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In the eye of the COVID-19 storm: searching for some knowledge and understanding

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This is a collaborative piece written with contributions from the SCALE team of Chief Advisors.

We don't really know that much about Coronavirus and the current state of infection across the globe. Everyone is getting the same information – flatten the curve, don't overwhelm the healthcare systems, practice social distancing. But what exactly is going on? What learning and associated actions are going to come out of this global crisis? The team at SCALE, made up of some of the best operators across the U.S. healthcare industry, has formalized what we think we as a public should know and predictions for how this crisis will impact the industry moving forward.

First, let's take a look at what we don't but should already know. The key question on everyone's mind is how deadly is COVID-19? To answer this question, we would need more than we have been provided to date.
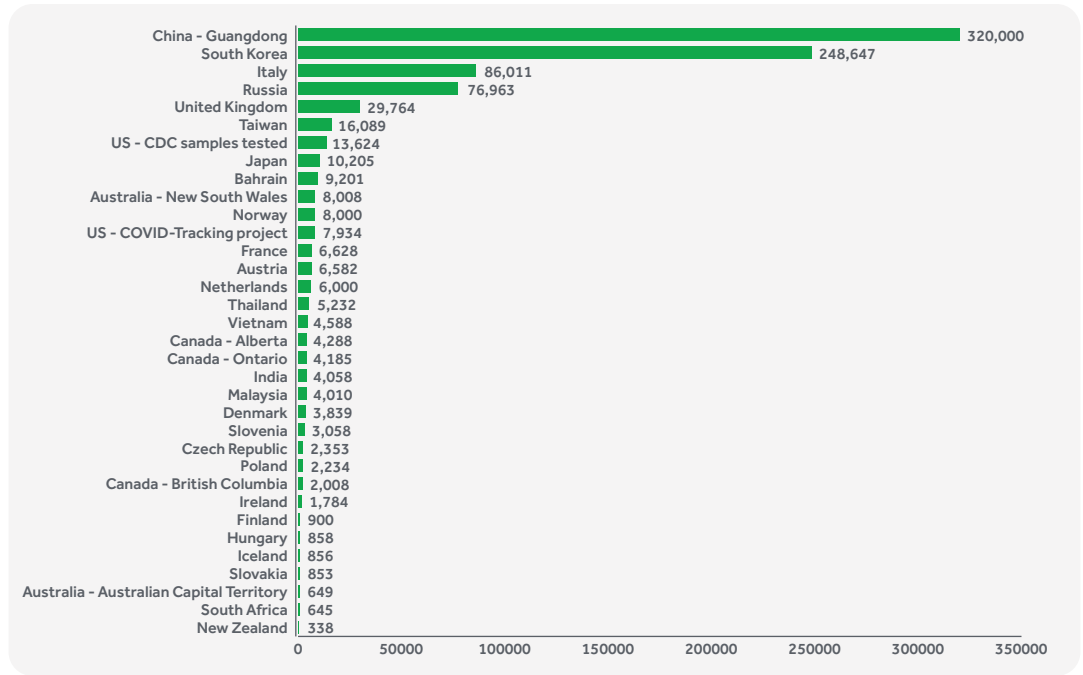
The World Health Organization estimates that coronavirus kills about 3.4% of those infected. Does this number show the full picture? No. At this point, we have no idea the true number of people infected because **far from everyone has been tested**.

We don't even know the rate at which people are being tested. There is a significant difference between the number of true cases and the number of confirmed cases. If we are looking only the number of confirmed cases, then we are inaccurately representing the death rate of the virus. Unfortunately, there simply are not enough tests being performed. Testing is crucial in understanding how deadly this disease is, but it also "allows the infected person to avoid infecting others and to quickly receive the care they need. And it is crucial for all of us to understand the prevalence of the disease, to understand how the disease evolves, and to allow us to take evidence-based decisions for counter measures that slow down the spread of the disease." (https://ourworldindata.org/coronavirus)

