Covid-19: People Activity, Monitoring Development and Environmental Issue

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Abstract. This research attempt to propose the development of human mobility monitoring in the pandemic area in Indonesia. Current data on the COVID-19 is still alarming the world of the vast and aggressive spreading and the urgency to call on responsibilities for pandemic preparedness and response. Country answer to COVID-19 is mainly guided by the international situation, with the advice of organizations such as the WHO, investigation, data modeling based on the best available evidence, and the references. The system-wide response plans will have focused on the steadiness of public and vital public services and the stability of the economy, have been improved for COVID-19, based on the best available systematic evidence and guideline. The methodology uses a descriptive approach with mostly desk research. Data is collected from a secondary source and presented as a report format. For Indonesia COVID-19 situation, to monitor the people activity, this system development needs to find a suitable business center to be determined as a government-controlled logistics center. So that people activity can be more effective because transportation is reduced. With the active location feature activated at the user smartphone, then the system at any time can find out how many people are in a specific location. Their mobility is known at any time. This decision as a basis for the implementation of tracing, tracking, and fencing through infrastructure, systems, and telecommunications applications to support Health Surveillance, therefore, require the government reinforcement.

1. Introduction

Based on the Report on Government of Health and Social Care, UK (2020) [1], Coronaviruses are a family of viruses common across the world in animals and humans; certain types cause illnesses in people. Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS), are severe diseases caused by the type of coronaviruses. The other will create a common cold. Both SARS and MERS of which often lead to pneumonia. Type of COVID-19 is the infection found in people infected by a new strain of coronavirus, which is not previously seen in humans.

It begins on December 31, 2019, where Chinese authorities reported the World Health Organization (WHO) of an epidemic of pneumonia in Wuhan City, which was later classified as a new disease: COVID-19. Soon, on January 30, 2020, WHO stated the outbreak of COVID-19, a "Public Health Emergency of International Concern" (PHEIC). Based on present evidence, the general symptoms of COVID-19 include a cough, high temperature, and, in severe cases, shortness of breath. The lack of immunity in the population (and the absence of an effective vaccine) means that COVID-19 has the potential to spread widely. The current data seem to show that we are all vulnerable to be infectious to this disease. However, new evidence has been demonstrated that among those who develop an infection, some will appear without symptoms. Early data suggest that of those who develop an illness,
show to have only similar to seasonal flu. Current data on the COVID-19 is still alarming the world of the vast and aggressive spreading and the urgency to call on responsibilities for pandemic preparedness and response. As shown in Figure 1 and Figure 2. Data from Worldometer update on COVID-19 (2020), reported the coronavirus COVID-19 is affecting 213 countries and territories around the world and one international conveyance (the Diamond Princess cruise ship harbored in Yokohama, Japan). The daily data is reset after midnight GMT+0. For all other countries, the "New" columns display the changes for the current day while still in progress (Worldometer, 2020) [2].

Country response to COVID-19 is mainly guided by the international condition, the advice of organizations such as the WHO, investigation, data modeling based on the best available evidence, and the recommendations of our proficient institution and bodies. In many cases of the pandemic, the system-wide response plans will have focused on the steadiness of public and vital public services and the stability of the economy, have been improved for COVID-19, based on the best available systematic evidence and instruction.

As shown in Figure 3, until March 16, 2020, the total number of positive cases of COVID19 in Indonesia reached 134 cases, with five people dying. The distribution of COVID19 sufferers includes DKI Jakarta, several
areas in West Java, several areas in Banten, Solo, DI Yogyakarta, Pontianak, Manado, to Bali. The number and distribution of positive sufferers of COVID19 in Indonesia, which is referred to are much higher than reported by the Ministry of Health. Researchers used the development of Richard's Curve logistics model. The model was chosen because it proved to have good results to determine the beginning, peak, and end of the SARS endemic in Hong Kong in 2003. The calculation of the curve model also predicted that Indonesia could experience the peak of the epidemic by the end of March 2020, and the end of the epidemic would begin in April 2020. It can be imagined if these preventive measures are not taken seriously. Cases can multiply in tens, hundreds, thousands, and even millions of sufferers if we do not do something to tackle this problem effectively. Therefore, we try to propose the people monitoring using smartphone tracking and geo fencing technology.

2. Methodology

Smartphone penetration to the Indonesia population is quite large, around a quarter of the total population (Nafi, 2019) [4]. Based on Statista data, smartphone users are projected to only reach 28% of Indonesia's total population in 2019, up 2% from the previous year. This number will creep slowly over the next four years, which is forecast to be around 33% of the total population of Indonesia. In 2018, the amounted to 163 million. In that year, Telkomsel had more subscribers than its rivals, Indosat and Hutchison. Soon, in the fourth quarter of 2018, approximately 90.66 percent of Indonesian cities have access to the LTE (4G) mobile network. The number of Indonesians accessing the internet from their smartphones is expected to grow to 33 by the year 2020 (Statista, 2020) [5].

