Lack of Testing Seals Our Fate

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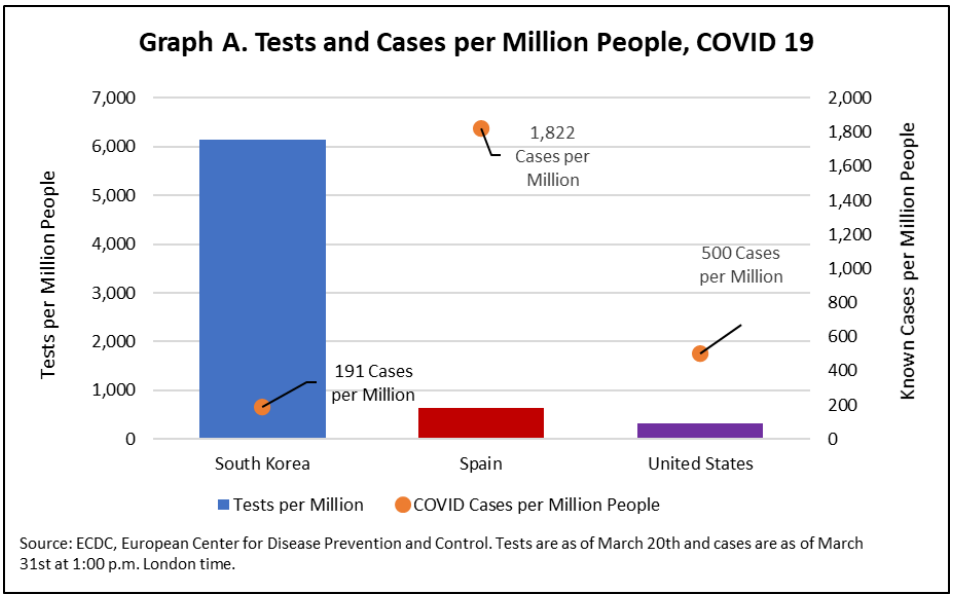
Most people do not realize that the greatest contributions to life expectancy and quality of life have been very simple: clean water, sanitation, prevention through vaccinations, and quarantine. But you have to know when someone has a disease in order to isolate them. We have a considerable advantage nowadays in terms of sophisticated testing as well as the ability to test broadly. We missed that boat and it is costing us dearly – not only in morbidity and mortality, but also in economic terms. Time is adding to the human death toll, but it is also setting us up for a long, hard economic downturn that will not entail a "V-shaped" recovery. Too many businesses will cease to exist, and too many consumers and businesses will be reticent to resume their usual spending patterns. We probably could not have avoided the COVID pandemic, but we could have mitigated the magnitude of the disaster. Broad-based testing still has great value in diminishing further losses.

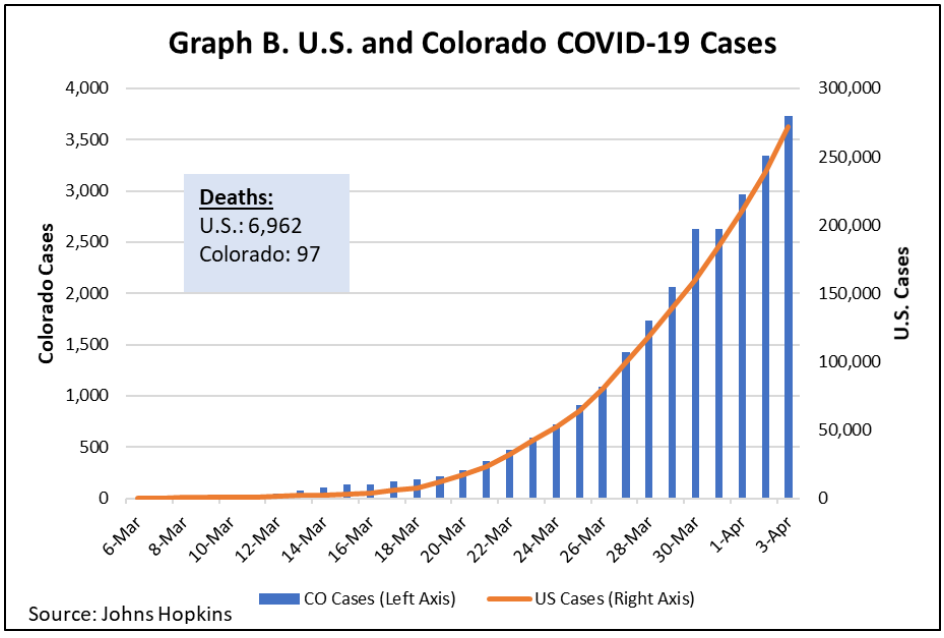
Currently, an infected person infects on average 2 more people. This is the replication rate (Ro) and any rate above 1.0 means the disease will continue to spread because you have more than one person becoming infected with each singular COVID case. Currently, the U.S.'s rate is one of the highest in the world with Ro that is about 2.5 translating to a doubling of cases every 3-4 days. We must get Ro to less than 1.0 in order to stamp out the disease. This isn't just for the sake of our overall public health; it directly translates into our economic wellbeing. We don't have to choose between the two: one translates into the other.