In aggregate we know that there is not enough testing, but every country is operating under different protocols making country specific information even harder to compare. For example, South Korea has tested about .5% of their population. In contrast, the United States has tested about .007% of their population. Looking at the graphs below, you can see that there is a significant disparity not only in the total number of tests performed by country, but also the number of tests per million people. The proportional comparison shows the true difference in how countries are testing their population.
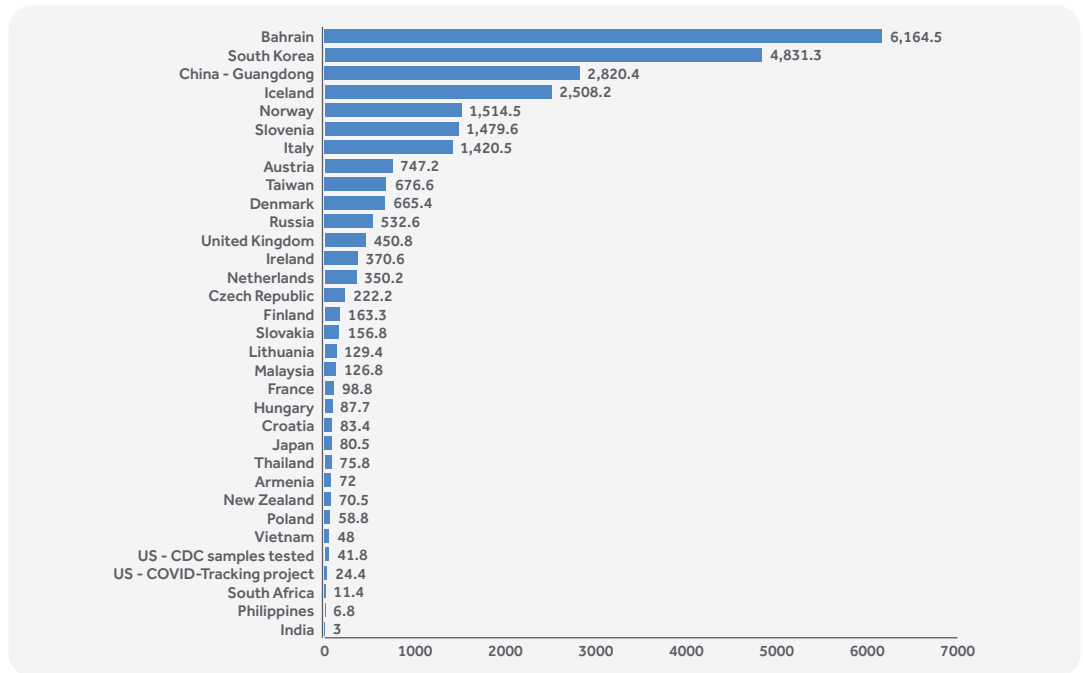
Total COVID-19 Tests Performed by Country

Source: Our World in Data based on official country reports

Country	Tests
China - Guangdong	320,000
South Korea	248,647
Italy	86,011
Russia	76,963
United Kingdom	29,764
Taiwan	16,089
US - CDC samples tested	13,624
Japan	10,205
Bahrain	9,201
Australia - New South Wales	8,008
Norway	8,000
US - COVID-Tracking project	7,934
France	6,628
Austria	6,582
Netherlands	6,000
Thailand	5,232
Vietnam	4,588
Canada - Alberta	4,288
Canada - Ontario	4,185
India	4,058
Malaysia	4,010
Denmark	3,839
Slovenia	3,058
Czech Republic	2,353
Poland	2,234
Canada - British Columbia	2,008
Ireland	1,784
Finland	900
Hungary	858
Iceland	856
Slovakia	853
Australia - Australian Capital Territory	649
South Africa	645
New Zealand	338

Total COVID-19 Tests Performed per Million People by Country

Source: Our World in Data based on official country reports

Country	Tests per Million
Bahrain	6,164.5
South Korea	4,831.3
China - Guangdong	2,820.4
Iceland	2,508.2
Norway	1,514.5
Slovenia	1,479.6
Italy	1,420.5
Austria	747.2
Taiwan	676.6
Denmark	665.4
Russia	532.6
United Kingdom	450.8
Ireland	370.6
Netherlands	350.2
Czech Republic	222.2
Finland	163.3
Slovakia	156.8
Lithuania	129.4
Malaysia	126.8
France	98.8
Hungary	87.7
Croatia	83.4
Japan	80.5
Thailand	75.8
Armenia	72
New Zealand	70.5
Poland	58.8
Vietnam	48
US - CDC samples tested	41.8
US - COVID-Tracking project	24.4
South Africa	11.4
Philippines	6.8
India	3

Are there not enough tests in the United States, and if so, why not? Or is the government restricting testing so that the total number of infections is low? It is impossible to say. However, we can no longer pretend that this doesn't exist. We need to be testing as many people as possible so that we can form or own domestic view of how truly dangerous this disease is.

