

THE EFFECTS OF CULTURE AND CULTURAL MEDIA ON COVID-19 COMMUNITY
RESPONSE

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Abstract

The side-by-side communities of Markham and Vaughan Ontario, situated directly north of Toronto have similar income profiles, housing types, education, and age demographics. Both cities share consistent policies as members of the Regional Municipality of York. Yet despite similarities, a year and a half into the COVID-19 pandemic, Vaughan saw 96% higher infection rates than Markham. One key difference in the demographics between Markham and Vaughan is the population of ethnically Chinese people. Markham has 77% visible minority and 45% ethnically Chinese population. Vaughan has an 8% ethnically Chinese population. The stark contrast in infection rates, despite similar socio-economic indicators, was the driving force behind this research. Key questions were whether culture or cultural influences played a role in pandemic behaviour. What role media consumed by diasporic communities had on decisions to wear a mask or practice social distancing, and how digital communication technologies can be used to influence pandemic behaviour.

The experiences of Vaughan and Markham demonstrate a clear emphasis on economic issues in English-language Toronto-based media, which creates a bias of economic importance compared to Chinese language media, which focused on the health impacts of COVID-19. The coverage did not merely report on the pandemic; it mediated the response by its framing and messaging.

Information flowed quickly from Chinese language sources to both individuals and family and friend group chats. The impact of this information flow was apparent as

many Chinese Canadians adopted masking before mandates came into effect, in fact, many were masking while Canadian officials were asking people not to mask.

Applied Science Communication, the science communication that attempts to influence either policy or public behaviour, should be treated differently from traditional forms of science communication. The political implications of behaviour compliance points to treating it more like political communication. The economic coverage of COVID-19 overshadowing the public health issues demonstrated how politically charged the issue became. As science and technology become more entwined in everyday life, scientists need to recognize the political implications of their work and research and communications should be done with this in mind.

Dedication

This work is dedicated to all the children, especially mine, that we have failed to protect from climate change and the apocalyptic conditions they are growing up in. May you, unlike your elders, fulfill your obligations to protect future generations. If any of this work has even an iota of use in fulfilling those duties, then please consider this elder as having at least tried to fulfill hers.

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List of Abbreviations

AI	Artificial Intelligence
BBC	British Broadcasting Corporation
BLM	Black Lives Matter
CBC	Canadian Broadcasting Corporation
CCNC	Chinese Canadian National Council
CDC	Centre for Disease Control
CIHR	Canadian Institute of Health Research
CNN	Cable News Network
COVID-19	Corona Virus Disease (used interchangeably with COVID)
CPHO	Chief Public Health Officer
CTV	Canadian Television
DDT	Dichlorodiphenyltrichloroethane
G&M	Globe and Mail
GTA	Greater Toronto Area
HKCNA	Hong Kong China News Agency
IBM	International Business Machines
JIT	Just in Time
MASC	Mass Applied Science Communication
NLP	Natural Language Processor
NoDaPL	No Dakota Pipe Line
NPR	National Public Radio
PAS	Public Awareness of Science
PES	Public Engagement with Science
PPE	Personal Protective Equipment
PTSD	Post Traumatic Stress Disorder
PUS	Public Understanding of Science
SARS	Severe Acute Respiratory Syndrome
SC	Science Culture
SL	Scientific Literacy
SSC	Strategic Science Communication
STEM	Science Technology Engineering Math
WHO	World Health Organization
WVS	World Values Survey
TMX	Trans Mountain Expansion

Introduction

After James Hansen testified at the American Congress in 1988 that Climate Change, then popularly referred to as “Global Warming”, was an existential threat to humanity, school children around the world were taught to care for the Earth, the three “R’s” (Reduce, Reuse, and Recycle). Every year, we would sing songs about the Earth, pick up garbage in the park. Those with the least agency in their lives were told that caring for the environment was their job and all they had to do was sort their garbage.

In 1989, the Exxon Valdez spilled over a quarter million barrels of crude oil into Alaska’s pristine waters. Images of oil-soaked birds and marine life lying lifeless on an oil slicked shoreline beamed across televisions around the world. There could be no better testament to spur the end of fossil fuel consumption. Instead, after the Kyoto protocol was signed eight years later and the world agreed to reduce emissions for the survival of humanity, Greenhouse gas emissions continued to rise at breakneck pace. Climate change denialism was rampant and even well-educated people had doubts about the cause. Children taught to recycle were growing up into young adults who saw New Orleans get pummelled by a ‘once in a century’ hurricane, Hurricane Katrina. Then in the same hurricane season Hurricanes Rita and Wilma would further cause record amounts of damage.

The disconnect between cause and effect was a barrier for climate change communicators. For many in the scientific world, including myself in the applied sciences, it was commonly believed that the time delay between burning fossil fuels,

hurricanes, and floods made it easy for denialism to flourish. Many of us were convinced that all the world needed was better communication to connect the dots and the world would act. If only people could see the immediate results, science denialism would disappear. People would take the actions that were necessary to save lives. I was wrong. Dead wrong.

In March 2020, it hit closer to home, in the heart of the Chinese Canadian community to which I belong. Death hit us in the face bringing along with-it science denialism, racism and bigotry. Doctors and scientists were taken by surprise at how television appearances discussing facts about the disease would beget death threats to their families. The scientific community was caught off guard by how strong the pushback against facts was despite people dying in front of our eyes. However, not every community reacted the same way as some communities led the way above and beyond officially recommended disease prevention practices. While cultural practices and restrictive authoritarian laws had been credited for the overall lower rates of COVID-19 in Asia, the media influence has been somewhat overlooked. Asian media reminded its readers to wear masks at all times while English language media reminded its audiences that COVID-19 was creating inflation. This work will show that *The Globe and Mail* wrote more articles about COVID-19 in relation to its impact on the oil and gas sector than it did about the health impacts of the disease. I show that English language media had already set the tone for the bulk of the population that COVID-19 was an economic problem, not a public health one. I argue that that the differing response

between the Chinese Canadian community and the dominant white community was largely media mediated, and the tight family connections coupled with technological tools allowed for the quick dissemination of information within diasporic communities.

On the eve of the Lunar New Year, January 25, 2020, between stuffing red envelopes and making weekend plans for dim sum and dragon dances, phones started buzzing across the Chinese diaspora around the world. Word that Wuhan and Hebei in China went into lockdown on January 23, 2020 (Qian & Hanser, 2021), over a respiratory virus plaguing the region, caused diasporic communities to hold a collective breath. Those in Canada who still carried painful memories of how severe acute respiratory syndrome (SARS) affected Toronto in 2003 (Ali, 2008; Ding, 2014; Keil, 2006; Keil 2008; Muzzatti, 2005; Schram, 2003; Strange, 2007), sprang into action. Memories of shuttered businesses and bullied children haunted the community and, together, they acted quickly to both stem the racism and brace their children for what would be coming at them. In the following days, television networks started showing Asian faces recounting SARS experiences and pleading with the public to help avoid a repeat. At the time, few predicted that lockdowns would spread across the world and that this new respiratory virus would leave SARS a mere footnote in history. By the end of 2021, COVID-19 (coronavirus disease discovered in 2019, also known as COVID), was estimated to have caused the deaths of nearly 15 million people globally, either directly or indirectly (Msemburi et al., 2023; Taylor, 2022).

By the time the World Health Organization formally named the virus “COVID-19” in February of 2020, segments of the news media and xenophobic politicians alike were already in the habit of calling it the “Wuhan Virus” or “Chinese Virus” (BBC, 2020a; John and Guy, 2020; Griffiths and Gan, 2020; Smith-Schoenwalder, 2020). Diseases named after places of origin tend to carry stigma against people from those places (Howells & Pieters, 2018; McCauley et al., 2013; Obilade, 2015; Taylor, 2022b). In the case of COVID-19, it brought back sentiments of the “Yellow Peril” (Chun, 2020). Masked Chinese faces were depicted in news stories about this disease, reinforcing the notion that it was a Chinese disease. This media mediation contributed the Chinese community’s response to the epidemic (Mamuji et al., 2020).

Pandemic related closures started in Toronto in March 2020 and eventually turned out to be one of the longest business shutdowns living history (Gallagher-Mackay et al., 2021; Krashinsky-Robertson, & Stone, 2021; Levinson-King, 2021; Smaggus et al., 2022). The length of this shut down had far-reaching effects in every aspect of life.

Education was negatively impacted with expected reductions in educational achievement at multiple levels not only in Canada, but around the world (Burki, 2020a; Eyles et al., 2020; Gallagher-Mackay, 2021; Harsha & Bai, 2020; Hoofman & Secord, 2021). Across Canada, several hundred thousand restaurant workers lost their jobs (Larue, 2020). Overall, there was a 15% decline in employment among working aged people in Canada (Lemieux, 2020). The pandemic also had mental health impacts across the population (Vigo et al., 2020), hitting women and minorities the hardest

(Beland, 2022). The lockdown also saw a resurgence of an intense wave of anti-Asian racism (Guo & Guo, 2021; Liew, 2020; Shang et al., 2021). The Chinese community in Toronto has a long and varied history of racism that shaped their response to COVID-19 (Mamuji et al., 2020; Misra et al., 2020; Zhao et al., 2022).

Chinese people are believed to have been in Canada as early as 1858, but the Chinese immigrant population did not grow substantially until the 1880s (Anderson, 2007; Hollan, 2007) Canada needed cheap labour to build the railroad linking British Columbia to the rest of Canada when it joined Confederation in 1871 (Chang, 2008; Faustino-Santos, 1988; Li, 1995; Satzewich, 1993; Zhi, 2011). An estimated 16,000 to 17,000 Chinese people arrived in Canada during the early 1880s to work on the Canadian Pacific Railway (Anderson, 2007). During the 1880s, there was a general opposition to the idea of Chinese people settling in Canada (Stanley, 2016; Wilkey, 1998; Zhi, 2011). Prime Minister MacDonald said during an 1882 Parliamentary debate that the Chinese were “an alien race in every sense, that would not and could not be expected to assimilate with our Arian population” (Stanley, 2016, p. 23). However, Prime Minister John A. MacDonald made it clear that if Canadians refused this cheaper Chinese labour, there would be no railway at all (Stanley, 2016; Zhi, 2011). During an 1882 House of Commons debate, MacDonald said: “At present it is simply a question of alternatives—either you must have this labour or you cannot have the railway” (Stanley, 2016, p. 23). Labour was recruited from China’s Guangdong province during a time of political turmoil so there were many men willing to take their chances to earn money

from abroad and bring it home (Chan, 2008; Zhi, 2011). These men worked under an indentured servant system that kept them working in dangerous and deplorable conditions, where many men would lose their lives to the railroad (Cloud and Galenson, 1987; Walia, 2010; Zhi, 2011). By the time the railway finished in 1885, the Canadian government decided they no longer wanted more Chinese migrants and implemented a Chinese head tax to dissuade immigration from China (Cho, 2002; Go, 1990; Li, 2008). The certificate for the head tax system would become Canada's first photographic identification system used to surveil and restrict the movement of the Chinese in Canada (Cho, 2018). The \$50 head tax introduced in 1885 was increased to \$100 and increased again to \$500 in 1923 (Guo & Devoretz, 2006, p. 279). To put that tax into perspective, the average wage earner in Vancouver in 1921 made \$1,095 per year (*Canada Year Book*, 1927/1928). At the time, 59% of Canada's Chinese population lived in British Columbia (Huang, 1998, p. 10). Despite this racist tax, the Chinese population would continue to grow and spread throughout Canada and, by 1951 Vancouver would be home to 8,729 ethnically Chinese people while Toronto's growing Chinese community boasted 2,879 (Wang, 2006, p. 83). As the Chinese population grew, they created community districts and self-organized into clan and business associations that would play important roles in the community (Wang & Lo, 2004).

In the 1950s, Toronto's Chinese population was largely concentrated in an area known as "The Ward" (Chan, 2013, p 37; Yee 2005). This area, bounded by Yonge St, College St, University Avenue, and Queen St. was segregated from the richer white

neighbourhoods of the city and its inhabitants lived in impoverished conditions (Chan, 2013, p 37). When Toronto needed a new City Hall, residents in this area saw their community and businesses get expropriated for the land that is now Toronto City Hall (Stanford, 2015; Zheng, 2021) forcing the Chinese population to relocate, mostly ending up along what is now known as “Chinatown” along Spadina Avenue between College Street and Dundas Street and Dundas Street between Beverly Street and Augusta Avenue. This is an example of government action disrespecting the Chinese Canadian community. The Chinese population was forcefully relocated despite the protests at the time (Yung, 1998). Racism did not end there.

Seeing racism mediated by the Canadian media is not new to the Chinese diasporic community. In the 1970s, the official policy of multiculturalism implemented by Prime Minister Pierre Trudeau attracted more Chinese immigrants to Canada, and Toronto was a popular place for many to settle. By the late 1970s, young immigrants and second-generation Chinese children were becoming successful in school and starting to enter the hallowed halls of academia in great enough numbers that the Canadian Television Network (CTV) aired a segment titled “*Campus Giveaway*” in which protesters decried Chinese students taking away academic spots from “Canadians” (Ho, 2014). The allegation was that Chinese people were not Canadian. This sparked the creation of the Chinese Canadian National Council (CCNC) and, through their work in bringing together the Chinese community, CTV eventually acknowledged their racism

and apologized (CCNC, n.d.). The CCNC would once again come to the forefront in the fight against anti-Asian racism during COVID-19.

Between 1980 and 2000, almost 800,000 Chinese immigrants landed in Canada with 90% hailing from four main origins according to research by Wang and Lo (2005): Hong Kong (46.5%), mainland China (27.7%), Taiwan (11.8%) and Vietnam (5.2%) (Wang & Lo, 2005, p. 43). Today, mainland China is the largest source of ethnically Chinese immigration into Canada. The pace of immigration in the early 2000s prompted Betty Granger, a Reform Alliance federal Member of Parliament candidate to dub the immigration wave the “Asian Invasion” (CBC, 2000), something the community remembers to this day. In Ontario, many of these migrants ended up in the suburbs of Toronto, particularly Markham Ontario, which boasts a 74% Asian population of which 46% identify as Chinese (Statistics Canada [Markham], 2017 “Ethnic Origin Population” Table). It is against this backdrop that COVID-19 arrived in Toronto in January 2020.

It is within the larger context of this history of Chinese communities in Canada that this investigation of differing understandings of approaches to the COVID-19 pandemic that this research has been designed. North of Toronto’s boundary of Steeles Avenue are two very similar, neighbouring municipalities. On the east side is Markham, and the west is Vaughan. A drive across these communities shows a very similar built form, similar housing types and, according to census data, very similar socio-economic circumstances (Statistic Canada [Markham, Vaughan] 2017).

During the first wave of the pandemic, there was a strong relationship between poverty and COVID-19 susceptibility (Kim et al., 2021; Patel et al., 2020; Pereira et al., 2020; Poirier, 2022). Changes in socioeconomic status will also have an impact on health (Barakat & Konstantinidis, 2023). Poverty, however, was not the only difference. The strength of this relationship is questioned by this examination of the communities of Markham and Vaughan given their very similar socio-economic characteristics - such as income, age, household size, educational attainment, and housing type, but large differences in COVID-19 infection rates. Markham has a largely Asian (74%) population, while Vaughan's Chinese population sits at 7% (Statistics Canada [Vaughan], 2017, "Ethnic Origin Population" Table). This dissertation identifies some of the reasons why Vaughan, had 80% higher COVID-19 infection rates in October of 2021 than Markham did despite being part of the same regional municipality (followed the same COVID-19 procedures), benefits from the same healthcare system, and obviously under the same federal laws. COVID-19 has affected low-income neighbourhoods disproportionately (Baena-Díez et al., 2020), yet despite being in a high-income neighbourhood, such as Vaughan, infection rates are higher than those in similar socioeconomic communities (Persico, 2021), leaving the question of what other influencing factors could be.

According to Jennifer Lerner, perceptions of unfairness between higher and lower income classes, who were minimally impacted by lockdowns, and those who work in professions such as retail who cannot work from home are one of the drivers of the anti-

COVID-19 sentiment (Pazzanese, 2020), but given Vaughan's relatively high income, something else must be driving the infection rate. The similar profiles of Markham and Vaughan make these communities ideal for studying cultural impacts, and media consumption, independent of socioeconomic conditions.

Mamuji et al. discovered through their interviews of the Chinese Canadian diaspora in the Greater Toronto Area (GTA) that the Chinese community defied the advice to not mask early in the pandemic (Mamuji et al., 2020). Mistrust in government by the Chinese Canadian community manifested itself in ignoring advice to not wear masks (Dunham, 2020), business creating COVID-19 protocols, and self-isolation long before government mandates. Why did mistrust in government manifest itself so differently between two communities that are physically situated side by side? Lee McIntyre (2019) attributes the current climate of mistrust to political and media manipulation that has been years in the making. Studying the COVID-19 response inside ethnic enclaves allowed for better understanding how this effect cut across cultural boundaries and the impact that media had on communities.

Chinese Canadians are no strangers to the idea of media not just reporting on a crisis, but having direct impact on it through propaganda. They already had a mistrust of Chinese officials disclosing the extent of the situation in China. There was also mistrust of Canadian officials taking competent, decisive action. Because of this mistrust, many Chinese Canadians took it upon themselves to wear masks, physically distance, and enact community protocols well ahead of Canadian government bodies (Mamuji et al.,

2021). These actions paid off in the form of Markham's lower COVID-19 infection rates. The Chinese Canadian population was also hit hard by SARS in 2003 (Flood & Williams, 2003; Low, 2004; Singer et al., 2003) and remember the lessons as a community, thus acted accordingly.

When we look at mistrust for other highly contentious issues, both climate change denial (Krange et al., 2019) and anti-vaccination discourse online has been linked to white supremacy (Davis 2019), populism (Bayerlein et al., 2021; Eberl et al., 2021) and political ideology (Pavlovic et al., 2021; Tung et al., 2022). Thus, it stands to reason that this racial demographic difference between a large ethnically Chinese population and a majority socially dominant (White) population has a larger impact on COVID-19 infection rates than public policy alone. Vaughan and Markham as distinct communities with so many similar features, such as the built form, income, age, and educational characteristics, allow for a case study to better understand some of the factors behind anti-science sentiments, such as ethnicity, and media consumption. The goal of this research is to understand how cultural media, ethnicity, and mistrust in such similar neighbourhoods translated to such drastically different COVID-19 outcomes in practice.

This dissertation demonstrates the importance that trust plays in community action and investigates some of the information flow patterns during the early phase of COVID-19. It also examines the differences between English and Chinese language media and its mediation effects as represented by major media outlets in Toronto, Hong

Kong, and Taiwan. A better understanding of how COVID-19 information reached their final audiences, and the level of trust that was put into the information will help Public Health officials and government officials managing a disaster or crisis to more efficiently get instructions to the general public. How information is disseminated to the public in an emergency deserves rethinking, as does the influence of technology over compliance behaviours. Better understanding the path of COVID-19 communication, how different communities reacted to it, will help us better understand the parallels to climate communication and the communication of future pandemics and other widespread emergencies. We are most likely too late to avoid a massive loss of human life from climate change as we are sure to see more intense and frequent climate-related emergencies in the future. Science communicators must do our best to convince both lay people and those in power to protect what we can and manage the upcoming disasters as efficiently as possible using the communication tools at our disposal.

There is a lot we can learn from the COVID-19 pandemic. Reactions varied when Wuhan went into lockdown in January of 2020, something thought impossible in Western democratic nations. The idea of restricting the movement of people is an affront to the idea of freedom in Western democratic nations where minimal restrictions in speech and movement are cornerstones of society. Mobility rights are enshrined in section 6 of Canada's Charter (Russell, 1983). Both popular media and academia remarked about how harsh curtailment of individual freedoms could only be done in authoritarian country such as China (McGregor, 2020; Wang, A, 2020; Wang, T., 2020).

Beyond individual freedom, the curtailing of individual movement had a huge economic impact in a globalized world where countless manufacturing facilities around the world have long adopted Just-In-Time (JIT) operating philosophies (Cheng, 1996; Golhar, 1991; Groenevelt, 1993; Hutchins, 1999; McLachlin, 1997, Monden, 2011), where companies no longer keep large inventories and instead rely on efficient transportation systems for goods as they need them, delivery delays translate into costly manufacturing slowdowns and is an economic threat. Limiting individual mobility was not only an affront to liberal democratic values, but it was also a threat to the economic order. The economic threat led the Lt. Governor of Texas, Dan Patrick, to say that grandparents like him (the age group most likely to die from COVID-19) were willing to sacrifice themselves for the sake of the economy (Knodel, 2020). The pandemic was quickly framed in the media as a balance between saving lives and saving the economy (Bauer et al., 2020; King, 2020). This mediation created a political division in COVID-19 responses that were particularly visible in the United States with Republican led states having fewer lockdown restrictions and masking mandates (Fowler et al., 2020; Hill et al., 2021; Samore et al., 2021; Thomson-DeVeaux & Wiederkehr, 2020) resulting in higher death rates (Morabia, 2023; Warshaw, 2020). Unvaccinated adults were also more likely to lean Republican (Freij, 2023; Zhang, 2023).

Despite the higher death rates, the political divide aided by the media remained strong with the mere idea of masking being associated with restrictions upon individual freedom (Bergen, 2020; Blunt, 2020; Cathcart, 2020; Costella, 2021). Canada was not

immune from the political machinations of mask and vaccine requirement as it saw protests arise around the country in places such as Winnipeg, Toronto, Vancouver (Bergen, 2020; Bogart, 2020; Ireland, 2020; Montpetit & McFarlane, 2020) that culminated in the “Freedom Convoy” in Canada’s capital where protestors blocked off roads and cut off traffic for weeks (Bolina, 2022; Dyer, 2022; Huang et al., 2022). The protests were ostensibly led by unvaccinated Canadian truck drivers who were upset that they would have to quarantine three days unless they took the COVID-19 vaccine (Mior 2023; Murphy, 2022). This was seen as an affront to individual rights. Reality would prove that conspiracy theories and white supremacy was the fuel that drove these protests (Graves, 2022; Knopka, 2023). The trucks congregated in Canada’s capital blaring their horns, playing loud music, and even bringing out hot tubs in Ottawa’s streets (Chianello, 2022). At the same time, a related group also blockaded the Canada-US border crossing in Windsor Ontario bringing cross border traffic to the standstill (Gollom and Craggs, 2022) costing both countries billions in trade (La Grassa, 2022). Ottawa resident Zexi Li described the atmosphere as intimidating and “near impossible” to live (Fraser, 2023). Li was the brave Ottawa resident who filed an injunction against the protestors at the cost of harassment and threats to her life and well-being (Dube, 2022) when no authorities were willing to act against them. She became the lead plaintiff in a class action lawsuit against the Freedom Convoy organizers (Osman, 2023). The protest was not brought to an end until then Prime Minister Justin Trudeau made history by invoking the Emergencies Act on February 14,

2022 allowing banks to freeze assets of protestors, the Federal police agency to act in the city, and prohibiting public assembly among other measures that finally broke up the blockades both in Ottawa and in Windsor (Aiello, 2023; West et al., 2022). The emphasis on personal freedom dominated the political and media narrative with those against masks finding a common enemy with those against vaccinations (Bracho-Sanchez, 2020; Brig, 2020).

