

THE INTERNATIONAL JOURNAL OF SCIENCE & TECHNOLEDGE

Coronavirus and Social Media: A Heuristic Approach in the Face of Pandemic

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Abstract:

Since the existence of mankind, we have been faced with series of pandemics, which has threatened our very existence. We hear of nearly-total elimination of communities, tribes or nations. Most of these cataclysmic occurrences are either classified as wrath of God/devil on mankind, being that we are always cough off-guard. Widespread of these diseases are aided by high population density caused by urbanization and commerce across international borders. The world is currently facing an unprecedented global health emergency, due to the outbreak of coronavirus pandemic. Corona Virus are large group of viruses which consists of core genetic materials and enveloped in protein spikes, which gives it the appearance of a crown. On the other hand, crown in Latin is called corona, hence the name Corona Virus. Finding solution to these pandemic occurrences has always been a serious challenge, ranging from vaccine, poor information channel among healthcare providers, poor media coverage in reporting the true situation and sensitizing the general public. The mainstream media rely on free movement to generate media content which has been hampered by the Sit-at-home order imposed by Governments across the world, while the social media platform has risen to the occasion of generation and circulation of news. People across the globe relied on the internet and social media as a source of alternative information since main stream media are controlled by the government, hence their contents are moderated. We are currently experiencing media overload, where people now freely share unverified news, inadequate number of cases, deaths, recoveries, prevention and cures. Governments across the world are not only fighting to combat the virus but cybercrime and fake news which has caused unnecessary panic, confusion and destruction of properties (5G masts) or even outright disregard to public order. The advent of coronavirus has further proven the fact that the world is a global village, seeing the speed at which the virus spread across the world, while the social media/internet has risen to the occasion of global communication, data sharing and e-commerce like never before. Social media is a blessing as well as a curse, depending on how we chose to use it during this pandemic.

Keywords: Pandemic, heuristic-systematic processing, coronavirus, social media, cybercrime, digital surveillance

1. Introduction

Throughout the world history, humanity has been plagued by varieties of virus and bacteria, at catastrophic levels, which claimed millions of lives at different point in time, and such pandemics include, Antonine Plague 5 million deaths, Black Death 200 million, smallpox 56 million, polio over 6 thousand, HIV-Aids 36 Million, Severe Acute Respiratory Syndrome (SARS) 774, Spanish flu 25 – 50 Million and currently, Coronavirus 110 thousand and still counting (Slawson, 2020). Many believed corona virus is traceable to bats, snakes and pangolin from a wild animal market in Wuhan, (Huanan South China Seafood Market) China, suggesting a possible zoonotic origin (Read et al., 2020). An increasing number of cases seems to have resulted from human-to-human transmission, and aided by widespread commerce and services across 210 countries as at 12 April, 2020 and territories around the world and two international conveyance the Diamond Princess cruise ship, harbored in Yokohama, Japan and the Holland America's MS Zaandam cruise ship, (Munster et al., 2020).

Various types of corona viruses which cause respiratory and gastrointestinal symptoms have been identified, such as: Severe Acute Respiratory Syndrome (SARS-CoV) which broke out in China, in 2003 and the Middle East Respiratory Syndrome (MERS-CoV) which broke out in Saudi Arabia in 2012, MERS was identified on May, 2015 in South Korea.

Corona virus consists of the following symptoms such as fever, cough, and shortness of breath, pneumonia, kidney failure, heart failure and eventually death. The World Health Organization (WHO) has in recent times declare coronavirus outbreak a 'pandemic' and a public-health emergency of international concern (Long & Ehrenfeld, 2020).

The aim of this study is to examines the impact of social media on corona virus pandemic and fairly investigate heuristic-systematic processing roles it plays (Choi, et al., (2017). Social media is a platform for social networking, content sharing, blogs, where individual create, modify, and share unfiltered information and discuss internet content in real time (Kietzmann et al., 2011). It also refers to designed website/online applications, which enables countless users to create, share, and modify data, efficiently and in real time, irrespective of their geographical location, as long as they are connected to the internet (Khurana, 2019).

This study is aimed at examining how social media could influence peoples risk perspective during this Corona Virus pandemic, what proportion of the population is affected, and how efficient our present day media is, as compared with the backdrop of other pandemic in the time past. Just as there has been a surge in the social media usage, there has equally been a rise in fake news, mass surveillance and attempts by unscrupulous quarters to exploit the unsuspecting audience. Social media in recent time, has experienced an unprecedented increase in diverse spheres of life, ranging from politics, advertising, marketing, dating, official purposes, and among the leading social media key players are, Facebook, Whatsapp, Instagram, Twitter, WeChart etc. (Choi et al., 2017).