![Figure 4. Number of smartphone users in Indonesia from 2011 to 2022 (in millions)* (Statista, 2020) [5]](image)

From March 12 to April 3, people throughout Italy were asked to stay indoors and roam outside for essential purposes only (The Localit, 2019) [6]. People who want to travel must first print a permit obtained by filling out a form and showing the permit when passing guard posts (such as bus stations, train stations, airports, and the like). Polices capture people were roaming in the city without the permit. Permission to leave home is granted for the following purposes: 1. Urgent reasons can be demonstrated related to work. 2. The situation of important needs, for example, to buy food and other basic necessities. 3. Health reasons, such as the appointment of an urgent doctor. 4. Return to home. The form contents consist of: Full name, Place and Date of birth, Residence, street address, Form of ID (e.g., Passport, ID card), ID number, Telephone number, Reasons to travel: work; needs; health; back home, Details of the reason for the trip, The date, time, and place that person submitted in the form and Signature.

The Indonesian Government to reduce the spread of COVID-19 so that no more casualties occur, it is necessary to enforce a rule so that each resident to activate the location feature on a smartphone to track its movements. The right to see and check the mobility log is the authorized party. If the person mobility is within a radius and permitted locations such as markets, grocery stores, pharmacies, and other vital facilities (police stations, hospitals, etc.), then they are considered complying with the Self LockDown rules. If the person goes to a new location and cannot show a clear reason, then it is considered violating the rules and be sanctioned.

Since the first report of COVID-19 in Wuhan, China, it has spread to more than 100 countries. China initiated its response to the virus and relied on its strong technology sector and specifically artificial intelligence (AI), data science, and technology to track and fight the pandemic. The leader in the technology industry, including Alibaba, Baidu, Huawei, is among the frontiers to initiate the company's healthcare. As a result, tech startups are integrally involved with clinicians, academics, and government entities around the world to activate technology as the virus continues to spread to many other countries. Here are ten ways of artificial intelligence, data science, and technology are being used to manage and fight COVID-19 (Forbes, 2020) [7]. Learning from China COVID-19 case that has been benefited by the use of advance technology on IT and AI, include:
1. AI to identify, track, and forecast outbreaks. By analyzing news reports, social media platforms, and government reports and releases, AI can acquire and detect the pandemic. Tracking infectious disease risks using AI as provided by Canadian startup BlueDot. Interestingly, the BlueDot's AI had warned of the threat several days before the Centers for Disease Control and Prevention or the World Health Organization issued their public warnings.

2. AI to help diagnose the virus. The Infervision, the AI company, has launched an AI solution that allows front-line healthcare workers to detect and monitor the disease efficiently. This solution advances CT diagnosis speed. Alibaba has developed the AI-powered diagnosis system in Chinese, which claimed it is 96% accurate at diagnosing the virus in seconds.

3. Process healthcare claims. Ant Financial, an AI company, developed a blockchain platform to help to the time and claims procedures while importantly reduces the amount of face-to-face interaction between patients and hospital staff.

4. Drones deliver medical supplies. Drone delivery is decided to be the safest and fastest way to get medical supplies to areas during a disease outbreak. To transfer medical samples and quarantine material with minimal risk between Xinchang County's disease control center and the People's Hospital Terra Drone is using its robotic aerial vehicles. Countries authorities have now increased the use of drones to patrol public spaces, track non-compliance to quarantine mandates, and for thermal observation.

AI and other advanced technology have also been introduced and implemented to fight COVID-19, including technology used in military and intelligent. Recently, Israel plans to use anti-terrorism tracking technology to minimize the risk of coronavirus transmission. Cyber tech monitoring would be installed to trace people who have been in interaction with those infected people. In the growth of safeguard measures, Netanyahu's Government announced that malls, hotels, restaurants, and theaters would shut down, and apply for work from home policy. However, vital services, pharmacies, supermarkets, and banks would continue to operate (EconomicTimes, 2020) [8].

In other parts of the world, The UK government has announced the tracing app and has informed residents of the Isle of Wight to download its official COVID-19 contact tracing app on May 5, 2020. The app launch will start with National Health Service and municipal staff, with all the island's 140,000 residents set to get access. The resulting test will then decide if it will be launched for the rest of the UK starting in mid-May. The app is part of a broader plan to start safely easing the country's lockdown measures, which includes hiring an additional 18,000 people to do manual contact tracing (Biotechnology, 2020) [9].