There is also very little information being shared related to testing, and it is hard to understand any testing data that is published. The dataset above shows the US testing broken down between CDC tests and the COVID Tracking Project tests – what is the difference and why is there no single source of information? Without accurate and comprehensive testing, there is no way to understand the mortality of COVID-19.

In addition to lack of testing and different protocols making it hard to understand the death rate, each country is showing a different death rate. Epidemiologists and disease modelers believe a "more reliable global case fatality rate is about 1 percent — but there's still a lot we have to learn about the disease. And even when we better understand how deadly this virus is, it's likely to look pretty different country by country." (https://www.vox.com/2020/3/5/21165973/coronavirus-death-rate-explained)

Is there truly a different death rate by country? If so, is it due to interventions that are more effective than others? Or is it due to the lack of testing in some countries?

COVID-19 Death Rate by Country

Source: Johns Hopkins as of March 17, 2020

Country	Total # Cases	Total # of Deaths	Death Rate
Italy	31,506	2503	7.9%
Iran	16,169	988	6.1%
Spain	11,309	509	4.5%
China	81,058	3230	4.0%
Japan	878	29	3.3%
UK	1,960	56	2.9%
Netherlands	1,708	43	2.5%
France	6,664	148	2.2%
US	5,702	94	1.6%
Switzerland	2,700	27	1.0%
South Korea	8,320	81	1.0%

Another way to look at it is the number of deaths per 1000 infections, seen below. Why is it that Germany is seeing significantly fewer deaths compared to "peer" countries like France and the US?

COVID-19 Death Rate per 1,000 Infections

Source: euronews.com
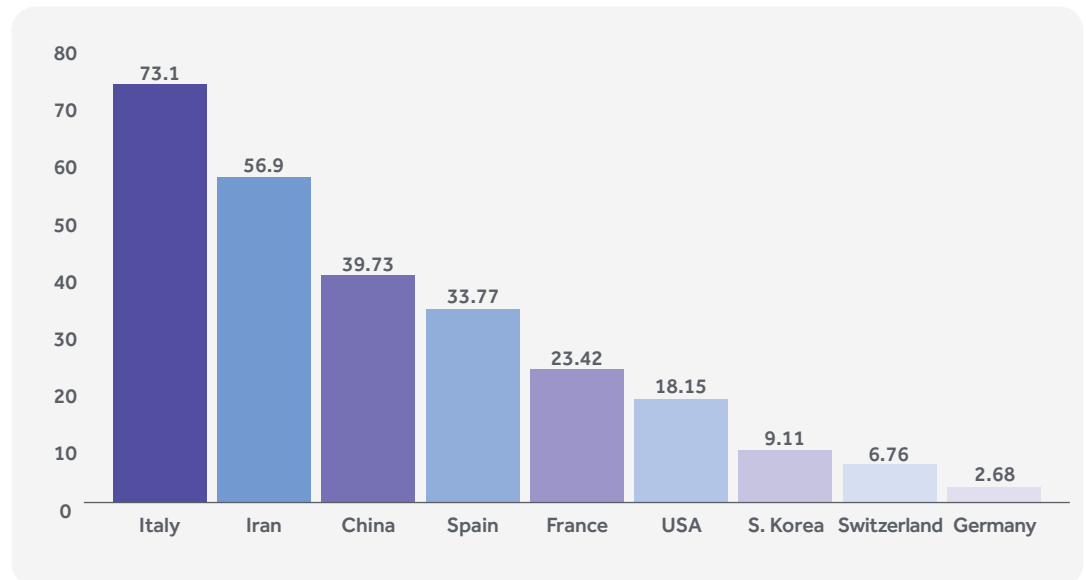
Having information is key, and at this point it isn't there. There is still no way to accurately answer the question of "what is the death rate of COVID-19?". The mortality rate is the number one driver of panic and mass hysteria. If the generally accepted death rate is off by an order of magnitude, which we at SCALE believe it to be, then we are reacting to something that isn't what we think it is.

Aside from the rate at which people are dying, people want to know who is dying from COVID-19. This is another question we cannot answer. Everyone is talking about the "at risk" population and correlating death with a patient's age. However, the only real study that has been distributed on the mortality broken down by age is from the Wuhan data through February 11. There are now more cases of COVID-19 outside of China than within China. How is it that there is no updated information on how age is affecting mortality in the non-Chinese population? There are over 2,000 deaths in Italy, and we know nothing about these people other than their location.

The only additional detailed information has come out of South Korea, which shows the death rate by age. While the trend in the data is similar, the numbers are very different compared to the Chinese Center for Disease Control study. Understanding who is dying should be a priority to calm the public and isolate those who are truly the most at risk.