Social media has been a household name among scholars from diverse disciplines which includes, sociology, psychology, business as well as communication (McIntyre, 2014). In recent years, social media usage has drastically impacted the way we interact with each other and how swift we can share information in real-time, irrespective of our geographical location or time, so long as we are connected to the internet. It has dramatically changed the landscape, in disease surveillance/awareness, public education/sensitization, and impact assessment and has been a viable tool in reaching out to the world on-the-go (Storey et al., 2014).

It is evident as seen in a world economic forum publication, that the declaration of global isolation and mandatory stay at home order due to COVID-19 has resulted in an unprecedented surge in media consumption and a drastic reduction in traditional mainstream media consumption in the areas of sports and live entertainment(Hall & Li, 2020).

Social media platforms has seen an unprecedented increase in the various sources of information, ranging from main stream media, unfiltered/uncensored information generated by users, as well as modified information that reflects the encoder's interest or background, (Choi et al., 2017). The interactive nature of social media makes it very easy for users to generate news, report incidents in hard-to-reach corners of our society, which are often neglected by the main stream media, as well as the leverage of reporting incidents in diverse language.

2. Literature Review (Coronavirus and Contemporary Technology)

In recent times, the technology sector has attracted so much attention around the globe, a key example is the social media being multifaceted, its potentials has been harnessed, especially in the area of healthcare, disease surveillance as well as having its own practical challenges, (Anene et al., 2019).

2.1. Coronavirus and Social Media

In December 2019, there was a cluster of pneumonia cases in Wuhan China, with previously unknown virus, now named the '2019 Novel Coronavirus', Covid-19,. The unusual pneumonia occurrence was reported to the World Health Organization (WHO) on the 31st December, 2019 and within 4 weeks, by 26th January, 2020, the causative organism has been identified as 'Novel Coronavirus', the genome of the virus has been sequenced and published, reverse transcription polymerase chain reaction test had been developed (McCloskey & Heymann, 2020).

Whereas, (Read et al., 2020), argued that 'On 29 December 2019, Chinese authorities identified a cluster of similar pneumonia cases of unknown etiology in Wuhan City, Hubei Province, China'. They further stated that 'novel strain of coronavirus (2019-nCoV) was subsequently isolated from a patient on 7 January 2020', (Read et al., 2020). A Canadian-based AI company (BlueDot) specializing in disease surveillance and epidemiology, predicted the 2019-nCoV outbreak and informed its customers on 31st December, 2019 even before The Centre for Disease Control and Prevention (CDC) on 6th January, 2020 while World Health Organization (WHO) sounded their alarm on 9th January, 2020 (Long & Ehrenfeld, 2020). This outbreak comes at a heightened increase in travel within and outside China as a result of China Lunar New Year, which holds on 29th January, where over 3 billion passenger were predicted from 10th January to 18th February, 2020 (Read et al., 2020).

The outbreak of coronavirus has suddenly turned everyone into a 'social media journalist', and as such it has created a deluge of information overload, hence, creating more confusion, while cybercriminals are exploiting it to perpetuate their nefarious art. This development saddled the government with the task of balancing the media eco system, debunking fake news, dousing tensions and avoiding unnecessary risks.

In general, risk perception refers to people's subjective estimation of the possibility that negative health-related outcomes or incident will occur. It is specifically constructed by two dimensions: severity and susceptibility. Susceptibility refers to one's notion of the likelihood of contracting the disease while severity refers to pathogenicity/harmfulness of a disease causing organism (Choi, et al., 2017).

The social media has been generally credited as an important platform to share data. In real-time, the current coronavirus outbreak has seen social media being used as a viable tool in sensitizing the public about the disease, its symptoms, as well as prevention, reporting new cases and control measures to be adopted in combating it. The social media is a viable tool in equipping the general public with the right information about this coronavirus outbreak as well as engaging them as a collective army in the fight to curb its spread. Early detection of infectious disease and dissemination of information is paramount to its containment as witnessed in the success of combating Zika virus, which originated from Brazil (Long & Ehrenfeld, 2020).

The impact of social media in the fight against Corona virus cannot be over emphasized, as we see The World Health Organization (WHO) partnering with Facebook and Whatsapp, in reaching out to people with latest news about COVID-19, which includes details on symptoms, mode of transmission and modalities to protect themselves against the deadly Virus, (WHO, 2020). The health alert service number (+41 798 931 892) now available in English lunched by WHO via Whatsapp, enables users across the globe to get acquainted with the latest information on COVID-19 in real time by sending 'hi' to the number, (WHO, 2020). Facebook and other social media platform providers, on the other hand, has launched an in-app platform/center, which is linked to both government and international health agencies, for visitors to be acquainted with the latest update about COVID-19, as well as safety tips.