The fight against vaccinations brought along with other forms of conspiracy theories that manifested into quack medical advice making it into the mainstream. It was aided by right wing politicians around the world, notably some in the US were promoting Ivermectin, best known as a horse dewormer, as a cure for COVID-19 despite the lack of efficacy (Farmer, 2021). During the pandemic, patients who reported higher levels of trust in social media or in United States President Donald Trump were more likely to take non-evidence-based medication (Perlis et al., 2023). Likewise, patients who scored higher on the American conspiracy thinking scale (Enders et al., 2023) were more likely to have received non-scientifically based treatments for COVID-19 during the pandemic (Perlis et al., 2023). The disinformation regarding COVID-19 was not merely in dark corners of the internet but led by powerful right-wing politicians like President Trump of the United States and President Bolsonaro of Brazil (Béland et al., 2021; Farmer, 2021). Near the start of the pandemic, President Trump suggested injecting bleach into the human body for the purposes of disinfecting (Evanega et al., 2020; McGraw and Stein, 2021). Despite the horror in the scientific community, this led to a Florida man and his

family peddling industrial bleach as a cure for COVID-19 (Schaefer, 2021; United States Attorney's Office, 2023). An Austrian man died after ingesting bleach to treat COVID-19 (Georgiou, 2021) and a CDC¹ (Centers for Disease Control) online survey estimated 4% of Americans may have ingested or gargled diluted bleach as a treatment for COVID-19 (Gharpure et al., 2020). COVID-19 brought science denialism to the forefront and its dangers. In the meantime, COVID-19 cases continued to rise in Ontario two years after the lockdowns (Public Health Ontario, 2022), partially fuelled by conspiracy theories that led to an anti-government protest (Pringle 2020).

Lee McIntyre (2019) attributes this science denialism to an overall atmosphere of mistrust. This erosion of trust in government and public institutions has undermined social stability in Western democracies (Leigh, 2006; McIntyre, 2018; Potter, 2020; Thompson & Smulewicz-Zucker, 2018). Mistrust led to the anti-vaccination and anti-mask movements that put public health at risk (Pazzanese, 2020). Whether it is vaccine hesitancy, COVID-19 denial, or climate change denial, heeding the advice of scientists is our best defence in overcoming the challenges that we will face. Yet, because of this distrust, fuelled by entrenched interests, historic corruption, and now social media (Oreske & Conway, 2011; Chambers, 2021), their advice is being ignored, or in some cases vehemently opposed. McIntyre believes that the problem doesn't so much lie in

¹ A discussion of WHO and CDC guidelines are included in this dissertation since Ontario, largely followed the guidelines issued by the larger, leading health agencies.

the fact that misinformation runs rampant on social media, but rather that we live in an environment where people are inclined to believe it (McIntyre, 2019).

Another problem that technology-enabled communication brings us is disinformation. While not unique to a diasporic community and certainly not unique to the technological age, disinformation is another source of social distrust. Technology did not cause disinformation, but it helped disinformation spread much faster. The impact of sustained disinformation is now being seen in the real world. The World Health Organization (WHO) has characterized the COVID-19 information landscape as an “over-abundance of information,” ultimately declaring the existence of a “massive infodemic” (Krause et al., 2020, p. 1052). The “misinformation about COVID-19 can encourage people to shirk experts’ recommendations for protective behaviours such as social distancing, thus accelerating the spread of the virus” (Krause et al., 2020, p. 1053). This is having an impact on everyone as death counts continue to rise. Conspiracy theories have also led to the destruction of 5G phone towers (Goodman & Carmichael, 2020).

Community influences play a role in science and health communication in an environment challenged by erosion of trust in public institutions (Constant & Zimmerman, 2008; Jimenez, 2010; Keefe 1992, Nagel, 1994). In particular, diasporic communities often turn away from mainstream media in favour of media in their own language that puts them in more favourable light (Oh, 2015; Staiger 2005). The research in this research will focus on two Toronto suburbs, one predominantly

ethnically Chinese, and how mistrust in that community, and a difference in media intake created mask wearing habits that were quite different from its neighbouring, predominantly white community. This work examines the underlying factors that Chinese language media and social media circles play in mediating public health measures and scientific information in general.

Markham and Vaughan

In the microcosms of Vaughan and Markham, Ontario socioeconomic indicators (income, housing density, education) are mostly equal (StatsCan, 2016). In 2021, Vaughan registered nearly 23,900 cases of COVID-19 compared to Markham's 13,000 (as of Oct 6, 2021, Persico, 2021), putting Vaughan at 96% higher per capita infection rate than Markham. The most apparent demographic difference between the two cities is ethnicity. Markham is 77% visible minority compared to 35% in Vaughan. Chinese people make up the largest visible minority group in Markham at 45% while Vaughan is 8% (Statistics Canada, 2016). This leaves a large question of to what degree ethnic identity and differing information sources (Hall, 2015; Uslaner & Conley, 2003) affect the way information is shared and interpreted. For example, in researching surrounding the impact of COVID-19 on the Chinese diaspora in the GTA Mamuji et al. (2020), came across no anti-maskers despite widespread anti-masking protests at the time. It is curious that the Chinese Canadian community seemed immune to this anti-mask phenomenon. This research investigates the differences between the two communities, their media sources and takes a deeper look at the Chinese community in particular.

Participants in Markham and Vaughan were interviewed and asked a series of questions in a semi-structured format about their media preferences and thoughts and habits related to the COVID-19 pandemic. Based on their responses, a media comparison was conducted to determine if there were material differences in how the pandemic was covered in the Chinese language in Hong Kong and Taiwan compared to Toronto and if that may have affected behaviours. The outcome of this work will inform authorities in risk communication particularly in relation to the Chinese Canadian community in preparation for the next pandemic or climate change induced emergencies.

Key Questions:

- 1) What roles do Chinese culture and cultural influences play in decisions to wear masks, get vaccinated, or follow social distancing protocols?
- 2) How does Chinese language media portray masks, vaccines, and COVID-19 protocols compared to English speaking corporate media?
- 3) Drawing on the examples the comparison of these two communities provides, how can digital communication technologies be used to influence behaviour in future emergencies?

This work demonstrates that media usage, trust and communication play a role in decision making about masking, vaccination, and social distancing protocols during COVID-19. Media did not merely report on this pandemic but helped shape its experience. The side-by-side communities with identical protocols and healthcare

systems gives us an opportunity to look at how differing media had a hand in mediating the crisis. Media impacted behaviour through its reporting. The emphasis on economic issues in English-language Toronto-based media created a bias toward economic importance. Chinese language media in Hong Kong and Taiwan focused on health issues related to the pandemic, creating a different sentiment toward masking. While neither mainstream media nor social media enjoy high levels of trust, by the time information has stepped into small, localized groups, it tended to be trusted due to the intimate nature of these groups and having a trusted resource like a friend or family member they could turn to.

This work challenges some popular misconceptions about the cause and effect in pandemic policies. At the start of the pandemic, corporate media had attributed China's lockdown success to its authoritarian nature with headlines such as "China's approach to containing Coronavirus cannot be replicated" (Huang, 2020). There was a strong sentiment that democracies would inherently have a harder time with managing the pandemic (Esarey, 2021). However, Markham and Vaughan tell a different story. Governance did not differ very much but infection rates did.

Neither Markham nor Vaughan is controlled by a dictatorial government. Both communities were subject to the same laws, have nearly identical socio-economic indicators, and have a very similar built form and economy. However, largely ethnically Chinese Markham had almost half the COVID-19 incidence rate as white majority Vaughan. This dissertation looks deeper into the role that Chinese cultural influences

and news media mediation played in pandemic mitigation beyond public policies or systems of governance. I argue that China's success at COVID-19 control had less to do with authoritarianism than trust and cultural values that highly value collective well-being as even when individuals are removed from that society, those values can remain, perhaps for several generations (Ocampo, 2016). The media that people received from Asia was a constant and repetitive reminder to mask up and care about people's lives, a stark contrast to how English Toronto media portrayed it. Masking friendly news from Asia made its way to diasporic communities, and those in Markham greatly benefitted from having information originating from overseas. That media sharing played a large role in convincing people to mask up, literally saving lives. However, not all media is equally trusted by its readers. The chat group effect, media coming from groups of people known to the user in real life was an important factor for many people when there was so much contradictory advice and misinformation in the early days of COVID-19 in 2020.

Earning people's trust is important for decision-makers and increasingly scientists themselves as people are often suspicious about the motives of their research. Addressing those feelings, understanding how people feel, and using the technological tools available for communicators will go a long way towards reducing the negative effects of the next disaster or emergency. Much like the Heisenberg uncertainty principle in science where the act of taking a measurement can affect the state of what is being measured, or the Hawthorn effect where the act of observing can change behaviour,

media coverage (or lack thereof) can and will affect the outcome of a crisis. Looking at these two side-by-side communities with so many other similar traits, healthcare access, and policies, but one a large diasporic population getting news from foreign sources, gives us a unique look at how much information mediation can impact a crisis. Markham and Vaughan give us a view of how Toronto's English media coverage increased the incidence of infection.

In the next two chapters, there will be a discussion of the history of communicating science, its goals, and challenges followed a brief history of the Chinese diaspora in Canada, setting the background for the work in this dissertation. Understanding the history of racism this community has faced as well as its experience with SARS will help the reader understand the context on which this work rests.

Chapter 3 will then discuss the methods used in this study. This dissertation was driven by interviews of residents in Markham and Vaughan. Their responses eventually led to conducting a comparative media analysis between English language media in Toronto and Chinese language media in Hong Kong and Taiwan.

I had wanted to confirm in person the masking behaviour differences and confirm what participants were telling me anecdotally. Chapter 4 discusses the observations made in person that is the foundation for the comparisons made between Markham and Vaughan. The observations in the community confirm what participants are reporting in the interviews and serve as confirmation that allows the rest of the study to be done

confidently. This chapter also sets the stage for a fair media comparison confirming the similar demographics between Markham and Vaughan.

Chapters 5 and 6 highlight the most importance differences that were found between Chinese language media from Hong Kong and Taiwan and English language media in Toronto. The economic bias shown in Chapter 5 coupled with the negative masking advice shown in Chapter 6 had a lot do with the lower masking rates in Vaughan. These two chapters tell the story of how influential foreign media is in diasporic communities and how we must take that influence into consideration in emergency planning.

The role of social media is presented in Chapter 7 with a discussion of how international media is sent to geographically large family group chats, that then get passed to other, more localized groups. The speed at which this information reached diasporic communities, along with their consistent pro masking message had a large influence on masking behaviour, and ultimately COVID-19 infection rates. This chapter also explores how the plethora of media platforms and outlets is complicating how officials target their messages during an emergency.

Trust is necessary in the basic functioning of society, let alone during an emergency such as COVID-19. Chapter 8 explores how trust and fear impacted people's decision to get a vaccine.

People's feelings and sentiment mattered a lot in their pandemic decision-making. Chapter 9 looks at the role of stigma in the decision to wear a mask and does a

preliminary study on using Artificial Intelligence (AI) tools on social media posts to give officials information on how the public feels about the pandemic. This chapter also looks at Mass Applied Science Communication (MASC) and how it was done effectively in the past and the lessons we can take from it going forward.

The final chapter in this dissertation will discuss where this work can be taken in the future, and the implications for how we can better manage future pandemics and emergency situations.

Chapter 1: Literature Review

Diverging reactions to public crises are governed by a variety of factors that depend on public trust, their sources of media, and community influences. This is particularly evident in the contrasts between diasporic and hegemonic communities within society and their take up of messages and actions. Among the factors are media consumption, support networks, and trust in information media and other sources.

Public Trust and the media

The idea that trust between people is of utmost importance is nothing new. The Chinese philosopher Confucius wrote about trust extensively (Wee, 2011). Confucius wrote that a functional society needs trust more than it needs grains or a military. The Chinese word for trust is the radical (closest equivalent in English is root or syllable) for person, paired with the radical for spoken words, the implication being that if it cannot be trusted, do not speak it. Trust is such a strong part of Confucian culture that all words spoken by a person are expected to be true and trustworthy. Confucianism still has a strong influence within many Asian societies, including the Chinese diasporic one. This trust-- in each other, in media, and in the government is a major factor in how people within the Chinese diaspora responded to the pandemic. The literature on trust is extensive. Authors such as Schneier (2012), Warren (1999) give us an understanding of the importance of social trust – that is the trust between people, and its impact on how society functions (or fails to function). Van Aelst (2017), Tsfaty & Cohen (2012), and Ladd

(2012) speak to the importance of trust in a functional democracy and the media's role in mediating that trust. By extension, trust in the media and the information that people receive is, they argue, part and parcel of functional democracy. All this becomes important in a pandemic when we are asked not only to trust politicians in making the best public policy decisions to keep people safe but also to trust that the science behind it is sound. Oreskes and Conway (2011) speak to the ways that public trust in science has been broken and lay the blame at the feet of a combination of corporate manipulation and media too willing to accept a corrupt narrative. In fairness to journalists, Allan (2002) gave us a picture of the challenges that journalists face when trying to relay complex scientific information such as what gets defined as a risk and how science fiction and warp how the public perceives scientific information.

The relationship between trust and media in past studies has tended to focus on domestic media. The nature of COVID-19 originating from China and spreading quickly around the world gave us an opportunity to explore trust within diasporic communities impacted by a disease, leading to question of trust in not just domestic media, but also foreign media, and how new technology and tools mediate social trust and scientific trust. Public trust is not just one of many factors that affect the public's willingness to comply with public health initiatives. Arguably, it is the single, most critical component to an effective public response to a crisis. Schneier (2012) describes public trust as believing that people around you will behave within certain norms dictated by culture and by enforcement in his book *Liars and Outliers* (2012). Schneier investigates trust on

a social level within group settings and humourously identifies exactly why trust is such an important part of a functional society. Cultural norms and their enforcement make up the basis for public trust. Schneier thinks that the foundation of trust is consistency and predictability. He says that trust is the behaviour that we expect from others and in turn, we reciprocate by behaving in ways that others expect. However, Schneier (2012) also notes that, for most people, the trust is in systems, not other people. However, this trust in the system that resides in the belief that wrong doers will be punished and that other members of the community will cooperate is the foundation that allows society to function on a basic level. Without trust, the ability to carry out daily tasks in society is hindered, let alone when trying to achieve a coordinated response to something as socially disruptive and life-threatening as a pandemic.

Trust is a fundamental part of a functioning society. Warren (1999) argues that strong social trust is important for the development of social systems like commerce. Without the basic trust that a stranger intends to do one no harm, it is difficult to engage in basic transactions. Inglehart (1999) also says interpersonal trust is essential for economic development and is conducive to stable democracy. Inglehart suggests that this is because those of relatively high education and high income have “resources and skills that shield them from many of the risks of life” (Inglehart, 1999, p. 89). Inglehart thinks that high interpersonal trust is a result of both education and income, but only when one lives in a relatively secure society. He continues that interpersonal trust is “strongly linked with democratic institutions, as well as with economic development”

(Inglehart, 1999, p. 93). Inglehart also believes that horizontal locally controlled organizations are more conducive to trust than top-down, hierarchical ones. Beyond the transactional nature of economic benefits in a trusting environment, Uslaner (1999) says that trust has other important payoffs such as creating a “vibrant and virtuous community where people know their neighbours, join together in voluntary associations, give of themselves, and commit themselves to moral codes” (Uslaner, 1999, p. 121). The benefits of a trusting society are numerous. While Uslaner does not think that trust leads directly to wealth production, as Warren and Inglehart argue, it allows for trade, which then will lead to greater prosperity. It also leads to joining voluntary associations and other activities that are important to building a society. The corollary of this is that when trust wanes, so does social participation. Not only do people withdraw from social participation in their communities, Uslaner writes, “fewer people vote, write to public officials, work for political parties, attend church or synagogue, belong to labor unions, belong to parent-teacher associations, volunteer their time, belong to fraternal organizations such as the Lions, Elks, Jaycees, Shriners, or Masons, or simply belong to voluntary organizations” (Uslaner, 1999, p. 131). Trust, he says, is the “core component of social capital” (Uslaner, 1999, p. 135) and he ties this trust to people’s optimism. Optimism is the worldview that people will be “helpful, tolerant of people from different backgrounds, and value both diversity and independent thinking” (Uslaner, 1999, p. 138). This optimism, he says, is foundational for interpersonal trust, and that interpersonal trust in turn lays a foundation for a vibrant, participatory society.

While most scholars agree that trust is generally good for society, Mark Warren believes that a healthy democratic system also needs distrust as part of democratic progress and a “healthy suspicion of power upon which the vitality of democracy depends.” (Warren, 1999, p. 310). Warren argues that distrust is an important part of a healthy democratic system. He argues that liberal democracies emerged out of a distrust of traditional political systems. Systems founded upon oligarchical systems or feudal lords where governance took place away from the public eye of scrutiny were disposed to corruption. Without this distrust he argued we would not have the checks and balance that define democratic systems. Paradoxically, Warren believes that although society depends on trust to be functional and vibrant, democracy needs our distrust to be sustainable.

Warren (1999) makes the case for the need for high levels of trust within a democracy for it to function despite the need for some level of distrust of the government to hold it in check. Without trust, there is no functioning liberal democratic system because trust is an important aspect of a mutually beneficial system based on an exchange of “some amount of risk for potential harm in exchange for the benefits of cooperation.” (Warren, 1999, p. 311). The basis of cooperation is trust in each other and Schneier (2012) points out it is a belief in enforcement of behaviours that makes societies and democracies function. People accept paying taxes in exchange for a government to gather that money to spend on large scale items of mutual benefit. Despite the expectation that everyone will be fair and participate, Schneier argues that

society will always have parasites, those who “steal, don’t pay our taxes, ignore international agreements, or ignore limits on our behaviour” (Schneier, 2012, p. 2). He says that “If the number of parasites gets too large, if too many people steal or too many people don’t pay their taxes, society no longer works.” (Schneier, 2012, p. 2). Because of this, there is a need for security within a system. This security, or enforcement, is part of the system that bolsters trust. Schneier argues that because we cannot trust everyone, the system of enforcement allows us to trust that people will follow the rules.

Bernard Williams (2010) explores the difference between telling the truth and the idea of being truthful in his book *Truth and Truthfulness*. Trust is the idea that what is being spoken reflects reality while the search for truthfulness is about avoiding lies and deception (Williams, 2010). When Williams separates out trust and truthfulness, there is a very fine line he draws that distinguishes reality from perception. It also distinguishes honesty from competency. People may be honest in their retelling of events, but their perception may be distorted by where they are situated or the role they play. Williams explains that this is where sincerity comes into play. In the most basic sense, sincerity does not require that every statement be completely accurate and devoid of mistakes. Mistakes are unavoidable whether someone is recalling events from memory or simply doing their work to the best of their ability. The question of sincerity comes into play knowing that people are not trying to deceive. Perceiving sincerity goes a long way towards trust building, even if the information is not entirely correct (Williams, 2010). Williams says that “sincerity which has been our concern throughout

could in itself be at the heart of virtue. If one can speak frankly and spontaneously to others, then it must be that one has no reason to conceal one's motives from them" (Williams, 2010, p. 179). Transparency of motive is a crucial element of trust that Warren and Uslaner both believe are an essential part of functional societies.

The media are important components of overall public trust because people get their information through the media and a lack of trust in media is part and parcel to the erosion of public trust in general. If the information that one receives cannot be trusted, it is difficult for people to know what is happening and take appropriate actions. Sadly, trust in media has been declining (Beasler, 2018; Geary, 2005; Van Aelst, 2017). Van Aelst stresses that media trust is very important in a liberal democracy. He argues that because politics are highly mediated by journalists, the implications of a loss of trust are large (Van Aelst, 2017). As Tsfati and Cohen point out, this mediation means that inaccurate information can lead to people feeling deceived or supporting the "wrong" candidate in an election, something that is detrimental in a functional democracy (Tsfati & Cohen, 2024). Further, Ladd believes media distrust results from people not believing what they see in the news, resisting policy, and seeking out partisan news sources (Ladd, 2012). Ladd blames some of this mistrust on the fragmented mediascape with the proliferation of news availability and sources. That fragmented landscape also made it hard to know which sources are reliable.

Jonathan Ladd's (2012) book, *Why Americans Hate the Media and How It Matters*, lays out some of the reasons there is a decline in trust in journalism over the

last several decades in the United States. In a 1972 survey, 72% of Americans trusted Walter Cronkite, then the well-known evening news anchor on CBS (Ladd, 2012). Trust in the media has been eroding since. By 2008, 45% of Americans said they had hardly any confidence at all in the news (Ladd, 2012). Low levels of trust in the media have frightening implications. Ladd (2012, p. 138) writes:

those who trust the press are more accepting of new messages about national conditions in major policy areas. In contrast, those who distrust the press are more likely to resist new information that they attribute to the institutional media and seek additional information from more partisan sources. As a result, their beliefs tend to be less accurate and shaped more by partisanship.

Media distrust also impacts how people vote. “Being less responsive to new information, those who distrust the institutional media are more likely to fall back on their party identification as a voting cue” (Ladd, 2012, p. 176). Even more frighteningly, according to Dahlgren, “traditional distrust of media has turned into an assault on basic Enlightenment premises, eroding shared understandings of reality and compatible discourse” (Dahlgren, 2018, p. 20). People become unable to relate to each other on a basic level because they no longer know what is true and what is not.

