SINGAPORE RESIDENTS' VIEW ON COVID-19 INFORMATION DISSEMINATION: RISK COMMUNICATION AND PUBLIC TRUST STUDY

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ACCEPTANCE PAGE

This thesis titled "**SINGAPORE RESIDENTS' VIEW ON COVID-19 INFORMATION DISSEMINATION: A RISK COMMUNICATION AND PUBLIC TRUST STUDY"** is hereby accepted by the Faculty of Information and Communication Studies, U.P. Open University, in partial fulfillment for the degree Master of Development Communication (MDC).

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BIOGRAPHICAL SKETCH

Rachelle Anne Lim Suarez is a licensed nurse and a graduate of Bachelor of Science in Nursing from Sacred Heart College, Lucena City in 2009, where she was a consistent dean's lister and was an academic scholar based on GPA. She was actively involved in CODES (Cordian Debate Society) and was sent to various universities in Manila to participate in symposiums at that time. From her early childhood education up to secondary years in Holy Rosary Catholic School, Lucena City, she won several awards in essay writing contests, oratorical, and extemporaneous speaking competitions. More than ever; she knew she was passionate to undertake a communication degree but was hindered by some factors back then. Fast forward to today, her love for communication re-ignited when she saw an opportunity for online learning in 2018 via the UP Open University platform.

Aside from being a nurse, the roles which she had undertaken in the past, were: Cabin crew (for Cebu Pacific and Silk Singapore Airlines),Business Development Consultant (for Global Recruitment Consultancy), and Corporate Group Assistant (for Macquarie). Currently, she is a Retail Manager for Lovisa, a role which makes her live up her passion of motivating and leading a huge team of women for success.

Concurrently, she has lived in Singapore for 12 years now and is an active member of Red Cross Singapore, United Women Singapore and AWARE (Association of Women for Action and Research). Having a strong advocacy for social change, she one day hopes to take part in major developmental projects across the world to better the lives of the vulnerable members of the community especially the women and young children.

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INTRODUCTION

Rationale and Background of the Study

In the face of a rapidly evolving COVID-19 global pandemic, the need for transparent and accurate risk communication became incredibly clear in many parts of the world. Poorly communicated information about transmission rates had fatal consequences in communities that did not act with a sense of urgency (Paulik, 2020). Currently, the World Health Organization has already declared the rapid spread of COVID-19 as a global public health emergency (Dryhurst, et al., 2020). COVID-19 infection continues to increase with more than 458 million confirmed cases and about 6million deaths as of March 14, 2022 (WHO, 2021). It is said that not in the history of mankind has a widespread pandemic been met with an extensive and invasive action from political authorities and the healthcare community (Finset, et al., 2020). With the crosscutting impacts of the said virus, individual country responses and the state of preparedness of local public health systems has greatly varied across the world (Kuguyo, et al., 2020).

Although Singapore secured much praise for its handling of the severe acute respiratory syndrome (SARS) in the past, it also had to "unlearn" and "unfix" assumptions and mindsets that grew out of that experience; hence, a protracted crisis of uncertainty raising difficult questions of sustaining public awareness and alertness had to be compounded (Menon, 2008).In Singapore, the first case of COVID-19 was detected on January 23, 2020 (CDC, 2020). It has about173,000 confirmed cases as of October 25, 2021 (Gov.sg, 2020). According to Abbasi (2020),

the outbreak is similar to other outbreaks such as the SARS or the MERS in which the causative organism migrated to human population from its animal reservoir, i.e., the bats. However, genomic comparisons suggest that the SARS-Cov-2 virus is the result of a recombination between two different viruses, and the exact origin is still unclear (Hassanin, 2020). While many infectious outbreaks have distressed Singapore in the past, the public's reaction to this outbreak has also called into question the city state's resilience and social cohesion at a time of increased stress (Xinghui, 2020). Researchers have emphasized that follow-up studies would be needed to gain a better understanding of this COVID-19 virus (Meredith, 2020).

However, despite several attempts, scientists have not come up with any vaccine that is proven 100% effective in fighting this virus. Communities have been left with insufficient explanation of the barrage of health-related information describing testing methods, positive versus negative test results, recommended precautions, symptoms, virus transmission, and contact tracing; yet, that information requires them to make real-time decisions that affect their health and their families (Paulik, 2020). As a result, the public has been left extremely worried and in fear of contracting the virus. According to a study conducted by marketing communications agency Wunderman Thompson, the impact of the corona virus outbreak has caused anxiety among three in every four Singaporeans (Goh, 2020). Being aware of the eminent panic buying among the public, the government has used media such as television, newspapers, radio, and digital display panels in Housing Board apartments (Gonzales, 2020). From a containment perspective, the goal was to have the community take precautionary measures without unnecessary anxiety and disruption to their lives (Jones, 2010). Early communication about the disease

outbreak will better help communicate the risk and assist the general public in responding quickly to the outbreak (Balkhy, et al., 2010).

Since COVID-19's speed and scale breed uncertainty,how organizations communicate about its risk can create clarity, build resilience, and catalyze positive change (Mendy, et al, 2020). The circumstances are changing, and information is rapidly evolving; hence, the focus must not only be on the transmission of reliable and up-to-date information but also on the dissemination of effective risk communication (Abrams, 2020). The overall aim of risk communication is 'to provide the public with meaningful, relevant, accurate and timely information in relation to ... health risks in order to influence choice. In addition, effective risk communication is also essential to limiting morbidity and mortality caused by communicable diseases (Infanti, et al., 2020). As it is very critical to emergency management (Zhang, 2020); the consequences of a pandemic will depend on the effectiveness of health risk communications (Vaughan, 2020).

However, studies on dissemination of risk communications were still fairly insufficient; the COVID-19 pandemic was a testing time for the field of risk and emergency communication (Abram, 2011). Since the COVID-19 outbreak started, there have been massive studies on the knowledge, perceptions, attitudes, and behaviors towards pandemic in different parts of the world such as that of Valdivia, et al., (2020), Seale, et al., (2020), Perrotta, et al., (2020), Reuben, et al., (2020), Wahed, et al., (2020), Nguyen, et al., (2020), Honarvar, et al., (2020), and in Singapore, Lim, et al., (2020), IPSOS, (2020), and Shorey, et al., (2020).The risk lapses though in communicating COVID-19 are still evident (Wucker, 2020). Even if

the pandemic has led to a massive global public health campaign to slow the spread of the virus such as increasing hand washing, and wearing masks in public (Bavel, et al., 2020), the success of policies to slow down the rapid transmission of a highly infectious disease will rely heavily on effective dissemination of health risk communication (Vaughon, 2009). Henceforth, studying how COVID is being communicated to the public is extremely significant.

Another emerging concern in communicating COVID-19 has been the spread of dis- and misinformation about COVID-19 on social media sites, which has led the WHO to host a page with “myth busters” on their website and engage in discussions with social media companies (Zarocostas, 2020). The intensifying state brought about by misinformation, with some members of the public spreading unfounded rumors and speculations (Gov.sg, 2020) have also been rising rapidly. According to Vaughan (2009), communications must be able to successfully instruct, inform, and motivate appropriate self-protective behavior; update risk information; build trust in officials; and dispel rumors.

Hence, this research generally explored how the Singapore residents viewed COVID-19 information dissemination. It soughtout to identify the primary channel of information used by the residents and gauge how the residents evaluated and received those communications.As trust is a major component of an effective risk communication, this research also determined the level of trust of the public towards the government. Consequently, this helped predict likelihood of their support towards various existing and future governmental campaigns on combatting COVID-19.

Statement of the Problem

Over the course of March 2020, the everyday life of most people changed from normal to extraordinary around the globe (Finset, et al., 2020). The COVID-19 pandemic has been a pressing issue in Asia at the moment, especially in Singapore, where the number of infections is one of the highest outside of China (Tan, 2020). COVID-19 has posed an unprecedented challenge to governments worldwide (United Nations, 2020) but despite global efforts to promote collaboration across sectors, having an efficient coordination and collaboration remained to be an opportunity for public health emergency preparedness and response (Kern, 2016). In the past, a pandemic like this has been proven to threaten public health security (Fatiregun, 2017) and the speed with which COVID-19 is spreading across the world, calls for rapid assessments of how COVID-19 should be communicated to the general public.

Communication lies at the 'heart of public health and plays a pivotal role in promoting core public health objectives...including disease prevention, health promotion and quality of life (Badr, 2009). However, one of the challenges is that COVID-19 pandemic produced a massive amount of information all around the world (Benski, et al., 2020). As it has always been, communication is a vast topic and is a broad science because some information can be delivered the same way but can bring forth different emotional reactions (Reynolds & W. Seeger, 2005; Gurabardhi, et al. 2005; Toppenberg-Pejcic, et al., 2019). Thus, COVID-19 has called for measures and platforms to ensure that the actual and true information reaches its target audience (Veil. et al., 2011; Lachlan, et al., 2016). Poor communication has

greater chances of ruining trust and reputation to the public, impacts economies and make fatalities even worst (Hassounah, et al., 2020). In contrast, according to Singapore's Minister for Communications and Information, Mr,Iswaran (2020), "good communications is proving an essential ingredient in quelling citizens' unease and fears.

Risk communication expert Sandman (2020) has also praised Singapore's Prime Minister Lee for illustrating what sets Singapore way above other countries so far in this pandemic, from warning people that containment efforts will change to mitigation and coping efforts, and what that may look like; however, every new outbreak, especially when an illness is unfamiliar still creates fear of the unknown (Moukaddam, 2019). Unfortunately, while some members of the public have understood the need to follow health communication guidelines, others have received the information on COVID-19 slightly differently, a factor that has led the nations to struggle in curbing the effects and containing the outbreak (WHO, 2020). In addition, researchers have also found that a challenge for risk communications is to correct for optimism bias — people's tendency to see things as rosier than they are in reality and thus, minimize or ignore risks (Wucker, 2020). Some members of the public have taken the COVID-19 risks so lightly that they have not adapted to the new norms of wearing masks and maintaining 1-meter social distancing rules.

In addition, with COVID-19 being an emerging virus, it has propagated extreme anxiety and panic among majority of Singaporeans. This was ignited after MOH (Ministry of Health) raised DORSCON (Disease Outbreak Response System Condition) alert to "orange" level indicating that the spread of the virus was

beingcontained and was one level away from red—the highest form of alert (MOH,2020). Inexperience with novel pathogens means that even the professionals would not be able to answer all of the questions, which can create public panic (Patrick, 2020). Consequently, pandemic anxiety towards COVID-19 in Singapore has been so particularly rampant as the public resorted to hoarding not only of masks and sanitizers, but even food and other daily supplies. Left unexamined, a pandemic like COVID-19 can spread fear and erratic behavior. The larger the scale of an outbreak, the greater the impact and magnitude of its sequelae will be (Moukaddam, 2019).

As little is also known about COVID-19, misinformation and misconceptions about this virus has also turned out to be extensive. For instance, fake news among others include claims alleging an individual has died of the infection and that train station was closed for disinfection due to a suspected case of the coronavirus (Lee, 2020). In some cases, social media greases and amplifies dramatic headlines (Fischer, 2020) about the virus while the useful and genuine information gets altered. In one-way or another, media coverage of COVID-19 can also either inform or misinform, causing adverse and unnecessary consequences (Patrick, 2020). Hence, providing accurate and reliable information during a pandemic is a fundamental modality of outbreak control strategies in communicating risk of COVID-19.

One of the ways to ensure preparedness in pandemic without paranoia is to disseminate effective communication strategies (Jones, 2010) but with the existence of misinformation and fake news, communicating COVID-19 risk has been difficult. While social media platforms have been increasing their vigilance about removing

COVID-19 conspiracies by continuing to update its policies, the growing popular usage of mobile phones and other communication technologies, and the rapid spread of information of all kinds, including fake news and unreliable information still exist. Moreover, in a pandemic like COVID-19, not everyone has access to reliable news media, and there are disparities in how relevant information is being disseminated (Johnson, 2017). In the hype of this virus infodemics, it is crucial, more than ever, that the public has access to genuine, reliable and accurate information. Therefore, it is also imperative to determine the public's source of information on COVID-19 and its impact in communicating COVID-19 to the public.

This study, while finding theoretical support from the extensive literature review, Berlo's Communication Model (1960), alongside Cutlip's 7 Aspects when Communicating to an audience (1985), Covello's 7 Cardinal Rules of Risk Communication (1984), and Beshi and Kaur's framework for evaluating trust (2019), attempted to answer the general question: How Singapore residents view COVID-19 information dissemination as risk communication and public trust?

Specially, it sought to find answer to the following questions:

1. What is the primary channel of COVID-19 information used by the Singapore residents?
2. What is their level of trust towards the government?
3. How did the Singapore residents receive the COVID-19 communications?

4. What is their likelihood of support towards existing and future COVID-19 communications? and
5. What is their assessment and evaluation of risk communication strategies by the government?

Objectives of the Study

Generally, this study aimed to determine how Singapore residents' viewed COVID-19 information dissemination under the context of risk communication and public trust. `

Specifically, it sought out to:

1. Identify the primary channel of COVID-19 information used by Singapore residents;
2. Measure the Singapore residents' level of trust towards the government;
3. Determine how the residents received the COVID-19 communications;
4. Explain their likelihood of support towards existing and future COVID-19 communications; and
5. Analyze the Singapore resident's assessment of risk communication strategies by the government.

Significance of the Study

In public health emergencies such as COVID-19, communication to the public is critically important (Savoia, 2013). Alongside its importance, it is also imperative to examine the extent to which this issue has received attention not only to the scientific community but to the residents as well. People live in unique social-cultural contexts, with relationship dynamics, and their own perception of risks, and trusted sources of advice do influence whether they will accept a health advice or not (WHO, 2020). If the public adapt accordingly to the health communication guidelines, the spread of a virus can be controlled. Hence, research and studies on the context of a pandemic not only guide communication and mitigation strategies during the event but can also inform future pandemic preparedness planning at the same time (Walter, et al., 2012).

Researches relating to COVID-19 are existent despite being a newly emerging virus. Other studies have been carried out focusing on its origin, epidemiology and pathology, the number of cases, and the perceptions and behaviors of the public; however, not many has endeavored to study the risk communication aspect of COVID-19. Communication has been highlighted as an important part of risk communication (WHO, 2001). Health risk communication is also regarded to be essential for protecting public health in the event of a pandemic as it maximizes the public's capacity to act as an effective partner by encouraging prevention, promoting containment, and fostering resilience and recovery (Holmes, 2008). Since accurate and well-developed health communication can facilitate how

societies handle uncertainty and fear, promote and accomplish adherence to necessary behavior change, and foster hope in the face of a crisis, health communication is a key and necessary factor in saving lives during the COVID-19 pandemic crisis (Finset, 2020).