Any public health student will tell you that identification of an infectious disease is where everything starts. There are two types of testing that would greatly expedite our progress. The first is the swab test for COVID itself, but at a much wider scale than what we have been doing. Large-scale random testing in South Korea showed the highest proportion of cases (30%) in the 20-29 age cohort. This is a truly evil disease that hides in already resilient-minded young people who are reinforced with the message that COVID will not make them very sick or will just pass through them asymptomatically. The evil extends to how incredibly easy it is to pass the disease onto others; even compliant individuals can transmit the disease 3 days after touching a shared surface. If we had extensive testing available, we could identify symptomatic and asymptomatic people, we could trace their contacts, and knowingly isolate people with active virus.

Many people say countries like South Korea are much smaller and it is easier for them to broadly test. I don't buy it. As the world's leader in pharmaceutical and university research, there is no excuse for us not to have a handle on this. Instead we have had such shortages in tests that most regions have had to prioritize health care workers, first responders, elderly care residents and those who "feel sick." What about the 30% of the infected who are young patients without symptoms? Even with shelter-in-place orders, these individuals are going out for essential activities, sometimes working in essential jobs and often living in our own homes. We are compromising our ability to mitigate the disease and the concomitant economic fallout because we can't perform tests that were created in January by the World Health Organization?

We have all heard by now that a rapid increase in caseload overwhelms the health care system and that is the main reason why case mortality rates (# of deaths/# known cases) are higher in regions with a high Ro. The greater the level of contagion, the faster and harder the disease hits, and the less likely it is that someone will get an ICU bed (and ventilator) when they need it. As of March 20th, Spain had tested 646 people per million with a case fatality rate of 8.3%. South Korea had tested 6,148 people per million with a case fatality rate of 1.6%. At that time, the U.S. had conducted 314 tests per million (Graph A). Our case fatality rate was 1.0% on March 20th, but it has increased to 2.5% as of April 3rd because of the burden on the health system. Testing in the U.S. has increased in the last couple of weeks, but that many more people are now infected, and those individuals are infecting others (Ro). That is the law of exponential increase (Graph B). It is true we missed the golden opportunity to avert the magnitude of the disaster, but we should still be focused on testing. Ubiquitous testing will allow us to identify and isolate both symptomatic and asymptomatic cases and that is the only way to bring down Ro and begin to resume economic activity. The longer cases continue to increase, the longer we must follow shelter-at-home orders, and the harder it is to dig ourselves out of the economic spiral once we are passed the disease.





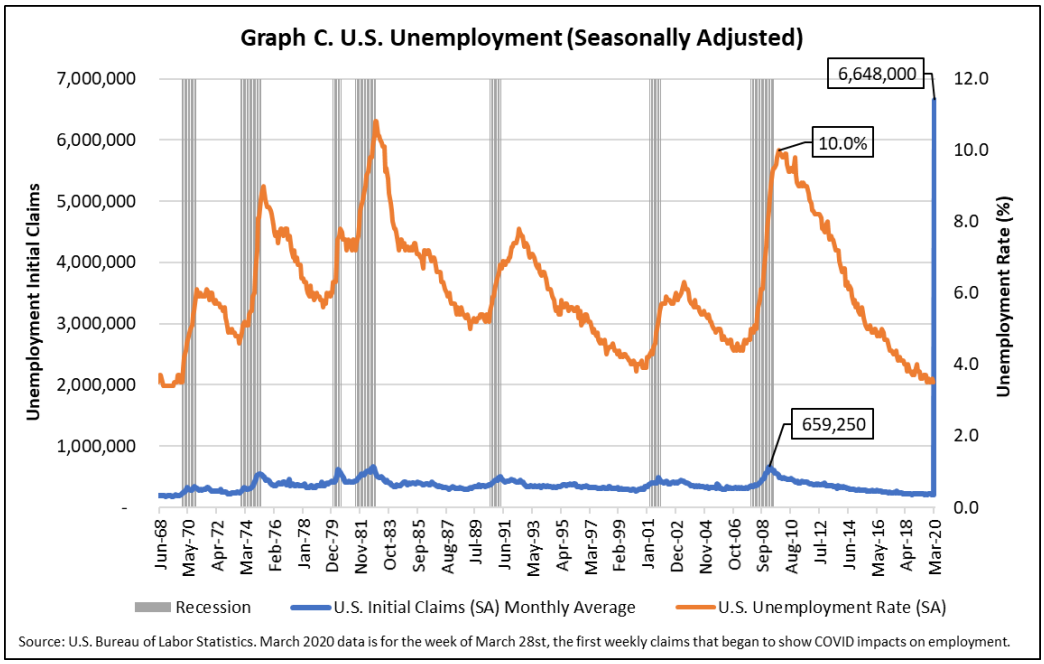
The other type of testing that would help is serologic testing, which tests for antibodies in people who have already been infected and recovered. We can phase recovered health care workers back to work to safely care for our most critically ill. We can likewise phase in immune workers to begin to add back to the