COVID-19 Death Rate by Age in South Korea

Source: businessinsider.com
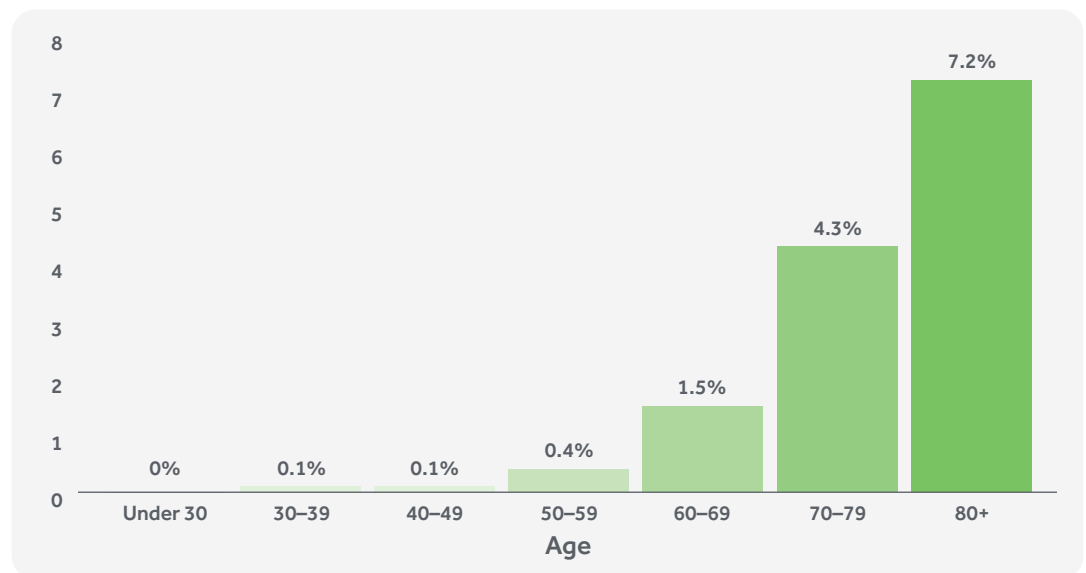
We believe that there is not enough data related to the disease, but also that there is not enough criticism of the data that is available. There needs to be informed criticism of data related to what has been discussed – the death rate, age impact, comorbidities etc. In a crisis evolving significantly by the day, reports and numbers that are days old no longer paint an accurate picture. And without a true understanding of the crisis, it is impossible to measure the impact, act accordingly, and correctly inform the public.

So, this leads to what we believe will be learned or change as a result of the COVID-19 crisis.

Adding Intellectual Capital

This crisis is testing the many healthcare systems around the world with the same exact challenge. For once, there is some way to compare these health systems apples to apples. We believe the world will study how different healthcare systems responded to the COVID-19 crisis and it will tell us which systems are better suited to deal with a sudden health crisis than others.

Early signs show that the differences between how health systems are responding makes an impact. Countries like Germany and Taiwan have been able to slow the spread unlike countries such as Italy and the US. Is it something about their system that has made them better prepared for a crisis? Is Germany simply choosing to define mortality and infection differently?

Taiwan seems to have learned from the 2004 SARS outbreak and used this knowledge to significantly reduce the COVID-19 impact within the country – the country only has 59 confirmed cases. In 2004, the government established the National Health Command Center (NHCC). The NHCC is part of a disaster management center that focuses on large-outbreak response and acts as the operational command point for direct communications among central, regional, and local authorities. The NHCC unified a central command system that includes the Central Epidemic Command Center (CECC). (https://jamanetwork.com/journals/jama/fullarticle/2762689)

As soon as the WHO was notified of pneumonia of unknown origin in Wuhan, Taiwanese officials began to take measures to understand the situation. The CECC was activated and coordinated efforts by various ministries, including the ministries of transportation, economics, labor, and education and the Environmental Protection Administration, among others, in a comprehensive effort to counteract the emerging public health crisis. The actions that Taiwan were able to immediately put into place due to the existing infrastructure allowed them to have significantly fewer cases than early models predicted.

In South Korea, another country showing early signs of a good response, medical providers immediately started offering drive-through testing centers. These centers not only prevent infection from spreading to those possibly not infected, but also reduce the time-consuming process of cleaning between patients, meaning more tests can be done in a shorter amount of time. How is it that South Korea was able to obtain and deploy significantly more tests than other countries? It could very well be their crisis management system that allowed for a quicker and more targeted response.