Exploring how COVID-19 communications was being disseminated to the residents was supposed to help maintain health systems that are agile and quick to respond to future threats (Kuguyo, 2020).As the consequences of this pandemic depends on the effectiveness of health risk communications (Vaughan, 2020), investigating risk communication guidelines is also thus significant. According to Zhang et al (2013), risk communication is an important means to enable cooperation, share resources, and develop efficient strategies to deal with a public health crisis.

This study, as it soughtout to gauge how COVID-19 communication was disseminated to the residents, attempted to also find out the primary channel of information used in doing so. The result of this study will also give an overview of the level of trust of the public towards the government. According to Glik (2007), public trust in institutions that are perceived to be providing reliable information is important in crisis and risk communication. In addition, findings from this study will tackle how COVID-19 communications were received and evaluated by the Singapore residents. By doing so, the outcome of the study may be used to predict the public's likelihood of adhering to COVID-19 measures and future health communication guidelines. Overall, exploring the aforementioned subject field is an indispensable tool in order to help improve public health campaigns on COVID-19 and implement a

coordinated disease outbreak response in the nation– a strategic, timely, and effective plan that prevent not only unnecessary deaths but anxiety and fear among the general public as well. This response will in turn benefit the general public themselves and will retain the peace and order in the communities of Singapore.

This study generally aimed to investigate the role of communicating risk in an emergency management of COVID-19. By doing so, it will potentially present possible answers behind the occurrence of communicational gaps such as misinformation, incidence of pandemic anxiety and existence of certain behaviors towards COVID-19 such as panic buying of masks, sanitizers and hoarding of several essential supplies. This should also be able to address the public's main channel of information and can be a platform to improve on existing communication strategies in disease outbreak management; thus, preventing communicational gaps from transpiring in the future. According to Geldsetzer(2020), understanding communication gaps about COVID-19 is also very important so as public health authorities, alongside media will be able to design effective information campaigns towards COVID-19.

Scope and Limitations of the Study

This study was conducted to determine how COVID-19 information was communicatedand disseminated to the Singapore respondents. Aspects looked into were concepts and theories of risk communication, the respondent's primary channel of information, the public's level of trust towards the government, their evaluation of

how COVID-19 communications were received and their assessment of the risk messages from the government.

This study was carried out in Singapore using a survey questionnaire. Due to the strict data policy in Singapore and the slim chance of getting all the list of the members of the population, one of the limitations of the study was the use of non-probability sampling. The participants then, did not have an equal chance of participating in the survey. To delimit the selection bias however, selection criteria was included such as the socio-demographic profile specifying location. To increase reliability, 114 respondents from the 5 regions in Singapore, namely, Central Region, North Region, North-east Region, East Region and West Region were recruited for this study. Hence, results were not generalizable considering that Singapore as an island city-state that has a population of about 5.6 Million (MOH, 2018).

Chapter 2

REVIEW OF RELATED LITERATURE

COVID-19 Overview

Infectious diseases continue to be a major threat to modern society (Lim, 2020). Over the last two decades, major outbreaks of deadly CoVs have been reported in humans and livestock, including severe acute respiratory syndrome (SARS) in 2003, Middle East Respiratory Syndrome (MERS) in 2012. and most recently, Swine Acute Diarrhea Syndrome (SADS) in 2017 (Virol, 2019). These outbreaks have had a significant impact on the economy, global travel and society, and should serve as a warning for other emergent CoVs (Lim, et al,. 2020). Thereafter, a cluster of pneumonia cases in China was discovered in December 2019 (Bokat-Lindell, 2020) and was provisionally named “COVID-19”, the 2019 Novel Corona Virus (WHO, 2020). This was for the third time in as many decades that a zoonotic coronavirus has crossed species to infect human populations (Perlman, 2020).

WHO defined Coronaviruses (CoV) as a large family of viruses that cause illness ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV). According to European Centre for Disease Prevention and Control (2018), SARS-CoV had triggered large outbreaks in different countries globally in between 2002–2003. It has caused severe pulmonary infections and has affected

8096 people in total. On the other hand, MERS-CoV was identified in 2012 in Saudi-Arabia and statistics from WHO showed 2494 confirmed cases of MERS with fatality rate of 34.4 percent while SARS fatality rate was at 9.6 percent.

The fatality rate for the COVID-19 virus was initially at 2.1 percent in January but progressed to about 2.7 percent as of October 11, 2020 (WHO, 2020). Still, a lot of scientists have argued that the number of death tolls keep on fluctuating; hence, defining its fatality rate will not be accurate at all. "The issue now with COVID-19 is that “there are a lot of unknowns” (Dr. Fauci, 2020). However, it has been identified thatthe current deaths associated with COVID-19 have surmounted the previously deadly virus SARS with 799 deaths including 33 in Singapore alone (Chew, 2003). Due to its prevalence, COVID-19 has been declared a global pandemic on March 11 (WHO, 2020). According to (Qiu, 2017), disease outbreaks, particularly those that become pandemics, have caused enormous negative impact on health, economies, and even global security in the world.

Singapore Management of COVID-19

Geographically, Singapore has been widely prone to various epidemics because of its vast exposure from other countries through the air (Hou, Yan’an, et al., 2018). The initial epicenter for COVID-19 pandemic was Wuhan, China and Singapore has the strongest contact with Wuhan, with an estimated 3.4 million people traveling between Wuhan and Singapore annually and had the greatest potential existential threat due to COVID-19 (WHO 2,020).

Researchers believed it is not easy to transmit COVID-19 virus from human to human; however, Singapore has been exposed massively due to the high influx of Chinese tourists visiting the country and the arriving locals who visited their mainland for the recent Lunar Year in February 2020. The flight frequencies between China and Singapore have also been relatively high having four major Singapore-based carriers serving China– Singapore Airlines, SilkAir, Scoot, and Jetstar Asia. As the Singapore-China market boomed, five new Chinese airlines in the past six months grew operator count to at least 18 carriers, the latest addition of which were Guangxi Airlines, Hainan Airlines, Juneyao Airlines, and Shandong Airlines (The Blue Swan Daily, 2019). This has led to the increased importation of this COVID-19 virus within the country. Singapore recorded its first case on 23 January 2020, at about the same time with the United States (WHO, 2020) and has been followed by 43 more confirmed cases in less than 5 weeks, which had prompted the government to cease all flights in and out of China in February 2020 (Wei, 2020). Subsequently, the government had implemented a strict quarantine procedure for all arriving passengers. This had left a number of passengers confused, as some were not aware of the preventive measures being undertaken. Similarly, findings from (Sridhar, 2016) suggested that methodologies for measuring travelers' risk perception of infectious diseases showed overall lack of knowledge among travelers about the most frequent travel-associated infections and associated preventive measures. For travellers at high-risk for developing complication, preventive measures should be strongly recommended (Goeijenbier, 2017).

The government also took preventive measures by liaising with the Ministry of Transport to track down whereabouts of the infected people (Ministry of Health,

2020). On the other hand, Ministry of Health has raised “Disease Outbreak Response System Condition” (a color-coded framework that shows the current disease situation) to orange level, which means, “The disease is severe and spreads easily but is being contained”. In addition, MOM (Ministry of Manpower) has required all work pass holders with recent travel history to Mainland China to serve a mandatory 14-day LOA(Leave of Absence) upon their arrival in Singapore. Employers should also comply with the advisory for their other workers with recent travel history to Mainland China to be place on 14-day LOA (Leave of Absence) upon arrival in Singapore (Ministry of Manpower, 2020).

Some religious bodies have also cancelled activities while others ramped up cleaning as a preventive measure against the COVID-19. As spread of communicable disease remains to be one of the challenges of religious mass gatherings, (Karamporian, 2019), social distancing and strict precautions on any large event have also been implemented by the Ministry of Health (MOH, 2020). The Table below summarizes the responses of the government during the initial stage of COVID-19 in Singapore:

Table 1. COVID-19 Initial timeline in Singapore adopted from (Goh 2020)

Date	Event
Jan. 22	A multi-ministry task force is set up to tackle the coronavirus
Jan. 23	Singapore's first case, a 66-year-old man from Wuhan, is confirmed
Feb. 4	Singapore sees its first case of infection in the community, a 28-year-old Singaporean who worked at Yong Thai Hang, a Chinese health products shop in Lavender.
Feb. 7	MOH raises the Dorscon level from yellow to orange. A wave of panic buying ensues.

Feb. 9	Case 42 is admitted to the hospital. He will spend the next five months fighting the infection.
Feb. 12	MOH first refers to the disease as Covid-19 in its daily press releases.
Feb. 13	Grace Assembly of God becomes the first religious organisation here to suspend services so as a result of Covid-19
March 5	A new cluster involving a dinner at Safra Jurong is announced.
March 21	Singapore sees its first two deaths from the virus.
March 23	Peak of daily imported cases. All short term visitors are no longer alllowed to enter or transit through Singapore from 11.59pm.
March 26	All bars, cinemas and entertainment outlets are closed.
April 7	Circuit breaker measures kick in. Most workplaces are closed, and dining-in at eateries is not allowed.
April 13	Peak of daily community cases.
April 14	Mask-wearing outside of one's house becomes mandatory.
April 20	Peak of daily dorm cases.
April 21	PM Lee announces that the circuit breaker measures will be extended till June 1. The measures are also tightened, with barber and bubble tea shops closing.
April 30	Changi Airport Terminal 2 suspends operations for 18 months. The last flight leaves at 6.10am for Tokyo.
June 1	The circuit breaker lifts and Singapore enters Phase One of reopening. Parents and grandparents can receive up to two visitors at once, from the same household.
June 2	Schools re-open, but only some students have to attend daily lessons.
June 26	Bangladeshi worker Raju Sarker, also known as Case 42, is discharged from Tan Tock Seng Hospital after spending almost five months there.
July 1	All acute respiratory infection patients aged 13 and above are swabbed for Covid-19 from this point.
July 10	Polling day: Long queues form at various polling stations across the island, in part due to the safe distancing measures. The Elections Department revises its earlier guidelines on wearing disposable gloves.

Pandemic Anxiety

The COVID-19 pandemic is an experience that is unprecedented in this lifetime (Lieberman, M.D 2020). Pandemics are shrouded by uncertainties, whereas risk communication is about communicating these uncertainties (or known and unknowns) to the public, healthcare workers, and the relevant stakeholders (Ejiuwugco, 2013).

Over the years, infectious diseases have had a significant role in shaping human history and have engraved an automatic response in the subconscious of a fear of infection (Pappas 2009). Hence, these days, there is a need to accept the anxiety inherent in living in the time of COVID-19 pandemic (Sharp, 2020). However, the outbreak of the COVID-19 may be stressful for some people as fear and anxiety can be overwhelming and can cause strong emotions in adults and children (CDC, 2020). According to a study conducted by marketing communications agency Wunderman Thompson, the impact of the corona virus outbreak has caused anxiety among three in every four Singaporeans (Goh, 2020). The top two concernswerethe fear of contracting Covid-19 in public spaces and the fear of long-term disruption to the economy.

In addition, inconsistent messaging from governments, the media, and public health authorities—such as all the varied recommendations on social distancing—fuels anxiety (Bishop, 2020). Research has also shown that different threats push various psychological buttons. For instance, unusual threats like Ebola

or avian flu raise anxiety levels higher than more familiar threats such as flu where individuals may feel less fearful (Lu, 2015).

With the existence of COVID-19 in Singapore, the public could not be more than worried and alarmed of its impending threat. It has been apparent that majority of the general public was anxious as they resorted to extreme panic buying and hoarding of stocks such as food and other daily essentials (Strait Times, 2020).

MrAbdolrezaAbbassian (2020), chief economist at the United Nations' Food and Agriculture Organisation (FAO) said “It is not a supply issue, but it is a behavioral change over food security."

Singapore Trade and Industry Minister Chan Chun Sing (2020) said:

> “Singaporeans should never succumb to short-term fears and behaviors such as panic buying and hoarding of masks, as these will destroy the entire system that the Government has built to counter infectious diseases”.

The warning came after the Government released 5 million masks from the national stockpile to retailers only to be seen snapped up within hours of their release (Ting, 2020). Environment and Water Resources Minister MasagosZulkifli emphasized, however, that Singapore had enough food stocks, with others saying that the island's supply chains remain intact, and sociologist Paulin Straughan condemning the hoarding behavior as "irrational" (Goh, 2020).

Historically, panic-buying of supplies is one-way humans have coped with uncertainty over epidemics since at least 1918 during the Spanish flu—when people in Baltimore raided drug stores for anything that would prevent the flu or relieve its symptoms—all the way up to the 2003 SARS outbreak (Mckeever,

2020). In addition, fear, denial, and frustration, have also been reported as predominant among patients or quarantined individuals during the SARS outbreak in Canada and Amoy Gardens in Hong-Kong (Lee, et al., 2004).

Challenges and Gaps in Communicating COVID-19

From the SARS outbreak in 2003 to the Ebola epidemic of 2014–2015, one thing that always seems to go wrong in health emergencies is how national authorities communicate about its risk (Ueda, Sayaka, et al., 2017). Communication lies at the 'heart of public health and plays a pivotal role in promoting core public health objectivesincluding disease prevention, health promotion, and quality of life (Badr, 2009). However, one of the challenges is that COVID-19 pandemic produced a massive amount of information all around the world (Benski, et al., 2020). As it has always been, communications is a vast topic, a broad science and an imperfect art; the meaning of the messages being conveyed may be interpreted differently and can bring forth different emotional reactions (Reynolds, et al., 2005, Toppenberg-Pejcic, et al., 2019). Communication is a subtle ingredient to organizations and even regions and the occurrence of COVID-19 has called for measures and platforms to ensure actual and true information will reach its target audience. (Veil, et al., 2011;Lachlan, et al., 2016). Yet, misinformation has gone viral and thus from the misrepresentation of the information, the audience and the recipients of the information choose to take what they think is right and form perceptions on how to get safe or even be cured (Wendling, et al., 2013; Graham, et al., 2015). Some have been submissive, while others have either received the information on COVID-19 differently, a factor that has led the nations to struggle in curbing the effects and containing the outbreak (World

Health Organization, 2020). To address this, maintaining an open and honest attitude and actively engaging stakeholders is needed to build trust and facilitate multi-sector collaborations in dealing with a public health crisis (Qiu&Wuqi, 2016). As circumstances are changing and information is rapidly evolving, the focus must not only be on the transmission of reliable and up-to-date information but also on the dissemination of proper and effective risk communication (Abrams, 2020).