There is a growing notion that the mainstream media, (print, TV and radio media's) has been compromised, hence certain information are under-reported or withheld from the public and the true nature of the situation are mostly not represented, while on the other hand, the social media has stepped up its game by reporting unfiltered news as they come. In this era of internet connectivity, everyone plays the role of a journalist, by capturing with their mobile devices and reporting incidents in real time, over different platforms as they emerge, which can be retweeted/reposted and viewed by millions of people at the same time.

Social media is changing the way information is shared across societies and around the world, where rapid spread of blogs, social networking sites and media sharing platforms is aided by rapid proliferation of mobile technology. It is on record that 'coastguardsman uses social media monitoring system to identify, assist in rescue and medical evacuations during wars (Mayfield, 2011). One of the key factors in successfully managing and curtailing incident rate of corona virus is the rapid sharing of data among countries and allied agencies.

Currently, there exists systems that scan through network of experts, main stream media and social media, to generate epidemic intelligence which are integrated with national and international surveillance systems. This development comes with the challenge in the volume and complexity of the information generated, which often times lack verification and difficult to make resolute interpretation or meaning, The world is currently facing a deluge of information overload due to this COVID-19 pandemic and as such, it is very difficult to filter fake news from fact thereby creating panic and anxiety, in response to that, people are taking extreme measures such as drug overdose, self-prescription and medication, as well as using toxic disinfectants in the bid to stay safe (McCloskey & Heymann, 2020).

2.2. Digital Surveillance for COVID-19

The emergence of COVID-19 pandemic has ushered in an unprecedented digital surveillance by various Governments across the world, in an attempt to combat the pandemic. This development has resulted in several Human Right Groups and allied NGO's in clamouring for transparency and strict conditions to prevent surveillance overreach (Amnesty International, 2020). While others are skeptical that surveillance measures ranging from artificial intelligence, facial recognition and phone tracking by various governments and agencies could outlast the current coronavirus crisis (Win & Yi, 2020).

According to Ali Dukakis, (2020), 'some 24 countries were using telecommunications for location tracking and 14 were using application for contact tracing or quarantine enforcement'. Various governments are hiding under COVID-19 pandemic to advance their digital surveillance on its citizens by gathering their location data using their smart phones and data from mobile network providers. It is recorded that China has begun tracking its citizens through a software app that require them to register with their national ID number, place of work, address, travel history and based on that, the software will sort them into color-coded categories -red, yellow, green. This move has triggered outcry by various human right organizations and NGO's citing it could lead to abuse and used as a tool against political rivals, human right advocates and minority groups (Dukakis, 2020).

Authorities all over the world are deploying various technology tools and devices such as, artificial intelligence (AI), big data, internet of things (IoT), Bluetooth technology, radar technology, mobile applications, drone, robots, surveillance cameras, smart phones as well as mobile network providers to trace contacts, monitor peoples movements, enforce quarantine, communicate with those quarantined, temperature scanning, facial recognition, punish offenders, warn offenders, disease surveillance while some countries are using it as an excuse in advancing their surveillance overreach on its citizens which will outlast this pandemic.

2.3. Cybercrime Spike amidst COVID-19

Cybercriminals are taking advantage of increasing amount of time people spend online due to the lockdown or quarantine, by devising ways to exploit their vulnerability and the lucrative opportunities this pandemic offers (Nicilas, 2000). There have been reports of cyberattacks on health agencies, such as WHO, hospitals, medical research centers, pharmaceuticals companies, medical centers, government agencies, online retail platforms as well as individuals.

According to Europol, 'a 39-year old man has been arrested in Singapore for his suspected involvement in money laundering and offences linked to a business email scam-related to COVID-19'. The incident was reported to Europol by

French police that a pharmaceutical company has been defrauded of €6.64 million by the individual, who became unreachable after the money has been transferred and the paid items were never supplied (Europol, 2020).

According to TheStar newspaper¹ publication on April 4, 2020, 'A total of 556 police reported cases of face mask scams resulting in losses amounting to RM4.2mil, have been recorded this year with the majority of it occurring during the Movement Control Order (MCO)'. This shows that about one million, one hundred thousand United States Dollars has been lost to scammers between March 18 and April 3, 2020, during the Movement Control Order, imposed by the Malaysian Government. It was reported that the spike in such cases occurred as scammers wanted to take advantage of shortage in stock of facemask, which led to advertisements on social media platforms, such as Facebook, Whatsapp, Instagram, Mudah.com, WeChat, when contacted, the scammers would provide account number, for the money to be transferred (Zolkepli, 2020).