For Indonesia COVID-19 situation, to monitor the human movement, the people mobility monitoring needs to find a suitable business center to be determined as a government-controlled logistics center. So that their mobility can be more effective because transportation is reduced. With the active location feature activated at the user smartphone, then the system at any time can find out how many people are in a specific location. Their mobility is known at any time. There are needs to be a warning feature on the smartphone when people are approaching geofence limits, see Figure 4.

![Figure 5. Geofence Tracking System (Esri's Geotrigger Service, 2012)](image-url)

Geofence is a virtual perimeter for real-world geographical areas. Geofence can be generated dynamically such as in a radius around a point location, or geofence can be a predetermined set of boundaries. If the Government can provide an ArcGIS server and set up each of its citizens to be given geofencing territory, it will make it easier for the Government to control the mobility of its population. As shown in Figure 5, each person can be tracked when he or she entered an area, how long he or she was there, and when he or she left. It can be further developed by anyone who is in a location at the same time can be detected and where they go. It would be better if the person's status is known to be positive or negative, having contracted COVID-19.
Figure 6. The human movements monitoring system

As shown in Figure 6, Police or authorities can also be notified if there are people who start violating their geophysical boundaries. Police also can stop and check a person or a group of people to check their COVID-19 status using an infrared thermometer and update their status using his/her smartphone to be recorded at the server. To prevent further mobility of that sick person, especially those who have been positive of COVID-19 status.

In Figure 7, it showed that on March 16, COVID-19 had been spread to 8 provinces with total infection 134 cases. It shows how important to monitor the people mobility closely to control and isolate and thus limit the contagion among the people as the primary carrier of the virus, where the opt to lockdown the country may not be favorable by the Government. The weakness of the system is their privacy is disturbed because their position can be tracked at any time. However, the right to see the log is at the authorized person and emergency situation. The second drawback is: if the person enters into an area or building where the GPS signal is unreadable or enters the blank spot area, there is no Base Transceiver Station (BTS). It can be minimized by the last known location (the last position known at DD / MM / YYYY and HH: MM) status. Security and technical experts have forwarded concerns, cautioning that the app will not work except people have it running continuously in the center, with their phone always switched on. Further, it takes 60% of the population to download the app to make it work and to be effective.

Figure 7. COVID-19 Spread by Region in Indonesia (Ministry of Health and Task Force for the Acceleration of Handling COVID-19, 2020) [11]

There has also been concern over the fact the data is based on residents' symptoms of self-report; therefore, it may be unreliable and could break the country's data legal and law (Biotechnology, 2020) [9].

3. Discussion

Apart from the use of technological-based tools to fight the spreading of the virus, the world is now introducing social distancing an action to stay as much as possible at home, stay away from the crowd, and not travel if it is not needed. Social distancing, which means keeping a distance from social life, will slow the spread of the coronavirus that occurs through contamination of droplets or saliva splashes at close range (Sehatq, 2020) [12].

With social distancing, the risk of contracting COVID-19 from others will be reduced. Conversely, if a person infected but does not realize it, then keep away from the crowd will really help prevent the spread.
Social distancing will reduce the risk of spread of infection to a maximum of 3 people, who are in one place of residence, or the closest relatives. Without this social distancing step, the spread of infection could reach 1,000 other people who were at the same concert.

Slowing the rate of spread of the virus is also essential so that people who are sick are not infected simultaneously. Of course, it will be much easier to treat four affected people compared to 1,000 sick people simultaneously.

Thus, social distancing is indirectly able to help hospitals, laboratories, as well as doctors and other medical personnel to avoid being overwhelmed by the number of COVID-19 patients that exceed the capacity and capability of the area. Thus, all sick patients can get optimal care.

If the availability of hospitals and the number of medical staff is not balanced with the number of patients, there will be many patients who are infected with the coronavirus that ultimately cannot get proper treatment. As a result, the death rate will be even higher (California Department of Public Health, 2020) [13].

4. Conclusion

The people mobility monitoring device is in urgent need to be set up and run as soon as possible to help the Indonesia government to combat COVID19. The Country government and regulator should issue a strict policy and regulation to make some changes and imposed location tracking features on a smartphone. This decision as a basis for the implementation of tracing, tracking, and fencing through infrastructure, systems, and telecommunications applications to support Health Surveillance complements the previous Ministry of Communications and Information Technology Decree KM. Number 159, the year 2020. This Ministerial Decree is special to apply only to emergencies of epidemics until the Government declares conducive conditions and emergencies to end. Further, the policy should convey that the Government guarantees the security of personal data of Cares Protect users. The more people willing to installs, the more massive the efforts to break the COVID-19 chain.

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