Myths and Conspiracy theories of COVID-19. From 31 December 2019, when the Chinese scientists announced the pneumonia-like flu that is sweeping out the Wuhan city, conspiracy and wild claims have been adopted around the globe. Social sites welcomed the information warmly, and the journalists were interested in bringing first-hand knowledge to the consumers (Visschers, et al., 2009). Predominantly, some sites fabricate stories and post them for audience's increased viewership. However, conspiracies have not been existent only in today's world (Ellis, 2020). During the black plague that ruined Europe, people were certain that the Jewish neighbors poisoned the wells in the 1300s (Paulik, et al., 2020). The current pandemic has been accorded claims that it was a bioweapon, while others state that the disease emanated from the people who consume bat soup. Just like in ancient times, the information has been based on racism and anxiety, which is obviously out of tune from reality (Glik, 2007). Misrepresentation of the true information falls under two categories; the conspiracy theory and misinformation on miraculous healing Quinn, 2008; Reynolds & Quinn, 2008; Prue, et al., 2003). Indeed, no one understands where the virus emanated from, but there are claims that the virus was hosted by animals and was later transferred to humans (Ejiugwo,

2014; Nowak, et al., 2020). Some researchers claimed that the vector was a bat though it has been the same regarding Ebola and other zoonotic diseases. The claim is somehow racial because it targets bat soup consumers, which is a Chinese consumption habit (Saxon, et al., 2019).

Other researchers claimed that the virus is a bioweapon, and unfortunately, the virus escaped the labs before they could get an antidote (Holroyd, et al., 2020; Qiu, et al., 2016). The culprit is an Israeli scientist who stated very clearly that there was no backup proof for that theory. Others believe that the coronavirus is a cover-up plot claiming that the disease is not new at all from supposed proof of patent vaccines labeled on cleaning products (Shrivastava & Shrivastava, 2020). According to Vaughan (2009), communication in times of crisis should be able to not only instruct, inform, and motivate appropriate self-protective behavior; update risk information, build trust in officials but dispel aforementioned rumors as well.

Optimism Bias. Another challenge to risk communication is when people exhibit optimism bias. These are the thoughts that there is less likelihood for bad things to happen to them than someone else (Dryhurst, et al., 2020). The optimism bias could be essential in addressing negative emotions, but it can also lead to people predisposing themselves, not adhering to public health warnings and ending up contracting the disease (Deng & Peng, 2020).

Researchers from the University of Connecticut and Zhejiang University in China found that a challenge for risk communication is to correct for optimism bias — people's tendency to see things as rosier than they are in reality and thus minimize

or ignore risks (Wucker, 2020). In Singapore, some members of the public are still taking the risk of COVID-19 lightly. Mask wearing has been mandated by the public since April 14, 2020; however, more and more people have beennon-compliant and have been fined $300 (Tay, 2020). Thus, communication strategies ought to balance optimism bias and, on the other hand, not induce excessive emotional charge and dread (Krause, et al., 2020).

Culture, Values and belief system.Risk communication is very important, but some challenges have rendered the communication less effective (Van Bavel, et al., 2020). Culture is defined as the pattern of beliefs, values and learned ways of coping with experience that have developed during the course of an organization's history, and which tend to be manifested in its material arrangements and in the behaviors of its members (Brown, 1995). One dimension of cultural variance is a society's 'tightness' vs 'looseness'; research has found that tight cultures, such as those of Singapore, Japan, and China, have strict social norms and punishments for deviance, while loose cultures, such as the US, Italy, and Brazil, have weaker social norms and are more permissive (Gelfland, 2011.).

Facts can hit a bottom rock when the information is served to a believer without considering their belief systems (Kitayama, et al., 2018; Kraus &Kitayama, 2019). For instance, many religious people will feel denied the chance to worship and praise their divine creator. A politician and a businessperson will be looking forward to the economic recession that will occur during and after the pandemic (Van Bavel et al., 2020). The rush of information can more probably than not influence the understanding of technical information (Gelfand, et al., 2017). People losing their

businesses and jobs are more likely to overlook the health factors in interpreting risks associated with the pandemic (Van Bavel, et al., 2020). The informers need to understand the audience's background and design the ideal way to make the information sensible. It would be a great disarray trying to think that everyone would internalize the messages as technical as they are uniformly disseminated. (Van Bavel, et al., 2020). Experts at the front line of a health emergency must be prepared in advance to translate medical observations, health statistics, and viral research into terms that are meaningful to a wide variety of audiences (Paulik, 2020).

Social Influence. Due to the extensive social influence, public health emergency has attracted great attention in today's society (Hu, 2015). Previously, the manner in which the disease (SARS) was portrayed by the media and its influence on the perspectives of the general public has fostered racial discrimination, alienation, and stigmas that damaged targeted Asian groups around the globe (Lee, 2013). While medical policies are different across societies, some differences in the response to the pandemic may be better described as cultural, and many of those have a linkage to the dimension of independence vs interdependence (Bavel, 2020).

The priority given to obligations and duties in Asian societies may motivate individuals to remain committed to social norms while suppressing personal desires (Kitayama, 2018). From an evolutionary perspective, when groups experience collective threats, strict rules may help them to coordinate to survive. Therefore, the spread of COVID-19 infections may tighten communities and cultures accustomed to prioritizing freedom over security may also have more difficulty coordinating in the face of a pandemic (Bavel, 2020).

The root causes of the rise of extreme opinions in society have also constituted nowadays a matter of intense debate among leading scholars. The degree of social and economic development, the religious beliefs, the full history, and many other factors, undoubtedly, all contribute to mold the distribution of opinions of the members of a society. However, besides those social features contributing to a collective mood, interactions between individuals played also an important, often underestimated, role (Ramos, 2015). According to Cui (2008), individuals may consider global information not only from news media but also from local first-hand encounters with disease such as infected acquaintances, friends or family members when gauging infection risk. In Singapore, the trust placed by Singaporeans in the Government and the media is higher than the levels seen in other developed countries.Two-thirds or 67 percent of Singaporeans trust the government, media and non-governmental organizations (Edelman Trust Barometer, 2019). Interactions among individuals may have also played a role in contributing to a collective opinion (Ramos, 2015) towards COVID-19. In today's society, public health emergencies, such as SARS in 2003, Bird Flu in 2006, A (H1N1) Flu in 2009, and EBHF in 2014, have also triggered extensive social influence by disseminating information (Hu, 2015) in various platforms.

Fake News and Misrepresentation. Fake news or misinformation (about COVID-19 have proliferated widely on social media, with potentially dangerous consequences (Frenkel, et al., 2020). For instance, claims alleging an individual has died of the infection and that train station was closed for disinfection due to a suspected case of the coronavirus have thriven in various social media sites (Lee, 2020). In some

cases, social media greases and amplifies dramatic headlines (Fischer, 2020) about the virus while the useful and genuine information gets altered. In one-way or another, media coverage of COVID-19 can also either inform or misinform, causing adverse and unnecessary consequences (Patrick, 2020). The WHO together with the UN, has specialized agencies and partners and called on countries to develop and implement action plans to promote the timely dissemination of science-based information and prevent the spread of false information while respecting freedom of expression (WHO, 2020). Preparing people for misinformation and ensuring they have accurate information and counterarguments against false information before they encounter conspiracy theories, fake news, or other forms of misinformation, can help inoculate them against false information.

Social Media and Mass Media . Many social media tools present potential risks in the distribution of poor-quality information (Ventola, 2014).The media has always played a critically important role in informing the public during crises and emergency disasters; social media now also plays a large and growing role in shaping outrage and thus the public's perceptions of risks and mitigation (Glik, 2007). Mass media campaigns and healthy behavior have reported that mass media could elicit positive behavior change and even prevent negative behavior change in individuals. Studies have shown that media reports about outbreaks that specify numbers of cases, hospitalizations or deaths, can influence avoidance behavior and contact patterns at both individual and community levels (Herrera-Diestra, 2019).

According to (Freiman, 2011), health messages delivered through various media, especially television, have been found to be effective in informing the public

of disease-related prevention measures during a developing influenza pandemic. Congruent to this, Bauch (2015) has also argued that mass media campaigns should be used to inform the public so that behavior change can be achieved.

However, the effectiveness of mass media in the fight of COVID-19 remains unclear. In some cases, social media greases and amplifies dramatic headlines (Fischer, 2020) about the virus while the useful and genuine information gets altered. For instance, arrests over fake news have jumped across Asia to stem coronavirus 'info-demic'. Governments have brought out the handcuffs to counter a scourge of misinformation that has been picking up steam as COVID-19 spread. The government separately blamed evil rumormongers for fueling a run on goods at supermarkets such as toilet paper and rice (Strait Times, 2020). In connection, health misinformation has also been proven to exacerbate infectious disease outbreaks like COVID-19. Especially pernicious advice could be classified as “fake news,” manufactured with no respect for accuracy and often integrated with emotive or conspiracy-framed narratives (Brainard, 2019).

In line with the COVID-19 misinformation, Attorney General Tommy Thomas in a Wednesday (Feb 5, 2020) statement included:

> *"Lies about the origins, scale and magnitude of the disease must not be permitted because they endanger public safety."*

As the public resorted to panic buying behaviors, government officials have reinforced that collective defense is the country’s strongest defense while acting in unison and not jeopardizing the system (Minister Sing, 2020).

Despite efforts by social media companies to stop false information about COVID-19, it is still proliferating all over the world (Frenkel, 2020).Vijaykumar, et al. (2015), in his study entitled “Social Media and the Virality of Risk: The Risk Amplification through Media Spread (RAMS) Model”, argued that social media has transformed traditional configurations of how risk signals related to an infectious disease outbreak (IDO) were transmitted from public health authorities to the general public. His paper drawn on key ideas from other models but suggested that the RAMS model brought clarity to the new complexities in media management of a disease outbreak and that the presence of social media can alter the prevailing pathways of risk signals associated with its process.In contrast, a study on “Amplifying Panic and Facilitating Prevention: Multifaceted Effects of Traditional and Social Media Use During the 2015 MERS Crisis in South Korea,” an analysis of a two-wave online panel survey suggested that social media use did not have a positive influence on disease management while traditional media use did (Seo, 2019).

Although coverage of social media is more often than not negative, COVID-19 per se has also revealed the positive social role of social media and the way it has become increasingly central to the public dissemination and discussion of vital information about the pandemic (Das and Ahmed 2020). For instance, it has served as a medium to voice criticism of governments. Many videos and social posts have emerged from the epicentre of the virus spread area in China with hashtags such as *#IWantFreedomOfSpeech*; the entire world has criticised president Trump’s interpretation of the current downturn saying *#TrumpLiesAboutCoronavirus*, while

people in the UK questioned the conservative government's initial passive response to the crisis asking #*WhereisBoris*.

While a major limitation of social media is its ability to quickly disseminate false information which can confuse and distract (Vera 2020), social media has rapidly become a crucial communication tool for information generation, dissemination, and consumption of information (Tsao 2021). As a matter of fact, guidelines, protocols and standardized operating procedures, usually kept within institutions, are being shared at an unprecedented rate during the pandemic, with social media being used as an effective vehicle. Messaging and conferencing platforms such as Zoom, Skype, Whatsapp, etc. are complemented by free and simple-to-use collaboration software such as GoogleDrive, DropBox and Slack (Wong et al. 2020).

The News as an Information Source

Other than social media, the news also played an important role on information dissemination and had a huge impact on how the public perceived COVID-19. News media play a critical role in the dissemination of the information about public health (Larson, 1991; Wade & Schramm, 1969) as well as the creation of public opinion toward issues (Iyengar, 1991). The news environment is a significant determinant of news framing (Beaudoin, 2007). Organizational environments, interest groups, government policies, rules, and practices all exert pressure on news coverage; ideologies, values, and attitudes of journalists on specific issues also influence news coverage (Shoemaker & Reese, 1996). In

Singapore, 68 percent of residents read news more than once a week, while 41 percent read online articles posted on either social media (39%) or websites (27%) more than once a week (National Library Board, 2016).

In connection, Jin(2016) studied how diseases were being framed and did an analysis of Chinese news coverage of SARS and EBOLA. His study examined the prevalence of using newspaper in dealing with a public health crisis and suggested the importance of how a collectivism society fostered and protected the public image of the government among citizens and kept the society become stable when dealing with potential crises related to public health.

Singapore, just like other countries, utilized various media outlets such as newspapers, television, radio, government websites, and social media platforms to improve awareness and this was useful to curb the stigma surrounding SARS-CoV-2 infection and spread (Kuguyo, et al., 2020). During the SARS outbreak, dissemination of information relied primarily on conventional media such as newspapers, radio, and TV broadcasts. Since then, the channels of social media and messaging applications have transformed communication, and the Singaporean government has taken advantage. For example, public agencies and leaders have engaged with citizens via WhatsApp, telegram, Facebook live, and YouTube to ensure that live updates reach further and enable citizens to remain updated on-the-go (Abdullah, 2020).

In the initial period of the outbreak in Singapore, the usage of conventional media and digital and social media were both observed with great emphasis given

the multi-lingual and multi-cultural context of Singaporeans (Wong and Jensen, 2020). When infection clusters began to emerge in some of the foreign worker dormitories housing workers, Minister for Communications and Information S. Iswaran conducted a dialogue with workers at one of the dormitories in English and Tamil (Lim, 2020). Moreover, one of the key instruments the government deployed very early in the crisis was WhatsApp; with some 4 million users out of Singapore's population of 5.7 million (Basu, 2020), the government recognized it would be the main channel of disseminating information to the public.

Risk Communication

"*We're deeply concerned both by the alarming levels of spread and severity, and by the alarming levels of inaction." We have rung the alarm bell loud and clear. – Tedros Adhanom Ghebreyesus, Director-General, World Health Organization*

Due to the unfamiliarity and unpredictability of COVID-19 virus, the test of this most challenging moment in history is how does humanity rise to the crisis at hand (Serani, 2020). During such a crisis, when information is unavailable or inconsistent, and when people feel unsure about what they know (or anyone knows), behavioral science points to an increased human desire for transparency, guidance, and making sense out of what has happened (Mendy, et al., 2020) .

The success of the management of a pandemic will depend on health communication strategies (Vaughan, 2020). Hence, studyinghow risk communication is disseminated to the residents is vital to the management of COVID-19. Developing an appropriate response to a public health emergency

requires extensive information sharing and collaboration among all stakeholder organizations. Risk communication is a useful tool as it helps to consider stakeholder views and their perceptions of risk, enhances collaboration, and facilitates the understanding of all risks by stakeholders, hence, enhancing the overall necessary collective response (Qiu, 2017).

Risk communication is defined as the mode at which information is exchanged in real-time; the information could be some advice, or opinions shared among stakeholders who are experts and the subjects of the health concerns (Mahajan &Tomar, 2020). According toWHO (2020), the objective of risk communication is to enable people at risk to take informed decisions to protect themselves and their loved one. Interested parties include government, agencies, corporations and industry groups, unions, the media, scientists, professional organizations, interested groups, and individual citizens (Covello, et al., 1991). The rationale behind risk communication includes but is not restricted to emergence of new diseases, high rate of international travel, aging population, climate change, high population density in high-risk areas, increased technological risks and re-emergence of diseases and antibiotics resistance (Reynolds, 2012).