2.4. Hypothesis

- H1. People are not fully aware of the impact of social media on corona virus pandemic
- H2. Adoption of technology is increasing in almost all spheres of life but the fear of its implementation in disease surveillance is imminent.
- H3. There are ethical and security concerns in deploying Social media for disease surveillance.
- H4. Implementation of Artificial Intelligence (AI) and Internet of Things (IoT) could boost the impact of social media on corona virus pandemic.
- H5. The use of social media in disease surveillance will continue to increase despite its security and ethical challenges.
- H6. Early detection and prompt dissemination of information could curb the spread of the disease.

3. Methodology

This is a qualitative research which uses a heuristic-systematic model to explain how people across the world are affected by information regarding the COVID-19 pandemic currently ravaging the world. It is imperative we use qualitative research methodology because of the lockdown and Movement Control Order (MCO) imposed by the government, making it impossible to generate primary data from direct respondents. Secondly, the chosen methodology entails analytic and comprehensive judgment of the subject matter, after careful comparison. The chosen methodology is robust in considering trends, characteristics, phenomenon, analysis and data collection which is suitable for this research.

4. Comparison and Discussion

4.1. Comparison between Coronavirus and Other Pandemics

In this section, we will compare coronavirus with other pandemics which occurred at different times over the years. The table below compares Coronavirus, SARS, Spanish flu, HIV AIDS, EBOLA and Yellow fever.

	Coronavirus	SARS	Spanish Flu	HIV-AIDS	EBOLA	Yellow Fever
Time/Period	December 2019 till date	November 2002 – 2004	1918 - 1919	1981 till present	December 2013 – March 2016	Late 18000s
Host	Wild animal(bat)	Bats, Civets	Pigs	Chimpanzee/ virus	Wild animal (Fruit bat, monkey)	Aedes mosquito
Mode of transmission	Human – human through respiratory droplets	Respiratory droplets and contaminated fomites	Respirator droplets from infected patients	Human to human through Sex, body fluids, blood	Spreads through bodily fluids, such as blood, sweat, saliva, urine faces and contagious towards end of the disease	Spreads through mosquito bites
Incubation Period	4 -14 days	4 days	Unknown	3 – 12 weeks.	2-21 days	3 - 6 days

Symptoms	Cough, fever, shortness of breath, sore throat	Fever, flu, cough, malaise	Fever, nausea, diarrhea and aches.	Fever, tiredness, swollen lymph nodes, sore throat, rashes, muscle and joint pains	Diarrhea, fever, weakness, pains, vomiting, sore throat	High fever, , chills, severe headache, vomiting, nausea, general body weakness and jaundice
	Coronavirus	SARS	Spanish Flu	HIV-AIDS	EBOLA	Yellow Fever
Treatment	No known cure yet	No know specific cure but steroids and antiviral medications worked for some patients	None; antibiotics and antiviral drugs was not in existence by then.	It has no cure but antiretroviral drugs are used to suppress the virus	Experimental vaccine (rVSV-ZEBOV)	There is currently no specific anti-viral drug for yellow fever but immunization is ongoing
Vulnerable Group	Adults over 65 years and those with underlying chronic health condition, such as diabetic, hypertension, cancer etc.	Adults over 60 and above	Adults between 20 – 40 years old	All ages. Initially most prevalent in adults of reproductive age then children	All ages while children recorded 20%	People of all ages
Death toll	Over 100,000 and still counting.	774	20 – 50 million	36 million and still counting	28,652 across 10 countries	1000,000 – 150,000

Table 1: Comparison between Corona Virus, Spanish Flu, SARS, HIV-Aids, Yellow Fever and Ebola

The above table illustrates the aforementioned diseases/pandemics which are from different zoonotic origin. Upon infecting human carriers, the disease are then transferred from human-to human through different mediums and spread across international borders. The swift spread is aided by rapid movement of goods and services across international borders and cities, as well as high population density due to urbanization.

Covid-19 as compared to the above mentioned pandemics has witnessed a dramatic rise in social media global communication, internet connection and data usage. During the early stage of the Covid-19 outbreak in Wuhan China, people shared information about the outbreak through their mobile devices, despite efforts by the Chinese government censorship on the outbreak, unlike other pandemics. The Chinese censorship of and control over online content created an information vacuum which enabled citizens to use social media to express valid criticism of government management and lack of its accountability of the pandemic.

4.2. Discussion

The advent of coronavirus created both opportunity and challenges. Technology can and is currently playing a vital role in health education during this pandemic, which is much needed to save lives, (Amnesty International², 2020). While some quarters are using it as a tool for negative reasons, such as mass surveillance by certain Governments, scam, fake news etc. It is evident that global isolation due to COVID-19 has resulted in an unprecedented surge in media consumption and a drastic reduction in traditional mainstream media consumption in the areas of sports and live entertainment (World Economic Forum, 2020).