Dahlgren holds the view that lack of trust in media and other vectors of information transmission is creating a crisis in the democratic system. Ladd (2012) also agrees that this feeds a spiral in polarizing politics since

[a] party's media criticism reduces media trust among its supporters. This causes them to discount new information they receive from the institutional media and turn increasingly to alternative (often partisan) news outlets. Consequently, their beliefs about contemporary national conditions, and their votes, will more reflect their partisan predispositions and less reflect contemporary policy outcomes (Ladd, 2012, p. 198).

The impact of this downward spiral of trust is that it erodes political confidence. Zmerli and Newton (2008) argue that there is "a strong and statistically significant three-cornered set of associations between generalized social trust, confidence in political institutions, and satisfaction with democracy (Zmerli and Newton, 2008, p. 719). Therefore, the declining trust in media is not good for society and democracy at large. Ladd adds that the "declining trust in the institutional media has large and potentially dire consequences, preventing journalists from checking political power and the public from learning essential information about public affairs" (Ladd, 2012, p. 6).

Kohring and Matthes (2007) break down trust in media into multiple dimensions beyond simply trusting and not trusting. Kohring and Matthes liken trusting media to a form of risk taking. Because not everyone can know everything and be an expert in all subjects, trusting is a replacement for knowledge. They call trusting "a state midway between knowing and not knowing" (Kohring and Matthes, 2007, p. 238). Because news media is a crucial source for information from other social actors and institutions, Kohring and Matthes believe that "trust in news media is therefore a necessary

condition for trust in other social actors” (Kohring and Matthes, 2007, p. 238). They also recognize that news organizations have limits, both in terms of how much space they had (during print media days) and limits to how much work a journalist can do realistically; they cannot provide information about everything. The multiple dimensions that Kohring and Matthes break trust in media down to are: a) trust in selectivity of facts; b) trust in accuracy of depictions; c) trust in selectivity of facts; and d) trust in journalistic assessment (Kohring and Matthes, 2007). They believe that, by breaking down measures of trust, we can get better understandings of trust that will be useful for studying trust breakdowns. Here Ladd departs from many other scholars such as Warren and Kohring as well as Matthes. Ladd celebrates the decline of the media establishment that acted as gate keepers to the information available to the public (Ladd, 2012). He argues that the mid-twentieth century model of a well-respected media establishment is a historical anomaly, not the norm. He argues it was a confluence of low economic competition among newspapers and relative party harmony between the major political parties of the United States. Despite the decrease in media trust over the decades since Walter Cronkite graced the airwaves, Ladd believes that a return to the hegemony of major newspapers in the mid-Twentieth Century is not desirable as people lacked real choice in the information they received. As long as there are still institutional outlets transmitting important information in which a significant portion of the public is confident, Ladd believes that people should have the right to seek out sensational and partisan news sources. This view is at odds with McIntyre (2018) and

Potter (2020) who have referred to the area of disjointed information fueled by extreme views the “post truth” era – the period where confusion and lies have dominated so long that it results in “the idea that feelings sometimes matter more than facts” (McIntyre, 2018, p. 13). The reality is not just that the alternative, sensational, and partisan news stand in a vacuum undisturbed, these news sources “fed back into the mainstream” (Potter, 2020, p. 177). Potter believes alternative news can greatly impact corporate news, particularly in politics. While this may be fine on a small scale, the influence that disinformation peddlers have had makes Potter believe that ultimately the political noise from the large number of information sources, its partisanship and unreliability, hurt the democratic system (Potter, 2020).

For Ladd’s somewhat utopic view of endless opinions to produce his desired result would take an investment in time that Anne Williams (2012) found is not placed in media when trust is low. A corollary to Ladd’s findings that when trust in media is low, people fall into partisan lines of thinking, Williams found that when trust is low, people simply do not give the media time, directly contradicting Ladd’s philosophy of endless media choice being good for information gathering. Williams (2012) measured how much people paid attention to various forms of media based on how much confidence they had in it. Williams found that, for newspaper readers, it was more important to trust the paper itself than to trust individual journalists (Williams, 2012). When it came to broadcast journalism, news consumers paid more attention to news when they trusted the broadcast entity that delivered the news. In other words, there is already bias in the

amount of attention paid to a news source based on preconceived notions of trust.

Williams found that as trust levels drop, the exposure to information drops.

Ladd, Williams, Kohring and Matthes all agree that trust in media is important to society because it is a vital vector for information. The decline in trust (Ladd, 2012; Williams, 2012) is a cause for concern, particularly in a pandemic because if people cannot trust the information available to them, they cannot be expected to take appropriate actions. While traditional gatekeepers lose influence in the new online media landscape (Ladd, 2012), the increase in information choices can either lead us towards better informed people by having more information available (Ladd, 2012) or create a dystopia of society distrustful of each other as that feared by Kohring and Matthes and Dahlgren. Thus, trust in the reporting of information is one dimension of a pandemic response. Another is the trust in the information itself, which requires a trust in science and the scientists behind it.

Allan (2002) distinguishes the difficulties that journalists face when trying to cover issues of science in the media when “it lacks the stuff of drama necessary to spark lively newspaper headlines” (Allan, 2002, p. 69). Allan admits that finding science stories with “fascination value” (Allan, 2002, p. 77) necessitates the science reporter be a newsroom gatekeeper – a function that requires public trust. The impact of the news media no matter the degree of effectiveness, can be affected by gender, race, education, and a host of other factors. Many studies have shown that media does influence its audience (Gene Zucker, 1978; King et al., 2017; Slater, 2007; Smith, 2010).

Katz and Lazarsfeld believed that “media messages significantly influence what the public thinks by shaping what they think about” (Katz and Lazarsfeld, 1957) but does not necessarily influence what they think. Drawing a line between topics and opinions about said topics, Robert Entman disputes this with his 1989 study that showed media have direct impact on what people think (1989). In the considerable time and change in technology between Katz and Lazarsfeld and Entman, media influence had increased. It is important to note that the quantity of media and the technologies that delivered media already evolved in the intervening years. However, influencing people’s opinions is not necessarily the same as influencing public policy, something that is important during a pandemic.

Mutz and Soss (1997) found that while media did not directly influence policy, they confirmed it influenced people’s perception of a topic’s salience to the community. In the era of social media, researchers are using social media engagement to assess media influence on public perceptions. In one of the few studies that showed causality, and not just correlation, King et al. (2017) convinced 48 small American media outlets to write and publish approved articles on a schedule set by the researchers and found a jolting 63% increase in topic discussion on social media on the days of publication. They found an increase not just in the number of posts on a particular topic but more unique authors participating in the discussions (King et al., 2017). News media organizations were shown to have a considerable influence on public discussions. This finding combined with Sujin Choi’s study (2015) of Twitter (Now X) users in Korea that most

shows people get their information that flows through only a small number of key influences. This points to the ability of news organizations to set discussion topics and having opinions effectively influenced by a small number of high follower users. However, Hunt and Gruszczynski, found that “engagement with social media has effects independent of traditional forms of media coverage” (2021, p. 1024). They analyzed tweets related to the No Dakota Pipeline (NoDAPL) protest in 2016 and 2017. They found that tweets from the protests impacted media coverage of the event, showing that social media and traditional media have a two-way influence on each other (Hunt & Gruszynski, 2021). When the main NoDAPL posted to Twitter (now X) and received substantial amounts of engagement, there would be coverage in traditional media outlets.

The breadth and availability of news on the internet also influences the audience in other ways. Michael Slater (2007) discussed the impact that media has on people’s identity and behaviours as a reinforcing spiral. People will actively seek out media that conforms to their values and beliefs that form part of their social identity. The idea is that people will seek out media, be it entertainment or information that conforms to their existing beliefs and reinforces them. This is bolstered by Young Mie Kim’s (2008) finding that people would seek out information that was of personal importance to them, regardless of whether it was a topic covered in traditional media. People will go to sources that reinforce their beliefs and actively seek out information of personal importance.

News media does have an impact on issue salience and people's perception. Now that news outlets can monitor and have direct contact with people on social media platforms, we now see that social media engagement can also influence traditional media coverage. Studies also point to the fact that social media is an important medium for information distribution as both traditional news media creates discussion on social media and the use of social media generates coverage in traditional media. Groups can use social media to drive coverage and can also influence people to seek out information if they make it important to them.

Trust in Science

Even before COVID-19 ravaged the world, there had been a general decrease in the public trust in science (Funk, 2017; Weber, 2019). Since the pandemic, trust in science took a sharp turn downward in the United States (Kennedy et al., 2022) and elsewhere (Endelman, 2020). In Germany, there was an uptick in scientific trust at the start of the pandemic that then started to trickle downward as the pandemic wore on (Bromme et al., 2022). The reality is that public health officials had to navigate the many intricate political complexities of disease control, which ultimately impacts public trust -- politics interfered with sound medical advice (Greer et al., 2020). Ironstone (2022) identified four challenges that added to the complexity of COVID-19 communication in particular. The novelty of the disease, the uncertainty surrounding its impact, the scale and scope of the disease, and the overwhelming avalanche of communication makes

for a particularly difficult environment in which to communicate information about the disease (Ironstone, 2022).

Lee McIntyre (2018) partly blames the lack of scientific trust in the seeming loss of science's political neutrality. What political neutrality scientists might have enjoyed is long gone as science in and of itself has become a political flashpoint in recent years. This was painfully apparent in not just how COVID-19 was handled but goes back decades with issues such as climate change and atmospheric pollution. Oreskes and Conway exposed the role that oil companies played in sowing distrust not just of science, but the integrity of scientists themselves. Scientists themselves became targets of partisan attacks (Oreskes and Conway, 2011). Mooney (2005) believes that the war on science was part and parcel to right wing political machinations to win over religious leaders. In this case, it was more about winning votes and science itself was just an unfortunate political obstacle. Scientists were not equipped for what Lee McIntyre calls the "post truth era", an era where the facts and data they so painstakingly produce does not matter to the public. McIntyre lays much of this blame at the hands of the media (2018). Mamuji et al. (2020) found that Chinese Canadians were extremely skeptical of news media, and yet that skepticism did not manifest itself in science denialism or ignoring masking advice. Skepticism in media was not related to skepticism in scientific information. The way that the Chinese community responded to distrust left an opportunity to explore why distrust presented itself so differently in the Chinese diasporic community of Markham compared to the dominant community in Vaughan.

There was a time in Western civilization when science enjoyed some privilege of “political neutrality”. This idea, however, is laid to rest in a brilliant acceptance speech for the 1986 Nobel Peace Prize. Professor and activist Eli Wiesel had this to say about neutrality. “Neutrality helps the oppressor, never the victim. Silence encourages the tormentor, never the tormented” (Nobel Prize, n.d.). There really is no such political neutrality whether as bystanders witnessing atrocities or scientists doing research. This spirit, the idea of scientists being politically neutral according to Wiesel’s definition, meant that they stood on the side of those in power, if not oppressors, then elite interests. The realities of climate change and the science behind it is increasingly conflicting with economic interests. Those same interests have been conflicting with pandemic response.

Media not only influences our trust in each other and our attitudes towards democracy, it also influences our opinions on science. Hmielowski et al. (2014), show that the media one consumes influences one’s trust and understanding of science (Hmielowski et al., 2014). They found that “conservative media use decreases trust in scientists” (Hmielowski et al., 2014, p. 866). The correlation between conservative news watching and disbelief in climate science was quite acute in their study. Media “affects people’s level of trust in scientists” (Hmielowski et al., 2014, p. 878).

Why conservative media has chosen to make science the enemy is explained by Conway and Oreskes in *The Merchants of Doubt* (2011). Conway and Oreskes (2011) explain science’s fall from grace on the political right simply as a clearing of obstacles

against their economic interests. Scientists were undermined by the political right quite simply because some scientific findings opposed corporate interests. As scientists found more evidence that by-products of capitalism were destructive to the earth and natural environment, the kings of capital rallied to protect their interests. As it got harder and harder to refute the evidence, the tactic they adopted was to undermine first the credibility of scientists, and, eventually, science itself (Conway and Oreskes, 2011). Conway and Oreskes (2011) argue that conservatives have grown into becoming anti science from its roots in opposing government regulation of the marketplace. Government regulations came about thanks to scientific discoveries in the areas of environmental and public health of the harm that industry was doing. They argue that the hatred for government regulation morphed into an overall anti-science sentiment that largely falls along political lines (Conway and Oreskes, 2011).

McCright et al. take a more nuanced approach to how political ideology impacts the acceptance of science. They write that

conservatives will report significantly less trust in, and support for, science that identifies environmental and public health impacts of economic production (i.e., impact science) than liberals. It also expects that conservatives will report a similar or greater level of trust in, and support for, science that provides new inventions or innovations for economic production (i.e., production science) than liberals. (McCright et al., 2013, p. 1).

The failures of science or, rather, how science got used in a capitalistic system became a point of distrust for science itself. When science was in the employ of capitalism, the right wing was happy to support it as an institution according to Conway and Oreskes. When science started to get in the way of the goals of capitalism, that relationship quickly broke down. For Conway and Oreskes, it was quite simple: “if you believed in capitalism, you had to attack science, because science had revealed the hazards that capitalism had brought in its wake” (Conway and Oreskes, 2011, p. 167). The fight against environmentalism (and in this case the science that supported it) became a proxy fight between socialist and capitalistic ideals. Science, at least one branch of it, stood in direct opposition to elite interest and needed to be quieted.

Mooney adds that the political right’s disdain for science is not simply a matter of monetary interests, but of political ones as well. The anti-science movement became mainstream when President George W. Bush appeased his religious support base with a nationally televised, false statement about embryonic stem cell research and faced no political consequences for it (Mooney, 2005). While appeasing this base, Bush “showed a deep disregard for the role of scientific information in political decision-making” (Mooney, 2005, p. 4). Mooney believes that “science abuse threatens not just our public health and the environment, but the very integrity of American democracy” (Mooney, 2005, p. 11). Mooney’s concerns stem from the fact that as societies become more technologically advanced, substituting ideological allegiance for scientific consensus and expertise becomes disastrous for people whose lives depend on sound political

decision making. The war on science not only attacks the foundations of science but is responsible for “massive amounts of misinformation, and sometimes even fosters outright ignorance” (Mooney, 2005, p. 11). Mooney lambastes the removal of evolution from the school curriculum in many states. Fundamentally, Mooney argues that the overall decline in critical thinking undermines the ability to “cut through all the lies and distortions and determine which ideas we should trust” (Mooney, 2005, p. 12). The war on science is not simply an issue of trusting scientists and the scientific method but also erodes social trust.

Slightly harder to comprehend is how science also fell into the crosshairs of the contemporary political left. Thompson (2018) thinks this phenomenon is difficult to understand without first putting it into a postwar context. Science itself became the subject of attack when the creations of scientific discoveries started to inflict noticeable harm to health, people, and society. Thompson writes that “on the left, science is now seen as a mask for power and domination” (Thompson, 2018, p. 37). Science, he says, is “cast as intolerant and imperious, brooking no compromise with the sensibilities of other cultures and those who choose to ‘think differently’” (Thompson, 2018, p. 37) which stems from science being conflated with technology and the metaphor of the machine. He thinks that this view of science has “become an ideology of control, and a means to dominate nature” (Thompson, 2018, p. 37). This conflation between science and technology forces us into a false dichotomy. The dislike of the social consequences of technology implies the need to oppose science itself.

Mooney (2005) would likely agree with Thompson's assessment when he argues that "environmentalists and consumer advocates use the food safety issue as a "surrogate for a host of broader social concerns. They argue about health risks because they lack a venue in which to air their real objections, about the corporate control of the food supply, for instance" (Mooney, 2005, p. 8). Although Mooney mainly critiques the political right's abuse and attacks on science, he acknowledges that the political left is not absolved from the guilt of distorting science for their own gains. This has been done in genetically modified foods and research on animals (Mooney, 2005). Both Thompson and Mooney view science and the trust in science as imperative to a functional democracy in a technologically advanced society. Trust is further hampered by the intricate relationship between those who conduct scientific research and companies that create products. In the medical field, trust is also lost to the complex relationship between drug manufacturers and doctors who prescribe and, in some cases, promote those drugs. Lexchin points out that doctors who are often paid to give lectures about drugs are often paid by the pharmaceutical companies whose drugs they promote (Lexchin, 2020). These influential doctors "are part of [the] marketing machine and cannot be viewed as impartial experts" (Lexchin, 2020, p. 150). While Lexchin does not necessarily believe that the integrity of these experts is in question, the lack of perceived impartiality will lead to public distrust.

Trust in science and scientists should not be viewed outside of the context of public trust in general, including politicians and media. Science may have been once

viewed through a noble lens of the scientist doing science for science's sake. However, that started to erode when the scientific granting system started to lose legitimacy when it was politically interfered with, and instead of the public at large being seen as the benefactors of scientific research, the money granted was seen as benefitting individual scientists, effectively gnawing at the trust of the scientific community (Ruscio, 1996). Adding to the distrust is the corporate reach into science as funding and ghost writing become common (Tierney et al., 2005), further eroding trust. However, it would be naive to think that political and corporate interference in science is a new phenomenon.

History of Science and Politics

Discrediting scientists is not a political tool unique to contemporary times. Elizabeth Eisenstein gives us a historical (albeit very Western) perspective about science's relationship with power. Eisenstein (1979) brilliantly exposes how deeply embedded in history control of science is. Galileo is one of the early examples of science conflicting with political power. Galileo's theory of the Earth revolving around the sun upset the church leadership. Copernicus later upset the powers that be even further when he formulated the model that put the sun at the center of the solar system. When science conflicted with orthodoxy and threatened the power of the elites, science became the enemy (Eisenstein, 1979). A few hundred years after Copernicus, science would find itself in the crosshairs of political leadership once again with Darwin's theory of evolution. Evolution, to this day, is a political "controversy" for religious sects that go

as far as limiting the science education in American schools to exclude it (Conway and Oreskes, 2011). While religious leaders fought against Darwin's theories of evolution, business leaders around the world fought against an emerging field – climate science. Conway and Oreskes say that it was highly inconvenient that scientists had discovered that carbon dioxide, a by-product of combustion, was trapping excess heat in the atmosphere. The fossil fuel industry spent incredible sums discrediting both the science of climate change and the scientists themselves. Trust in science continues to be eroded by those with political and economic interests and that erosion happens from both sides of the political spectrum. Although there are situations of international cooperation such as the banning of CFCs to protect the ozone layer (Blegen, 1987), the fossil fuel industry has been a strong lobby against similar action on climate change.

Particularly in a situation like a pandemic, it is important to revive and maintain the multiple forms of public trust – general trust between neighbours, trust in media, trust in officials, and trust in scientists. As a solution, Emma Wood (2019), suggests that data synthesis is a method to help cut through the noise of excess information and bring back confidence in scientific data-gathering. This effort is meant to increase the robustness of information gathered and bolster confidence in the scientific process. However, Wood missed a very important factor that no amount of scientific rigor will bring to the table – ideological values. With rigorous training in evidence-based decision making, evaluating information, and looking at outcomes, scientists have failed to

understand the lack of training is not the only gap. A portion of the public does not even share their values and no amount of proof or rigour will change the situation.

Onora O'Neill offers a different solution to reviving public trust in her 2002 Reith Lectures hosted by the BBC (O'Neill, 2002). She too places trust as a foundational requirement of a functional society. Quoting Confucius, she says that without trust, society cannot stand. Trust is more fundamental to a functional society than even weapons or food. Without trust, there would be no one to wield the weapons to protect society from invaders, and no one to grow and distribute food she says (O'Neill, 2002). O'Neill (2002) talks about an extremely uncomfortable kind of trust – a trust none of us have a choice in. Whether we trust the water quality standards or trust air quality monitoring, we have little choice in the water we drink or the air we breathe. Because of this lack of choice, our actions tend not to reflect our level of trust in these matters. We turn a blind eye because whether we trust air quality or not, we all must still breathe. O'Neill's solution to public trust is the duty we must secure each other's basic human rights, particularly when it comes to things like water and air over which there is little choice.

O'Neill says that states alone are powerless to truly protect our rights and entitlements. We need people willing to protect each other and, with that, trust in each other (O'Neill, 2002). The interconnection between science and politics throughout history is why science communication deserves to be viewed through a political lens and why science communication methods should start leaning on political

communication tools. Political trust is important because political trust along with social trust are two crucial elements of social capital and, according to Wu (2021), had effects on overall COVID-19 exposure. Political trust played a stronger role than social trust in people reporting exposure to the virus (Wu, 2021). Stronger political and social trust was also correlated with a lower number of COVID-19 cases (Wu, 2021).

Science Communication

Doctors, scientists, and public health professionals suddenly found themselves in the role of science communicators when COVID-19 struck and faced the plethora of challenges that came with it. Chris Bryant (2003) eloquently defined science communication as “the processes by which the scientific culture and its knowledge become incorporated into the common culture” (p. 357). As eloquent as this is, it leaves a lot of room for open interpretation, causing Burns et al. (2003) to lament that the field of science communication is “plagued by an unfortunate lack of clarity” (Burns et al., p. 183) and thus an under researched area of study. It is worth defining what is meant by science communication and for that, this work bases itself on the definitions used by Burns et al (2003). The loose term “science communication” has been used for as a synonym for “Public Awareness of Science” (PAS), “Public Understanding of Science” (PUS), “Scientific Culture” (SC), and “Scientific Literacy” (SL), making for some confusion. It is important to understand the various forms of science communication and their roles within the scientific community. The generally accepted view in the literature

states that there are three accepted models of science communication (Hetland, 2014; Kessler et al., 2022; Metcalf, 2019; Trench 2008).

The first model of science communication is the one most people would find familiar – the deficit model, also known as the Public Understanding of Science (PUS) model. Kessler et al (2022) describe this as “the idea of a deficit of knowledge or understanding among scientific laypersons that needs to be eliminated” (p. 711). The deficit model is an unidirectional model of science communication that sees information flow from scientists to lay people, an efficient but not very effective form of communication as it assumes a hierarchy of knowledge and talks down to people. Simis et al. (2016) believe that this model stubbornly exists largely because of the lack of communication training in STEM fields. They also think that “scientists who have fewer positive attitudes toward the social sciences are more likely to adhere to the knowledge deficit model of science communication” (Simis et al., 2016, p. 400). Suldovsky is even blunter in his assessment when he says that “affording science absolute epistemic privilege...is the most compelling factor contributing to the continued use of the deficit model” (Suldovsky, 2016, p. 415). This model “separates the public from scientific discourse and prevents them from influencing it” (Kessler et al., 2022, p. 711). The deficit model has not been very effective in communicating science largely because it only tells, and fails to engage people in the science. Both Simis et al. and Sudovsky put forth that this largely insufficient model is highly persistent as form of science communication because of entrenched attitudes among the scientific community. Simis

et al. puts the blame on the institutional structures of the STEM education while Sudovsky places blame on the privileged attitude that scientists hold surrounding their work. In both cases, the problem rests with the scientists. As does the solution – better communications training in the STEM fields.