This crisis will allow us to not only analyze what went right, but also understand where systems failed – for instance in Italy. I am not convinced that the UK will get it right either. Physicians were given expired masks with stickers over the date, hoping no one would notice. Is this a quality of a system that can successfully navigate a crisis? Will the Scandinavian countries, with robust universal healthcare, show that one strong public system is the most effective? The US will also be an interesting case study to see the impact of a public and private system.

The CDC did not seem prepared to handle the crisis and needed to rely on private hospitals and systems. Should everyone partner and better coordinate with the private sector to be more efficient and effective? All of these questions are hard to answer now, but we believe that by the end of this crisis we will be able to truly compare health systems – seeing what worked, and what didn't. And by seeing what worked, some systems could implement significant changes to their structure and organization.

Adding Supply

Another thing that has become clear is that health systems around the world do not have the capacity to handle a crisis of this magnitude without having issues. This includes hospital beds, devices needed for treatment, labs for testing, and supplies. In Italy, doctors are basically deciding which patients live and which patients die because there are not enough ventilators for all who need one. This shouldn't be the situation we are faced with. Adding supply is critical to successfully managing a crisis. What exactly does adding supply mean? It means stress testing health systems to ensure they can handle a situation like we have with COVID-19, better coordinating outpatient centers with beds, ventilators and other critical supplies, for example ambulatory surgery centers to ensure they can help in times of crisis, expand pathology labs for testing, and perhaps organizing for a bifurcated healthcare system ahead of time, one required to deal with the crisis and the other required to deal with the ongoing healthcare needs of the public that are totally unrelated to the crisis.

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Our system was, it seems, primarily prepared for a "normal state" – not a crisis. We live with the expectation that "once-in-a-century" events won't happen to us, and yet, they keep happening in different forms. What is worse is that our supply of clinicians decreases during a crisis due to infection. So when demand peaks, supply actually shrinks. Intensive care units (ICUs) function at 90% capacity without a crisis. There will need to be more slack in the system to make the public feel safe that a crisis can be handled. We should be stress testing the system outside of a crisis to ensure there is enough supply. We stress test our banks and other financial institutions very effectively, can we take those lessons and apply them to better stress test our healthcare system?

In the US, we would like to see our outpatient facilities that are privately owned be organized as second responders to our hospitals. There are 6500 ambulatory surgery centers across the country. Each with an average of 3 procedure rooms and 6 recovery beds – that's 40,000 recovery beds, each with its own oxygen supply and basic medical equipment and supplies.

Are these surgery centers coordinated such that they can be leveraged during a time of crisis? There are about 7,000 urgent care centers in the United States – are these being coordinated to help in the face of a crisis? What about our micro-hospitals? Saving hospital resources to allow for emergency care is important. By effectively using the network of outpatient centers for the otherwise healthy, we raise the capacity of our entire health system during a time of crisis.

Using a network to create "clean zones" whereby off-site, ancillary, outpatient, non-hospital providers can divert healthy people that still need care away from hospitals which are "infected" or have capacity constraints could also help reduce the spread. It is important to remember that people still need healthcare unrelated to COVID-19, and we want those people to receive care without putting themselves at risk of contracting the virus.

Testing for a virus pandemic should not be occurring across our emergency departments (ED). We believe many cases have come from the unnecessary spread of COVID-19 within hospitals. EDs and their waiting rooms should have been immediately closed off from patients with symptoms, to reduce any potential spread from infected individuals coming in for testing. Non COVID-19 care must be separated from COVID-19 care.

Telemedicine could also play a large role in adding supply for this crisis and future crises. Vice President Pence recently announced that insurance companies will cover telemedicine reimbursements during this time. However, payments are still very complicated for services rendered. So much so that supply is still constrained. If we are able to effectively organize and support telemedicine services, we can have doctors understand a patient's condition before recommending testing or allow elderly to remain at home rather than go into the hospital. Telemedicine could also help increase capacity of hospitals or urgent care centers dealing with illnesses unrelated to COVID-19. However, the true value of telehealth in this type of situation is unknown as most use-cases until now have been in a primary care setting.

This experience could jumpstart telemedicine policy and use in different situations. Providers may begin to develop strategies and tactics to initiate and rollout a robust telehealth program across practices whether it is a single location or distributed campus. You should expand the services you already have and know to connect providers with patients using different types of devices and platforms. You could create and manage virtual patient waiting rooms so your providers can digitally queue patients, see them remotely on demand or by schedule, and conduct triage. In addition, universal training could be deployed via telehealth to providers across the country. We cannot solely rely on telehealth in a crisis, but it could be a good way to communicate with patients and providers. Having contact with a provider during a crisis could also reduce panic levels.