Effective Approaches to Risk Communication, Public Trust

Maintaining an open and honest attitude and actively engaging stakeholders is needed to build trust and facilitate multi-sector collaborations in dealing with a public health crisis (Qiu and Wuqi, 2016).Aiming to earn trust from the audience is a subtle ingredient when considering effective communication. Trust will win the crowd

before knowledge; then a combination of technical expertise and confidence will carry the session. The prime minister of New Zealand has cultivated trust in people, and so the government has equipped and invested in him to talk to the public and so they adhere to the restrictions since they were imposed on March 2020 (Edwards et al., 2008; Palenchar& Heath, 2002). By so doing, the pandemic was almost buried in the nation by June 2020. In contrast, the United States has had to deal with unabated health conditions due to the political atmosphere, which distorts trust and confidence from the healthcare providers and the authority. People are hesitant in internalizing any information from a technical expert who is untrusted.

Though there is some controversy, there is a relationship between practices of good governance and public trust in local government (Beshi& Kaur, 2019). According to Farazmand (2004), key implementers of policy decisions that produce the outcomes of those decisions in the governance process are the local governments. He added further that local governance is extremely important because it is the central arena for public participation and the democratic exercise of citizens' rights. The government is closer to citizens and stakeholders; and they must be accessible and responsive to citizens.

Public trust in the authorities has been recognized in risk research as a crucial component of effective and efficient risk management. However, in a pandemic, where the primary responsibility of risk management is not centralized within institutional actors but defused across society, trust can become a double-edged sword (Wong&Jensen, 2020).

Evaluating public trust towards the government requires looking at the perceived transparency, perceived accountability and perceived responsiveness of the government. (Beshi&Kaur, 2019). Congruent to this, the Singapore government responded with a series of broadscale public health measures and managed to contain this first wave of infection (Chen, 2020).According to the survey conducted by IPSOS(Institut de Publique Sondage d'OpinionSecteur2020), Singaporeans remain confident in the Government and the country's ability to contain and manage the COVID-19 outbreak. In addition, six in 10 Singaporeans were satisfied with how the Government managed the Covid-19 situation though they may feel stressed by the pandemic (Teo, 2020).

Studies have revealed that members of the public who feel a connection with the spokespeople delivering messages are more likely to have increased problem recognition and involvement; with a stronger understanding of spokesperson impact, risk communicators can choose more effective ways to disseminate information and engage publics (Sheppard, et al., 2012). Early engagement of key stakeholders and involving them in the decision-making process is vital for the success of cooperation for prompt responses to crisis (Qui, 2017). Research has also shown that organizations with strong relationships with key stakeholders will benefit from those relationships during a crisis. As crises magnify poor or non-existent relationships, investment in pre-crisis communications is a cost-effective strategy to minimize damage to an organization during a crisis. It is therefore important to have a crisis communications plan in place as this allows accurate information to be provided in a timely fashion when an issue arises.

According to Cutlip, et al., (1985), there are seven key aspects to consider when communicating to an audience:

(i) Credibility. The audience must have confidence in the agency and high regard for the agency's competence on the subject;

(ii) Context. The communications program must acknowledge the realities of its environment. The context must confirm, not contradict the message;

(iii) Content. The message must have meaning for the audience and compatibility with the audience's value system;

(iv) Clarity. Simple terms are most appropriate, and it is important to ensure that the message means the same to the audience as it does to the communicating agency;

(v) Continuity and consistency. Communication requires repetition to achieve penetration. Repetition, with variation, contributes to both factual and attitudinal learning;

(vi) Channels. Established channels that the audience uses, and respects should be utilized and different channels are required to reach different target audiences; and

(vii) Capability of audience. Communications are most effective when they require the least effort on the part of the audience. This involves factors of availability, habits, reading ability and audience knowledge

Theoretical Framework

There is a general consensus that risk communication should be a two-way process between the communicator(s) and the recipients of the messages, but beyond that, different definitions often include unique variables and understandings (Sheppard, et al., 2012). Several models have tried to explain and elaborate on risk communication concepts. The four major theories include mental-noise, negative dominance, trust determination, and risk perception (Edwards, et al., 2008). The mental-noise model states that when people are overwhelmed by a significant threat that they cannot withstand, their mental capacities are significantly impaired. The inability to process information at the very moment could elevate some emotions such as anger, fear, outrage, and worry (Palenchar& Heath, 2002). When the emotionally charged conditions are experienced, the reasoning part of the brain seems to be covered so nothing substantial can be discussed on how to address the issue at the very moment (Yu, et al., 2020).

The negative dominance theory emphasizes how a person reacts when they are emotionally charged (Andersson, et al., 2007; Couch, 2008). For the COVD-19 pandemic case, the affected people are more inclined to think of the negatives that will befall them other than the positive that will present itself. Covello, et al., (1991) argued that an effective risk communicator would be effective when the plans are inclined on what is being done other than the gaps that have not been addressed.

The risk perception theory is an approach that includes all the cultural, religious, racial, ethnic, and even geographical differences that were seen worldwide

(Reluga, 2010). When all the factors are considered, the risk perception will vary from person to person, assessing whether the created risk was human made, involuntary, unfamiliar, exaggerated, or natural (Kapilan, 2020). Such bets will elevate the emotional charges, which will lead to desperate measures and thus officially complying with the official guidelines for managing the hazardous movement of the condition. Risk perception was also shaped by factors that altered acceptability of risk in the minds of different audiences, messages, and in different context. For example, despite clear evidence that wearing masks can reduce transmission of COVID-19, the acceptability of and adherence to wearing masks varies greatly (Malecki, 2020).

On the other hand, the trust determination model states that only when trust and credibility are established can the risk information received be reliable. Trust determination factors such as empathy, caring, dedication, commitment, competence, expertise, honesty and openness, which are noticed very quickly by stakeholders, are important for receivers to accept a risk message as credible. Public trust in institutions that are perceived to be providing reliable information is important in crisis and risk communication (Glik, 2007). Trustworthy communicators then, are essentially important in addressing and communicating risks of COVID-19.

For decades, scholars have also been working to improve risk communication practice through developing, testing, and refining communication theories and models that endeavor to explain the expected and unexpected impacts of risk communication. These efforts have led to an abundance of scientific discoveries, but there is no single theory or model that captures the full range of considerations that

impact risk communication efforts (Sheppard, et al., 2012). Risk communication definitions are often similar to the definition offered by Covello (1992), who wrote of the “process of exchanging information among interested parties about the nature, magnitude, significance, or control of a risk” (p. 359). He also posited the importance of compassion, conviction and optimism when engaging the public and had outlined the guidelines for a successful risk communication, which they called “The Seven Cardinal Rules of Risk Communication.”

Table 2. The Seven Cardinal Rules of Risk Communication, adopted from US EPA archive document by Covello et al. (1984)

1. Accepting and involving the public as a legitimate partner	People and communities have the right to participate in decisions that affect their lives, their properties and the things they value.
2. Planning carefully and evaluating efforts	Communications must be aimed at specific subgroups for the audience; different risk communication goals, audiences, and media require different risk communication strategies, evaluating the information about risk and knowing its strengths and weakness is significant
3. Listening to the public’s specific concerns	People in the community are often concerned about such issues such as trust, credibility, competence, control, voluntariness, fairness, caring and

	compassion than about mortality statistics.
4. Being honest, frank and opening- state credentials	It is about not asking to be trusted but disclosing credentials instead, admitting mistakes without minimizing or exaggerating the risk
5. Coordinating and collaborating with other credible sources	Includes devoting effort and resources to the slow, hard work of building bridges with other organizations
6. Meeting the needs of the media	Involves media being the prime minister of information on risks, playing a critical role in setting agendas and in determining outcomes
7. Speaking clearly and with compassion	Encompasses using simple non-technical language, being sensitive to local norms, discussing actions that are underway and telling people what cannot be done, promising them what can be done, and doing what is being promised.

On the other hand, Fischhoff, et al., (1984) reasoned that objectivity can never be an achievement of science and that when public and experts disagree, it is a clash between two sets of differently informed opinions. He claimed that an explicit and accepted definition of risk is essential, and creation of that definition is a political

act, expressing the definers' values regarding the relative importance of different possible adverse consequences for a particular decision. He also argued that interpretative questions must be answered before risk levels can be estimated and as such, total agreement on those issues is a rarity in any active science.

Similarly, Slovic (1992) had posited that risk does not exist "out there" independent of our minds and cultures, waiting to be measured. He also argued that human beings have invented the concept of "risk" to help them understand and cope with the dangers and uncertainties of life, and therefore there is no such thing as "real risk" or "objective risk."

However, Sandman et al. (1993) pointed out that it is the outrage (the relationship between the agency and the neighborhood) that affects the perceived seriousness of the situation by a factor of five relative to the 'actual' seriousness. He concluded that when people are outraged, they tend to think that the hazard is serious. Therefore, it is important to look at the factors, which affect risk perception and evaluation and are thus, likely to affect public concern.

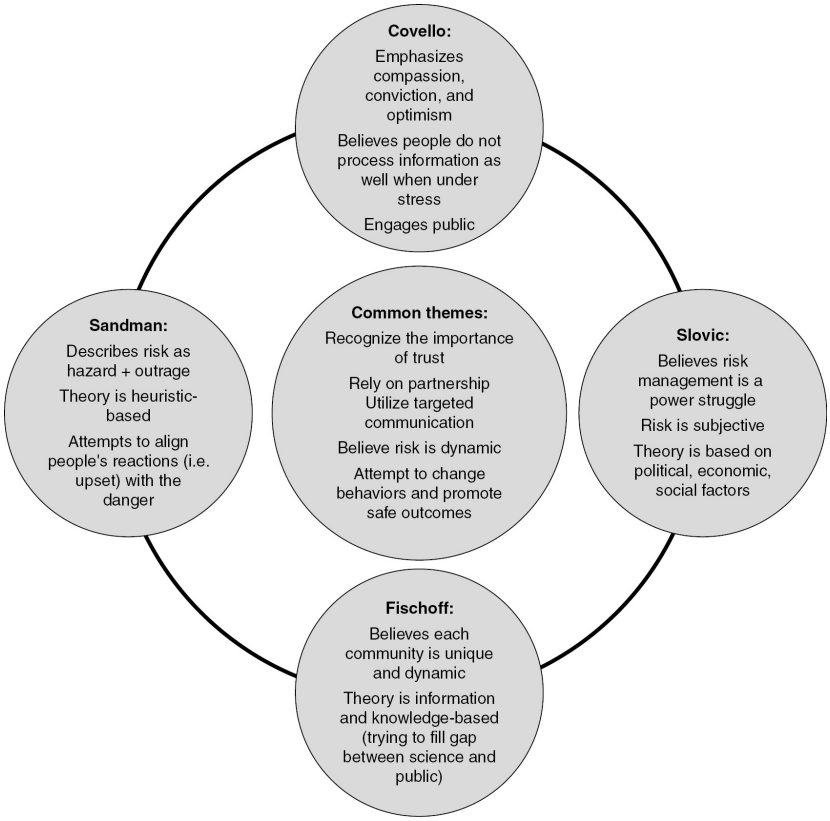

Figure 1. Risk Definitions by theorists, adopted from Dodgen et al. (2017)

Inherent to the definitions of theorists: Covello (1984), Fischhoff (1984), Slovic (1992), and Sandman (1993), the key points for risk communication are:

(i) recognizing the importance of trust;
(ii) relying on partnership;
(iii) utilizing targeted communication;
(iv) believing risk is dynamic; and
(v) attempting to change behaviors and promoting safe outcomes.

The Centers for Disease Control and Prevention (CDC) crafted the CERC model after the 9/11 attacks and the 2001 anthrax attacks to combine image and reputation research with persuasion and strategic messaging research (Seeger, et al., 2010). It provides an evidence-based framework and best practices for anyone who communicates on behalf of an organization responding to a public health emergency.

Figure 2. Five (5) stages of CERC MODEL adopted from Seeger et al. (2010).

During the pre-crisis, communication is directed to the public and response community to provide risk messages, warning, and guidance regarding preparation. On the next stage, which is the "initial event,"communication is directed to the general public and affected groups to reduce uncertainty and increase self-efficacy and reassurance; strategies include informing in the simplest terms, establishing spokespersons' credibility, and providing emergency courses of action. The third stage is "maintenance" whereby communication is directed to continue the communication efforts from the initial event; strategies include providing necessary background information, listening to public feedback, correcting misinformation, and empowering decision-making.

On the other hand, "resolution," the fourth stage, is directed to inform the public and provide updates regarding resolution and discuss causes and new risks or new understandings; strategies include examining problems and reinforcing what worked, persuading publics to support necessary policy and resource allocation. Lastly, the last stage is "evaluation" whereby communication is directed to agencies and response communities to discuss the adequacy of response; strategies include evaluating communication plan performance, documenting lessons learned, and determining specific actions to improve the crisis plan.

In Singapore, the government has begun temperature screenings at airports and has launched a multi-ministry task force to address the virus as early as January 2020. Singaporeans and residents can subscribe to “WhatsApp” updates from the Ministry of Health or find them on the government’s website. On February 8, 2020, Prime Minister Lee addressed the citizens describing some of the measures already being taken to prevent the viruses spread, in addition to isolating confirmed cases and quarantining their contacts, the government called for "reducing mingling in schools," tightening access to hospitals, and taking extra precautions during large public events (Firth, et al., 2020). In the prime minister’s speech, he warned that if the number of cases continues to grow and the virus becomes more widespread, the existing strategies would have to be reconsidered.

Inherent to the five aforementioned stages is communication to the public; hence, it is imperative to look at the most basic model of communication, which will help in the analysis of the risk communication dissemination of COVID-19. Over the last two decades, the science behind risk communication has grown. The National Research Council (1989) in Stanford University defined risk communication as an interactive process where information and opinions are exchanged among stakeholders. Integral to the definitions, two subtle elements have emerged—the first being the idea that risk communication is a two-way flow of information; secondly, the need to incorporate cross-level linkages in studying risk.

There is always a constant communication of risks between government and stakeholders, and it becomes critical to ‘pass the message across’ by one side and to ‘get the message’ by the other side (Benner, 2000).

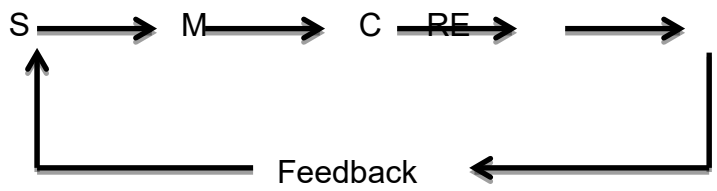

Figure 3. Basic Communication Model Berlo (1960)

When communication is looked upon as a process, it follows that it has elements that are continually changing, dynamic, and interacting (Ongkiko&Flor, 1998). Berlo's model was first published in 1960 in the book entitled El Proceso de la Comunicación (The Process of Communication) and initially included four components to describe the communication process: sender, message, channel, and receiver. It then expanded to S-M-C-R-E wherehe also discussed the element of feedback.