The mainstream media rely on free movement to generate media content which has been hampered by the Sit-at-home order imposed by Governments across the world, while the social media platform has risen to the occasion of generation and circulation of news. Just as there has been a surge in the social media usage, there has equally been a rise in Fake news, mass surveillance and attempts by unscrupulous quarters to exploit the unsuspecting audience. People now freely share unverified news, ranging from inadequate number of cases, deaths, recoveries, prevention and cures.

On the other hand, the social media has helped in reporting occurrences as well as the true situation of things that would have been kept secret by the government. We all remember the Dr. in Wuhan, China who through his smart phone, informed the world about the true situation of things in China, whereas the Chinese government was downplaying the

figures. Furthermore, the improved internet connectivity during this lockdown and compulsory quarantine is important to stay positive and social media is actually helping with creation and sharing of fun-filled and entertaining videos and messages to alleviate people's mood. Others over exaggerated occurrences, resulted in panic buying as well as pandemonium in different cities across the world.

Various conspiracy theories and myths have been making rounds on social media that tends to influence peoples reaction and with most of them having dire consequences.

- One of the first conspiracy theories circulating the social media, claims 5G technology helps transmit coronavirus. According to BBC News publication on April 5, 2020, it reported of videos circulating on social media, suggesting coronavirus is somehow transmitted through the use of 5G technology. Others claim 5G has the capacity of suppressing human immune system, hence making people susceptible to getting the virus (Schraer & Lawrie, 2020). The above conspiracy theory has led to people destroying and setting mobile phone masts on fire across the UK and China.
- Lemon Juice Myth: It has been making rounds on the social media that lemon juice protects people against corona virus. This was said to have originated from a 'Chinese scientist' (Morris¹, 2020). Once again, the above myth resulted in people negating social distancing because.
- Mosquito Myth: another fake news circulating on the social media suggests that coronavirus could be transmitted by mosquito, just as they are vectors to malaria, dengue fever and zika virus (Morris¹, 2020). There is no scientific evidence to prove the virus can be transmissible by mosquito.
- Holding your breath Myth: This is claimed to have originated from a Japanese doctor and has been circulating on the social media that if you could hold your breath for 10 seconds without any difficulty or discomfort, it is evident you do not have any scarring or fibrosis in your lungs, which is evident you don't have the virus (Morris², 2020). It is expedient to say that fibrosis is not a symptom of coronavirus, which makes the claims baseless.
- Cow Urine Myth: this originated from India amongst Hindu worshippers and has been making rounds on the social media, that cow urine has medical properties that can ward off/cure corona virus and other diseases, such as cancer (Morris², 2020). Once again, the above myth is baseless and has no scientific backing.
- Garlic Myth: It has been making rounds on social media that eating garlic prevents/cures coronavirus but in reality, the claims are fallacious, as debunked by the World Health Organization (Morris³, 2020).
- Drink water every 15 minutes Myth: One of the earliest fake news circulating on social media is, drinking warm water every 15 minutes, to wash down coronavirus hanging on your throat down to your stomach where the acidic juice of the stomach neutralizes them. There is no biological connection between our nasal pharynx and our oral larynx, where such could be possible (Morris³, 2020).
- Drinkable Silver Myth: another fake news circulating the social media is the use colloidal silver (drinkable silver), which was claimed to boost immunity. Unfortunately, it has other side effects, such as, kidney problem, seizures, as well as turning your skin blue (Morris³, 2020).
- Black Skin Myth: Amongst fake news circulating the social media, is that the black skin is resistant to coronavirus. While other news making rounds on social suggested the Virus cannot survive in Africa due to its hot temperature. Unfortunately, the above claim is fallacious as the black community in the US are the most affected ethnic tribe.
- Wrath of God myth: Many religious leaders are asserting that coronavirus pandemic is the 'wrath of god' upon evil doers. This crude belief has led to disastrous outcomes that resulted in the infection and death of thousands, if not millions (LePan, 2020).

It is evident that the social media is a two-edged sword which can be used positively or negatively, depending on individual motive. People across the world are using the social media to capture and report incidents of people violating the lockdown imposed by the government, hence giving the right tool to law enforcement agents to arrest and persecute recalcitrant citizens (Win & Yi, 2020).

Police in New Zealand launched a website to allow residents to report cases of neighbours flouting the isolation rules, the site crashed few hours after going live, due to high traffic. Such tip-offs and videos have sparked debate over privacy and digital ethics, with some arguing that public safety is paramount during health emergencies, while others argue that privacy is not an absolute right but must be balanced, against other interests and rights. Others argued that community surveillance could be weaponised and used in a malicious way, which could further promote division by entrenching bias or prejudice in the society (Win & Yi, 2020).

