Memorandum

To: U.S. Department of State, EAP/MLA, ASEAN/EAS Unit
From: Dianna Garzon, Student, Wilbur Wright College
Subject: Smart Cities in Southeast Asia & Pandemic Responses
Date: May 1st, 2020

Issue for Discussion

The use of smart technology has been discussed in recent years for the purpose of establishing or furthering urbanization throughout the world. With various detailed action plans and propositions, such as in *Smart Cities in Southeast Asia*, the implementation of smart technology is planned and blueprinted for all categories of life. This includes boosts in the economy, environment, mobility, and social infrastructure to name a few. However, given the present-day circumstances with COVID-19, the application and research towards smart technology is best when coupled with furthering healthcare. With Southeast Asian countries such as Vietnam and Japan gaining praise for their response to the pandemic, much of their strategy focuses on the inclusion of smart technology and data tracking. Consequently, through the effective and innovative application of smart technology in healthcare, countries have seen a dramatic containment and depletion of COVID-19 cases.

Literature Review

In order to accomplish a protected future against biological threats, effective planning is needed to prevent the possibilities of a global catastrophe from occurring again.

- Allam argues smart city officials should collaborate to draft a preparedness response: "Smart cities host a rich array of technological products that can assist in early detection of outbreaks; either through thermal cameras or Internet of Things (IoT) sensors, and early discussions could render efforts towards better management of similar situations in case of future potential outbreaks, and to improve the health fabric of cities generally" (Allam, 1). Examining current COVID-19 hotspots, many of these locations are entirely overwhelmed and do not have the infrastructure or technology in place to keep up with their exponentially growing number of cases. Through Allam's discussion, he details and poses the recommendation of the collaboration between city officials and directors of smart technology. In countries such as Singapore or China, they are seeing a dramatic decrease in number cases because they have already developed their healthcare system to incorporate artificial intelligence or the development of data tracking. In various other affected countries, such as Italy or Spain, the number of cases, contact and fatality rate are dramatically higher than their smart city counterparts. Through effective planning and use of smart technology to further revolutionize healthcare, pandemics such as COVID-19 would be met with adequate response and a thorough plan of action.
- Given the universality of smart phones and understanding of applications, self-data tracking could positively impact healthcare and the relationship between smart city services. Cook discusses how data tracking methods allow for a cohesive understanding of neighborhood health: "ICT infrastructure throughout a city can offer a more global view of the health status of community residents and insights on the relationship between city services and health provisioning" (Cooke, 2). In the face of COVID-19, it is necessary for community members to know and track exposures that occur nearby. Not only would this further prevent the possibility of infection, but also accurately provide statistics for healthcare professionals. While self-data tracking can positively impact communities, it can also allow for a better ability to provide adequate health needs to

individuals. Cook further discusses how self-data is financially beneficial and could improve healthcare: “This technology also connects healthcare with other smart city services. This connection can improve the ability for city services to respond to health needs. Smartphones enable information gathering without spending city dollars on additional facilities and infrastructure” (Cooke, 6). As many individuals own a smart phone, enacting data tracking for the purpose of healthcare could prove globally beneficial. Not only is it simplistic, but financially advantageous as no further resources would need to be purchased. With self-regulation in data tracking, there will be an added factor of transparency and affectability in reaching the needs of individuals.

- Transparency is critical when addressing healthcare, as this is how basic needs are met with resources. Pyzyk discusses how pivotal data tracking is when considering the increase in information that could be collected: “Information integration and communication lie at the heart of an effective public health threat mitigation operation. The concept holds true for city departments both internally when working to address an outbreak, and externally in public engagement” (Pyzyk). With effective collaboration between city departments and individuals, pandemics and virus outbreaks will be met with increasingly accurate response. The application of this concept paired with smart technology is seen enacted in countries such as China. As COVID-19 devasted resources and their population, China needed to act quickly in order to contain the spread of the virus. Given the technological advancements already in place, they further applied it to the concept of healthcare and data tracking. Pyzyk discusses an effective method to enforce quarantine: “Drones are one of the tools used to maintain quarantine restrictions. They are often equipped with cameras, a standard drone feature, and many also have loudspeakers to communicate with citizens who are observed breaking rules or not taking government-mandated precautions” (Pyzrk). Using drones has proven to be an efficient method of quarantine because it enforces these precautions safely without putting any more at risk in doing so. Additionally, the application of data tracking by facial recognition can assist in the tracking of potential violators. This method has proven to be useful in China, however, the utilization of data tracking in countries such as the United States is limited by rising concern in data ethics.
- In order to limit and contain the risk of infection, China has also implemented the wide use of artificial intelligence to complete necessary tasks. Arthur details how smart technology is applied to delivery transportation: “Two White Rhino vehicles were brought to Wuhan from Beijing by the company CEO and two engineers who set them up to transport medical supplies, deliver meals for doctors and patients, and complete other emergency tasks in the hospital” (Arthur). The Rhino automobile company created unmanned vehicles that were adopted to be used throughout China. Rather than pose the risk of cross infection, the Rhino vehicles delivered medication, food, and other necessities to patients without the need of human presence. Also, the unmanned vehicle promptly decreased the amount of work exhausted medical officials would need to complete.
- Aside from smart delivery transportation, China adopted smart technology on a patient basis. Arthur discusses the innovative health monitoring China is using to decrease the amount of exposure between patient and medical professionals: “Patients at the facility wore smart bracelets and rings that synced with CloudMinds’ AI platform so their temperature, heart rate and blood oxygen levels could be monitored. Other robots provided patients with food, drinks, medicine and information, while others sprayed disinfectant and cleaned floors” (Arthur). Given many countries, such as the United States, lack resources necessary for the COVID-19 pandemic, the use of artificial technology could further decrease the chance of infection between patient and medical staff. Rather than routinely check vitals, the smart bracelet and ring automatically