Berlo's communication process starts at the source, which is the part that produces the message using its communication skills, attitude, knowledge, social system, and culture. After the message is developed, which are elements in a set of symbols, the sender step begins. The encoding process is where the motor skills take place by speaking, writing, touching, etc. The message goes through the channel, which carries the message to the receiver. The decoding process is where the sensory skills take place by hearing, seeing, feeling touching, etc.Then, the effect is the outcome of a communication or the response of the receiver to the message of the source. Sometimes, the effect is not the desired outcome (Ongkiko&Flor 1998). Finally, feedback refers to the response or reaction of receiver to the sender's message. When messages reached the receiver, he/she/they decodes the message and sends his/her response to the sender to complete the communication process.

Some scholars have criticized the initial S-M-C-R model of Berlo for not having any barriers to communication such as noise and for being a linear model. Subsequently, it was further developed by W. Schramm (1973) who used a relational model instead of linear. Schramm also used the effects and effects analysis components from Berlo's model and suggested an interaction component in relation with active, selective and manipulative audience. He argued that the most dramatic change in communication theory in the last 40 years has been the abandonment of the idea of passive audience. Audience then is a full partner in the process of communication (Babe, 2015).

Conceptual Framework

The study assumed that communication is triggered by a risk event, which for the purpose of this study was COVID-19. Sources of risk communications are generally grouped as primary and secondary sources with scientists, which are depicted as the primary, while secondary sources of risk communication are institutions, industry, regulators, agencies or interest groups (Benner, 2011).

In Singapore, most communications have come from the government. Given its unique political system dominated by the People's Action Party (PAP) and bureaucratic culture and the centralized nature of authority in the country, the Singapore government has made it particularly easy to roll out communications. The bureaucratic apparatus is ever ready to implement amendments, and the state-linked media has played an important role in disseminating the messages (Abdullah, 2020).

The Prime minister, being the ruler of the country, and the source of COVID-19 information, needs to be trusted by the receiver of the risk messages.Building and maintaining trust and credibility are one of the baseline characteristics of effective risk communication in the event of an outbreak/pandemic (Abaram, 2011).

According to Beshi and Kaur (2019), evaluating public trust towards the government requires looking at its perceived transparency, perceived accountability and perceived responsiveness. Hence, the same framework was adopted in gauging the level of trust of the respondents to the Singapore government.

The channels or the transmitter then convey the health-related risk information from the government (the source) towards the public (the receiver). However, transmitters tend to focus on attracting the attention of the recipients, hence, selecting messages that would be appealing for its audience. Since transmitters focus on the risk message that is attractive for the receiver, it then amplifies signals relating to these factors to ensure attention by the recipients (Benner, 2011).Social Media, television, newspaper, radio and governmental agencies among others can amplify these messages and this could help explain why various communicational gaps such as misinformation and fake news exist. Vijaykumar, et al. (2015), in his study entitled “Social Media and the Virality of Risk: The Risk Amplification through Media Spread (RAMS) Model”, argued that social media has transformed traditional configurations of how risk signals related to an infectious disease outbreak (IDO) were transmitted from public health authorities to the general public. His paper drawn on key ideas from other models but suggested

that the presence of social media can alter the prevailing pathways of risk signals associated with its process.

When it comes to the receiver, the receivers of risk information were the residents and their response towards the message and the effectiveness of the message were put under “effects”. The respondents’ assessment of COVID-19 communications was measured using “Cutlip’s 7 Aspects when communicating to an audience (1984)” while the effectiveness of risk communication aspect was evaluated using “Covello’s 7 Cardinal Rule of Risk Communication (1985)”.

All throughout the risk communication process is a continuous cycle of feedback, and according to Benner (2011), a constant communication of risk between the government and stakeholders and vice versa (Figure 4).

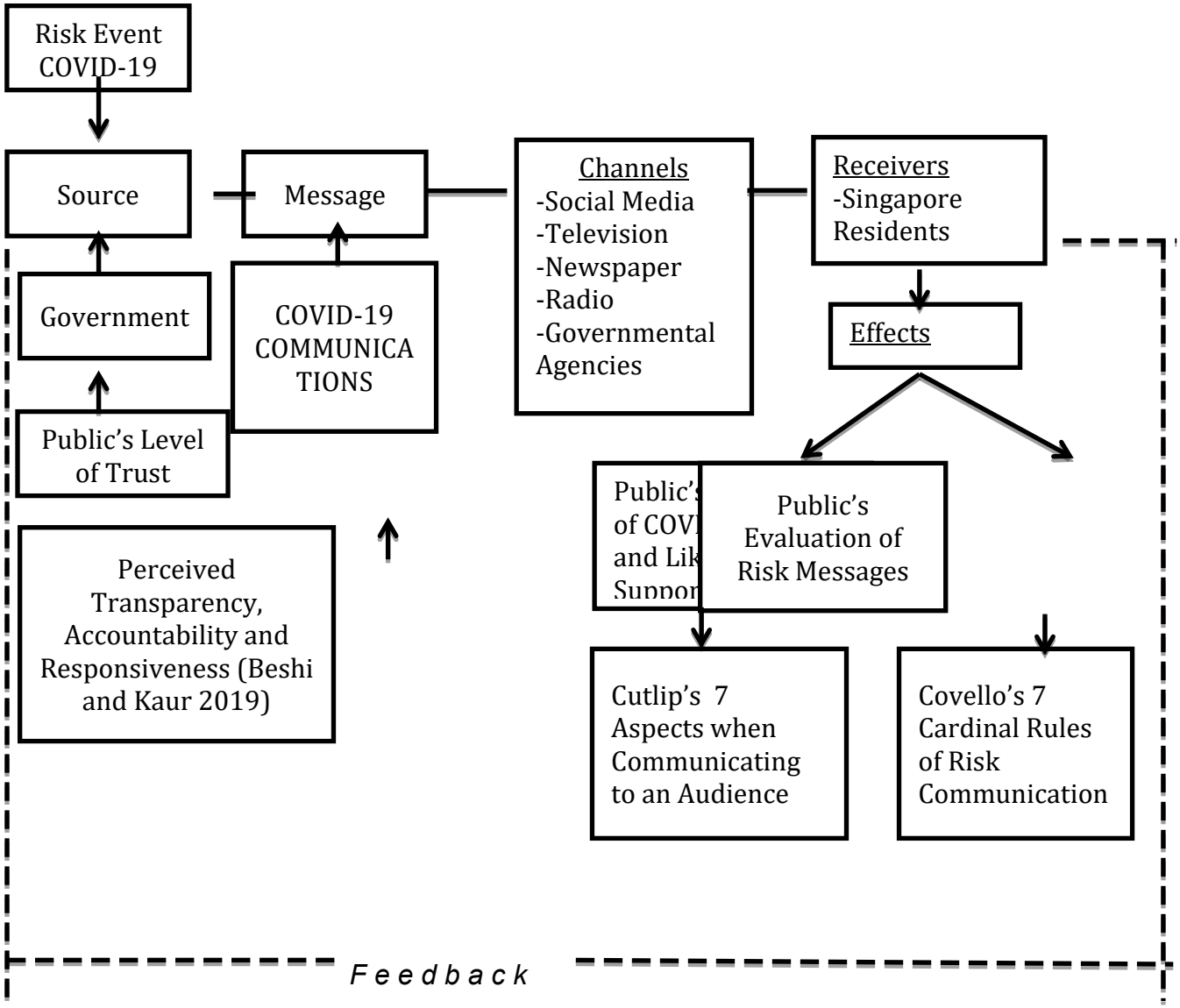

Figure 4. Risk communication Framework from Berlo (1960) Beshi and Kaur (2019), Cutlip (1984) and Covello (1985)

Table 3. Variables and Relationships to be measured

Variables and Relationship	Method of Measurement	Indicators
Level of Trust to the Government	5 point Likert Scale with assigned values:5:Strongly Agree, 4:Agree, 3:Do not know 2:Disagree,1:Strongly Disagree	Level of agreement towards statements measuring trust towards the government.
Public's assessment of COVID-19 Communications	Likert Scale with assigned values:5:Strongly Agree 4:Agree, 3:Do not know 2: Disagree,1:Strongly Disagree	Level of agreement towards statements assessing how COVID-19 is communicated.
Likelihood of the Public in Supporting COVID-19 communications	Likert Scale with assigned values: 5:Strongly Agree,4:Agree 3:Do not know,2: Disagree 1:Strongly Disagree	Level of agreement towards statements assessing likelihood of the public in supporting COVID-19 communications
Public's Evaluation on the Effectiveness of Risk Communications	Likert Scale with assigned values: 5:Strongly Agree, 4:Agree 3:Do not know,2: Disagree 1:Strongly Disagree	Level of agreement towards statements measuring sufficiency and effectiveness of COVID-19 Risk communications

Operational Definition of Terms

Channel of Information	-refers to the various channels such as radio, television, newspaper, social media sites, governmental agencies where respondents get COVID-19 information from.
Level of Trust	- refers to the level of trust of the Singapore residents to the government in terms of disseminating COVID-19 communications and risk messages.
Perceived Transparency	- measured by a 5-point Likert scale ranging from “strongly agree” to strongly disagree” and designated by respondents’ agreementtowards statement “the government has been transparent in providing COVID-19 information from the onset of the virus up to effects brought about by the COVID-19 outbreak”
Perceived Accountability	- measured by a 5-point Likert scale ranging from “strongly agree” to strongly disagree” and designated by respondents’ agreement towards statement “Singapore is

	well equipped to containand manage the COVID-19 outbreak", adopted from IPSOS (2020) survey on Singaporeans Attitudes towards COVID-19.
Perceived Responsiveness	-measured by a 5-point Likert scale ranging from "strongly agree" to strongly disagree" and designated by respondents' agreement towards statement "I trust that the government puts suitable measures in place and responds timely to prevent the harmful effects brought about by the COVID-19 outbreak"
Respondent's View of Covid 19 comunications	-refers to the respondent's view on how COVID-19 communications was disseminated to themusing a 5-point Likert scale level of agreement on statements under Cutlip's 7 Aspects when Communicating to an Audience (1984).
Respondent's Evaluation of Risk Messages	-refers to the respondent's assessments on how they received risk messages from the government using a 5-point Likert scale level of agreement on statements under Covello's 7- Cardinal Rules of Risk Communication (1985)

METHODOLOGY

Research Design

This study employed a quantitative survey research design. The strength of quantitative approaches is in making predictions about the likelihood of an infectious disease outbreak, how the disease will spread, and how to control it (Woolhouse, 2011). Survey research is a quantitative approach that features the use of self-report measures on carefully selected samples. It is a flexible approach that can be used to study a wide variety of basic and applied research questions. Survey research is defined as "the collection of information from a sample of individuals through their responses to questions" (Check & Schutt, 2012).

This type of research allows for a variety of methods to recruit participants, collect data, and utilize various methods of instrumentation. As it is often used to describe and explore human behavior, surveys are therefore frequently used in social and psychological research (Singleton & Straits, 2009).

Locale of the Study

The study was carried out in Singapore where COVID-19 started in January 2020. The Urban Authority of Singapore (URA) has categorized Singapore into 5 regions, namely; Central Region, North Region, North-East Region, East Region, and West Region.

Respondents of the Study

The respondents were Singapore residents on the said regions regardless of their nationality, ethnicity or race, age group, and religion. Even if the study was conducted in Singapore, participants were not limited to Singaporeans and had also included other nationalities residing in Singapore at the actual time of data gathering. More specifically, the administration of survey questionnaires was done in several MRT stations island wide, including Orchard MRT, Yishun MRT, Jurong MRT, and Changi MRT.

Sampling procedure

A total of 114 respondents were recruited for this study. Non-probability sampling, particularly, accidental sampling, was utilized with samples being drawn from a part of the given population close to hand and relatively convenient. While this kind of sampling was used due to its availability and easy access, this was the best method because of the strict data privacy acts in Singapore and the limitations brought about by COVID-19 measures.

Research Instrument

Survey. Online surveys and mobile surveys were the most cost-effective modes of survey research, yet they may not reach those respondents that can only respond using alternate modes. Hard-to-reach respondents may be easier to reach using

more traditional methods such as face-to-face interviews (De Franzo, 2012). For this reason, the study used an online survey but was facilitated face to face through various MRT stations island wide where respondents were given a link to the survey either through their mobile number via “Whatsapp,” or through QR CODE.

As studies on communicating COVID-19 in Singapore were fairly scanty, several survey methodologies from studies not only on COVID-19 but on previous pandemic diseases as well were used. The survey questionnaire had been organized into sections namely: socio-demographic information, channel of information, level of trust, public’s view on COVID-19 communications which included likelihood of support to future campaigns on COVID-29, and the public’s assessment of the effectiveness of existing risk communication strategies on COVID-19. Respondents were offered anonymity to reduce possible bias on their answers.

After pre-testing the survey to 16 participants who were not part of the actual respondents for the study, feedback was obtained to enhance the instrument. Internal consistency and reliability were measured using Cronbach’s alpha coefficient of internal consistency. Ethical considerations such as voluntary participation, informed consent, anonymity, and confidentiality were observed and the final survey was then generated utilizing features of “google form”.

In order to identify the personal characteristics of the respondents, Socio-demographic Information profiling was utilized. The first section of the questionnaire was as follows:

(i) Age Bracket

(ii) Sex

(iii) Region

(iv) Education Level

(v) Race/Ethnicity

To identify the public's main channel of COVID-19 information, the second question was derived from IPSOS (2020) poll on source of information of the public towards COVID-19.

(i) Where do you usually get your information on COVID-19 from?

To measure the variables in question, a Likert scale system was used in the third section of the questionnaires.

1. Level of Trust.

Respondents were asked on their level of agreement or disagreement on their level of trust towards the government in handling and management of COVID-19. According to Glik (2007), public trust in institutions that are perceived to be providing reliable information is important in crisis and risk communication.

A.Perceived Transparency

(i) The government has been transparent in providing COVID-19 information from the onset of the virus up to this time, including but not limited to virus transmission, disease prevention and precautions, and number of death tolls.

B. Perceived Accountability

The statements for part B and C were adapted from IPSOS (2020) survey on Singaporeans Attitudes towards COVID-19 as follows:

(ii) Singapore is well equipped to contain and manage the COVID-19 outbreak.

C. Perceived Responsiveness

(iii) I trust that the government puts suitable measures in place and responds timely to prevent the harmful effects brought about by the COVID-19 outbreak.

2. Public's Assessment of COVID-19 Communications

To assess the public's view of COVID-19 communications and predict their likelihood of supporting existing and future COVID-19 campaigns, the respondents were asked statements in terms of Cutlip's (1985) 7 Aspects to consider when communicating to an audience," namely; credibility, context, content, clarity, continuity and consistency, channels and capability of the audience. The first statements accounted for public's view of COVID-19 communications while the last statement was used to predict likelihood of the public in adhering to future COVID-19 communications.