TheStar newspaper publication on April 9, 2020, reports that Turkey is using mobile phone data to monitor those coronavirus patients, to ensure they do not break quarantine order. Other countries such as Singapore, China and South Korea implored their citizens to use social media applications/platforms and other technologies to track their quarantine compliance, (TheStar², 2020). Other mobile applications are doing their best to encourage users to stay at home during the Movement Control Order (MCO), imposed by the Malaysian Government. A good example of such platform is Waze, which projects a 'drive only if necessary, stay safe and healthy', prompt, to users anytime the app is deployed.

South Korea government has taken to the social media in sending advisory tests, including hyperlinks which opens to detailed data of infected persons, this measure has been viewed with skepticism due to its breach of medical confidentiality, raised ethical concerns as well as fueled stigmatization against patients with the virus and their families (Amnesty International², 2020).

One of the leading tech giant Alibaba has deployed a health tracking application capable of tracking individual health and assigning colour-coded status to them. Green is for 'safe', yellow requires seven days quarantine and red is for 14 days quarantine (Amnesty International², 2020).

The Polish government has deployed a facial recognition and location tracking application that requires people to take selfies and upload to the platform, to ensure people don't break quarantine orders (Amnesty International², 2020).

Other agencies such as WHO, LiveMap and SkyNewsLive, have dedicated platforms for information on coronavirus which is updated every few minutes. Online panel for discussion on coronavirus proves that social media is used positively as an approach to the pandemic. Data collection, from different media platforms are used to educate the public about the virus and to teach basic hygiene. Social media helps citizens, NGO's and international organization coordinate donations as well as proper channeling of funds and resources to where they are needed most, as well as enhancing data collection for resource allocation and evaluation.

The use of internet of things in the war against coronavirus has helped in reducing the spread of the virus, tracking the spread of the virus, tracing the origin of cluster outbreaks, quarantining, treating seriously ill patients, preventing cross-infection. Countries are working to combat coronavirus by forming alliance on joint prevention and control mechanism while sharing resources and information beyond national borders. It is used a vital tool for public education regarding basic personal hygiene, social distancing, signs and symptoms of the disease.

Most organizations have migrated their operations to the cloud while their staff work from their various homes, as long as they are connected over the internet and this has been achieved through social media platforms, such as Google hangout, zoom, Facebook, WhatsApp, Skype etc. Schools are currently closed but students continue with their classes through various online platforms aided by electronic learning materials. On the other hand, distance learning capabilities are limited because not all families/students can afford a smart phone or computer. Due to the fact that financially struggling families cannot afford a computer, two third of school system do not have nor use digital contents.

Based on the aforementioned challenges it is imperative for government/countries to focus on target programs to include the most vulnerable children with equipment and connectivity. Secondly, improve internet connectivity for schools that needs it most. Thirdly, improve financing of digital curriculum and materials, for example, digital libraries, lesson, learning items etc. fourthly, improve telecommunication capabilities for schools to be able to deliver education online.

5. Conclusion and Implications

The increased access to early information from varied sources such as main-stream media, internet and social media forms the core of global epidemic intelligence and disease surveillance. The social media has been a vital tool in information dissemination and well as fake news, which mislead people and spread panic. Currently the media is flooded with so much information; some accurate while the other part are partially true, over-exaggerated or completely false, thereby leaving the government with the burden to balance the media tide. Certain school of thoughts suggest that, it is better to over-react and then scale back if necessary rather than under-react, as agreed by (McCloskey & Heymann, 2020). Depending on the side of the coin chosen, we must take responsibility for our action and inactions, as they may save us from impending pandemonium or further push us into it. Governments and other organization around the world are requesting people to stay at home, observe proper hygiene and practice social distancing to help break the chain of new infections, Social media has stepped up to the challenge by allowing individual across the globe maintain connection in other to breach the communication gap.

The advent of coronavirus has further proven the fact that the world is a global village, seeing the speed at which the virus spread across the world, while the social media/internet has risen to the occasion of global communication, data sharing and e-commerce like never before. In the wake of social media been viewed as one of the most unreliable platforms for conspiracy theories and fake news with regards to healthcare and ethical concerns, international health organizations such as WHO, Harvard Health, Center for Disease Control and Prevention, National Institute of Health, etc, are taking advantage of social media platform such as Facebook, Twitter, Instagram and Whatsapp, as well as other designated websites to regularly update/interact with the public about latest news about COVID-19. It is imperative for people to be guided by medical advice from accredited agencies, avoid compulsive use of sanitizers and washing of hands, limit excessive exposure to COVID-19 news as well as maintaining calmness in the midst of this raging storm. Social media is both a blessing and curse during this coronavirus pandemic.