Adding Coordination

By nature, the response to a crisis is interdisciplinary. It requires the work of medical providers, government officials, schools, etc. Similar to what Taiwan has implemented, there is a need for organized, centralized communication and coordination of the different providers, which perhaps does not exist to the same extent within the United States. In fact, we make the response more complicated through various governing organizations and sources of information. Hospitals are relying on public news outlets to get information related to the crisis. FEMA has specific programs and guidelines that hospitals are required to follow – for example a mass casualty plan. However, the CDC dictates the response for an infectious disease. Who has jurisdiction in this situation? There needs to be a better way that information is distributed, especially to healthcare professionals. We have no single communication tool to use that can reach both providers and the public. We also see a lot of false information and rumors spreading, which is detrimental in a crisis. Having one communication tool would add coordination and keep individuals calm.

We need to use this experience to solve for what crisis management should be – a term that is rarely used. Where and how do resources come into the system to help in these crisis situations? Patients should be able to know exactly where they need to go and when. Telemedicine could be a great way to then supplement this coordination.

We also could see a coordination of public and private services emerge from this crisis. There is a good chance that these will be formalized so that next time, the planning doesn't need to occur real time, but instead private companies are ready to act and assist immediately.

Companies like Walmart and CVS – people rely on these stores to get things they need in a crisis and they already have robust supply chain networks that could be utilized. Google could help disseminate information from the government in a coordinated and organized way. There are many private companies that are acting to help in the situation, but there could be a formalized partnership and coordinated effort to reduce the lag time and uncertainty – less ad hoc, more pre-planning.

A mistake many politicians and academics make is they equate a nationalized healthcare system with a perfectly coordinated healthcare system. The missing piece in coordination is also investment. If public ownership of healthcare corresponds with material under-investment in healthcare, then coordination becomes illusory. There is simply not enough supply to go around. Bureaucrats make the argument that supply can be solved with more public funding but somehow it never quite works out that way. The talent finds other more lucrative endeavors and the industry as a whole sees a decline in quality, experimentation, risk taking, investment and solutions. We need more coordination for next time, but we will also need investment, private capital and talent – lots of talent to create really effective solutions we can be proud of. Important not to ignore that not so little point.

Micro Forecasts

It is very likely that the macro healthcare system will change because of the COVID-19 crisis. But what about the micro? What will happen to individual providers and healthcare companies?

We believe individual healthcare operators will change coming out of this crisis. Those that didn't have a crisis plan will most likely develop one to be ready for next time. These plans should be more specific to the organization, not simply following FEMA or CDC guidelines. For example, what is the role of the management team in a crisis? There needs to be a plan for IT and communication, costs to be addressed, staff to be managed. Who is our contact person from what government agency that we will rely on for information so that we aren't simply relying on mass media? There needs to be coordination of care if you are a healthcare provider. Do you have emergency supplies? If so, how do you organize the use of it and if not, how do you procure supplies?

All of these questions are things that can and will come up in a crisis. We believe that individual operators will be focused on these changes.

In Conclusion

The immediate actions in light of the COVID-19 pandemic are clear – social isolation and reduced contact to slow the spread and not overwhelm our heath-system. However, there are more ideas to come out of this pandemic we are living through.

The healthcare industry as a whole is becoming increasingly coordinated for reasons that have nothing to do with the crisis. We are coordinating care in order to improve outcomes and reduce costs. Those same efforts should be expanded to include the coordination of care during a crisis.

This will be the first experience in which healthcare systems across the world can be compared in terms of their crisis response capabilities. Who will come out as the example of what works? Other nations will want to emulate that example as quickly as unequivocally as possible.

The healthcare system in the US needs to be better prepared. Will this experience be the impetus we need to make changes to the current system? Will it push our system further into care coordination? Into public and private sector coordination? There needs to be better communication and coordination in these situations and the assurance that there is enough supply to handle the possible demand.

We at SCALE believe there are a lot of opportunities to take away from our current situation and that there will be a lot of change to come in the near future. We hope to do our part to not only help reduce the negative impact of COVID-19 today, but also help the system prepare for whatever might come next.

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Contact Susan Silhan at ssilhan@scale-pg.com or +1 (646) 761-1831 to continue the conversation.

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