A 5-point Likertscale was used to measure the level of agreement from strongly agree to strongly disagree with 5 being the highest and 1 being the lowest.

Table 4. Statements on Public View of COVID-19 Communications and Likelihood of Support in future Communications

Statements	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
1. I have high regard on the competence of the government in handling and communicating COVID-19					
2. The context in which COVID-19 communication is set out was informative and consistent.					
3. The content of COVID-19 communications I receive are important and valuable					
4. The COVID-19 messages I receive are always clear and easy to understand					
5. I receive regular updates and communications on COVID-19					
6. The channels in which COVID-19 communications are relayed are accessible to me.					
7. I am capable to engage in COVID-19 preventive measures as messages are easily understood and require less effort on my part					
8. I will support existing and future communicational campaigns on COVID-19.					

3. Public's evaluation of the effectiveness of risk communication strategies of the government.

To evaluate the effectiveness of COVID-19 risk communications from the government, the respondents were asked statements utilizing Covello's (1984) 7 Cardinal Rules of Risk Communication. A 5-point Likert scale was used to measure the level of agreement from strongly agree to strongly disagree 5 being the highest and 1 being the lowest (Table 5).

Table 5. Statements on Public's Assessment of Existing Risk Communications on COVID-19

Statements	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
1. The existing risk communications on COVID-19 involved me as a partner, and I am able to participate in decisions that affect my loved ones and me.					
2. The existing risk communications on COVID-19are planned carefully.					
3. The existing risk communications on COVID-19 take into consideration my concerns and that of the community.					
4. The government has been honest and frank all throughout the management and disseminating of COVID-19 risk messages.					

5. The existing risk communications on COVID-19 are from credible and reliable sources.					
6. The risk communications I received have been passed down to correct channel of information such as the government agencies alongside social media.					
7. The government has always relayed risk messages clearly and with compassion.					

Validity and Reliability

The researcher formed the research instrument used for this study after an extensive review of related studies and literature. In addition, it was also pre-tested among 16 participants who were not part of the actual survey. Cronbach's alpha coefficient of internal consistency was also computed in order to ensure internal consistency reliability of the final questionnaires. Each Likert Scale items obtained a cronbach's alpha of greater than 0.70 indicating high internal reliability

Table 6. Cronbach's Alpha Value, Level of Trust

Statements	Cronbach's Alpha Score
The government has been transparent in providing COVID-19 information from the onset of the virus up to this time, including but not limited to virus transmission, disease prevention and precautions, and number of death tolls.	.926
Singapore is well equipped to contain and manage the COVID-19 outbreak.	.922
I trust that the government puts suitable measures in place and responds timely to prevent the harmful brought about by the COVID-19 outbreak.	.924

Table 7. Cronbach's Alpha Value, Public's view of COVID-19 Communications and Likelihood of Support in COVID-19 Communications

Statements	Cronbach's Alpha Score
1. I have high regard on the competence of the government in handling and communicating COVID-19	.920
2. The delivery of COVID-19 communications are always informative, accurate and consistent.	.922
3.The content of COVID-19 communications I receive are important and valuable	.924
4. The COVID-19 messages I receive are always clear and easy to understand	.924
5. I receive regular updates and communications on COVID-19	.927
6. The channels in which COVID-19 communications are relayed are accessible to me.	.926
7. I am capable to engage in COVID-19 preventive measures as messages are easily understood and require less effort on my part	.925
8. I will support existing and future communicational campaigns on COVID-19.	.924

Table 8. Cronbach's Alpha Value, Public's Assessment of Risk Messages and Strategies.

Statements	Cronbach's Alpha Score
1. The existing risk communications on COVID-19 involve me as a partner, and I am able to participate in decisions that affect me and my loved ones.	.926
2. The existing risk communications on COVID-19 are planned carefully.	.922
3.The existing risk communications on COVID-19 take into considerations my concerns and that of the community.	.924
4. The government has been honest and frank all throughout the management and disseminating of COVID-19 risk messages.	.922
5. The existing risk communications on COVID-19 are from credible and reliable sources.	.922
6. The risk communications I received have been pass down to correct channel of information such as the government agencies alongside social media.	.922
7. The government has always relayed risk messages clearly and with compassion.	.923

Data Gathering

The data gathering for this study was carried out through the use of survey questionnaires, which was aligned to the objectives of the study.

From April 17, 2021 to Aug 10, 2021, questionnaires were administered in several MRT stations island wide, namely; Orchard MRT, Yishun MRT, Jurong MRT and CHANGI MRT. Visits to these sites were done during weekends and each day yielded to approximately 10 respondents. Each potential respondent was

approached, and objectives of the study were explained. Respondents had access to the survey either through their mobile number where a link to the survey was sent via “Whatsapp”or through a hardcopy generated “QR code” which directed them to survey questionnaires upon scanning. For both aforementioned ways, an informed consent form was sought and anonymity of the respondents were observed for ethical considerations of this research.

As the study was intended for Singaporeans and residents, “Social Visit Pass or Tourist Pass” on question was number 5 of the Socio-demographic section was included initially in order to determine whether some respondents were tourists. Out of the initial 116 respondents, 2 respondents were found out to be social visitors and thus was taken out from the sample.

Data Analysis

Descriptive statistics such as frequency counts and percentages were employed to analyze distribution of responses. Analysis was limited inasmuch as accidental sampling was used.

Frequency and Percentage

The frequency count and the percentage were used in presenting the socio-demographic profile of the respondents and the channel of information.

$$\% = \frac{f}{N} \times 100$$

Mode

Mode was computed in order to present variables such as level of trust, public view of communication, likelihood of the respondents in supporting future COVID-19 communications and evaluation of the effectiveness of existing risk communications on COVID-19.

$$x = \frac{\Sigma X}{N}$$

Chapter 4

RESULTS AND DISCUSSION

Socio-Demographic Profile of the Respondents

Of the 114 respondents, less than ½ of the overall respondents(53 or 46.49%) belonged to the “28-37” years old age group which connotes that respondents were relatively young and in their prime. The youngest was 18 while the oldest was 57. This means that all respondents were adults and would have the ability to comprehend the questions to be asked. With this age group, it can be surmised that they are mature enough to understand what is happening during the pandemic and should need to know what they should do to protect themselves from contracting the virus.

With regard to gender, almost two-thirds (75 or 65%) were female. This implies that more women in the sample were outside their homesdespite the threat of contracting the disease. As people's concern about food shortages increase, more women may have goneout stocking up on foods and supplies. In addition, out of 42,000 nurses in Singapore, 91% were female (Chin 2019) which connotes womenbeing at the forefront on the battle against COVID-19.

Out of the 5 regions in Singapore, the Central region and the East Region obtained exactly the same results at (31 or 27.19%). It was closely followed by the West Region at(28 or 24.56%), while both the North Region and North-East Region

garnered (12 or 10.53%) respectively. Considerably, the largest region in terms of area is the West Region with 201.3 km^2 (77.7 sq mi), while the Central Region is the most populous with an estimated population of 922,980 inhabitants in the area in 2019 (City Population 2019).

In terms of educational status, a great majority (61/53.5%) was from the "Tertiary/Bachelor category", followed by Vocational/Diploma at (36 or 31.6%). This connotes that respondents are fully able to comprehend the statements on the questionnaires and are aware of how COVID-19 was communicated to them. The category "Secondary N Level" obtained (7 or 6.1%) while "Tertiary Master" garnered (6 or 5.3%). On the other hand, the lowest category was "Secondary A Level which obtained (4 or 3.5%).

When it comes to race and residential status, a big majority, 64 or 56% were Singaporeans while 50 respondents at 43.8% were foreigners on work passes. Specifically, (35 or 30.7%) were Singaporean Chinese, (21 or 18.4%) were Singaporean Malay, while both "Singaporean Indian" and "Singaporean other" obtained (4 or 3.5%). Singapore is a multiracial country with ethnic Chinese (76.2% of the citizen population), Malays (15.0%), and ethnic Indians (7.4%) (Gov.sg 2019). Congruent to the large majority of Chinese in the entire Singapore population, Chinese Singaporeans make up a large fraction amongst Singaporean respondents. (Table 9).

Table 9. Socio-demographic Profile of the Respondents

Age	**Frequency *(n=114)***	**Percentage**
18-27	37	32.46
28-37	53	46.49
38-47	20	17.54
48-57	4	3.51
Gender	**Frequency *(n=114)***	**Percentage**
Male	39	34.2
Female	75	65.8
Region	**Frequency *(n=114)***	**Percentage**
Central Region	31	27.19
North Region	12	10.53
North- East Region	12	10.53
East Region	31	27.19
West Region	28	24.56
Highest Educational Attainment	**Frequency *(n=114)***	**Percentage**
Secondary “N”Level	7	6.1
Secondary “A”Level	4	3.5
Vocational/Diploma	36	31.6
Tertiary/Bachelor	61	53.5
Tertiary Master	6	5.3
Race/Ethnicity	**Frequency *(n=114)***	**Percentage**
Singaporean Chinese	35	30.7
Singaporean Malay	21	18.4
Singaporean Indian	4	3.6
Singaporean Other	4	3.5
Foreigner on Work Pass	50	43.8

Channel of Information

Respondents were asked on their main source of information pertaining to COVID-19. Among the given selections such as “friends, family and colleagues”,

“governmental sites, government announcements”, “medical professionals such as doctors and nurses”, “social media networks (facebook, instagram, twitter)”, “newspaper”, “television” and “radio”, (55 or 48.2%) answered ‘governmental sites, government announcements” as their primary source of information. According to Gonzales (2020), the government has used mediums and even displayed digital display panels in Housing Board apartments. Congruent to this, the trust placed by Singaporeans in the Government and the media is higher than the levels seen in other developed countries. This is also supported by Edelman Trust Barometer (2019) stating that 67% of Singaporeans trust the government. While dissemination of information relied primarily on conventional media such as newspapers, radio, and TV broadcasts during the SARS outbreak in the past, the channels of social media and messaging applications have now transformed communication, and the Singaporean government has taken advantage. For example, public agencies and leaders have engaged with citizens via WhatsApp, telegram, Facebook live, and YouTube to ensure that live updates reach further and enable citizens to remain updated on-the-go (Abdullah 2020). The government also deployed communication very early in the crisis via WhatsApp; with some 4 million users out of Singapore’s population of 5.7 million (Basu 2020).

On the other hand, second in rank was “social media networks (facebook, instagram, twitter)” which obtained (35 or 30.7%). While the result was considerably high, this still came as a surprise given the positive impact of social media and the way it has become increasingly popular on the dissemination of COVID-19 information. For instance, it has served as a medium to voice out disparagement of governments.Many videos and social posts have emerged from the epicentre of the

virus spread area in China with hashtags such as *#IWantFreedomOfSpeech*; the entire world has criticised president Trump's interpretation of the current downturn saying *#TrumpLiesAboutCoronavirus*, while people in the UK questioned the conservative government's initial passive response to the crisis asking *#WhereisBoris*.

According to Chua (2017), the government has the ability to even screen websites in Singapore, and at the very least, Singapore newspapers are controlled by a single holding company largely owned by the government (Constitutional Rights Foundation n.d). Given the beaurocratic approach in governance, residents' choice of the primary channel of information may have been directly impacted.

On another discourse however, social media being ranked "second" still implies that majority of the respondents still rely on social media as their primary source of information. But despite efforts by social media companies to stop false information about COVID-19, it was still increasing all over the world. Since social media also plays a large and growing role in shaping outrage and thus the public's perceptions of risks and mitigation of COVID-19,respondents who trust social media as their information source will then have to gauge the advantages and disadvantages of using such platform, and would mean they need to be adept in spotting misinformation and fake news respectively.

Third in rank was " friends, family, colleagues" which obtained (12 or 10.5%). According to Cui (2008), individuals may consider global information from local first-hand encounters with disease such as infected acquaintances, friends or family

members when gauging infection risk. The result implies that a small number of the respondents rely primarily on their family and friends when obtaining information on COVID-19.

Fourth in rank was “television” which obtained (6 or 5.3%) out of the 114 respondents. Health messages delivered through various media, especially television, have been found to be effective in informing the public of disease-related prevention measures during a developing influenza pandemic (Freiman 2011). However, this result connotes that very small number of the respondents obtain their information from television. It can be concluded that the traditional media use in Singapore has been predominantly replaced by conventional media such as social media sites and networks hence explaining the low percentage of respondents who get information on COVID-19 from television.

On the other hand, “newspaper” ranked ‘fifth” with results of (3 or 2.6%); this is despite the 68% fraction of Singaporeans who read the newspaper weekly. “Medical professionals such as doctors and nurses” ranked “sixth” having (2 or 1.6%). This is an unusually low result, considering the surge of hospital and clinic visits during the pandemic.

Remarkably, “radio” ranked the least resulting to only (1 or 0.9%) of the respondents. According to (Kuguyo et al 2020), Singapore, just like other countries, utilized various media outlets such as newspapers, television, radio, to improve awareness and this was useful to curb the stigma surrounding SARS-CoV-2 infection in the past (Kuguyo et al 2020). However,the result of this study validates that there

was a massive shift in dissemination of information during COVID-19 from conventional media such as newspapers, radio, and TV broadcasts to new channels of social media and messaging applications (Abdullah 2020). As there is only 1 respondent who get information from the “radio”, it makes sense as well that radio may not be an effective and popular tool in communicating to audience in Singapore. (Table 10).

Table 10. Channel of Information

COVID-19 Information Source	**Frequency *(n=114)***	**Percentage**
friends, family, colleagues	12	10.5
governmental sites, government announcements	55	48.2
medical professionals such as doctors and nurses	2	1.6
social media networks (facebook,whatsapp, instagram, twitter)	35	30.7
newspaper	3	2.6
television	6	5.3
radio	1	.9

Level of Trust to Government

According to Glik (2007), public trust in institutions that are perceived to be providing reliable information is important in crisis and risk communication. Key implementers in delivering such policy decisions and communications were local governments (Farazmand 2004), which for the purpose of this study, was, the Singapore government. Evaluating public trust towards the government requires looking at the perceived transparency, perceived accountability and perceived

responsiveness of the government. (Beshi and Kaur 2019). Hence, respondents of this study were then asked on the statements pertaining to the three aforementioned variables in order to identify the respondent's level of trust to the Singapore government. (Table 11).

