone app can better diagnose the risk for each individual. Finally, virus testing kits would be prioritized and sent to high risk individuals as identified by the questionnaires. This plan both identifies vulnerable individuals while reducing the disease burden within ERs and hospitals and ultimately improving healthcare delivery.

The first step in improving healthcare delivery starts with having enough resources to tackle the issue at hand, which includes PPE and virus testing kits. The shortage of PPE needs to be mitigated in order to ensure the safety of healthcare workers and reduce the transmission of nosocomial infections. Italy has gained critical notoriety for its response to the pandemic, and it has one of the highest total recorded COVID cases. From Italy, we can see the importance of increasing PPE production to support patients that healthcare workers are taking care of; 8920 Italian healthcare workers were found to be infected as of March 30, 2020, and in the Italian region of Lombardy, SARS-CoV-2 became largely a nosocomial infection¹. A lack of adequate PPE has been cited as part of the blame for the high numbers of Italian healthcare workers who have been affected⁵. Not only does this pose an increased risk of virus transmission to patients but it also leads to an irreparable loss of medical personnel fighting the virus at the forefront. In contrast, Taiwan is a country gaining praise and acclaim for their handling of the virus; Taiwan has a population of 23 million but only 393 confirmed COVID19 cases and 6 deaths³. Analyzing Taiwan's extensive plan, it reveals that early on, the country diverted military and government resources towards ramping up PPE production. On January 22, the Taiwanese Ministry of Economic Affairs stated that daily local mask manufacturing capability of 2.44 million units was surpassing the local demand of 1.3 million per day⁴. By February 17, the daily mask output was 5 million⁴. Increasing mask production afforded Taiwan not only the luxury of setting masks aside for healthcare workers but also distributing them to stores for sale as well as to schools in order to provide protection to children. Furthermore, PPE is needed to combat the other critical supply limitation seen in this pandemic which is that of virus testing kits. One major limitation of being able to roll out more PCR testing kits is the shortage of supply of chemicals and other equipment needed to be able to increase production which needs addressing, but equally as concerning is that the limited supply of PPE for technicians handling specimens itself is also a hindrance for increased testing production². Testing kit production as well as supplies needed to make testing kits needs to be ramped up by diverting both private sector companies and government resources towards production. Ideally, there are enough testing kits for every house in America to have one delivered and enough tests within hospitals to perform on suspected patients. Even amidst being in the eye of the storm,

a small town in Italy of Vò managed to eradicate the virus just two weeks after the first case had been detected in the third week of February by testing all 3300 residents, asymptomatic or not, and therefore allowing the COVID positive patients time to self-quarantine⁶. This example also elucidates how to combat the challenge that COVID presents which is that many people can be asymptomatic carriers; by the time the first symptomatic case was diagnosed, 3% of the population had already been infected but most were asymptomatic which further elucidates the importance of testing asymptomatic and symptomatic people to reduce virus transmission⁶. By examining the successes and the areas of improvement of different countries, we can learn the importance of ramping up PPE and virus testing kit production is imperative towards improving healthcare delivery amidst any global pandemic and particularly COVID and this is a feat that can be accomplished by deploying companies with the infrastructure already in place to do so.

Once PPE and virus testing kit production can be increased, we can begin to address how to increase healthcare delivery to vulnerable populations while reducing disease burden within hospitals, which can be accomplished using a free phone app, a call-in hotline service, and an online medical chat bot. The advent of technology applications to medicine has revolutionized the field, and during this pandemic this is an area of untapped boundless potential to reduce disease burden. France has implemented the use of Covidom, a free phone app that allows monitoring of suspected COVID patients by administering medical questionnaires once or several times a day and through this app, 300 app users were identified as needing hospitalization and were subsequently hospitalized before their condition became critical⁷. Since the most vulnerable demographic right now appears to be older persons who may not be as technologically savvy, a call in hotline service can be employed with trained medical professionals, including medical students, triaging which patients should come in and which should stay home to safely quarantine. Developing an online medical 'chat bot' can also help to reduce the workload that may come with a hotline service. Once high risk patients have been identified, they would either be recommended for hospitalization based on severity or testing kits would be mailed to them to test them and anyone living with them. If the test comes back positive, they would be closely monitored and asked to follow strict self-quarantining measures. If a high risk individual is unable to perform the testing on themselves, local healthcare workers, geared up in full PPE, would be deployed to visit the patients' homes and conduct the testing. Ultimately, the goal is to reduce the amount of patients entering the hospital in an effort to prevent virus transmission amongst patients, preserve PPE, and also to protect our healthcare workers by limiting exposure.

Finally, it cannot be forgotten that there are many populations, such as the homeless, for whom this plan would not be feasible, and they are not to be overlooked. A subset of trained medical professionals would be deployed to shelters in order to perform adequate testing and establish effective quarantine measures, such as by utilizing nearby empty college dorms or empty hotel rooms. Every life lost in this pandemic is a tragedy, and it is our responsibility to care an equitable playing front for every single individual to be tested and treated. However, nothing can be accomplished if we don't have the proper equipment and the skilled task-force of healthcare workers needed to combat the pandemic.

My brother's test came back negative. We all breathed a short lived sigh of relief before the foreboding truth hit us once more; the next test may produce a different result, and there will be a next time so as long as our healthcare workers are sent naked into the abyss of the many unknowns of this virus, unprotected against the challenges it poses. My mother, a pediatric ICU intensivist, is being asked to reuse masks and gowns, while my brother dons a homemade cloth mask sewn by my grandmother to his shift at work. It leaves me wondering: does being a physician really mean being a martyr? Or can we do more to ensure that the next foot healthcare workers set out their homes comes with a guarantee of their return? This pandemic has taken a massive physical and mental toll on everyone, especially those at the frontlines, and as we reflect on what more can be done, we must ensure a tragedy of this magnitude never repeats itself again by learning from our mistakes and those of others.

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