The second model is the Public Engagement with Science (PES) model of science communication. Benneworth (2009) defines PES as “as the activities where scientists meet with publics and have discussions which shape the practice of science” (Benneworth, 2009, p. 2). This model emerged in the 2000s after the top-down model of PUS dating back to the 60s was failing to win general public support for funding the sciences (Kessler et al., 2022). The late ‘70s was what Simon Lock (2011) calls that low point in scientific community in the United Kingdom as the tangible environmental harms of scientific discoveries started coming to light (Lock, 2011). The Thatcher era funding cuts to scientific research and education demoralized the scientific community further in the United Kingdom., it was clear that the community needed to do something to regain public support for the sciences. The historical PUS was discredited because of its top-down approach to science that essentially left out the public. Lock details how this new model of public communication was meant to give the public a say in what type of research gets funded and meet the concerns of the citizenry early in areas of new technology such as genetically modified foods or nanotechnology (Lock, 2011). “The legitimacy of public engagement does not just depend on its inputs, but also on its outputs” (Stilgoe et al., 2014, p. 6). The explicit purposes of the PES model of science

communication are to have “impact on governance” according to Stilgoe et al. (Stilgoe et al., 2014, p. 6) with increased support and funding for science and scientific research. Despite PES’s goal of engaging the public early on issues of scientific research, Richard Jones (2011) says the purpose of the role of public engagement still lacked clarity leaving space for cynicism that the process of PES was less about giving the public a real role in deciding on what scientific processes get funding and support but rather giving a gloss of legitimacy to decisions already made (Jones, 2011). Lock also questions if the PES method has truly moved science from the realm of deficit to a dialogue model (Lock, 2011).

The PES model has also taken on a slightly different meaning with technological tools allowing for massive citizen science projects such as the Eclipse Soundscape project (Eclipse Soundscapes, 2024) where citizen scientists were asked to download an application to their phone and produce recordings of the April 8, 2024 solar eclipse in North America. Bonney et al. (2016) believes that these projects “contribute positively to social well-being by influencing the questions that are being addressed and by giving people a voice in local environmental decision making” (Bonney et al., 2016, p 2). Unlike earlier PES projects that sought to allow the public to voice concerns in the early stages of funding decisions, citizen science projects make use of public participation in data collection or processing, making use of the public as a resource and Bonney et al say that this engagement has the potential to lead to different directions for new research (Bonney et al., 2016).

The third model of science communication identified by Kessler et al. is what is referred to as the Strategic Science Communication (SSC) (Kessler et al., 2022), Nisbet and Markowitz wrote a white paper on various forms of strategic science communication for environmentalists (2016). The stated goal of SSC is to influence “public perception and behaviour” (Nisbet and Markowitz, 2016, p 2). These discussions tend to focus on highly politicized issues such as food bioengineering and climate change. Because of the politicized nature of their subjects, Nisbet and Markowitz place the maintenance of trust high on the list in terms of importance when it comes to science communication. Within this spectrum of trust, they feel that there is room for scientists to hold both politically neutral positions and take on more activist roles as many scientists can use that knowledge to advance a position. They also feel that while it is futile to refute misinformation, it is important to inoculate an audience from misinformation by pre-bunking - first telling them that their research is likely to invite misinformation because of the nature of the work. The researchers also believe that tailoring information based on different audiences is an important way to reach different audiences. It is useful to create mental models, knowing what the audience knows, and understanding their values - information that is time consuming to obtain. Pairing with a social scientist to create frames for messaging and using a narrative storytelling approach are effective tools of strategic science communication. Their work found that promoting informal conversations to be an effective way to help people process the information that comes to them. Similarly, Andrew Binder has said that “interpersonal discussion can be an

important mediator of messages about science issues, which is especially valuable for strategic communication campaigns” (Binder, 2010, p. 400). Although Binder (2010) does not use the term “Strategic Science Communication”, in a 2010 paper he discusses the communications pathways for what he calls “public perceptions of science controversy” (Binder, 2010, p. 383). Unlike Nisbet and Markowitz, Binder thinks that mixing political discussions and scientific ones may not get the desired results. His work shows that discussing politics made the issue of climate crisis less salient, but scientific discussions outside of political ones at least showed greater acceptance of climate change. He writes that “whether or not they disagree on what exactly to do about climate change, the result is the same: increased levels of salience regarding climate change as a problem” (Binder, 2010, p. 403), He believes that discussions both scientific and political are an important method for science communicators to get their messages across with an emphasis on the science before the politics.

Strategic science communication can take on many forms. The one we will explore more closely in subsequent chapters is Mass Applied Science Communication (MASC). This is untargeted communication to a general population with the explicit goal of changing behaviour and/or public policy. This form of mass communication, as in COVID-19’s case, involves traditional media and newer forms of social media. The main difference is the scale on which the communication takes place. COVID-19 was an event that affected the entire world population at roughly the same time. It was not

possible to separate out target audiences. The communication that scientists were tasked with involved every corner of the globe and they did not have the luxury of time.

Public health is no stranger to mass communication methods. The world of public health communication has had tremendous success with social marketing tools (Smith, 2005), social mobilization tools (Patel, 2005), and even social change interventions (Smith et al., 2005). The effectiveness of these types of mass media campaigns have been demonstrated over the years (Abroms & Maibach, 2008; Anker et al., 2016; McCombie et al., 2002; Worden and Flynn, 2002). Public health has also had to contend with misinformation such as in the case of the polio vaccine refusal in Nigeria (Charles et al., 2014) and religious interference (McDuffie, 2021). However, COVID-19 still presented public health officials with an unprecedented global challenge. In an age of hyper fast communication via social media and extreme political polarity, authorities were tasked with disseminating information that often conflicted with counterparts around the world. Doctors, scientists, and public health professionals were tasked with informing about the public while politicians had to maintain order and protect economic interests that the science was indifferent toward.

Risk Communication

A well-practiced branch of science communication is risk communication. Risk communication, the act of informing the public about potential dangers or threats can simply take the form of information labels, or interactions such as news conferences or

press releases, from public officials, industry representatives, or members of the media (Covello, et al., 1986). The purpose of risk communication is to allow the public to know the risks of anything from consumer products, government or industry practices, or even infrastructure projects. The WHO defines it as “the real-time exchange of information, advice and opinions between experts or officials and people who face a hazard or threat to their survival, health, or economic or social wellbeing” (WHO, n.d.a)

In some cases, risk communication is used to inform the public about risks so they can take appropriate safety precautions. Government information campaigns about wearing floatation devices and seat belts are excellent examples of this. In other cases, risk communication is used to get the public to accept risks such as landfills or nuclear power plants. This risk acceptance is the focus of much risk communication research (Cvetkovich & Lofstead, 1999; Siegrist et al., 2007; Kasperson & Kasperson, 2005; Covello et al., 1987; Wardman, 2008).

Communicating a risk has often been about “‘correcting’ misconceptions about, or perceptions of, risk; in other words, risk communication is used as a vehicle for attempting to align lay perceptions with their expertly assessed severity” (Arvai, 2014, p. 1245). Joseph Arvai believes that this notion of what risk communication is must end. Much like PUS, Arvai thinks that risk communication with the goal of clarifying or education at its core centers around the opinions of experts. The first problem that Arvai identifies with this model of risk communication is in the belief itself that risk assessment

views need to be “corrected” whereas in reality they need to be understood (Arvai, 2014, p. 1246).

Arvai found that “better information and more education are largely disconnected from improved decision-making” (Arvai, 2014, p. 1246). The odds of successfully communicating a risk goes up when communicators switch mind frames and adopt what Arvai calls a decision-focused approach to risk communication. In practical terms, this means engaging the affected public early and understanding how lay people understand perceived risks.

As Kasperson points out one of the challenges is that there is no set standard for what constitutes an acceptable risk. It is often up for debate depending on what the accepted benefit to individuals or society is (Kasperson, 2005). There are also socioeconomic, race, socioeconomic, and gender differences in risk acceptability (Slovic, 1993, Ballew et al., 2021). Because of the challenges, Arvai believes that the “risk communication processes must help people think both creatively and broadly about both risk problems and risk management options” (Arvai 2014, p. 1247). In lieu of simply communicating expert opinions, successful risk communication should also help those affected consider trade-offs between the various risk mitigation options, much like the Public Engagement with Science (PES) approaches to science communication.

In addition to these contextual challenges shaped by gender or status, Forney and Sadar (2021) identify two more challenges in contemporary risk communication. Forney and Sadar believe that risk communication is both imprecise and irreversible.

The imprecision starts with the biases and filters of the communicators themselves. What they choose to say and not say is shaped by their experiences, knowledge, and point of view. Then as that information get stepped down through media, and now social media, every point of contact can impact or impair the original message. The irreversibility of communication is nothing new as it has always been difficult to retract printed text, but Forney and Sadar identify a new meaning this has taken on in the age of social media. Information can be instantly disseminated and incorrect information is impossible to retract. Communicators are under pressure to ensure they have it right the first time, something particularly challenging to accomplish given a new disease that is not well understood. Risk communication practitioner Vincent Covello agrees and specifically points to social media as the largest hurdle facing risk communication practitioners during the COVID-19 pandemic. Everyone had trouble internalizing the information because “they were experiencing high levels of stress, uncertainty, and anxiety about their health and every aspect of their lives” (Covello, 2022, p. 8). Under these conditions with the unprecedented volume of information available to anyone with an internet connection, communicators had trouble overcoming what the WHO termed the “infodemic” (Covello, 2022, p. 8), the deluge of information, both accurate and not that overwhelmed useful advice.

Historically, even without the complications of the internet, the late 70s was an era with a string of risk communication failures by engineers and scientists leading to misunderstandings about issues like climate change and nuclear energy. Similar to

Arvai, Forney and Sadar also attribute these failures to “the prevailing thought about the source of the problem was that the public was incapable of understanding complex technical information.” (Forney & Sadar, 2021, p. 3). However, trust in technical information was mostly not the problem. Forney and Sadar believe that the failures came down to the emotional aspects of risk acceptance. The two practitioners therefore believe that risk communication is more an art than the science of communicating complex and technical information. It is the art of trying to understand how the public perceives a risk. It is an art in understanding the non-technical factors that shape those risk perceptions.

Kasperson and Slovic also point to the importance of social trust but in this case related to risk perception. In a democratic society, perceived risk is highly linked to social trust (Kasperson, 1988; Slovic, 1993). High levels of trust are associated with power put in the hands of local authorities, open and honest communication, having local advisory boards, and public consultation (Slovic, 1999). Trust is such an important part of risk communication to Covello that his guiding principles of risk communication all revolve around building and maintaining trust (Covello, 2022). Herein lies the additional challenge of those trying to communicate the risks of COVID-19. Traditional risk communication methodologies have been centered around well-defined projects such as nuclear power plants, or landfills, with risk tradeoffs for well-defined groups of stakeholders (Arvai, 2014; Covello, 2022; Nelkin, 1992). The stakeholders in the pandemic involved the entire world population making it nearly impossible to have

stakeholder engagement meetings and two-way discussions. Nor was there time. This is a different type of risk communication that involves a lot of science communication, which also differs from traditional science communication of insects and water. This type of science communication, MASC, with a goal of influencing behaviour and policy lies between traditional science communication and risk communication.

Message problems

Data and information are often confused by communicators (Brecher & Flynn, 2002). While scientists are highly trained to deal with a complex myriad of data, the general public is not. Scientists can, in theory, sort through the data and come to certain conclusions based on mathematical analyses, comparisons to other data sets, or even logical reasoning. Not having the experience to manipulate data or the tools to do complex analyses (whether computational tools or skill sets) puts the general public at huge disadvantage. Data dumps are often mistaken as providing the general public with information (Brecher and Flynn, 2002). To become an effective risk communicator, the data must be synthesized in a way that is comprehensible in plain language. This may often involve data visualization such as charts or diagrams. Data alone is insufficient to inform the public about potential risks. The messaging problems with COVID-19 started early with multiple health agencies giving differing advice. Agencies in Asia, such as Taiwan's CDC, told people to wear masks from the start (and started a distribution strategy in February of 2020) while agencies such as the WHO and Canada's public

health agency started the pandemic by telling people NOT to wear masks (Dyer, 2020a). Despite experts calling on the WHO to declare the virus airborne, they stubbornly refused to do so until 4 years after the initial outbreak (Looi, 2024; Miller, 2020). The COVID-19 messaging was mixed from the start and added additional complexity for communicators.

Source problems

The low levels of scientific literacy in the general population creates a trust barrier for scientists. Science is imperfect. Experiments can have flaws or different external factors. It is through a repetitive and rigorous process of repeat experimentation, documentation of results, and repeated trials under different conditions that scientists then accept certain truths. During this process, there can be disagreements on how to interpret certain findings or methods between scientists. Without understanding the process, the differences of opinions can result in the erosion of trust and credibility in the eyes of the general public (Brecher & Flynn, 2002). On top of the differences of opinions, scientific and technical jargon causes confusion that further erodes trust (Covello et al., 1986). This problem is a difficult one particularly for emerging problems such as COVID-19. Science was continuously changing leaving the public with no clear understanding of how the virus transmitted or behaved.

Channel problems

Corporate media tends to focus on sensational news items. What aspects of risk the media tends to cover and report on can greatly sway opinions about how much of a

risk something poses (Covello et al., 1986). In the age of social media, these channel problems are exacerbated by echo chambers that tend to disseminate partisan information to self-selected groups of individuals (Cinelli et al., 2021). People within echo chambers may start to believe that many share their views, opinions, and information sources. Finding reliable channels of communication will be an ongoing challenge for risk communicators.

Risk perception

Public perceptions of risks are often inaccurate. Slovic believes that people have a challenging time judging relative risk based on information alone (Slovic et al, 1977). Slovic et al. found that subjects could not consistently identify the higher risk of death between two activities unless that death rate was greater than 2:1 (Slovic et al., 1977). If people are giving an anchor in answering “What percentage of the population is 55 or older” they would bias high or low depending on the initial guess provided (Slovic et al., 1977). Even knowing about a previous event affects how people view risks (Slovic et al., 1977). Having information alone does not always equate to better risk judgement. Whether it is risk judgement, risk mitigation or risk acceptance, this kind of communication asks the receiver to take a position. For this reason, risk communication, like MASC should be seen as closer to political communication than traditional science communication if we subscribe to the idea that political communication’s core is the power of persuasion (Hill et al., 2013; Huckfeldt, 2007; Wring, 2001). Mass applied science communication fundamentally has this in common

with political communication – trying to convince people or policy makers of behaviour or policy changes, and sometimes both.

Ritualization of what is important

James Carey, a prominent communication scholar, developed the ritual view of communication, the theory that rituals are the “highest manifestation of communication not in the transmission of intelligent information but in the construction and maintenance of an ordered, meaningful cultural world that can serve as a control and container for human action” (Carey, 1975, p. 15). It is the idea that actions and symbols, not content of communication are important in behavioural membership within a social group. Like religious rituals, they are performed for each other, as much as for oneself. This could be something elaborate like a coming-of-age ceremony or mundane like wearing a ball cap with a sports team logo. Rituals are an important element of group belonging. Unlike the transmission view of communication, which is the dissemination of information, the ritual view serves as a confirmation of existing beliefs (Carey, 1975). It is not just what it said, but how it is said and how often.

Extrapolating James Carey’s (2008) ritual view of communication to contemporary, technology-enabled communication modes, we should look at the various ways that rituals as performed in a digital environment, has fundamentally changed how communication is done. These rituals also serve to remind us of what is important. Take for example photo messages, the practice of taking photos and sending them as text messages. Mikko Villi (2006) considers photo messages to be part

of contemporary ritual communication. He found that “subjects have explained that they send pictures of daily life to family, for information, but even more, for connection” (Villi, 2006, p.4). Similarly, these photos, memes, and connections on social media serve as reminders of what is important. Digital media has essentially created its own set of rituals, habits, and customs for users. In the case of science communication, it is the lack of science stories in the media, the lack of rituals around reading about science and science related matters that decrease their importance.

Gwendolyn Blue (2019) argues that Carey’s ritual view of communication deserves a prominent place in science communication. Blue believes that Carey’s ritual view of communication should not be distilled down to symbols and rituals, but for a field like science communication should be regarded in terms of foregrounding – simply setting up the importance of science to the general public (Blue, 2019). In other words, the act of presenting science as something important is as important as the scientific content itself, similar to agenda setting. Blue would like media to present science as something as general, not special interest, and present it often.

Social Media Echo Chambers

We now have to contend with more than just traditional forms of media shaping our views of science in the digital age. In 2009, Lievrouw took a high-level view of the role technology plays in our lives and the way it mediates our communication. She wrote that “any satisfactory theory of communication today must account for its dual

social and technical nature, and for the experience of communication as a seamless and continually negotiated web of meaning, practices, tools, resources, and relations” (Lievrouw, 2009, p. 317). In light of the technologies available since Lievrouw wrote her work, it is important to view the technological tools not simply as enabling human interaction but having a much larger influence. As such, Soffer in 2021 has adapted the traditional communication theories for the digital age of mass data and algorithms. Soffer adapts the original two-step communication flow theory and says that “that the mediation of opinion leaders is often replaced by automated, computational two-step flow mediation. This algorithmic computational calculation imposes grouping clusters onto individuals based on data calculations, taking into account users’ online history.” (Soffer, 2021, p. 298). Soffer continues that “algorithms function as decision-makers and should be considered like human actors or institutions in their effect on social decisions— as they can affect users’ preferences and behaviour through technological means that are embodied in organizational contexts” (Soffer, 2021, p. 303).

Algorithms have such a large role in the content that is seen, they cannot be ignored as a factor in media mediation. Much of this mediation happens in the private sphere of companies, invisible to the user. Soffer then questions what kind of responsibilities that these companies have when they play such a large role in mediating the communications of people (Soffer, 2021), Soffer says that “it would be wrong to ignore algorithmic mediation, along with its social and grouping implementations, just because the process is rapid and invisible” (Soffer, 2021, p. 307).

These grouping implementations lead us to another pitfall of digital media known as echo chambers. Much like physical echo chambers, online echo chambers are spaces where one can only hear themselves, or rather a reflection of themselves. The idea of online echo chambers was first put forward by Cass Sustein in his 2001 book *Republic.com* (Sustein, 2001). Sustein described online spaces where the inhabitants all share essentially the same opinions and reflect those opinions back to each other, leading people to believe that more people than in reality agree with them and allowing for further and further fetched viewpoints to normalize due to the plethora of media choice available in the online environment. Sustein compares media choice to ice cream. If there is only one flavour of ice cream, people have a choice of picking ice cream or an alternative snack. He says as ice cream flavour options increase, more people will choose ice cream and will choose different varieties or types. As more websites, social media platforms, and chat groups increase, people will have more choices as to which service to use, as opposed to finding no interest and staying away from media. However, all this media choice naturally leads to fragmentation among segments of the population. Unlike the early days of radio and television when families gathered around to listen to or watch a single broadcast, people now have a choice as to what media they want to consume, on their own terms. Even with a fraction of the internet offerings that we have today in 2024, Sustein already found in 2001 the top websites for men, women, teens, African Americans, whites, had very little overlap. For men over 50 and women over 50, only “hotmail.com”, a popular email provider at the

time, were on a list of top websites for both (Sustein, 2001, p. 58). The variety that makes the internet exciting is great when people can find like-minded people to share a similar interest. People who like “particle physicists, Star Trek fans, and members of militia groups have used the internet to find each other, swap information and stoke each other’s passions.” (Sustein, 2001, p. 58).

The segmentation of viewpoints and interests is like a self-fulfilling prophecy by design. Using the tools Sustein had available to him in 2001, Sustein found that only 15% of political websites linked to sites with opposing views while 60% linked to sites with similar views (Sustein, 2001, p. 59). This lack of counter-opinions already concerned Sustein in 2001 as he recognized how this could allow bad actors to manipulate segments of the population. In 2015, Pablo Barbera led a team of researchers in analyzing Twitter (now X) content from the 2012 election, Superbowl, and 10 other major events between 2012 and 2014 Barbera and his team analyzed content from 3.8 million Twitter (Now X) users across 150 million tweets and were able to find data that corroborated Sustein’s original theory of internet fragmentation even on social media. Although there is evidence of “cross-ideological dissemination” (Barbera et al., 2015, p 1531), studies of online spaces have found that most users tend to interact among like-minded peers. A finding echoed by other researchers of online spaces (Cinelli et al., 2020, 2021; Diaz Ruiz & Nilsson, 2023).

Not everyone agrees with Sustein’s theory of internet fragmentation. In a 2017 project based out of Norway, Rune Karlsen and a research team directly take issue with

Sustein's fragmentation theory and describe online spaces more as "trench warfare" (Karlsen et al., 2017, p. 257). The Karlsen research team used Norway as a case study because of its high internet penetration at the time and high social media usage with 67% of the population using Facebook daily and 20% of the population being on Twitter (X). They used survey questions and exposure to online stimuli to gauge people's change of opinions. They found that while people of similar viewpoints do interact more with each other, there is evidence of people of differing opinions reaching out across to each other, but "attitudes are reinforced through both confirmation and disconfirmation biases" (Karlsen et al., 2017, p. 257). Karlson believes that the echo chambers walls are more porous than Sustein and Barbera lead us to believe. There may be online groups of similarly thinking people, but they believe that information does reach across the aisle. Bruns (2017) would agree with this assessment based on data he analyzed from Australia's Twittersphere in February of 2016. While there are distinct clusters of people based on follower connections, interactions reached out across clusters corroborating Karlsen's findings from another part of the world. However, Bruns cautions extrapolating findings from Australia to places like the United States that is currently suffering from high levels of political polarization. In other works, Dubois and Blank (2018) also believe that the echo chamber hypothesis is overstated. They believe that only a small segment of the population would find themselves trapped in echo chambers because people who are interested in politics will often have diverse media available to them. Most studies on echo chambers focus on a single medium or platform. They say that "single media

studies and studies which use narrow definitions and measurements of being in an echo chamber are flawed because they do not test the theory in the realistic context of a multiple media environment” (Dubois & Blank, 2018, p. 729). In reality, people may be in a social media echo chamber, but they may also get information from television, radio, or other media sources. Dubois and Blank do not think the echo chamber effect is as pronounced as studies show, nor do they believe it will create problems that media literacy education cannot address since most people have diverse media intakes. They believe only a subset of the population (around 8%) (Dubois & Blank, 2018, p. 741) are at risk of being caught in echo chamber silos. This is a population who has expressed little interest in politics and have low media diversity scores. However, there is an offline world where these people could be influenced by friends and family who have broader media diets.