Table 11. Respondent's Level of Trust to Government

Statements	Mean	SD	Verbal Interpretation	Level of Trust
1. Perceived Transparency "The government has been transparent in providing COVID-19 information from the onset of the virus up to this time, including but not limited to virus transmission, disease prevention and precautions, and number of death tolls."	2.97	1.1	Agree	High Level of Trust
2. Perceived Accountability "Singapore is well equipped to contain and manage the COVID-19 outbreak".	3.23	.95	Agree	High Level of Trust
3. Perceived Responsiveness "I trust that the government puts suitable measures in place and responds timely to prevent the harmful brought about by the COVID-19 outbreak."	3.05	1.11	Agree	High Level of Trust
WEIGHTED MEAN		**3.08**	**Agree**	**High Level of Trust**

Strongly Agree = 3.26-4.00, Agree = 2.51-3.25, Disagree = 1.76-2.50, Strongly Disagree = 1.0-1.75

Amongst the above three variables, "perceived accountability' scored the highest at (M:3.23, SD= 0.95), with verbal interpretation "high level of trust". This suggests that respondents found the government accountable in containing and managing the COVID-19 outbreak. As explained by a survey on workplace resilience

(Teo 2020), six in 10 Singaporeans were satisfied with how the government managed the Covid-19 situation, despite feeling stressed by the pandemic.

Second in rank was “perceived responsiveness” with relatively close result at (M:3.05, SD= 1.11) and a verbal interpretation of “high level of trust”. The government responded with a series of broadscale public health measures and managed to contain the first wave of infection; however, continued vigilance and preparation for new infections was necessary. According to (Chen et al. 2020), as early as March 2020, the government was already warning that Singapore needed to be prepared for new spikes in COVID-19 cases. Thus, the above result signifies that the government has been very responsive even at the initial onset of the pandemic in Singapore.

Third in rank was “perceived transparency” which obtained (M:2.97, SD= 1.1) with verbal interpretation “high level of trust”. Being transparent and putting out clear, accurate information is important to allay people's fears amid the coronavirus outbreak (Deputy Prime Minister Heng SweeKeat 2020). This suggests that people trust the source of the message when they get accurate and honest information. The result validates that majority of the respondents found Singapore Prime Minister Lee transparent and honest when he addressed the nation regarding COVID-19.The communications have always been straightforward and direct, not giving false hopes and re-assurances.

Overall, results of the three variables reasonably connote very high level of trust. Interestingly however; when researching studies and articles relative to Singapore's transparency, responsiveness, and accountability in handling COVID-19, most search results yielded to affirmative articles. However; while 67% of Singaporeans trust the government (Edelman Trust Barometer 2019), a study by Abdullah (2020) suggested Singapore was aided by its bureaucratic culture and its centralized nature of authority due to its unique political system dominated by the People's Action Party (PAP). As such, the ever-present state-linked media played an important role in disseminating the messages, which has put the Prime minister to an advantage of being trusted by the receiver of the risk messages. In addition, opponents of the People's Action Party (PAP), which has ruled Singapore without interruption since independence, have often found themselves on the losing end of defamation suits (The economist Asia 2017).

According to Chua (2017), Singapore lacks both a confrontational media to hold the government to account and a vibrant civil society sector. The government screens books, magazines, movies, videos, music recordings, live performances, and the Internet while privately owned TV satellite dishes are illegal. All Singapore newspapers are controlled by a single holding company largely owned by the government (Constitutional Rights Foundation n.d). Thus, the researcher is also considering aspects of government censorship as a fact of life in Singapore that may have directly or indirectly induced fear and may have led to an overstated high level of trust.

Respondents' view of COVID-19 Communication

Respondents were asked statements in terms of Cutlip's (1985) 7 Aspects to consider when communicating to an audience" namely credibility, context, content, clarity, continuity and consistency, channels and capability of the audience. The first 6 aspects accounted for public's view of COVID-19 communications.

With (M= 3.34, SD= .759) and a "positive" verbal interpretation, first in rank was "channels" with statement "The channels in which COVID-19 communications are relayed are accessible to me". This result suggests that the respondents have access to COVID-19 communications. One of the key instruments the government deployed very early in the crisis was WhatsApp. Singapore has been using WhatsApp for government updates since October 2019, but the system hadn't quite been put to the test until January this year. To date, it has over 4 million users out of Singapore's population of 5.7 million (Basu 2020).

Second in rank were both "content" (M= 3.20 SD= .944) and "continuity and consistency" (M= 3.20 SD= .906) with statements "The content of COVID-19 communications I receive are important and valuable" and I received regular updates and communications on COVID-19 respectively. Both had a verbal interpretation of "positive view". This suggests that the government provided timely updates and accurate turn-around time of the block-out period including the time set to review existing policy and guidelines on COVID-19.

Third in rank was “clarity” (M= 3.09, SD= 1.03) with statement “The COVID-19 messages I receive are always clear and easy to understand” and a verbal interpretation of “positive view”. This connotes that the communications the respondents received have always been easy to comprehend, and did not contain much complex and technical words.

Fourth in rank was “credibility” (M= 3.05, SD= .1.20), with statement “I have high regard on the competence of the government in handling and communicating COVID-19” and a verbal interpretation of “positive view|. The result suggests that the respondents find the government reliable and dependable on its fight against COVID-19. This is despite a huge outcry of the citizens for massive $300 fine set for not wearing a mask, and the numerous complaints of people who went to jail for not following COVID-19 health protocols and guidelines.

Sixth in rank was “context” (M= 3.00, SD= .1.11) with statement “The delivery of COVID-19 communications is always informative, accurate and consistent” and a verbal agreement of “positive view” (Table 12). This result suggests that the words and figures used by the government in communicating to the respondents are highly factual and trustworthy.

Table 12. Respondents' view of COVID-19 communication

Statements	Mean	SD	Verbal Interpretation	Respondents' Views
1. I have high regard on the competence of the government in handling and communicating COVID-19	3.05	1.20	Agree	Positive
2. The delivery of COVID-19 communications are always informative, accurate and consistent.	3.00	1.11	Agree	Positive
3.The content of COVID-19 communications I receive are important and valuable	3.20	.944	Agree	Positive
4. The COVID-19 messages I receive are always clear and easy to understand	3.09	1.03	Agree	Positive
5. I receive regular updates and communications on COVID-19	3.20	.906	Agree	Positive
6. The channels in which COVID-19 communications are relayed are accessible to me.	3.34	.759	Strongly Agree	Very Positive
WEIGHTED MEAN	**3.15**		**Agree**	**Positive**

Strongly Agree = 3.26-4.00, Agree = 2.51-3.25, Disagree = 1.76-2.50, Strongly Disagree = 1.0-1.75

Respondents' Likelihood of support to existing and future communications on COVID-19.

Being guided by (Cutlip's1989) 7th aspect when communicating to an audience, which is "capability of the audience", respondents were then asked on statements "I am capable to engage in COVID-19 preventive measures as messages are easily understood and require less effort on my part " and "I will support existing and future communicational campaigns on COVID-19. The first statement obtained (M= 3.28, SD= .800) with a likelihood interpretation of "very high likelihood" while the latter garnered (M= 3.15, SD=1.18) with a likelihood interpretation of "high likelihood". In Singapore, the trust placed by Singaporeans in the Government and the media is higher than the levels seen in other developed countries. 67% of Singaporeans trust the government, media and non-governmental organizations (Edelman Trust Barometer 2019).

The result implies that the respondents strongly believe in their capacity to follow COVID-19 preventive measures and guidelines, and are thus, willing to support existing and future health communication campaigns by the government. According to Gelfand (2011), research has found that tight cultures, such as those of Singapore, Japan and China, have strict social norms and punishments for deviance, while loose cultures, such as the US, Italy, and Brazil, have weaker social norms and are more permissive. Given the tight culture in Singapore, respondents were more obedient to governmental rules and regulations on COVID-19. Respondents may have feared not to submit to COVID-19 guidelines as there were heavy fines such as $300 for not wearing mask, and being jailed for repeat offenders.

Table 13. Respondents' Likelihood of support to existing and future communications on COVID-19.

Statements	Mean	SD	Verbal Interpretation	Likelihood
1. I am capable to engage in COVID-19 preventive measures as messages are easily understood and require less effort on my part	3.28	.800	Strongly Agree	Very High Likelihood
2. I will support existing and future communicational campaigns on COVID-19.	3.15	1.18	Agree	High Likelihood
WEIGHTED MEAN	**3.22**		**Agree**	**High Likelihood**

Strongly Agree = 3.26-4.00, Agree = 2.51-3.25, Disagree = 1.76-2.50, Strongly Disagree = 1.0-1.75

Respondents' Assessment of Risk Messages and Strategies

Guided by Covello's 7 Cardinal Rules of Risk Communication (1984), respondents were asked on their level of agreement on how well the government communicated risk messages in aspects pertaining to*:* accepting and involving the public as a legitimate partner, planning carefully and evaluating efforts, listening to public's specific concerns, being honest, frank and opening state credentials, coordinating and collaborating with other credible sources, meeting the needs of the media, and lastly, speaking clearly and with compassion.

Overall, the respondent's had a positive assessment on all the statements asked to them. First in the rank thatreceived the highest score of (M= 3.17, SD=

.989)was the statement “The risk communications I received have been passed down to correct channel of information such as the government agencies alongside social media. Congruent to this, a large majority of the respondents (48.2%) also have governmental sites, government announcements as their information source. Hence, this result validates that the government is trusted by the respondents as their main channel of information.Social media now also plays a large and growing role in shaping outrage and thus the public’s perceptions of risks and mitigation (Glik 2007). As such, the Singapore government also activated their state-linked media, which has played an important role in disseminating the messages.

Second in rank was the statement “The existing risk communications on COVID-19 are from credible and reliable sources (M= 3.03, SD= 1.15). This suggests that the respondents find the government credible and reliable when communicating risk messages pertaining to COVID-19. The respondents also trust that the information they received was factual.

The statement “The existing risk communications on COVID-19 take into considerations my concerns and that of the community” obtained the third rank at (M= 2.96, SD= 1.099). The anxiety and worries brought about by COVID-19 have been predominantly high; the result above shows that the risk messages the respondents received from the government somehow ease up their worries and concerns be it as an individual, or in a larger scale like a community.

Fourth in rank was the statement “The existing risk communications on COVID-19 involve me as a partner, and I am able to participate in decisions that

affect me and my loved ones" which obtained (M= 2.87, SD= 1.23). This result suggests that respondents feel that the risk communications they received are in one way or another interactive, and is a two-way process. This is despite Singapore's bureaucratic and strict approach in managing COVID-19.

The statement "The government has been honest and frank all throughout the management and disseminating of COVID-19 risk messages' took over the fifth rank with scores of (M= 2.85, SD= 1.26). Sixth in rank was the statement "The government has always relayed risk messages clearly and with compassion" which obtained scores of (M= 2.83, SD= 1.29). As risk information are usually straightforward, respondents might feel that it lacks emotion and compassion. While this was the second to the last rank, the overall Mean still connotes "positive assessment".

Lastly, the statement "The existing risk communications on COVID-19 are planned carefully" obtained the least score at (M2.78, SD= 1.28). This connotes those changes in risk messages happen abruptly and most communications were bound to change in a snap of time. For instance, the government once announced opening boarders for the UAE and Saudi Arabia in December 2021, but it was revoked just a week later. Given the discovery of new variants, and the overwhelming surge of cases across the world, communications tend to fluctuate and thus, becoming difficult to be planned ahead of time.

Table 14. Respondents' Assessment of Risk Messages and Strategies

Statements	Mean	SD	Verbal Interpretation	Public's Assessment
1. The existing risk communications on COVID-19 involve me as a partner, and I am able to participate in decisions that affect me and my loved ones.	2.87	1.23	Agree	Positive Assessment
2. The existing risk communications on COVID-19 are planned carefully.	2.78	1.28	Agree	Positive Assessment
3.The existing risk communications on COVID-19 take into considerations my concerns and that of the community.	2.96	1.099	Agree	Positive Assessment
4. The government has been honest and frank all throughout the management and disseminating of COVID-19 risk messages.	2.85	1.26	Agree	Positive Assessment
5. The existing risk communications on COVID-19 are from credible and reliable sources.	3.03	1.15	Agree	Positive Assessment
6. The risk communications I received have been pass down to correct channel of information such as the government agencies alongside social media.	3.17	.989	Agree	Positive Assessment
7. The government has always relayed risk messages clearly and with compassion.	2.83	1.29	Agree	Positive Assessment
WEIGHTED MEAN		**2.93**	**Agree**	**Positive Assessment**

Strongly Agree = 3.26-4.00, Agree = 2.51-3.25, Disagree = 1.76-2.50, Strongly Disagree = 1.0-1.75

Chapter 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

Risk communication plays a critical role in an effective communication and supports public needs under stressful situations (Enader and Gutteling 2017). This survey study investigated how 114 respondents from Singapore received COVID-19 communications under the context of risk communication and public trust. Utilizing Berlo's Communication Model (1960), alongside Cutlip's 7 Aspects when Communicating to an audience (1985), Covello's 7 Cardinal Rules of Risk Communication (1984) and Beshi and Kaur's framework for evaluating trust (2019), this study examined how the respondents viewed dissemination of COVID-19 communications, how they assessed risk messages from the government, their level of trust to the government and their likelihood of supporting existing and future COVID-19 communications in Singapore.

As emerging concerns in the rise of fake news and misinformation were evident, the respondents' primary source or channel of information was also explored. Inarguably, majority of the respondents chose governmental sites (48.2%) as their primary source of information and the radio being the last. The Singapore government played a major role in disseminating information to the Singapore public. In the initial stage of COVID-19 surge, Prime Minister Lee had set Singapore way above other countries from warning people on containment measures to mitigation

and even coping efforts. Social media (30.7%) ranked “second” despite its prevailing easy access to information and the way it has become popular on the dissemination of COVID-19 communications.Congruently, trust, being a major component of an effective risk communication, was one of the variables looked into. Results of the survey suggested a large majority of Singapore residents trusted the government. Public trust in the authorities has been recognized in risk research as a crucial component of effective and efficient risk management. Poor communication has greater chances of ruining trust and reputation to the public, impacts economies and make fatalities even worst.

Descriptive analysis of the questionnaires pertaining to COVID-19 communications also revealed that the communications the respondents received were credible, consistent and reliable. Moreover, the respondents also agreed that the channels of communication by which they received the communications from were made accessible to them. Correspondingly, results of the survey showed “very high likelihood” which connotes that the respondents felt capable and equipped in supporting existing and future COVID-19 communications.

Looking through the lens of Cutlip’s 7 Aspects when Communicating to an audience (1985), and Covello’s Cardinal Rules of Risk Communication (1984), respondents agreed and viewed the risk messages they receive from the government positively. As such, this implies that the national authorities were able to communicate COVID-19 messages, its risk and mitigation process to the public promptly and effectively.

Conclusion

The study acknowledges the importance of risk communication during a pandemic like COVID-19. The results of this study also concludes that the channel of information has greatly evolved through the years. In Singapore, majority of the respondents have sought information from digital and social media platforms more than the conventional media such as newspapers, radio, and television. Primarily, WhatsApp was largely used as a vehicle of information given that more than 4 million out of the 5 million population of Singapore were users of the said application. It was identified then that governmental sites, and government announcements were the primary channel of information amongst 114 respondents of the study.