update an AI system that medical professionals can observe in distance. This is especially aided by the use of robots, as nursing staff is usually tasked with providing information, food, and medicine to patients. Artificial intelligence completely revolutionizes and increases readiness response to a pandemic, and in dire circumstances such as COVID-19, this is especially necessary.

- South Korea has also been met with praise over their swift response to the COVID-19 pandemic. Buchwald discusses the readiness South Korea displayed as a result of their previous MERS outbreak in 2015: "South Korea quickly implemented legislation that would allow health officials to aggressively trace the footsteps of citizens who test positive for an emerging infectious disease. Using security camera footage, credit-card records, GPS data from cellphones and car navigation systems, they are able to pinpoint exactly where a person has been" (Buchwald). From their experience of the MERS pandemic, South Korea knew and emphasized the need for early testing. As a result, they have a manufacturing capacity of 100,000 test kits a day. Through data tracking utilizing smart technology, South Korea has been able to flatten their curve and further contain the spread of the virus. Not only have they been allowed to track COVID positive patients through the means of GPS, but also through the downloading of an application. While South Korea does not mandate positive patients to quarantine in hospital, they must download an app that will track if they violate their stay at home order. If they leave their residence while being COVID positive, their violation could cost them a fine of $2,500 and an alert to officials.
- Much like South Korea, Singapore's previous experience with a deadly pandemic positively impacted their rate and effectiveness of response. During Singapore's SARS outbreak in 2002-2003, the deadly circumstances highlighted flaws and capacities in the country's resources. Fisher observes the lack in resources during Singapore's SARS pandemic: "It was aware then that its infrastructure wasn't ready for an outbreak of this kind. So, in the years since, isolation hospitals were built" (Fisher). Singapore, observing the over exhaustion of their resources, promptly planned for future pandemics. This has positively affected their preparedness by allocating a location for all positive patients. Unlike South Korea, however, Singapore does not allow for self-isolation for any COVID positive patient. It can be difficult to isolate in a home with family, which is something very common in other countries. Oftentimes, various other family members contract COVID-19 and reap the deadly effects. With the resources Singapore has available, such as the isolation hospitals, they are able to properly contain patients without overwhelming their system. For this reason, Singapore has effectively implemented appropriate measures to eliminate contact with affected individuals.
- However, the Southeast Asian country of Vietnam lacks the necessary resources for an appropriate response plan. Significantly understaffed, with approximately 8 doctors per 10,000 people, they have turned to methods of data tracking. Fleming discusses the economical manner in which Vietnam is preventing the further spread of COVID-19: "There is also a strong culture of surveillance, with people expected to inform on their neighbours if they suspect any wrong-doing" (Fleming). In order to track who an infected person has come in contact with, they heavily rely on neighbors to report any suspicions on infected individuals. Furthering Vietnam's efforts to contain the spread, they have incorporated a mandated a 14-day quarantine period for anyone newly entering Vietnam and have cancelled all flights from leaving and entering the country. With the success rate of a surveillance community, if Vietnam had the resources available, incorporating smart city technology would exponentially grow and contain the spread of COVID-19. As seen in the developments in China and South Korea, artificial intelligence, facial recognition, and self-data tracking through applications coupled with the already successful response from Vietnam could propel them ahead of other Southeast Asian countries. The impact smart technology has in healthcare has been proven to dramatically increase health response, and that is especially something a less developed country like Vietnam needs.

Conclusion

When considering catastrophes such as COVID-19, smart technology could increase the rate and effectiveness of response. Considering modernized and developed countries such as China, it is clearly demonstrated how advantageous artificial intelligence and data tracking proves to be. When considering Southeast Asian countries, the capabilities and resources are especially aided by the use of smart technology for data tracking. The implementation of smart technology in COVID-19 is pivotal, leading to a huge reduction of exposure for medical personnel and more precise data gathered from patients, and can revolutionize healthcare preparedness for future pandemics.

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