Challenges of risk communication.

It is not good enough to simply communicate what a risk is to the general public and call it a day. Authorities and other social actors must legitimate their decisions politically and socially (Renn, 1991). Credibility is at stake and communicators need to be aware of different actors, their various interests.

Trust and media dissemination methods were large factors in COVID-19. Public trust and trust in science itself had already suffered setbacks at the time that the pandemic started. Couple those challenges with the digital media age where many

people got information online and from varying, sometimes questionable sources, communicating the risk of COVID-19 and how to protect oneself became an even more difficult task.

Chapter 2: The Chinese Diaspora in Canada

Turning to Chinese Language Media

The nature and role of Chinese language media in the Canadian diaspora has evolved quite a bit over the long history of Chinese people living in Canada. It is important to understand why people would choose to turn to Chinese language media despite living in a land that is predominantly English speaking. Ethnic communities turn to these sources often because ethnic minorities are often ill-served by the dominant groups that control media by poorly representing minority groups, not representing them at all, or creating stereotypes about those groups (Ramasubramanian et al., 2017; Staiger, 2005; Yu & Matsaganis, 2023). “Conventional news paradigms continue to frame racialized minorities as troublesome constituents, that is, as problem people who are problems” (Fleras, 2011, p. 230) when they are covered. Most of time they are rendered “invisible except in contexts of crisis or conflict, in the process reinforcing their precarious status as the “other” within” (Fleras, 2011, p. 230). Staiger calls out the invisibility as “another method of marginalization” (Staiger, 2005, p. 158). These well recognized biases in dominant, commercial media drive those underserved segments to seek out forms of media that better represent them. Ethnic media, conversely, often challenge stereotypes of minority communities that are present among the dominant ethnic group (Ramasubramanian et al., 2017). These challenges are a welcome change from dominant media as they can help diasporic communities stay connected to their home countries and even help these groups find a sense of belonging within the new

countries that they now call home (Ramasubmanian et al., 2017). “Ethnic media embody and embrace the inclusivity principle at the heart of Canada’s official multiculturalism” (Fleras, 2011, p. 231). For this reason, during the early stage of Canada’s multiculturalism policies, Prime Minister Pierre Elliott Trudeau placed a great deal of importance on fostering Canada’s ethnic news sources (Lam, 1980). Canada’s official policy of multiculturalism was meant to be “a new symbolic order of governance that respected immigrants’ ethnicity differences” (Fleras, 2023, p. 22). The idea was that if “migrants and minorities were more likely to emotionally embrace Canada if they took pride in their cultural traditions as grounds for regulating the pace of adjustment and integration” into Canadian society (Fleras, 2023, p. 22).

Despite the importance that political leaders such as Prime Minister Pierre Trudeau placed on ethnic media during the introduction of multiculturalism to integrate new immigrants into Canadian society, early studies had shown that those in the diaspora who read Chinese language newspapers had lower levels of acculturation than their peers who did not (Lam, 1980). Having the opposite effect that Trudeau intended, rather than facilitating a transition into Canadian life and culture, the Chinese readers of Chinese language papers participated less in politics and other aspects of Canadian culture. Respondents who depended upon ethnic media in Canada “show[ed] little interest in and concern about Canadian personalities, symbols, and institutions. Clearly the Chinese media have failed to bring the immigrants closer to the new society” (Lam, 1980, p. 86). This could perhaps be attributed to ethnic media providing more coverage

about issues related to the home country compared to local geo ethnic issues (Lin and Song, 2006).

Despite the lower levels of acculturation into Canadian society, these Chinese language publications were important for the Chinese communities that they served. The communities have benefitted from diasporic media that have been able to create space based identities in many communities such as “Chinese in Vancouver” (Sun, 2009) among Vancouver’s vibrant Chinese community. Content within Chinese diasporic media has increased also substantially since the great migration in the 90s aided by Canadian media’s Canadian content rules, Chinese Canadian media flourished with the post Tiananmen Square massacre, pre- Hong Kong handover wave of migration (Kong, 2015).

The nature and role of Chinese language media in diasporic communities has evolved along with technology and the way they are influencing people is changing. Fleras attributes these challenges to the “Post-Multicultural world” that we live in (Fleras, 2023, p. 9). Quite simply, because of the ease of transportation and hyper mobility, and immigration and multiculturalism is no longer the one-way street it was envisioned to be under Pierre Elliott Trudeau. The multicultural model no longer functions the way it used to. Moreover, ethnic media are no longer confined to that produced by the diasporic communities in their host countries. The internet has enabled the diasporic community to access Chinese language news directly from their home countries. With the “plethora of free social media including WeChat, Facebook,

Instagram, and TikTok, to name just a few, have contributed to the formation of ‘virtual transnational diasporas’” (Guo, 2022), the ethnically Chinese population are still able maintain access to Chinese language media from their home countries, which is the focus of this study. The ability to influence diasporic communities has also shifted as more and more people turn from traditional media sources to social media sources and, according to Sibó Chen (2021), they are being used to manipulate public opinion in these communities. For example, a study of WeChat accounts (a Chinese language micro blogging site similar to Twitter) among public accounts found that there was largely a parroting of Canadian petronationalism targeted at the Chinese speaking diaspora (Chen, 2021). The WeChat public accounts framed opposition to the TMX (Trans-Mountain Expansion) pipeline as being an issue of importance only the “environmental elites” and outside of the concern of everyday Chinese Canadians (Chen, 2021). Chen found a propaganda campaign specifically aimed at Chinese Canadians designed to influence Canadian domestic policy. Technology has also enabled that influence to go beyond the written word. With video and audio content widely available, even those in the diasporic community who find reading Chinese difficult, if not impossible, due to lack of formal Chinese language education can still access Chinese language content. As a result, Chinese language media originating from Asia still has a large influence on the diasporic population in Canada.

COVID-19 highlighted how different the diasporic mediascape can be from their English language counterparts. Zhang studied the role that Chinese diasporic media

played on the Chinese American community during COVID-19 (Zhang, 2021). The diasporic media became a place for Chinese Americans to share their fears about racism during the pandemic and the held as a haven against the racist language used in mainstream media. *Sing Tao*, a Hong Kong based newspaper, was among the first to drop the racist language such as “Wuhan pneumonia” or “Wuhan virus” that English language media continued to use after the WHO formally named COVID-19 (Zhang, 2021). The Chinese language media was not only an important source of pandemic information for Chinese diasporic communities, but it was also a place they could avoid the judgement and racism of mainstream media. Technology has enabled the diasporic community to maintain ties to Chinese language media through both locally produced sources and sources from abroad. This dissertation will show that technology and the community ties to Chinese language media had a deep influence on COVID-19 response within the diasporic community and how that information has more influence than local mainstream media.

This finding is corroborated by Lin and Song (2006) when they found that “news coverage in the ethnic press included a large amount of news related to the home country, as opposed to a relatively small number of geo-ethnic stories that are essential to community building” (Lin and Song, 2006, p. 362). Extending this idea to the pandemic in 2020, the question that begs asking is what the effect Chinese language media has on pandemic behaviour given the large number of media choices available to the diasporic community. As Guo noted: “today, in the early 2020s it is the plethora of

free social media including WeChat, Facebook, Instagram, and TikTok to name just a few which have contributed to the formation of ‘virtual transnational diasporas’” (Guo, 2022, p. 859). The diasporic media following has created virtual communities that cross borders thanks to communication technology and shared languages. There is reason to believe that the media effects are substantial since the masking levels in the Chinese Canadian community were surveyed to be higher in Markham than in neighbouring Vaughan, the non-Chinese area. This masking behaviour not only failed to extend very far outside of the ethnically Chinese areas at the start of the pandemic, but Chinese people also masking outside of these communities were stigmatized. In research conducted at the start of the pandemic, Mamuji et al. (2020) found that within the Chinese Canadian community, people who wore masks early in the pandemic received “dirty looks” and were made to feel uncomfortable in public places. This “otherness” as Edward Said describes it (Said, 1978), also influences behaviour as people tried to avoid awkward feelings of personal discomfort around other people. The difference in Chinese language media coverage and consumption is further explored in this work.

History of SARS and its impact on the Chinese Canadian community

Before COVID-19, there was SARS (Severe Acute Respiratory Syndrome) that hit Canada’s Chinese Canadian community hard in 2003. In particular, the Toronto population was greatly affected and it had a lasting impact. In late 2002, Guangdong province reported an atypical pneumonia causing abnormally high death rates.

However, SARS was not discovered until February of 2003 (CDC, n.d.a). The WHO issued a global alert for a severe form of pneumonia on March 12, 2003, and on March 14 the United States' Centers for Disease Control (CDC) activated its Emergency Operations Centre (CDC, n.d.a) and issued a high alert notice for passengers returning to the US from Hong Kong and Guangdong, China.

SARS is suspected to have made its way into Canada, specifically the Toronto area on Feb 23, 2003, when a couple vacationing in Hong Kong returned home ill (Low, 2004). The woman's son took care of her until her death on March 5 and the son also became ill and went to hospital on March 7, 5 days before the world was alerted to this new pneumonia (Low, 2004). Toronto would later become the epicenter of the disease outside of Asia with the most SARS related deaths outside of Hong Kong and China. In the aftermath of the SARS pandemic, experts concluded that the first patient brought to Toronto's Scarborough Grace hospital was left in the Emergency Room for an excruciating 16 hours spreading the disease to other patients and staff (Adler, 2020), a mistake that would not be repeated with COVID-19.

In total, SARS would take 774 lives globally, 44 of which were in Toronto (CDC, n.d.). SARS ushered in a new wave of Anti-Asian racism in Canada (Leung, 2008) that the community remembered well in 2020 (Mamuji et al., 2020). SARS left not just a scar, but a permanent disfigurement in the collective memory of the Chinese Canadian population in the GTA. The pain was felt and recalled in a set of interviews conducted by Mamuji et al. at the start of 2020 in their study looking for the effects that diseases with

well-defined places of origin would have on their diasporic communities. The author of this dissertation was a co-applicant of the Mamuji study that was funded by the Canadian Institute of Health Research Operating Grant: COVID-19 - Public health response and its impact titled “Destigmatizing Chinese Communities in the face of 2019-nCoV: Emergency Management Actions to Address Social Vulnerability in Toronto and Nairobi”. The author has permission to use the data collected as part of this dissertation.

During the course of the 83 interviews conducted by Mamuji et al., participants who mentioned SARS also ignored government recommendations by wearing masks before Canadian officials made the recommendation to do so in April of 2020 (Mamuji et al., 2000).² The memory of SARS was clearly a lasting one. A 2009 study found that among survivors of SARS, 25% were found to have Post Traumatic Stress Disorder (PTSD) (Mak et al., 2009). This likely explains why the term “PTSD” was mentioned in conjunction with SARS by multiple participants. When asked about whether they started wearing a mask, one participant in Mamuji et al.’s study, who works at a medical clinic said:

I did. I did. I did. Especially if I have to go on public transit and stuff like that and also for my clinic. When I talk to people very early on because I have patients

² Please note that the author of this dissertation is a co-author on the various Mamuji et al. publications cited in this dissertation. Additionally, the author of this dissertation has access to the original data set of interviews and has permission to use them.

who actually came from Hong Kong after 2003, like after SARS, you can actually see symptoms of their PTSD when they talk about this again. They showed symptoms as in, like, they're super anxious, they start losing sleep, especially people who have families that have experienced SARS before. (Participant 14, Mamuji et al., 2020 Dataset).

The experience unquestionably left a mark on people who had lived through SARS, particularly those in Hong Kong in 2003, where masking became a social norm. After SARS, it was not unusual for people in East Asia to mask as routine practice (Ironstone, 2022). The measures that were enacted in Hong Kong when COVID-19 broke out then were quickly adopted by those from the Hong Kong community in Canada as well.

So, you have to understand, we kind of had the experience before. When was SARS? 14 years ago, when we went through SARS. So, we did something similar. Almost every single Chinese family that I know would have stocked up a mask [...] we have [...] more experience with these type of infectious disease[s], so, we're a little bit more prepared, so, we know the danger of it, so, we take more precautions. (Participant 65, Mamuji et al., 2020 Dataset).

The memory of SARS left an indelible mark for those who experienced it. Participants who lived through SARS did not need to be told to wear masks. They did it of their own accord as soon as they learned about COVID-19. Since SARS, mask wearing has been a fixture in many Asian countries including Hong Kong, Taiwan, and China, where most study participants hailed from (Flaskerud, 2020; Ironstone, 2022). The collective trauma

from SARS forced the Chinese Canadian community to act rather quickly. They remembered both the deaths in their community that resulted from the disease and the racism that followed.

Diasporic spread of information

During the Mamuji et al. study in 2020, researchers found that information arrived within the Chinese diasporic communities much earlier than mainstream and traditional forms of news started to share information about the pandemic. As early as late 2019, members of the Chinese Canadian community started to learn about a virus that had emerged out of Wuhan.

I knew about or learned about COVID-19 early. It was about January when my Hong Kong and Taiwan friends were telling me that. They do not know the harm but be careful. They said SARS might have returned. They still used this word. At that time, they did not know what this illness was. They already warned me. So, most of my Hong Kong friends already started wearing masks. So, I knew it early on. It was way before that this side said anything I already knew. (Participant 82, Mamuji et al., 2020, dataset).

At the beginning, even about let's say in January – February, one or two months ago since we saw this coming out of China, there was a large community awareness of what was going on and a bit of fear going on at that time, for sure. And so, we saw people taking certain protective measures like wearing masks,

etcetera, which this really happened fairly early on. (Participant 1, (Mamuji et al., 2020, dataset)).

Earlier access to information would prove to be important. This study will also demonstrate that it is not simply early access to information, but also the quality and tone of reporting on what is valued and important impacts behaviour. The Mamuji et al. study found that the Chinese community took the virus seriously from the start. This research will show how the media coverage impacted this. Participants had reported that they took threat seriously because of the information they received.

Chinese community on Wechat group believed the threat was real. Information in those groups [was] very different from public media. News inside those networks said Wuhan was really bad. News was covered up by government. Be aware of that (Participant 51, Mamuji et al., 2020, dataset).

This information was circling within chat groups and social circles of the Chinese Canadian community. Many people had friends still in China, Hong Kong, or Taiwan, who would send information and that information quickly made its way into the hands of the diasporic community, which in turn got passed on mainly through chat groups and social media. The threat of this virus that, at the time, few people knew anything about was perceived very differently by those inside the Chinese diasporic community, particularly those with closer ties to Asia. However, there is a weak power dynamic between the Chinese and non-Chinese community. The attempts to spread the word about the seriousness of COVID-19 fell largely on deaf ears so they could only protect

members of their own community the best they could by sharing information within the community.

Beyond electronic means of information sharing, word of mouth and face to face interactions are also important during times of uncertainty. Information came to a high school principal the traditional way through word of mouth as parents came to pick up and drop off their children.

It was parents coming to speak to me. It wasn't the kids. The kids didn't really know much about it [COVID-19]. Parents were definitely more worried about it. You hear little bits of things on the news. You'd get from other people snippets of news from overseas, and they would share that with me at the school as well. I find that the schools are quite a bit of a hub, so parents are worried about it, they'll send it, "Have you heard about this?" and they'll send me their news articles and so on. So, that's how I started hearing about it. I'd say more from the parents first, then you hear a little bit on the mainstream news, but we were getting a lot more from parents. (Participant 15, Mamuji et al., 2020, dataset).

Places like schools tend to be close-knit communities where in-person conversations still take place. Parents will speak to other parents, even just a head nod to say hello.

Alongside schools, another very important venue, arguably even more important for these types of conversations, are religious organizations.

Or if you're talking about the groups themselves raising awareness, yes. I think actually, the church groups did get on that quite well. And if anything, I think they

all, along with many other organizations, almost hit their stride at the same time. Because at least, with the church groups, they were quick to be like Okay, well, if you're starting to feel symptoms, just any symptoms, just stay home, take care of yourself. They're giving out newsletters and stuff to basically be like, oh, yeah, this is how you wash your hands. I noticed there's definitely a lot more signage, even my native church in terms of washing your hands, using towels, all that stuff. So that was definitely present, which was really cool to see. (Participant 29, Mamuji et al., 2020, dataset).

Places where people met were important information hubs. These are groups of people where there is a sense of familiarity and trust among members.

Social media played an important role in information dissemination during this pandemic, too. These again are spaces that have a high impact on individuals due to the trust built between people but have very limited reach compared to mass media. Some members tried to reach out to broader audiences through social media, petitions, and trying to get mainstream media's attention to the larger threat than was being reported.

Right. So of course, from the get-go, we started to compose a lot of different news articles and post regarding hey something's going on here, that kind of thing, right? And then you said we launched a petition. We actually, I personally I have been tweeting a lot myself and I actually, I'm a freelancer with Apple Daily (a small Hong Kong based celebrity gossip magazine). So, there was an article

that I wrote regarding people should start wearing mask. And the government should be actually telling people to at least accept people to wear masks. And that was mid-February I believe that article came up. And then me myself I had done other thought posts on my own website regarding what people should do to avoid COVID-19 stuff like that. That was probably beginning of March.

(Participant 77, Mamuji et al., 2020, dataset)

It was difficult for people to try to sound the alarm as official channels were focused on not causing panic in the population. When shutdowns finally started to happen information was hard to come by and individuals would then rely on social media and their community chat groups.

The content on social media varied from useful information to confusing and in some cases, very misleading. What was more important than information simply being shared through social media was the filtering it received through family and friend chat circles before being passed on to others. These circles are tight chat groups of people who tend to know each other and have a trust bond far greater than general social media circles. Looking at the publicly available interview data from Mamuji et al. (2020) gives us a hint as the reason. During the early days of the pandemic, they interviewed members of the Chinese Canadian community in the Greater Toronto Area. From the interview data, there is a strong sense within the Chinese Canadian community, of which many live in Markham, that the reaction was slow and competency was lacking.

The interviews of the Chinese Canadian Community in the GTA conducted by Mamuji et al. noted a very distinct difference in how distrust presented itself (Mamuji et al., 2020, dataset). There was distrust in the Chinese government's truthfulness, and, interestingly doubts over the Canadian government's competency. Participants from Hong Kong and Taiwan were more likely to distrust the COVID-19 information from the Chinese government. This distrust stems from geopolitical reasons. In the case of Taiwan, they have been self-governed since Chaing Kai Shek and feel at risk of China invading them. Until 1997, Hong Kong was a British colony and its residents received education consistent with Western philosophies. In 2019, waves of pro-democracy protests ripped through the city and China's response to it created further tensions and distrust of the Chinese government (Yeung, 2019). It was unsurprising to the researchers to hear repeated doubts over the perceived accuracy of the COVID-19 information from China. "The Chinese government control a lot of information and stuff that doesn't fit censorship. It usually [won't] get out. I think the whole world is doubting whether the statistics were accurate" (Participant 27, Mamuji et al., 2020).

News of Chinese government dishonesty had made its way to the diaspora and circulated within it.

You know there was a Chinese doctor who was whistle blower, right? He was actually censored off internet before the pandemic that was declared. He actually signed a paper. The paper was that you understand that you are spreading rumors and you know you can't do that anymore and he wrote, "I understood."

He contracted COVID and he actually died. The Chinese media is shady.

(Participant 27, Mamuji et al., 2020).

The distrust among some members of the diaspora runs quite deep. Sentiments like Participants 30 and 60 in that study were not uncommon from the Chinese Canadian community. They believed the Chinese government under reported and could not be counted on for accuracy. There was a feeling that something was happening, and the government was trying to control the extent of the damage.

When Wuhan is locked down, my colleague told me to go home, because when the Chinese government announced it, two zeros were missing. It means that if they tell you that 1,000 people are dead, actually 10,000 people are already dead. They [my colleagues] are all from mainland. They said that if they [the government] tell you that the matter is very serious, it is actually super serious. If they say it is nothing, it should be seen as serious. (Participant 30, Mamuji et al., 2020, dataset).

The reason why I don't watch Chinese news media is because I don't think it's reliable. I think a lot of it is propaganda. It doesn't pertain to me. Whatever is happening in China is not the same case here. The spread is a lot more different. There's a lot of speculation about the reporting of their numbers which is very fishy. (Participant 60, Mamuji et al., 2020, dataset).

Participant 83 was even less nuanced. The distrust was not just about COVID but about all news and information from Chinese news agencies “the news that China airs is never true.” (Participant 83 (Mamuji et al.), 2020, dataset).

Censorship in China is well known both inside and outside of China (Xu & Albert, 2017; Lorentzen, 2014, MacKinnon, 2008; Hassid, 2020, Dowell, 2006). Within China, though there are high levels of trust of both the government and Chinese state media, that trust breaks down with higher levels of education and exposure to online media (Xu, 2013). Trust in government also decreases with those who have lower levels of government media control (Xu, 2013). This correlates well with Markham’s population being above average in terms of wealth and education as well, with the Chinese population within Markham being of no exception. Media here is also not subject to the controls like it is in China. There are large levels of skepticism in the truthfulness of the Chinese government (and by extension the state media). In sum, the Chinese Canadians who are in the GTA mostly lack trust in the Chinese news and doubts the truthfulness of Chinese authorities. This is a marked difference to the distrust shown toward Canadian authorities.

In general, there is no lack of trust in terms of information reported, but a lack of confidence in their competency. Canadian authorities changing position on mask wearing further eroded confidence.

Even though I keep hearing that it [masks] doesn’t make a difference if you’re not the who’s sick and so my husband and I were on that for a while but now, you

know, things have changed and like Dr. Tam has said to wear a mask and I know that there are people out there who say they can't trust her aim or because she like flipflops on some stuff. (Participant 23, Mamuji et al., 2020 Dataset).

The flip flop not only cost the government credibility in the eyes of Participant 9, but it also created doubt and confusion when people do not have confidence in who to take directions from.