While theoretical background of this study conveyed general consensus of risk communication being a two-way process between the communicator and the recipients of the messages, results of related literature review showed that the bureaucratic culture with centralized nature of authority in the country and the communications from the Prime Minister have made it particularly easy for the Singapore government to roll out communications. Strict regulations and high fines on non-compliant citizens have made COVID-19 mitigation of risks achievable and attainable in the country. The researcher deduces that a relatively strict governance was needed to battle the pandemic promptly.

In addition, the study validates that trust is a major component of an effective risk communication. The respondents trusted the Singapore government because they believed they received accurate and honest communications from it. With a

general weighted mean of 3.08 which indicated “high level of trust”, it can be concluded that Singapore residents trust the government’s transparency, accountability and responsiveness in its overall handling COVID-19.

Moreover, the study concludes that respondents viewed COVID-19 information dissemination in Singapore positively (WM: 3.15). Respondents believed on the content of the communications they received and that they found them informative, accurate, easy to understand, consistent and reliable. Respondents felt positive because they received regular updates on COVID-19 communications and because they felt that relevant messageswere easily made accessible to them. With a weighted mean of 3.22, the respondents felt capable in adhering to existing COVID-19 guidelines, and thus, had high likelihood of supporting existing and future communications on COVID-19.

Lastly, respondents had positive assessment on the risk messages they received from the government (WM: 2.93). Existing risk communications the respondents received were found to be honest, credible and reliable. Respondents also felt their concerns and fears were taken into consideration and that the government relayed risk messages clearly and with compassion. Respondents also believed that the risk communications they received were passed down to correct channel of information with their government being transparent all throughout the management and disseminating of COVID-19 risk messages.

Recommendations

The following recommendations are forwarded to COVID-19 communicators, health organizations, and future researchers of risk communication in coming up with COVID-19 campaigns and strategies for the Singapore community:

1. While this study sought to identify the main channels and sources of COVID-19 information, it will be good for future researchers to include the respondent's level of trust towards the various channels of information so as future communications may be crafted according to the main channels utilized by the corresponding audience.

2. It is with no doubt that Singapore government has taken great advantage in handling COVID-19 communications and in mitigating its risks, given its centralized and bureaucratic approach. As such, the researcher suggests that future studies may explore political and cultural challenges and correlates them with risk communication practice.

3. As the researcher only focused on Beshi and Kaur's Framework (2019) in determining level of trust, it will be deemed constructive for future studies to explore other theories and framework that tackle trust and governance. In so doing, the overall risk communication practice may considerably be improved as trust is a major component of an effective risk communication.

4. This study only recruited 114 respondents. Future studies may cover a much bigger population to increase reliability as Singapore has over 5 million population currently.

5. This study only focused on how the respondents viewed COVID-19 information dissemination under the context of risk communication and public trust, it will be good for future researchers to explore other variables that tackles risk communication on a deeper extent such as risk communication plan and preparedness, and crisis management response. Perception and behavioral variables such as readiness to get vaccine and adapting to health promoting behaviors may also be areas to be explored further.

6. As there was no correlation that can be inferred from the results of the study due to usage of “Accidental Sampling”, the researcher suggests future studies to utilize more accurate sampling techniques where possible.

7. Lastly, the researcher recommends this paper to be used as a tool in order to help improve public health campaigns on COVID-19 and continuously implement a coordinated disease outbreak response in Singapore.

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ANNEXES

Annex 1. Research Instrument

Survey Consent Form

DESCRIPTION: You are invited to participate in a research study on "Public's View of COVID-19 Communications in Singapore". You will be presented with questions on how this outbreak was communicated to you and you will be asked to select options in multiple choice questions or type answers into text boxes. The objective of this research is to improve public health efforts in relation to campaigns for the general public in the future.

TIME INVOLVEMENT: Your participation will take approximately 5-6 minutes.

RISKS AND BENEFITS: There are no seen risks associated with this study. There are no direct benefits to you from participating in this study. However, the information you provide may help improve public health efforts with regards to COVID-19, thus, reduce harm from this pandemic. There is no guarantee or promise that you will receive any benefits from this study.

PARTICIPANT'S RIGHTS: If you have decided to participate in this research, please understand your participation is voluntary and you have the right to withdraw your consent or discontinue participation at any time without penalty. The alternative is not to participate. The results of this research study may be presented at UPOU journal
and your individual privacy will be maintained in all published and written data arising from the study.

CONTACT INFORMATION: *Questions:* If you have any questions, concerns or complaints about this research, its procedures, risks and benefits, contact the researcher, Rachelle Anne Lim Suarez at rlsuarez@up.edu.ph.

If you agree to participate in this research, please select "I consent, begin the study" below.

- o I consent, begin the study
- o I do not consent, I do not wish to participate

ANNEX 2. Survey Questionnaire

I. Demographic Information

1. How old are you?

(1) 18-27
(2) 28-37
(3) 38-47
(4) 48-57
(5) 58 and above

2. What is your gender?

(1) Male
(2) Female

3. In which region are you from?

(1) Central Region
(2) North Region
(3) North- East Region
(4) East Region
(5) West Region

4. What is the highest level of education you completed?

(1) Primary or equivalent
(2) Secondary GCE “0”level
(3) Secondary “N”Level
(4) Secondary “A”Level
(5) Vocational/Diploma
(6) Tertiary/Bachelor
(7) Tertiary Master
(8) Tertiary Doctoral

5. What is your race or ethnicity?

(1) Singaporean Chinese
(2) Singaporean Malay
(3) Singaporean Indian
(4) Permanent Resident, Work Pass
(5) Social Visit Pass

II. Channel of Information

1.Where do you usually get your source of information on COVID-19 from?
(1) friends, family, colleagues

(2) governmental sites, government announcements
(3) medical professionals such as doctors and nurses
(4) social media networks (facebook, whatsapp,instagram, twitter)
(5) newspaper
(6) television
(7) radio

III. The public's view of COVID-19 communications

A. Level of Trust
1. The government has been transparent in providing COVID-19 information from the onset of the virus up to this time, including but not limited to virus transmission, disease prevention and precautions, and number of death tolls.

(1) Strongly Agree
(2) Agree
(3) Neither Agree nor Disagree
(4) Disagree
(5) Strongly Disagree

2. Singapore is well equipped to contain and manage the COVID-19 outbreak.

(1) Strongly Agree
(2) Agree
(3) Neither Agree nor Disagree
(4) Disagree
(5) Strongly Disagree

3.I trust that the government puts suitable measures in place and responds timely to prevent the harmful brought about by the COVID-19 outbreak.

(1) Strongly Agree
(2) Agree
(3) Neither Agree nor Disagree
(4) Disagree
(5) Strongly Disagree

B. Public's view of how COVID-19 is communicated and likelihood of support to existing and future communications on COVID-19.

Statements	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
1. I have high regard on the competence of the government in handling and communicating COVID-19					
2. The delivery of COVID-19 communications are always informative, accurate and consistent.					
3.The content of COVID-19 communications I receive are important and valuable					
4. The COVID-19 messages I receive are always clear and easy to understand					
5. I receive regular updates and communications on COVID-19					
6. The channels in which COVID-19 communications are relayed are accessible to me.					
7. I am capable to engage in COVID-19 preventive measures as messages are easily understood and require less effort on my part					
8. I will support existing and future communicational campaigns on COVID-19.					

C. Public's Assessment of Risk Messages and Strategies.

Statements	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
1. The existing risk communications on COVID-19 involve me as a partner, and I am able to participate in decisions that affect me and my loved ones.					
2. The existing risk communications on COVID-19 are planned carefully.					
3.The existing risk communications on COVID-19 take into considerations my concerns and that of the community.					
4. The government has been honest and frank all throughout the management and disseminating of COVID-19 risk messages.					
5. The existing risk communications on COVID-19 are from credible and reliable sources.					
6. The risk communications I received have been pass down to correct channel of information such as the government agencies alongside social media.					
7. The government has always relayed risk messages clearly and with compassion.					

Annex 3. Survey Questionnaire Results

I. Demographic Information

1. How old are you?

Age	**Frequency *(n=114)***	**Percentage**
18-27	37	32.46
28-37	53	46.49
38-47	20	17.54
48-57	4	3.51

2. What is your gender?

Gender	**Frequency *(n=114)***	**Percentage**
Male	39	34.2
Female	75	65.8

3. In which region are you from?

Region	**Frequency *(n=114)***	**Percentage**
Central Region	31	27.19
North Region	12	10.53
North- East Region	12	10.53
East Region	31	27.19
West Region	28	24.56

4. What is the highest level of education you completed?

Highest Educational Attainment	**Frequency *(n=114)***	**Percentage**
Secondary “N”Level	7	6.1
Secondary “A”Level	4	3.5
Vocational/Diploma	36	31.6
Tertiary/Bachelor	61	53.5
Tertiary Master	6	5.3

5. What is your race or ethnicity?

Race/Ethnicity	Frequency *(n=114)*	Percentage
Singaporean Chinese	35	30.7
Singaporean Malay	21	18.4
Singaporean Indian	4	3.6
Singaporean Other	4	3.5
Foreigner on Work Pass	50	43.8

II. Channel of Information

COVID-19 Information Source	Frequency *(n=114)*	Percentage
friends, family, colleagues	12	10.5
governmental sites, government announcements	55	48.2
medical professionals such as doctors and nurses	2	1.6
social media networks (facebook, instagram, twitter)	35	30.7
newspaper	3	2.6
television	6	5.3
radio	1	.9

III. Respondents' Views on COVID-19 Communications

A. Respondents' Level of Trust to COVID-19 Communication Source

Statements	Mean	SD	Verbal Interpretation	Level of Trust
The government has been transparent in providing COVID-19 information from the onset of the virus up to this time, including but not limited to virus transmission, disease prevention and precautions, and number of death tolls.	2.97	1.1	Agree	High Level of Trust
Singapore is well equipped to contain and manage the COVID-19 outbreak.	3.23	.95	Agree	High Level of Trust

I trust that the government puts suitable measures in place and responds timely to prevent the harmful brought about by the COVID-19 outbreak.	3.05	1.11	Agree	High Level of Trust
WEIGHTED MEAN		**3.08**	**Agree**	**High Level of Trust**

Strongly Agree = 3.26-4.00, Agree = 2.51-3.25, Disagree = 1.76-2.50, Strongly Disagree = 1.0-1.75

B. Respondents' view of how COVID-19 is communicated

Statements	Mean	SD	Verbal Interpretation	Respondents' Views
1. I have high regard on the competence of the government in handling and communicating COVID-19	3.05	1.20	Agree	Positive
2. The delivery of COVID-19 communications are always informative, accurate and consistent.	3.00	1.11	Agree	Positive
3.The content of COVID-19 communications I receive are important and valuable	3.20	.944	Agree	Positive
4. The COVID-19 messages I receive are always clear and easy to understand	3.09	1.03	Agree	Positive
5. I receive regular updates and communications on COVID-19	3.20	.906	Agree	Positive
6. The channels in which COVID-19 communications are relayed are accessible to me.	3.34	.759	Strongly Agree	Very Positive
WEIGHTED MEAN		**3.15**	**Agree**	**Positive**

Strongly Agree = 3.26-4.00, Agree = 2.51-3.25, Disagree = 1.76-2.50, Strongly Disagree = 1.0-1.75

C. Respondents' Likelihood of support to existing and future communications on COVID-19.

Statements	Mean	SD	Verbal Interpretation	Likelihood
1. I am capable to engage in COVID-19 preventive measures as messages are easily understood and require less effort on my part	3.28	.800	Strongly Agree	Very High Likelihood
2. I will support existing and future communicational campaigns on COVID-19.	3.15	1.18	Agree	High Likelihood
WEIGHTED MEAN	**3.22**		**Agree**	**High Likelihood**

Strongly Agree = 3.26-4.00, Agree = 2.51-3.25, Disagree = 1.76-2.50, Strongly Disagree = 1.0-1.75

D. Respondents' Assessment of Risk Messages and Strategies.

Statements	Mean	SD	Verbal Interpretation	Public's Assessment
1. The existing risk communications on COVID-19 involve me as a partner, and I am able to participate in decisions that affect me and my loved ones.	2.87	1.23	Agree	Positive Assessment
2. The existing risk communications on COVID-19 are planned carefully.	2.78	1.28	Agree	Positive Assessment
3.The existing risk communications on COVID-19 take into considerations my concerns and that of the community.	2.96	1.099	Agree	Positive Assessment

4. The government has been honest and frank all throughout the management and disseminating of COVID-19 risk messages.	2.85	1.26	Agree	Positive Assessment
5. The existing risk communications on COVID-19 are from credible and reliable sources.	3.03	1.15	Agree	Positive Assessment
6. The risk communications I received have been pass down to correct channel of information such as the government agencies alongside social media.	3.17	.989	Agree	Positive Assessment
7. The government has always relayed risk messages clearly and with compassion.	2.83	1.29	Agree	Positive Assessment
WEIGHTED MEAN		**2.93**	**Agree**	**Positive Assessment**

Strongly Agree = 3.26-4.00, Agree = 2.51-3.25, Disagree = 1.76-2.50, Strongly Disagree = 1.0-1.75

Annex 4 Pre-Testing Cronbach's Alpha

A. Level of Trust

Statements	Cronbach's Alpha Score
The government has been transparent in providing COVID-19 information from the onset of the virus up to this time, including but not limited to virus transmission, disease prevention and precautions, and number of death tolls.	.926
Singapore is well equipped to contain and manage the COVID-19 outbreak.	.922
I trust that the government puts suitable measures in place and responds timely to prevent the harmful brought about by the COVID-19 outbreak.	.924

B. Public's view of how COVID-19 is communicated and likelihood of support to existing and future communications on COVID-19.

Statements	Cronbach's Alpha Score
1. I have high regard on the competence of the government in handling and communicating COVID-19	.920
2. The delivery of COVID-19 communications are always informative, accurate and consistent.	.922
3.The content of COVID-19 communications I receive are important and valuable	.924
4. The COVID-19 messages I receive are always clear and easy to understand	.924
5. I receive regular updates and communications on COVID-19	.927
6. The channels in which COVID-19 communications are relayed are accessible to me.	.926
7. I am capable to engage in COVID-19 preventive measures as messages are easily understood and require less effort on my part	.925
8. I will support existing and future communicational campaigns on COVID-19.	.924

C. Public's Assessment of Risk Messages and Strategies.

Statements	Cronbach's Alpha Score
1. The existing risk communications on COVID-19 involve me as a partner, and I am able to participate in decisions that affect me and my loved ones.	.926
2. The existing risk communications on COVID-19 are planned carefully.	.922
3.The existing risk communications on COVID-19 take into considerations my concerns and that of the community.	.924
4. The government has been honest and frank all throughout the management and disseminating of COVID-19 risk messages.	.922
5. The existing risk communications on COVID-19 are from credible and reliable sources.	.922
6. The risk communications I received have been pass down to correct channel of information such as the government agencies alongside social media.	.922
7. The government has always relayed risk messages clearly and with compassion.	.923