5.1. Implication

The world is completely taken off guard by the emergence of the coronavirus. We all watched helplessly as the disease spread uncontrollably and ravaged our societies, while some governments were reluctant in sharing information with their counterparts or reporting the true situation. It took various government days, if not week to agree in shutting down their borders and declaring a state of emergency. There was no facility on ground or funds set aside to handle a pandemic of this scale. A time of crises such as this, is also an opportunity for all sectors of the economy, to look into the future and adjust to possible threats and build their capacity.

6. References

- i. Amnesty International¹, (2020). *Digital Surveillance to fight COVID-19 can only be justified if it respects human right*. Published 02/04/2020. <https://www.amnesty.org/en/latest/news/2020/04/covid19-digital-surveillance-ngo/> Accessed April 2, 2020
- ii. Amnesty International², (2020). *COVID-19, surveillance and the threat to your right*. Published April 3, 2020. <https://www.amnesty.org/en/latest/news/2020/04/covid-19-surveillance-threat-to-your-rights/>. Accessed on April 10, 2020

- iii. Choi, D. H., Yoo, W., Noh, G. Y., & Park, K. (2017). The impact of social media on risk perceptions during the MERS outbreak in South Korea. *Computers in Human Behavior, Vol.72*, 422-431. doi.org/10.1016/j.chb.2017.03.004 <https://www.sciencedirect.com/science/article/pii/S074756321730153X>. Accessed 4/04/2020
- iv. Dukakis, A. (2020). *China rolls out software surveillance for COVID-19 Pandemic, alarming human rights advocates*. Abc NEWS, April 14, 2020 Publication. <https://abcnews.go.com/International/china-rolls-software-surveillance-covid-19-pandemic-alarming/story?id=70131355>. Accessed 15/04/2020
- v. Europol (2020). *Corona Crimes: Suspect Behind €6 Million Face Masks and Hand Sanitisers Scam Arrested Thanks to the International Police Cooperation*. Europol Published April 6, 2020. <https://www.europol.europa.eu/newsroom/news/corona-crimes-suspect-behind-%E2%82%AC6-million-face-masks-and-hand-sanitisers-scam-arrested-thanks-to-international-police-cooperation>. Accessed 17/04/2020.
- vi. Hall, S., and Li, C. (2020). COVID-19 proves that the media's value is growing – bet we need to find better ways to measure it. *World Economic Forum* publication 02/04/2020. <https://www.weforum.org/agenda/2020/04/covid-19-media-value> Accessed on April 3, 2020
- vii. Kharpal, A., (2020). *Use of surveillance to fight coronavirus raises concerns about government power after pandemic ends*. CNBC, March 30, 2020. <https://www.cnbc.com/2020/03/27/coronavirus-surveillance-used-by-governments-to-fight-pandemic-privacy-concerns.html>. Accessed 15/04/2020.
- viii. Khurana, A. (2019). *Disadvantages of E-commerce*. The Balance Small Business, 14. Published 14/01/2019 <https://www.thebalancesmb.com/disadvantages-of-e-commerce-1141571>. Accessed 25/03/2020
- ix. Kietzmann, J. H., Hermkens, K., McCarthy, I. P., & Silvestre, B. S. (2011). Social media? Get serious! Understanding the functional building blocks of social media. *Business horizons, Vol. 54(Issue 3)*, 241-251. <https://www.sciencedirect.com/science/article/pii/S0007681311000061>. Accessed 26/03/2020
- x. LePan, N. (2020). Visualizing the History of Pandemics. VISUAL CAPITALIST, March 14, 2020 publication. <https://www.visualcapitalist.com/history-of-pandemics-deadliest/>. Accessed 12/04/2020
- xi. Long, J. B., & Ehrenfeld, J. M. (2020). The role of augmented intelligence (ai) in detecting and preventing the spread of novel coronavirus. *Vol 44(Issue 3)*. <https://link.springer.com/article/10.1007/s10916-020-1536-6>. Accessed 11/04/2020
- xii. Mayfield III, T. D. (2011). *A commander's strategy for social media*. Army Europe and Seventh Army Apo New York 09403. <https://apps.dtic.mil/dtic/tr/fulltext/u2/a535374.pdf> Accessed 28/03/2020
- xiii. McCloskey, B., & Heymann, D. L. (2020). *SARS to novel coronavirus—old lessons and new lessons*. *Epidemiology & Infection*, 148. <https://www.cambridge.org/core/journals/epidemiology-and-infection/article/sars-to-novel-coronavirus-old-lessons-and-new-lessons/E28FC07E555D77BFAB262A678099EA90#>. Accessed 30/03/2020
- xiv. McIntyre, K. E. (2014). *The evolution of social media from 1969 to 2013: A change in competition and a trend toward complementary, niche sites*. *The Journal of Social Media in Society, Vol 3(No2)*. <https://www.thejsms.org/index.php/TSMRI/article/view/89/43> Accessed 30/03/2020
- xv. Morris¹, C., (2020). Health myth busted. BBC Reality Check. BBC News, April 2, 2020. <https://www.bbc.com/news/av/52093412/coronavirus-more-health-myths-to-ignore>. Accessed 06/04/2020
- xvi. Morris², C., (2020). More coronavirus myths to ignore. BBC Reality Check. BBC News, March 23, 2020. <https://www.bbc.com/news/av/51979410/coronavirus-more-myths-to-ignore>. Accessed 06/04/2020
- xvii. Morris³, C., (2020). Coronavirus: Health myths to ignore. Reality Check. BBC News, March 21, 2020. <https://www.bbc.com/news/av/51979410/coronavirus-more-myths-to-ignore>. Accessed 06/04/2020
- xviii. Munster, V. J., Koopmans, M., van Doremalen, N., van Riel, D., & de Wit, E. (2020). A novel coronavirus emerging in China—key questions for impact assessment. *New England Journal of Medicine*, 382(8), 692-694.
- xix. Nduka, A., Samual, J., Elango, S., Divakaran, S., Umar, U., & Senthil Prabha, R. (2019, December). *Internet of Things Based Remote Health Monitoring System Using Arduino*. In 2019 Third International conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud) (I-SMAC) (pp. 572-576). IEEE. <https://ieeexplore.ieee.org/abstract/document/9032438> Accessed 29/03/2020
- xx. Nicilas, S.E., (2000). Cybercrime rises during coronavirus pandemic. Euobserver. March 25, 2020. <https://euobserver.com/coronavirus/147869>. Accessed 17/04/2020.
- xxi. Read, J. M., Bridgen, J. R., Cummings, D. A., Ho, A., & Jewell, C. P. (2020). Novel coronavirus 2019-nCoV: early estimation of epidemiological parameters and epidemic predictions. *MedRxiv*. <https://www.medrxiv.org/CONTENT/10.1101/2020.01.23.20018549V2>. Accessed 3/04/2020
- xxii. Schraer, R., & Lawrie, E., (2020). Coronavirus: Scientists brand 5G claims 'complete rubbish' BBC News, April 5, 2020 publication. <https://www.bbc.com/news/52168096>. Accessed 06/04/2020.
- xxiii. Slawson, L. (2020). The 10 Worst Pandemics in History. Larry Slawson. <https://owlcation.com/humanities/The-10-Worst-Pandemics-in-History>. Accessed 06/04/2020
- xxiv. Storey, M. A., Singer, L., Cleary, B., Figueira Filho, F., & Zagalsky, A. (2014). *The (r) evolution of social media in software engineering*. In *Proceedings of the on Future of Software Engineering* (pp. 100-116). <https://dl.acm.org/doi/abs/10.1145/2593882.2593887>. Accessed 27/03/2020
- xxv. TheStar Newspaper, April 5, 2020 publication. <https://www.thestar.com.my/tech/tech-news/2020/04/05/covid-19-residents-take-coronavirus-surveillance-into-their-own-hands>. Accessed 06\04\2020