I really don't like them [government authorities] telling others not to wear masks. I still think that mask shaming and toilet paper shaming are caused by the government, or that they are involved in it. They created an idea for others not to fight the virus. The 'I get corona, I get corona, but I still get my spring break.' Mentality of young people is from there. To this day, some people are still saying it is similar to the flu, why do you have to do so much? But now the government has changed its attitude. They asked people not to go out, don't even smoke on balconies. But people won't listen to you anymore, because they're convinced by what you said before (Participant 9, Mamuji et al., 2020, dataset).

Discussions within the Chinese Canadian community became very negative when it came to trust in authorities. Participant 82 expressed it with the following and Dr. Theresa Tam, despite being a member of the Chinese Canadian community herself, bore much of the negativity.

As soon as somebody brings this topic up, of the hundreds of comments, 95% are against Teresa Tam. These things, people have different opinions; if it is open in public, I will not say them out loud. I have to tell you right now; I absolutely do not like her. I think she is doing all the wrong things. She said we do not need to wear face masks and now it may be a good idea. Why are you saying this? You are dictating Canada's policy. (Participant 82, (Mamuji et al., 2020, dataset).

That switch between telling people not to wear masks and then telling them to mask up cost Canadian officials' credibility in the eyes of participants. The WHO gave firm guidance against the widespread use of masks at the start of the pandemic (Howard, 2020). At the time, Canada, alongside the rest of the world, was also suffering from a shortage of Personal Protective Equipment (PPE) (Dyer, 2020b; Howard 2020). The reluctance to advise against mask use was driven by the desire to preserve PPE for healthcare workers and decrease the risk of running out of them the way stores ran out of toilet paper (Howard, 2020; Proctor, 2020). However, in a study of disasters in the United States, Erik Heide found that though most emergency managers prepare for panic, mass panic rarely materializes, and authorities underestimate the resilience and pro-social behaviour of the greater community (Heide, 2004). Dynes and Quarantelli wrote that, among the myths about disasters, the most pervasive the belief that "people will panic in the face of great danger" (Quarantelli & Dynes, 1968, p. 5) leading to the withholding of information. Sadly, despite this research dating back several decades, the belief that mass panic and civil disorder running rampant during a disaster persists,

even among police and civilian safety officials. (Drury et al., 2013). As such, great deal of resource goes into planning for the worst of human behaviour that rarely materializes, and volunteers, donations, and other offers of help are often not taken advantage of because disaster planning rarely considers the pro social behaviour of the general public (Heide, 2004). Heide contends that emergency planning ends up wasting or underutilizing resources because planners imagine and plan for the worst of human behaviour, not the best of it.

The lack of trust in government authorities was a factor in the Chinese Canadian community pulling together in a pro social way that Heide found common in disasters. Most of the criticism from the Chinese Canadian community came in the form of the government acting too slowly at the beginning of the pandemic. Pleas for stricter border controls and social distancing protocols failed to get the attention of authorities.

I truly see that the Canadian government is not doing enough.... They will not close the border, they cannot, as in not allowing non-Canadian travelers into Canada which we are clearly doing now but there's too much effort to do this and that. They are saying closing the border will not stop the spread and I think that that is understanding the concept or trying to create a different concept. There's no stopping it, they're slowing it so that we can get more prepared for it when it hit us, because obviously, there are a lot of people that were already traveling at that time. I think it was probably mid-February-ish when we were doing the petition (Participant 72, Mamuji et al., 2020, dataset).

From the interviews and the Mamuji dataset, we can see that there was lack of confidence in the government, but it was rooted in very different things. In the Chinese Canadian Community, there was great concern about whether people were being adequately protected from the virus. The fact that the concerns about government responses being too much were only coming from the mainstream community in Vaughan leads to questions about whether those sentiments are coming from a media influence that may not exist in Markham. As an immigrant community, Markham has many small businesses that also rely on a strong economy. The differences in community response demand for a look at the media influences on the community.

Pro social Behaviour in a disaster

Countering anti-social behaviour is part of disaster management protocols (Heide, 2004). Heide argues that planning for anti-social behaviour is a “common misconception” (Heide, 2004, p. 304) for behaviour that normally does not occur that takes away resources and fails to take advantage of the pro-social behaviour that usually presents itself during an emergency (Dynes & Quarantelli, 1968). Dynes and Quarantelli believed that “most people held pre-conceived notions about natural disasters that were essentially false” (Dynes & Quarantelli, 1968, p. 5). As early as 1968, Dynes and Quarantelli found that while behaviours such as looting often do take place during civil disturbances, this is rare during disasters. Oftentimes, legitimate behaviours such as surveying one’s own damaged property or helping a relative retrieve

an item is misconstrued as looting by the casual observer (Dynes & Quarantelli, 1968). During his research, Heide spoke to many disaster management personnel who felt that the pro social behaviour they witnessed during the disasters they managed were exceptions to the norm, despite nearly all of them reporting few incidents of social breakdown (Heide, 2004). The myth of anti-social behaviours is a costly aspect of disaster management that can be avoided.

Vardy and Atkinson (2019) found that different types of disaster solicited different responses. Exposure to others in distress invoked prosocial behaviours while property damage resulted in higher incidents of parochial behaviour (Vardy & Atkinson, 2019). Popular media widely reported on anti-social behaviours following Hurricane Katrina (Guarino, 2015; NBC, 2005; Solnit, 2010; Thevenot, 2005; Tierney et al., 2006) but instances of pro social behaviour dominated the public response to Katrina (Thevnot, 2014; Tierney et al., 2006). In the case of Hurricane Katrina, the narrative was shaped by racial discrimination within the popular media (Berger, 2009; Johnson et al., 2011; Marable, 2006). Media's outsized role in how the public sees an event and inaccuracies and biases can have lasting impacts like perpetuated racism (Giroux, 2006; Thevnot, 2014). In all these cases, the perception of anti-social behaviour was at odds with the reality of pro-social behaviour found by researchers. There is an opportunity for authorities to anticipate and help direct pro-social behaviour such as volunteers and donations in coordinated ways to increase their effectiveness.

Chapter 3: Methods

This research is based on a mixed methods research design. It is framed as a comparative analysis of two communities. To assess the media usage of the communities a content analysis of the newspapers in the communities. A brief observation in both communities was conducted, followed by a sentiments analysis of social media, and semi-structured interviews with members of both communities. The mixed methods design permits an analysis of the media, verification of reports in the media through observation, further media analysis of social media, and the qualitative data from the interviews broadens the larger sense of the interaction between community members and the media.

Comparative Analysis

After speaking to residents in Markham and Vaughan about their media habits, I wanted to know how representative Chinese language and English language media that the two communities primarily consumed differed in their coverage of COVID-19. A comparative approach was chosen because it “forces us to revise our interpretations against cross-cultural differences and inconsistencies” (Esser and Hanitzsch, 2012, p.4). Esser and Hanitzsch also point out that comparative research “helps us realize that Western conceptual thinking and normative assumptions underpin much of the work in our field and that imposing them on other cultures may be dangerous” (Esser and Hanitzsch, 2012, p.4). Related to this, Esser and Hanitzsch believe that

comparative research challenges the notion that media from one's own culture is "normal." Keller et al. (2021) analyzed news sources in Montana and its impact on mask wearing commenting on the perceived threats and benefits. Shin et al. (2022) analyzed tweets from US political elites and studied how mask messaging broke down along party lines and ultimately how that influenced mask wearing. The situation in Markham and Vaughan presented a rare opportunity to analyze different media in different languages and how that affected behaviour without any differences in official policy towards the disease.

Markham has high proportion of ethnically Chinese people, while Vaughan does not; ethnically Italian people make up the largest group in the city. Both communities are in Ontario, Canada and are in fact side by side in York Region. The laws, policies, and healthcare systems are identical. Because so much about Markham and Vaughan are similar in terms of socio-economic indicators, this presents a unique opportunity to focus on cultural differences and particularities within the Chinese culture starting with media consumption to see if there were differences that could account for the drastic difference in COVID infection rates outside of policy differences in how authorities handled COVID.

Representing English language newspapers in the Toronto area, *The Globe and Mail* and *Toronto Star* were chosen for analysis based on their prominence in the two areas of study and position as the two highest circulation newspapers in Canada. The selection of Chinese language newspapers to study was less straightforward. Chinese speaking residents in the two study areas mentioned a variety of sources from abroad.

This study wanted to find two comparable papers to *The Globe and Mail* and *Toronto Star* in terms of prominence, coverage types, and political leanings. Mainland Chinese sources were excluded from this study. Mainland Chinese sources are not generally considered trustworthy because of the country's known censorship policies. In the interviews in this study, participants expressed distrust in news from Mainland China for this very reason. To avoid any biases that may arise because of the censorship in Mainland Chinese news so no outlets located there were considered.

Sing Tao is a business focused newspaper based in Hong Kong. Because *Sing Tao* and *The Globe and Mail* are both business-focused news outlets, the two are potentially comparable. *Liberty News* is based in Taiwan and popular among the Taiwanese community in Canada. It and the *Toronto Star* both have left of centre political focuses and therefore can be considered comparable.

This study used the Dow Jones Factiva database that keeps records of published news articles for major news outlets worldwide. Using the keyword search function, I searched for all articles in English in *The Globe and Mail*, and *Toronto Star* containing either "COVID" or "coronavirus." In Chinese, the equivalent search terms were "新冠病毒," "疫情 or 病毒." All three terms are often used to refer to COVID-19 both specifically and generically. Comparisons were made for March, April, May, June, and July 2020 as lockdowns in Ontario had lifted in July of 2020. On a broad level, this study examined the types of articles that contained the keyword since Factiva labelled articles by both industry and subject matter. For a deeper comparison, a select number of articles from

the top industries were evaluated for COVID-related content and whether the articles were about COVID or about COVID's impact on the economy. In an agreement test using these criteria, a test coder had 100% agreement with the original coder.

Table 1: Criteria for economic vs. health focused articles

Criteria for determining subject focus	
Economic Focus	Mention of inflation or price increases/decreases from COVID Mentions of profit loss due to COVID Mentions of stock prices
Health Focus	Mentions of Risk mitigation procedures Mentions of health risks or death from COVID

Because of the observed differences in mask usage in Markham and Vaughan, a second media comparison was done for March 2020, during the most critical stage of mask communication when shutdowns started. Knowing that the Chinese community received information from foreign Chinese language sources, it was important to know if the Chinese language media differed in its advice on mask wearing. This study investigated whether there were differences in information newspapers conveyed to their readers with respect to masks. The four newspapers selected for the comparative analysis may be subject to editorial bias. This study was designed to gain a broader look beyond the four papers analyzed in the earlier part of the study and included Hong Kong China News Agency (HKCNA) and Canadian Press (CP), two newswire agencies. Newswire agencies serve a larger audience because multiple newspapers may be drawing from their original work. With a higher-level look, this study determined whether

there were differences between the papers and the information coming from the newswire they draw from on masking advice, as well as the editorial decisions that present mask wearing differently between the source and the paper. This study investigates the differences between the representative Chinese language media and Toronto-based, English-language media handled masking information and news. This comparison provides a sense of where media stood with respect to masking. If there are large differences in how the different media handled masking advice, the difference in masking behaviour between Markham and Vaughan can be at least partially attributed to the difference in coverage based on reported news sources from participants in Markham and Vaughan. For the English language sources, all articles containing the word “mask” were pulled from the Factiva database. The Chinese language sources used the search term “口罩” (mask). Given the considerable number of articles (241 in March of 2020 for HKCNA alone), a 10% sample was selected from each paper and articles were evaluated to assess whether they were positive, negative, or neutral on mask wearing. Every 10th article was chosen for analysis. Positive articles encouraged mask use. Negative articles discouraged mask use. Neutral articles neither encouraged nor discouraged mask use but were matter of fact in their treatment of masks. Examples of this would be news articles about shipments and deliveries of masks where the article would simply state that shipments or deliveries had been made. Rabb et al. (2024) conducted a similar but larger scale study specifically on US media outlets. They looked

at five American outlets and used student volunteers to rate paragraphs on a slightly more complex 7-point scale.

In the current study, negative articles had explicit negative advice against mask use, or implied negative advice against mask use. An example of being masked as negative is a *Globe and Mail* article from March 11, 2020 that indicated “masks can do more harm than good” (Moore, 2020). If there is an implied health impact if one wears a mask that is harmful, dangerous, or lacking in benefits, then it is categorized as negative. Any explicit advice to not wear a mask or questioning the utility of masking is also categorized as negative.

Neutral ratings are articles that mention masking but have no opinions over their utility, whether one should wear them, or even their overall function. These articles simply state the news involving masks. An example is this article from March 2020 in HKCNA “韓國宣佈全面禁止口罩出口” which simply states that “Korea has announced the complete ban on mask exports” (HKCNA, 2020). The piece gives no opinion on the utility of masks, does not give instruction to wear a mask, nor does give any benefits or consequences of mask wearing. Articles about masks that give neither instruction or opinions about whether or not one should use a mask are rated as neutral.

Positively rated articles advise the reader to wear a mask or discuss the benefits of masking. There are often explicit instructions for masking; some may provide specific instances to mask as appropriate. A reader should get the impression that wearing a mask is the right thing to do to protect oneself or others from COVID-19. An example of

a pro masking headline is “I think I may have the new coronavirus. What should I do?” from March 18, 2020. In this piece the reader is advised to wear a mask if they have the virus. Any instances in which the reader is given a positive impression of mask wearing, when the reader is told to use a mask is labelled as positive for masking in this study. Using this criterion, a test coder had 90% agreement with the original coder.

Table 2: Criteria for masking articles

Masking Criteria	
Positive	General advice for masking Mentions health/safety benefits of masking Instructions to mask
Neutral	No masking advice given Caveated masking advice
Negative	Advice against masking Mentions negative consequences of masking Instructions not to mask

The picture that this comparison draws shows on a very simple basis whether the overall message from a media outlet would push readers toward or away from adopting masking as a pandemic behaviour. If the Chinese language media was indeed more mask positive, then we can infer that this had an influence on the diasporic community in Markham because of their consumption of Chinese language media.

Sentiment Analysis

Natural Language Processors (NLP) are a relatively new tool made available for public use. The sentiment analysis investigated the feasibility of incorporating these

tools into the public communication arsenal for public health professionals. Due to the newness of these tools, few studies have been done on them. Early studies on using different sentiment analysis techniques have shown promise in their future applicability (Dang et al., 2020; Kanakaraj and Guddeti, 2015; Khan et al, 2016), however, they faced challenges with accuracy.

Trust is an important component of risk and disaster communication (Humpherson, 2019, Paton, 2008). The lack of public trust leads to skepticism about the advice given, leading to misinformation and inaction. Public trust is crucial to disaster and risk management. Sentiment is potentially an imperfect but fair proxy for quickly measuring public trust and the likelihood of mask compliance. This study used tools to categorize tweets by emotion because emotions have a large impact on an individual's perception and interpretation of events. Emotions are a rapid evaluation of a situation (Barrett & Barrett, 2017). For example, individuals who are angry have a higher likelihood of viewing authority figures as unjust or untrustworthy (Dunn et al., 2005). Asserting autonomy and resisting any notions of perceived control is a natural reaction to this distrust. Fear also has a negative impact on social trust and social cohesion (Svendsen, 2008). When individuals feel threatened, they put less trust in others and are more likely to be suspicious of them. Therefore, on the aggregate, knowing the sentiment of tweets in particular fear and anger can provide valuable information to authorities trying to control a disaster or, in this case, a pandemic.

Given the improved states of Natural Language Processors (NLPs) since some of these studies were done, this study was designed with utmost simplicity using publicly available tools provided by IBM (International Business Machines). Given the number of participants who listed social media as a source of information, aspects of this study was designed to investigate if public health officials could use publicly available information (social media posts) and use existing tools (there will be no time to create new tools in an emergency) to harvest useful information, which they can use to adjust their messaging.

For the purposes of this study, IBM's NLP is treated as a black box, the exact mechanisms of how it functions is unknown. This feasibility study used the emotional sentiments that they have available, and did not question the algorithms behind the interface. This study used tweets from Twitter (now X) as it was the largest social media network and was also used by many participants in both Markham and Vaughan. Using a custom-built tool based on academic access to X's Application Program Interfaces (APIs). Wanting to know more about how people in general were reacting to COVID-19 and mask mandates, I downloaded all tweets containing the words "mask" and "COVID." The keywords were not case sensitive. Tweets were downloaded in this case by month (in a real situation this could be by day) of all tweets across the platform. Location specific tweets were not available. The tweets were then cleaned and fed into IBM's NLP. There were also other limitations. The NLP could not discern information from tweets less than three words. The NLP also had trouble with images and could not

detect sarcasm or make use of context in replies. Any tweets less than three words, containing images, or were replies also were eliminated. The NLP went through two rounds of training with human corrections. As a verification, a human categorized sample sets of tweets and the results against the machine were compared for agreement. The analysis was done for March to July 2020. While the data still exists, Twitter (X) is no longer a viable platform to repeat this experiment. Since the new platform owner has taken control, academic access has been removed. Future researchers will have to use different platforms, but the principles of the study remain the same. The results of this experiment will indicate future feasibility of using these methods to determine public sentiment to events such as news of disease spread or changes in rules or mandates in major areas. Tracking sentiment of key terms will give communicators an idea of how information is being received quickly without the expense of surveys or polls. The sentiment can be used as a proxy for trust in the communications coming from officials.

Community Observations

After the mandates were removed in spring 2022, it was important to know what the masking rate would be without laws and enforcement. This is an indicator of voluntary COVID-19 avoidance measures and spoke to a community's willingness to adopt certain behaviours outside of the threat and hammer of law and law enforcement. While there is data from public health showing that infection rates were lower in

Markham compared to Vaughan, there is no publicly available data to confirm whether masking rates were different. Not wanting to rely on assumptions, a brief snapshot observation was conducted in Markham and Vaughan to verify differences in masking rates. The observation of store signage was included to detect any differences in policies for customers regarding masking. This was a simple count for stores that did and did not ask for masking in each location.

In June 2022, stores in primarily Chinese neighbourhoods were observed for masking rates. One popular Chinese grocery store in Markham and an Italian grocery store, several kilometers away in Vaughan were chosen as comparators. Observation was conducted from locations where people could be seen coming into the store. Patrons were counted as wearing a mask or not as they entered or exited the building. Only one direction was counted to reduce the risk of double counting. Each store was observed for approximately 20 minutes with a target sample size of 50 in each location. If people were masked when they walked through the doors, they were considered masked. If they put on their masks later, it did not get counted.

A commercial district in Chinese communities in Markham and downtown Toronto were surveyed and compared to similar districts in non-Chinese neighbourhoods in Vaughan and downtown Toronto. A typical grocery store in Markham was chosen because it was Chinese, primarily staffed by Chinese speakers, and used Chinese signage. In Vaughan, a store named Fortino's was chosen that was popular in the neighbourhood, particularly among the Italian community. Each area was surveyed for

the number of stores requesting masks verses stores with no mask requests. Empty storefronts were ignored. Additionally, stores were separated into eating verses non-eating establishments (with the understanding that one cannot be masked while eating).

To ensure that this was not simply a coincidence of Markham and Vaughan in which high masking rates might instead be related to the Chinese community, two more locations outside of this study area were chosen as comparators. A popular grocery store in Toronto's downtown Chinatown and another grocery store in a very wealthy and white neighbourhood, known as Yorkville, were also observed. These masking and signage observations were taken approximately two years into the pandemic in June of 2022.

These observations are intended to supplement the data on lower infection rates as lower infection rates do not necessarily correspond to higher rates of masking. The observations were meant to verify whether, in the absence of masking requirements, there would be differences in masking rates in the different communities. The observations were made shortly after Ontario removed all masking mandates. The main purpose of the observation was to confirm that the anecdotal reports of higher rates of masking among the Chinese Canadian communities that serve as the foundation of this study.

Interviews

The demographics of Markham and Vaughan made these two communities particularly appealing to study because of their similar socioeconomics, governance structure, the fact they are in the same regional municipality (following the same COVID-19 protocols) and yet experiences such a large difference in infection rates. This study sought to understand if there are differences in attitudes towards COVID-19 and what impact media or culture might have on it. This study uses qualitative methods to understand subtle differences of the media impact between the two communities. We also believe that “qualitative methods are indispensable for understanding forms of cultural meaning and practical consciousness that are hidden behind large-scale patterns” (Ang, 1991, p. 153). The semi-structured interviews were guided by questions and participants were encouraged to speak freely about issues that crossed their minds.

Using a concept analysis of three interview sets, Rowlands et al., (2016) found that theoretical saturation during qualitative interviews, the point where no new data occurs happens at 27 interviews (99% confidence interval). Baker et al. (2012) also advise a sample size of 30 as it “offers the advantage of penetrating beyond a very small number of people without imposing the hardship of endless data gathering” (Baker et al, 2012, p. 9). Therefore, a target of 30 residents were targeted for interviews in each of Markham and Vaughan for a total target of 60 participants. When Leung et al. (2024) completed a secondary analysis COVID-19 interview data collected by Mamuji et al. in

2020, they found that thematic saturation was found by 36 interviews. A total of 60 qualitative interviews would be sufficient for data saturation.

This research builds upon the work done by Mamuji et al. (2020) when they interviewed Chinese Canadians in the Greater Toronto Area on the impacts that COVID-19 had on them as members of a minority group associated location origins of the disease. Certain trends presented itself within the Chinese Canadian community from that research. Having Markham, a place with a high proportion of Chinese Canadians situated beside Vaughan, a place with a low proportion of Chinese Canadians, but otherwise very similar socioeconomic indicators presented an opportunity to study the cultural and media impacts on COVID-19 behaviours that may account for the lower infection rates reported by public officials. The interview questions and study advertising had received ethics approval before public dissemination and use. Data had been stored in accordance with privacy protocols stipulated by York University in order to protect the privacy of participants. Data will be destroyed after publication of this dissertation. Participants needed to sign a consent form (in Appendix) that stating their consent to be interviewed and recorded and their ability to withdraw from the study at any time.

This study used a mixture of convenience sampling and snowball sampling similar to the method employed by Mamuji et al. (2020). Attempts to recruit on social media platforms were hampered by platform algorithms either filtering out or putting warnings on posts containing COVID-19 information resulting in very low responses.