broader labor pool. This is all assuming that the few observed cases of reinfection remain rare. At some point if this disease continues, we may start to face shortages in necessities other than those related to the provision of health care. Workers are needed for food production, transport and other essentials. Knowing the level of infection and immunity allows us to begin to ease social distancing measures, to keep hospital caseloads and mortality rates low, to increase (consumer) confidence that the disease is "under control," and to slowly but safety get the economic cogs in motion. I'd rather start turning on the lights with a dimmer than be completely in the dark.

It is true that we have a more decentralized political and health care system, but we also have provisions in place like the Defense Production Act and the Emergency Use Authorization (EUA). The EUA is an existing provision of the Food and Drug Administration's statute cutting through the usual protocols to develop new drugs or tests in times of emergency. There are various layers of complexity to this such as the shortage of certain components of the tests as well as the swabs that are needed. These special, federal government provisions enable the drastic ramp up (albeit imperfect) of the requisite production lines. Had this been invoked sooner, we just might be on the other side of the curve. Lamenting the past will not change it but given that many U.S. regions are still experiencing replication rates greater than one, identification of COVID is still one of our best weapons. It's not too late.

Widespread testing also buys time to develop and widely distribute a vaccine and/or treatment. It's a gamble that this will occur within six months or even a year, but we do have the advantage in the last 80-100 years of rapid and nearly miraculous medical breakthroughs. A protocol with widespread testing, contact tracing, and quarantine also writes the playbook for a fall resurgence if we don't have a vaccine or treatment by then (or it's not available to everyone).

Let us now shift attention to the employment and economic situation. Graph C shows that the pinnacle of unemployment claims during the Great Recession was 659,250 while the peak unemployment rate was 10.0%. The weekly unemployment claims last week broke through all previous records at 6.6 million. The correlation between claims and the unemployment rate from 1968 to February of this year is high at 0.81. A 1.0 correlation means they perfectly correlate. With a simple algebraic calculation, the 6.6 million unemployment claims extrapolate to virtually no employment in the U.S. starkly telling us the dire nature of the situation. Thankfully, there



have been swift and extensive monetary and fiscal policies that should help moderate this astronomical, hypothetical calculation. My hope is that they are enough to keep small and large businesses from massive layoffs. We also have many more people than even ten years ago able to work from home (including distraught economists). The Bureau of Labor Statistics in 2016 calculated that about 30% of the U.S. workforce could work from home although I am guessing many companies have made Herculean efforts in the past couple of weeks to continue as much work as they possibly can through remote means. We won't know exactly how effective the federal, state and local policies have been or how many workers have and can continue to be successfully transitioned to remote work until the official unemployment rates are released in coming months. What worries me is that the longer this disease shuts us down, the more difficult it will be for businesses and government to withstand the blow.

With these major job losses, imminent personal and business bankruptcies, and an historic fiscal stimulus that further balloons the national debt ($2.2 trillion, or 10% of annual GDP), the question has arisen: should we just stare COVID in the face and allow the disease to "run its course?" Wouldn't this create "herd immunity" where most people become immune and the pestilence gets stamped out the way most pandemics have throughout human history? The incongruency in the U.S. is that we are instilling social distancing and other (helpful) measures, admittedly self-inflicting unprecedented economic hardship but not alongside the widespread testing that much more efficiently halts the (physical and economic) disease in its tracks.

An aggressive public health strategy and severe economic pain are not mutually exclusive. A rampant disease still has ramifications to the economy in the short and medium run. High death rates from highly infectious diseases still disrupt supply chains and spook consumers. Consumer sentiment experts are saying that the impact on consumer spending will last two to three times longer than the virus itself. All the pieces fit together so we must decisively undercut the disease by severing its replication rate. And given the stealthy, diabolical transmission and wildfire spread across the globe, we should also be working in concert with other nations and international health organizations to aggressively instill this strategy across nations. We may not have set the stage for reducing the deficit (while in good times), for promoting international cooperation, or preparing for a pandemic, but that is part of our past and we cannot change it. Let our future entail listening to medical and epidemiological experts so we can effectively plan and execute a (disease) exit strategy. If we don't instill a rigorous, broad-based and sustained protocol for testing and containment of the disease, not only can it more easily resurge, we won't have the framework in place to quickly stamp it out again in the absence of vaccines and/or treatments. This makes it more likely that we will have a W-shaped "recovery" or even an L-shaped, protracted economic calamity. We must be at least one step ahead of this disease.

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