- xxvi. The Star newspaper², April 9, (2020). Turkey to track citizens via mobile phones to enforce quarantine. <https://www.thestar.com.my/tech/tech-news/2020/04/09/turkey-to-track-citizens-via-mobile-phones-to-enforce-quarantines>. Accessed 10/04/2020
- xxvii. WHO¹, (2020). Coronavirus disease 2019 (COVID-19): World Health Organization situation report, 59. Published March 19, 2020. https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200319-sitrep-59-covid-19.pdf?sfvrsn=c3dcdef9_2. Accessed 03/04/2020
- xxviii. WHO², (2020). Coronavirus disease 2019 (COVID-19): World Health Organization situation report, 60. Published March 19, 2020. https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200320-sitrep-60-covid-19.pdf?sfvrsn=d2bb4f1f_2. Accessed 03/04/2020
- xxix. Win, T.L., & Yi, L.B., (2020). Covid-19: Residents take coronavirus surveillance into their own hands. The Star Newspaper, April 5, 2020 publication. <https://www.thestar.com.my/tech/tech-news/2020/04/05/covid-19-residents-take-coronavirus-surveillance-into-their-own-hands>. Accessed 10/04/2020
- xxx. Zolkeple, F., (2020). 556 cases of face mask scams so far, RM4.2mil lost. TheStar Newspaper¹, April 4, 2020 publication. <https://www.thestar.com.my/news/nation/2020/04/04/556-cases-of-face-mask-scams-so-far-rm42mil-lost#cxrecs>. Accessed 06\04\2020