COVID-19 disinformation was rampant on social media during this time. The original recruitment text was reworded to exclude the word “COVID,” yet still posting on Markham, Vaughan, and York region specific sites yielded only a few respondents. Due to the difficulties of recruiting online, attempts to solicit in person were made at locations in Vaughan and Markham. Study information was distributed outside the Vaughan Metropolitan Centre and emails were collected for follow up. Some participants then recommended family or friends for the study. In Markham, recruitment was done outside of a popular community centre.

After asking a series demographic questions, participants were then asked questions about their media consumption habits, views on COVID-19, and some other categorization questions. This study asked where participants gained information, the types of sources on which they relied, and if they felt they contained biases. This study also asked the types of social media participants used, if any, and if there were major influencers that shaped their opinions. The interview was searching for patterns in media consumption and COVID-19 behaviour. From a more intimate communication perspective, this study also asked participants if there were family and friends that they relied on for information. This study wanted to know how having influencers that they knew in person shaped their opinions and possible COVID-19 behaviours.

The section on COVID-19 views inquired whether participants have had COVID-19, been vaccinated (for this study, the definition of “fully vaccinated” was the two shots mandated in Ontario at the time of study), if they wore masks, continued to wear masks,

and if they had preferences for stores that mandated masking. This study also asked participants if they felt any responsibility for not spreading COVID-19. These questions were designed to assess attitudes toward COVID-19 and what actions people had taken in terms of public health compliance. This study also followed this with a question about their views on the government's handling of COVID-19 and their thoughts about the shutdown. Interview questions are available in the Appendix. Interviews conducted in Chinese were translated into English. Interviews were anonymized and coded using NVIVO. This portion of the research has been approved by York University Office of Research Ethics Certification Number; STU 2022-084 (in appendix).

The findings in this dissertation are based on the observations, which helped inform the questions for the Markham and Vaughan interviews. The media analysis was motivated by the results of the interviews and the conclusions are based on a combination of the interviews and the media comparison findings. The feasibility study using Twitter (X) and International Business Machine's (IBM's) Natural Language Processor (NLP) demonstrates the potential to use machine learning algorithms in emergency communications, but more will need to be done on the next dominant social media platform.

Chapter 4: Observations, participant and demographic information

In an effort to check the consistency of behaviour and the reported rates of masking an observation was conducted. The publicly disclosed infection numbers and the sample observations made in Markham and Vaughan formed the basis for this study. The motivation behind this work is to discover some of the media influences that may have had an impact on these communities that would contribute to the differences in masking rates and infection rates. Once high-traffic locations were selected for the observation, self-selection became a variable in this non-random group, tending to favour women and higher income respondents. There were more people in the under 30 age group in Vaughan, which may have been due to the location outside the transit station, which was unavailable in Markham. In Markham, recruitment was located outside a popular community centre used by a diverse range of people.

Other important impediments to recruitment were restrictions due to the pandemic and pandemic fatigue. The collected data, instead, was an effort to seek saturation, this research qualitatively covers a good range of opinions, though not a statistically representative sample. In terms of ethnic diversity, the sample is somewhat representative of the population in both communities with a large Chinese population in Markham and a sizeable, White and Italian population in Vaughan.

Table 3: Demographic information of participants

	Markham	Vaughan
Age	2	19
<30	10	14
30-39	9	18
40-49	2	3
50-59	3	4
60-69	3	3
>=70	0	0
Income		
<\$50,000	1	3
\$50,000-\$100,000	6	10
\$100,000-\$150,000	9	6
>\$150,000	13	11
Unknown	0	2
Gender		
Female	21	21
Male	8	10
Other	0	2
Ethnicity		
Chinese	16	4
White	3	8
South Asian	6	6
Italian	0	6
Jewish	4	3
Black	1	2
Middle Eastern	2	2
East Asian	1	0
Southeast Asian	2	1
Latino	0	1

The observations of predominantly Chinese vs. non-Chinese communities, two years after the start of the pandemic, the Chinese Canadian community was mostly still masking at higher levels than their non-Chinese counterparts, stores in those communities were more likely to have signage requesting masks despite the official lifting of mask mandates in Ontario. The observational data collected in June 2022 (Table 4: Masking comparison of Markham vs Vaughan Grocery Store on June 2, 2022), indicated that 90% of shoppers at Asian grocery stores continued to mask, despite there being no mandate to do so. In comparison, in a similar, but non-Chinese grocery store, observed shoppers wearing masks were only about 30%. In the same vein, out of non-eateries at a Chinese plaza, 2/3 asked for masks whereas in a similarly sized non-Chinese plaza, only 1/3 of non-eateries asked for masking. Among the participants, they spoke about how their communities did or did not wear masks and this is in line with their observations. It is important to note, self-selection played a role in the willingness to participate and about half in each city wore masks, a much higher rate than observed in Vaughan.

Table 4: Masking comparison of Markham vs Vaughan Grocery Store on June 2, 2022

Markham Community		Vaughan Community	
Freshway Grocery Store		Fortino's Grocery Store	
Mask	Unmasked	Mask	Unmasked
50	5	16	41
91%	9%	28%	72%

Table 5: Comparison of stores requesting masks on June 2, 2022

Markham Plaza		Vaughan Plaza	
Eateries		Eateries	
Mask Requests	No Mask Requests	Mask Requests	No Mask Requests
9	8	0	3
53%	47%	0%	100%
Non-Eateries		Non- Eateries	
Mask Request	No Mask request	Mask Request	No Mask request
13	7	5	10
65%	35%	33%	67%

Note that the two comparator locations in downtown Toronto (Table 5) are much more diverse. Despite being called “Chinatown”, the downtown location does not have the same ethnically Chinese population density as Markham. Both the downtown locations are in Ward 19 of the City of Toronto’s electoral district. And as a ward, it only has 11.1% ethnically Chinese people (Toronto, 2016, p. 22). Nonetheless, the trend is similar. Chinatown saw about 60% masking while Yorkville was around 30% (see Table 7). This points to the Chinese Canadian community as opposed to Markham specifically adopting higher rates of mask wearing.

Table 6: Masking Comparison of Chinese vs Non-Chinese Community in Downtown Toronto June 24, 2022

Chinese Community		Non-Chinese Community	
Lucky Moose		Whole Foods Yorkville	
Mask	Unmasked	Mask	Unmasked
30	20	16	41
60.00%	40.00%	28%	72%

Table 7: Comparison of stores requesting masks on June 24, 2022

Chinatown Area		Yorkville Area	
Mask Requests	No Mask Requests	Mask Requests	No Mask Requests
15	28	5	9
34.88%	65.12%	36%	64%
Non-Eateries		Non- Eateries	
Mask Request	No Mask request	Mask Request	No Mask request
23	7	5	35
76.67%	23.33%	13%	87%

These observations indicate that the Chinese communities in both Markham and Toronto have higher rates of mask use than non-Chinese Chinese communities confirming the anecdotal evidence from the interviews during this time period. The rest of this study builds upon these observations and studies that media may have had on these differences in behaviour.

The observations above coupled with the overall similarities in demographics (Table 8) between Markham and Vaughan form the foundation for this thesis. How two socioeconomically similar side by side communities came to have such differing COVID-19 infection rates.

Table 8: Key demographic comparators between Markham and Vaughan

Statistics Canada (2017)	Markham	Vaughan
Population (Line 4)	328,966	306,233
Average Household Income (Line 754)	113087	133095
Median Age (Line 43)	41.1	40.2
Average Household Size (Line 61)	3.2	3.2
Total Visible Minority Population (Line 1327)	255,155	107,685
Chinese Visible Minority Population (Line 1329)	147,725	20,790
Bachelor's Degree (Line 1711)	54,920 (16.7%)	43,545 (14.2%)
Master's Degree (Line 1714)	16,530 (5.0%)	13,615 (4.4%)
Doctoral Degree (Line 1715)	1,825 (.6%)	1,710 (.6%)
Total Labour Force (Line 1882)	172135	169225
Total Employee (Line 1885)	143110	141155
Total Self Employed (Line 1886)	24180	24775
COVID-19 Infection As of October 6, 2021 (Persico, 2021)	13,000	23,900
Statistics Canada Vaughan and Markham 2017 Datasets		

Chapter 5: Mainstream Media Influences

Media emphasizing what is important to them

Differences in culture flow into how issues like the economy are dealt with, and in turn how media covers those issues. In 1994, James Fallows asked, “what is an economy for?” (Fallows, 1994). He contrasted how the American economy was distinctly different from the Japanese economy in how its rules and people prioritized different actors in the system. In the American system, the consumer was placed first whereas in the Asian system, the producers were most important to the point where consumers willingly paid more, accepted lower standards, and took home lower wages in the name of strengthening the industrial actors – seen as the backbone of their countries and economies (Fallows, 1994). Strong industries and employers are seen as strengthening the state, something valued in Asian societies. It is very natural for all actors within society from workers to politicians to media to take actions that strengthen the overall state players over individuals. This idea that Fallows highlights of putting the collective first in Asian cultures re-emerges when we look at how the COVID-19 coverage differs between two Asian news sources and two local Toronto ones and how that might impact how people respond to the pandemic.

In 2020 when a pandemic started killing people around the world, how newspapers from about the crisis still differed sharply from its Canadian counterparts. This research compared two Toronto based English-language newspapers and two Asian-based Chinese language ones, one in Hong Kong, and one in Taiwan. Although

there are larger and arguably more influential Chinese language outlets in China, they were not included in this analysis because of Chinese censorship rules and the bias that puts into media. The four outlets here were all mentioned by participants in this study. While the differences were less nationalistic than the post WWII era Fallows wrote about, there are still sharp differences in how Asian verses Canadian media covered pandemic issues.

Globe and Mail

The Globe and Mail is Canada's largest circulation newspaper with an estimated access to 20 million Canadians each month (Globelink.ca, n.d.). Its roots can be traced back to 1844 to George Brown founding *The Globe*, which would later be merged with *Mail and Empire* to become *The Globe and Mail* in 1936 (Doyle et al., 2015). In 1999, it launched the successful *Report on Business Television* channel which was later folded into the Bell Canada Enterprises (Doyle et al., 2015). The paper is now owned by Woodbridge Company Ltd, who also owns a majority stake in Thomson Reuters (Doyle et al., 2015). *The Globe and Mail* caters to business decision makers, high income households, and high net worth individuals (Globelink, n.d.). With its coast-to-coast coverage and circulation, *The Globe and Mail* is a well-regarded newspaper in Canada. *The Globe and Mail* also has a strong online presence at theglobeandmail.com which is regularly updated; its Twitter (now X) account is followed by 2 million people as of April 24, 2023 (@globeandmail). *The Globe and Mail* has a large reach earning itself the title as "Canada's newspaper of record" (Fillmore, 2009).

Using the Factiva database operated by the Dow Jones, *The Globe and Mail* showed that it featured 2861 stories containing the word “COVID” or “Coronavirus” in March 2020. Of those, 2052 and 1849 were categorized as being about “Coronavirus” or “outbreaks”. There is clearly an overlap in Factiva’s categorization. More telling is the number of articles categorized into industry. Of the 2861 articles in March 2020, 1109 or roughly 40% were categorized into an industry, with the most belonging to oil and gas (Table 10). April saw 2909 articles featuring “COVID” or “Coronavirus” with 1138 categorized as belonging to industry. These numbers were similar through the summer to July of 2020. The categorization into industry is an indicator that the piece deals with sector specific information, usually on an economic level.

Table 9 Globe and Mail articles containing COVID or Coronavirus

	2020	March	April	May	June	July
Total Articles containing "COVID" or "Coronavirus"		2861	2909	2614	2061	2001
Articles categorized into an Industry		1109	1138	1039	840	787

According to Factiva, the top industry mentioned in conjunction with the keywords “COVID” and “Coronavirus” is the oil and gas sector in the month of March, April, May, and June. In July, the top industry switched to “Real Estate.” Knowing that articles mentioned an industry is insufficient to know whether the COVID-19 article was about the pandemic in relation to COVID-19 such as requiring masks on an oil rig or about the industry in question such as COVID-19 causing a dip in oil prices. A brief headline analysis of the articles was conducted to determine whether they were about

COVID-19 as a mention, in the context of industry, or if it was about the industry that happened to mention the pandemic.

The majority of headlines analyzed were focused on business and economy, specifically mentioning the pandemic's impact on the sector. Five articles were chosen randomly each month in the Factiva database. This was done by selecting a keyword on 5 pages both "COVID" and the top industry identified by Factiva each month. Of the 25 selected headlines of articles containing "COVID" or "Coronavirus" (5 in each month), 13 were about the pandemic's impact on businesses and economy with only 6 about the pandemic itself. Over half of the articles related to COVID-19 were about business and economy in *The Globe and Mail*. This is consistent with the number of articles pertaining to industry. See Figure 1 for most written about industries related to COVID-19 from March – July 2020 according to Factiva.

Globe and Mail Most Mentioned Industries for "COVID"

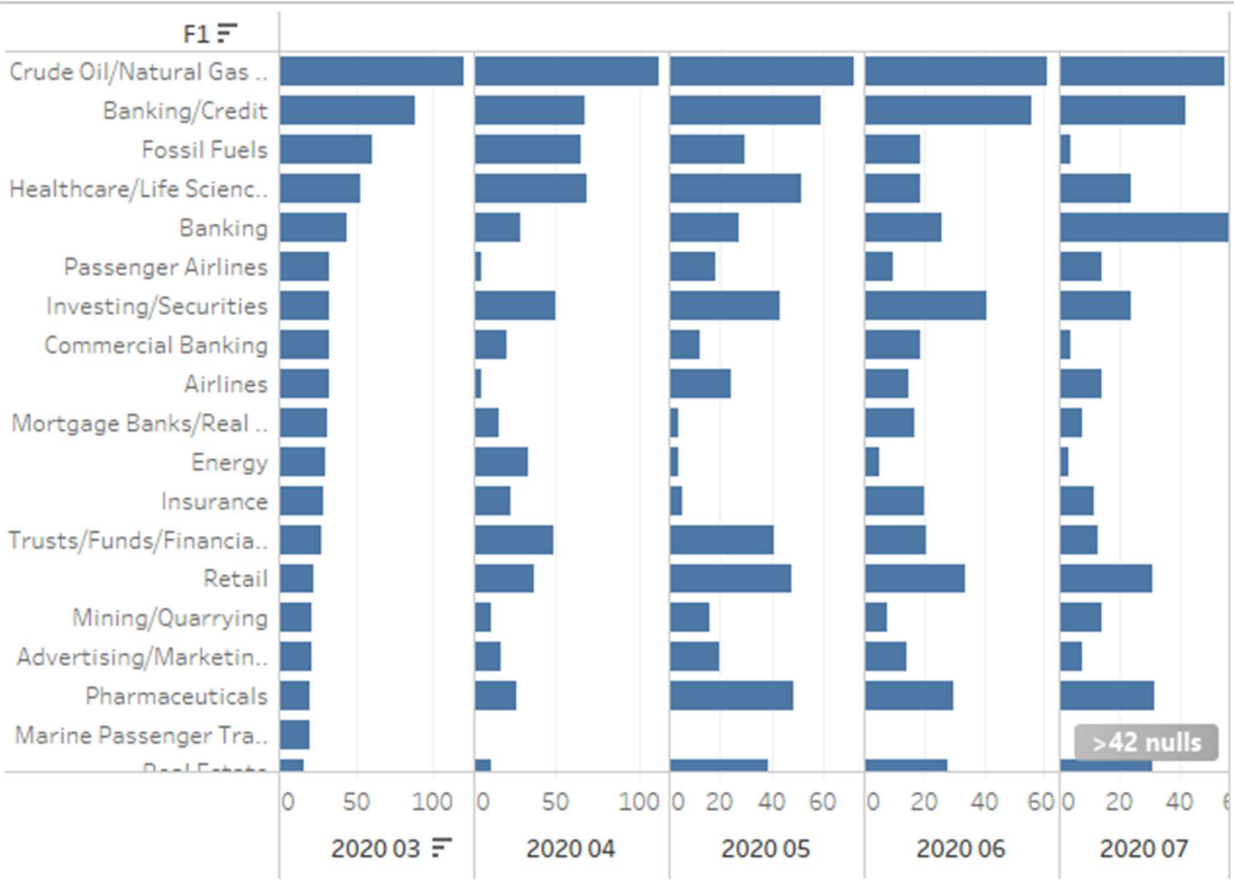


Figure 1: Globe and Mail COVID topics by industry according to Factiva

Using the keyword "oil" within the returned articles, 25 headlines were examined for their topic. Headlines include "For Alberta's oil producers, the red ink is just beginning; The industry has been buffeted by the collapse in demand as COVID-19 pandemic restrictions have driven down economic activity. The big question now is how long this will last" and "Pandemic-fuelled oil crash hastens Europe's flight, but oil sands are

resilient” that talk about the pandemic, but in economic terms. The headlines containing “oil” were not about any health implications of COVID-19 within the oil sector, it was only about economic implications of COVID-19. Out of the 25 headlines that contained the keyword “oil” in March 2020, 23 of the COVID-19 articles were about business and economy. In other words, the articles identified by Factiva as pertaining to industry are largely about business and economy, not COVID-19, despite COVID-19 being the initial search term. What this indicates is that *The Globe and Mail* COVID-19 was more an economic problem to be solved than a public health crisis.

In March of 2020, out of the 2861 articles containing ‘COVID’ or “coronavirus” in *The Globe and Mail* 1109 were categorized by Factiva as pertaining to industry. In comparison, Taiwan’s Liberty newspaper had 3241 articles with the Chinese equivalent of “COVID” and only 409 were categorized by Factiva as pertaining to industry. The ratios in April, May, June, and July of 2020 are similar (see Figures 1,2,4,5 for comparison). *The Globe and Mail*’s readership is largely “high net worth Canadians” (globelink.ca, n.d.) so it might be unsurprising that their articles largely pertain to business and economy.

Globe and Mail Most common subjects for "COVID"

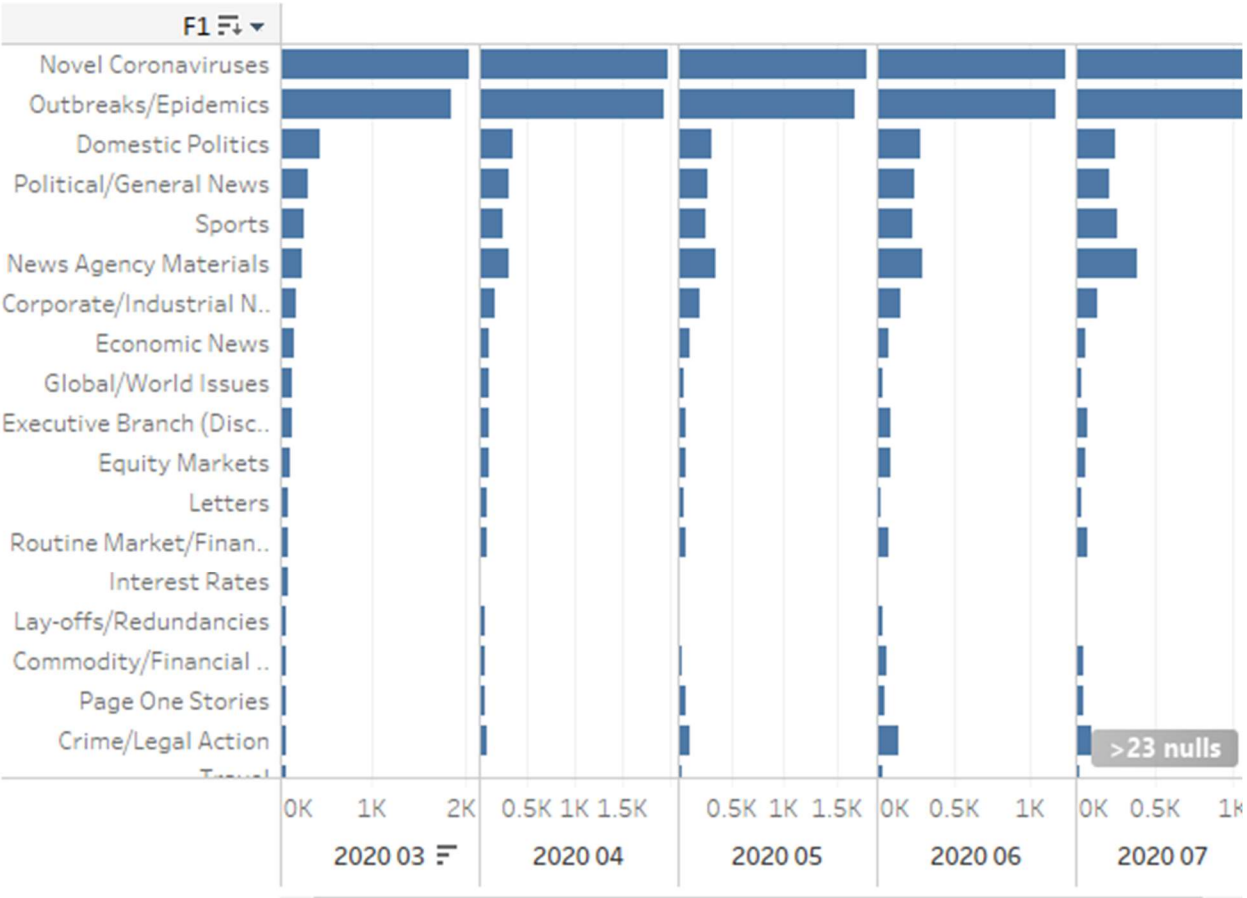


Figure 2: Globe and Mail: COVID articles by topic according to Factiva

The quantitative analysis alone would be unfair without looking at the importance that *The Globe and Mail* put on economic issues over pandemic ones. Using the Wayback machine this study looked at a randomly selected day at the height of the pandemic for all 4 newspapers under analysis. Figure 3 depicts *The Globe and Mail's* March 18, 2020, front page.

In the COVID-19 specific section that dominated the landing page, two of the articles are about the economy. Featured prominently beside it is a section titled “Coronavirus and Business” that features all articles about the economic impact of COVID-19. On the landing page alone, business and economic issues share the same weight as COVID-19, the largest global event in decades since at least WWII. The economically dominated news is featured heavily, lending weight to its importance on the issue. Even in the absence of telling readers what to think, the coverage has a hand in mediating the pandemic by telling the readers what to think about. In this case, it is about the economic impact of the pandemic.

The Ritualization of Business and Economy

For anyone whose primary information source is *The Globe and Mail*, the pandemic was presented as an economic problem first and foremost. In comparison to the other newspapers in this study, issues such as deaths, actions to take, or healthcare problems were not as prominent as the impact of pandemic response measures on economic activity. In the context of agenda setting, this puts the economy at the top of the pandemic agenda, not lives or healthcare itself. Readers of *The Globe and Mail* would naturally center the pandemic around economic terms. No other pandemic-related issue took center stage the same way as economic ones did in volume or article placement.

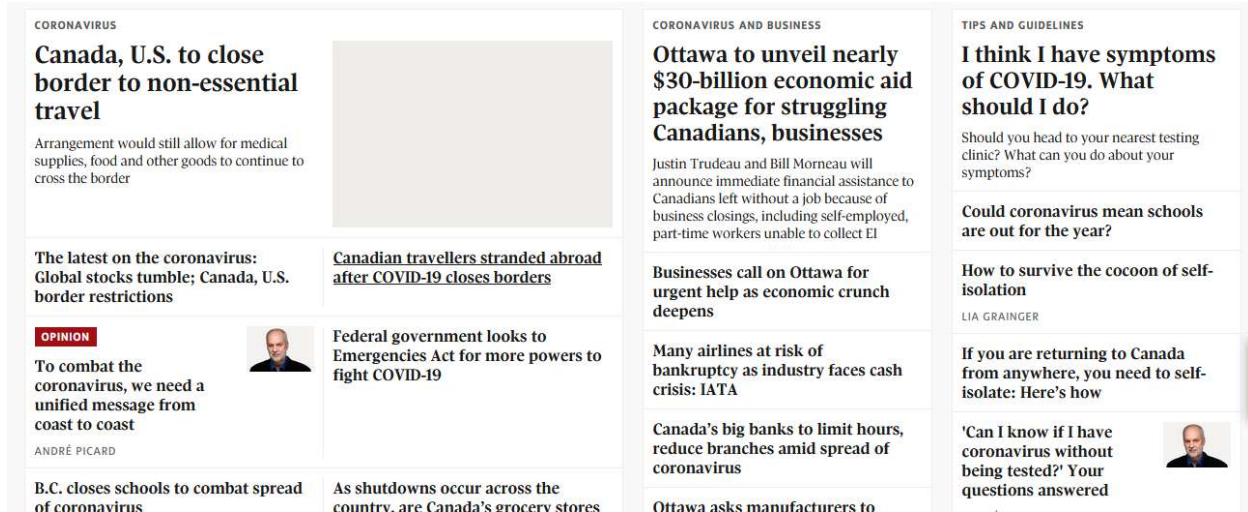


Figure 3 Globe and Mail Online landing Page Sample (March 18, 2020)

Both quantitatively and qualitatively, it is fair to say that *The Globe and Mail* prioritized economic issues over public health ones. This would fall into Slater’s (2007) notion of “reinforcing spirals” – essentially media reinforcing attitudes, beliefs, and identities that already exist. In the case of *The Globe and Mail*, the economy of the nation takes precedence over the health of it. The constant reminders that COVID-19 is causing economic issues makes the economy the most important crisis that needed to be solved during the pandemic.

Toronto Star

The Toronto Star is a Toronto based newspaper with its history dating back to 1892 when Toronto was a city of under 200,000 people and 7 daily newspapers jostled for attention (Toronto Star, n.d.). At the time, *The Evening Star* used the slogan “A paper

for the people” to represent itself as the voice for the working class of society (Toronto Star, n.d.). In 1899, Joseph E. Atkinson would come from *The Globe* and take on the editorial position at *The Toronto Star* and lead it for nearly a half century. To this day, all employees at *The Toronto Star* must still adhere to what are known as the “Atkinson Principles” – principles rooted in social justice, civic engagement, civil liberties, the necessary role of government, and the rights of working people. In the Canadian media landscape, this positions *The Star* on the left of the political spectrum particularly when compared to other national newspapers such as *The Globe and Mail* or *National Post*. *The Toronto Star* boasts an average weekday print readership of 952,000 and an average daily readership of 2.7 million when their online resources are included (Toronto Star, 2019). As of April 24, 2023, *The Toronto Star*’s Twitter account had 1.1 million followers (@TorontoStar). *The Toronto Star*’s online edition has a strong national presence with readership spanning coast to coast with 33.1 million unique page views per month (Toronto Star, 2019). The readership and influence of *The Toronto Star* is large, particularly in the Toronto area.

Looking at the month of March 2020, 3486 articles contained the words “COVID” or “Coronavirus”. Out of that only 651 were judged by Factiva to pertain to a specific industry with Healthcare/Life Science having the most articles at 54 (Table 11). From March until July of 2020, a consistent 20% of articles were categorized by Factiva as being industry specific. *The Toronto Star* had more articles containing the word “COVID”

or “Coronavirus” that was about the pandemic than about the economy when compared to *The Globe and Mail*.

Table 10 Toronto Star articles containing COVID or Coronavirus

Toronto Star Industry Stats	2020	Mar	Apr	May	Jun	Jul
Total Articles containing "COVID" or "Coronavirus"		3486	4492	3700	2872	2776
Articles categorized into an Industry		651	906	751	588	455

In April, May, and June of 2020, the top identified industry for “COVID” related articles in *The Toronto Star* was “Residential care” (Figure 4). This is a departure from *The Globe and Mail* whose top industry for COVID-19 related articles continued to be oil and gas in this period. By July of 2020, the top industry related to COVID-19 became pharmaceuticals as talk about potential vaccines and treatments dominated the news.

Out of the 25 random headlines related to COVID-19 (5 from each month), 11 were explicitly about the pandemic and a further 5 were related to the politics of the pandemic. Only 6 articles in *The Toronto Star* were about business and the economy – roughly half of what *The Globe and Mail* featured. This is consistent with the data from Factiva showing about half as many industry-related articles as *The Globe and Mail*.

Toronto Star "COVID" containing articles by Industry

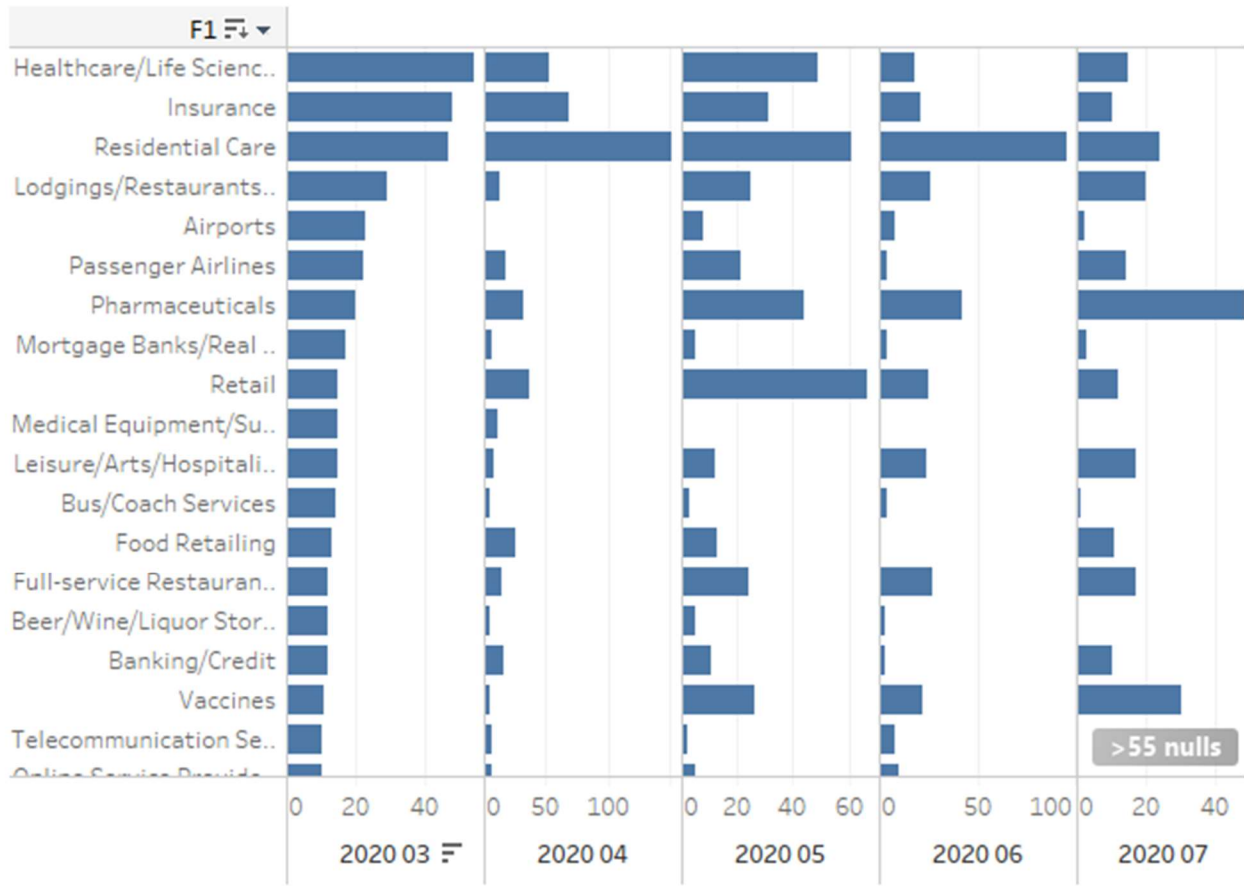


Figure 4: Toronto Star COVID articles by Industry according to Factiva

Based on the top industry keyword from each month, out of the 25 headlines selected, 14 were about the pandemic, despite being categorized as an industry topic. This is likely due to the fact that the top industries were healthcare and vaccines.

[OBJ]

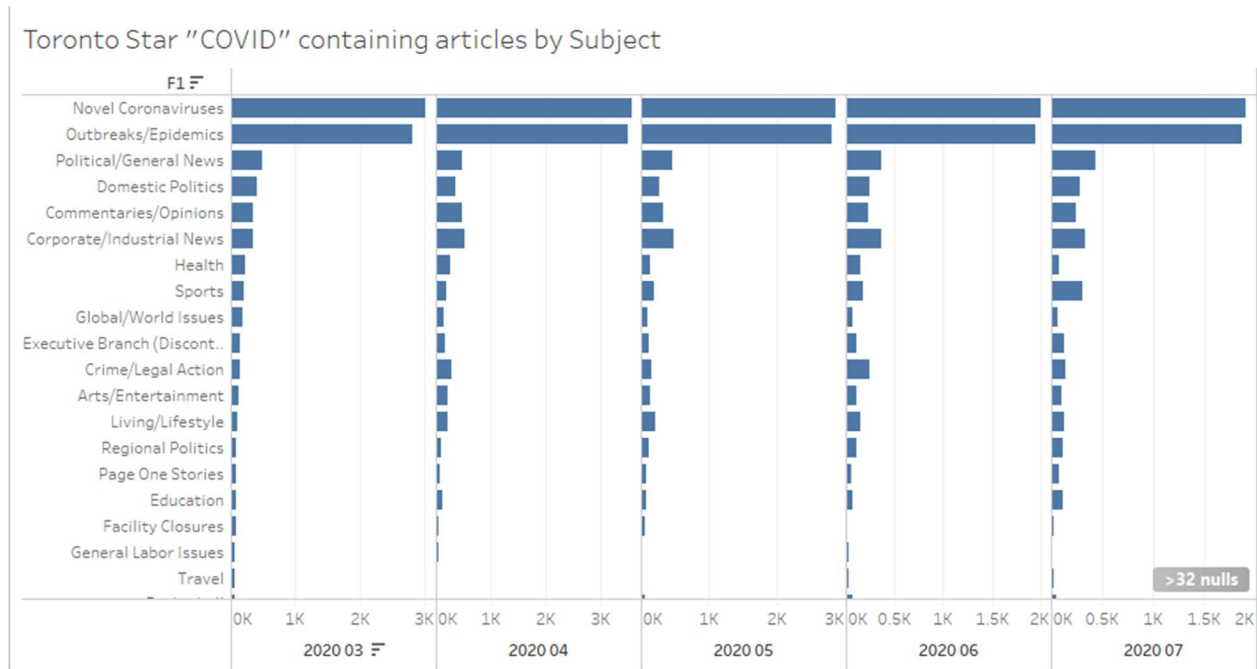


Figure 5: Toronto Star COVID articles by topic according to Factiva

From an Agenda Setting standpoint, *The Toronto Star* prioritized issues such as the pandemic response or nursing homes over economic issues related to COVID-19 due to the prominence and volume of such articles. On the same day as *The Globe and Mail* featured business-related articles about COVID-19, *The Toronto Star* featured an article about NHL players testing positive and alternatives to live entertainment. In relation to *The Globe and Mail*, *The Toronto Star* deprioritized economic issues in favour of human-interest ones.

These two samples are consistent with the overall data showing that the *Globe* heavily biased toward the economic impact of COVID-19 while the *Star* showed more

balance between health and business both from a strictly quantitative analysis and a qualitative one.

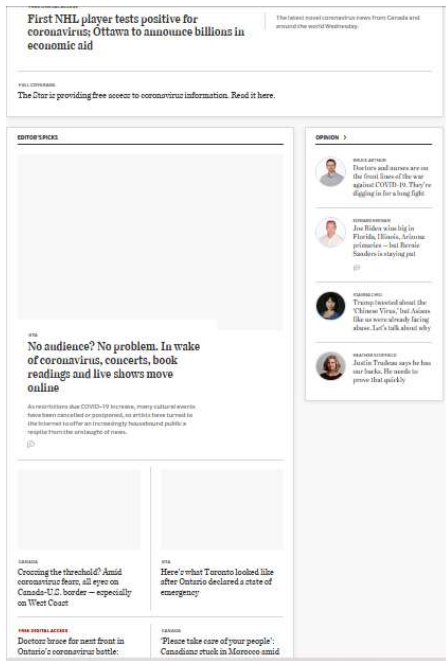


Figure 6: Toronto Star Online Landing Page Sample (March 18, 2020)

Sing Tao

Sing Tao Daily is an international daily newspaper based out of Hong Kong. Founded in 1938, it targets middle class families with a focus on real estate, finance, sports politics, and education (Adintime, n.d.). *Sing Tao Daily* has a circulation of 180,000 copies and over a million daily readers (Adintime, n.d.). *Sing Tao Daily* boasts a plentiful online readership with a dedicated app launched in January of 2022 (Sing Tao,

n.d.). *Sing Tao Daily* has been a strong presence in the Chinese Canadian community as evidenced by the interviews conducted in this study and that by Mamuji et al. (2020).

In March of 2020, *Sing Tao Daily* Hong Kong had 2872 articles related to COVID-19's Chinese equivalent keywords 新冠病毒 or 疫情 or 病毒 (Table 12). Of those, 671 were categorized by Factiva as belonging to industry with real estate as the most discussed subject.

Table 11: *Sing Tao* COVID articles

Sing Tao Industry Stats

	2020	March	April	May	June	July
Total Articles containing "COVID" or "Coronavirus"		2782	2624	2044	1582	2033
Articles categorized into an Industry		671	701	646	454	687

Using the same sample check as the previous papers, *Sing Tao Daily* had approximately 25% of COVID-19 articles related to Business and Economy.

SingTao "COVID" containing articles by Subject

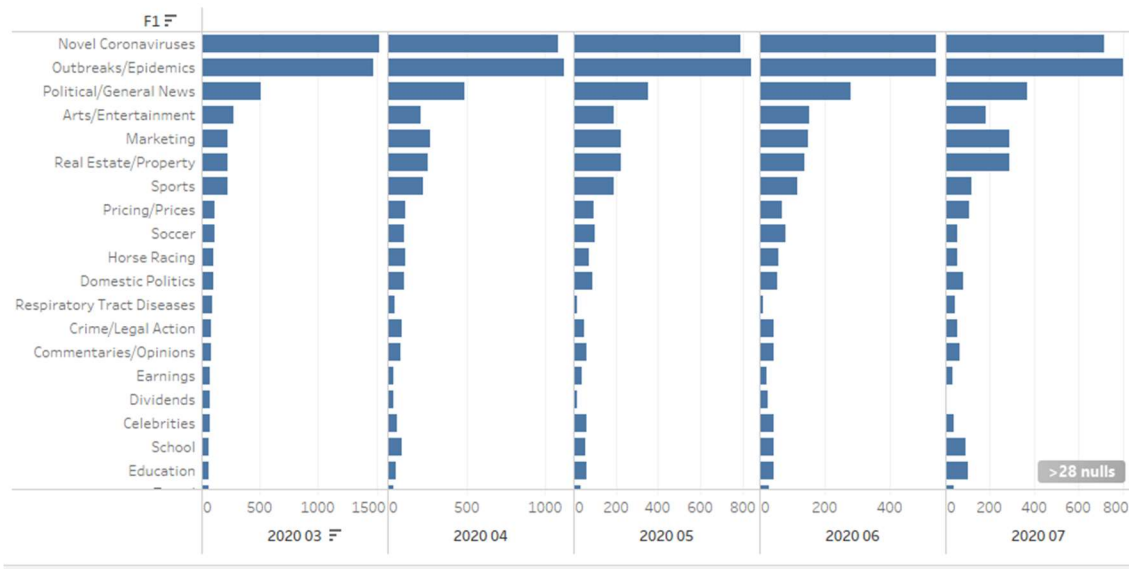


Figure 7: Sing Tao COVID articles by topic according to Factiva

While *The Globe and Mail's* top industry was "oil and gas," *Sing Tao Daily's* top mentioned industry for COVID-19 was real estate. This would be consistent with the leading industries of both countries. Both countries would naturally have news articles centered around their leading industries and COVID-19 would be unavoidable as a topic.

Sing Tao "COVID" containing articles by Industry

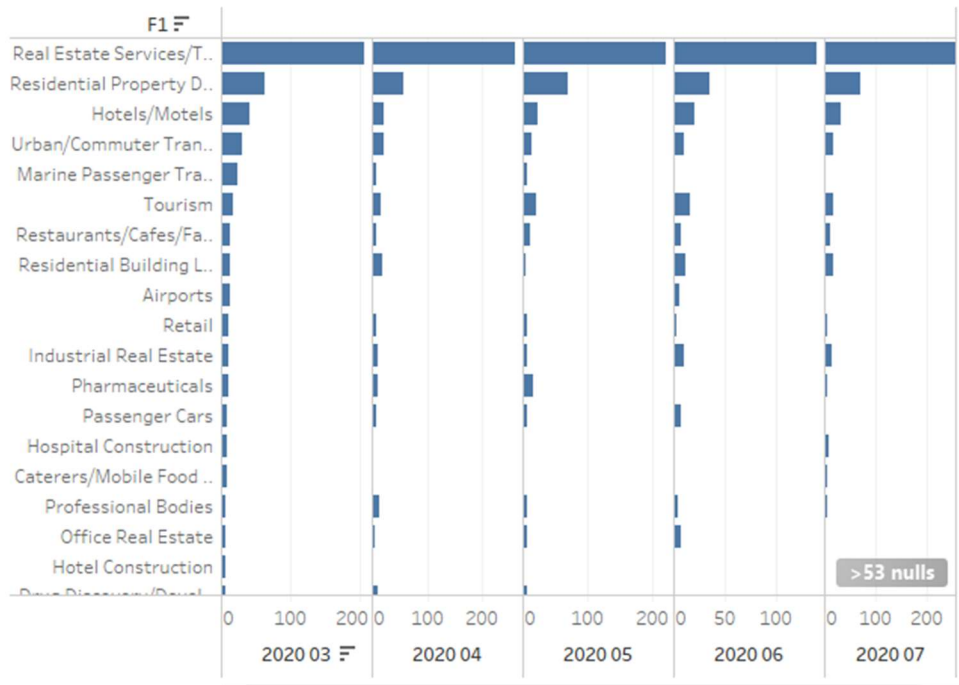


Figure 8: Sing Tao COVID articles containing Industry keywords according to Factiva

Real Estate, Residential property Development, and Hotel/Motels dominated the COVID-19 industry coverage during the period of this study.



Figure 9: Sing Tao Online Landing Page Sample (March 18, 2020)

In the sample headline analysis, health and pandemic related articles combined outnumbered the business/economy ones 2:1 in *Sing Tao Daily*. Though this is a small sampling, it is in line with the larger data from Factiva showing a high number of articles related to the COVID-19 keywords but very few that are industry related. Out of the 25 random COVID-19 headlines, 6 were related to business and economy. This is consistent with Factiva labeling between $\frac{1}{4}$ to $\frac{1}{3}$ of the articles as related to a particular industry.

Despite being a business-oriented newspaper in Hong Kong, *Sing Tao Daily's* landing page also featured only one business and economy article on the first page favouring coverage of COVID-19 instead. *Sing Tao Daily's* coverage of economic issues is quantitatively on par with *The Toronto Star*. The COVID-19 related articles, unlike *The Globe and Mail*, were largely about COVID-19.

Liberty News

Liberty News is Taiwan's most read newspaper with a daily circulation of 714,000 copies (潤利艾克曼公司, 2021). *Liberty News* is a well-respected news source in Taiwan that is considered impartial and tries to live up to its role as the fourth estate (Taiwan Newspaper Association, n.d.). The reason Taiwan's *Liberty News* was chosen to be part of this analysis is because of its relatively large reach within Taiwan and the diaspora community. Despite the large size, Chinese news outlets were not chosen to be part of this analysis because of tight government control over media. Trust in Chinese news outlets in our study group was low. Therefore, *Liberty News* is used as a fair representation for Chinese language media outside of censorship control in China.

In the month of March 2020, *Liberty News* published 3241 articles containing the search terms 新冠病毒 or 疫情 or 病毒. All these terms were used to describe COVID-19 (Table 13). The Chinese language is highly efficient in terms of word use so all of these terms were included in this search. Out of the 3241 articles containing the terms for COVID-19 in March, 409 were categorized by Factiva as belonging to an industry. This represented about 12% of the articles. There was a slight increase going into the summer months, but the number of articles stayed below 20%. Cross checking these statistics with a sample headline check (5 from each month), the figure is consistent with the number of business and economy related articles.

Table 12 Liberty News COVID articles

Liberty News Industry Stats

	2020	March	April	May	June	July
Total Articles containing "COVID" or "Coronavirus"		3241	3172	2365	1698	1321
Articles categorized into an Industry		409	385	361	298	242

Liberty News "COVID" containing articles by Subject

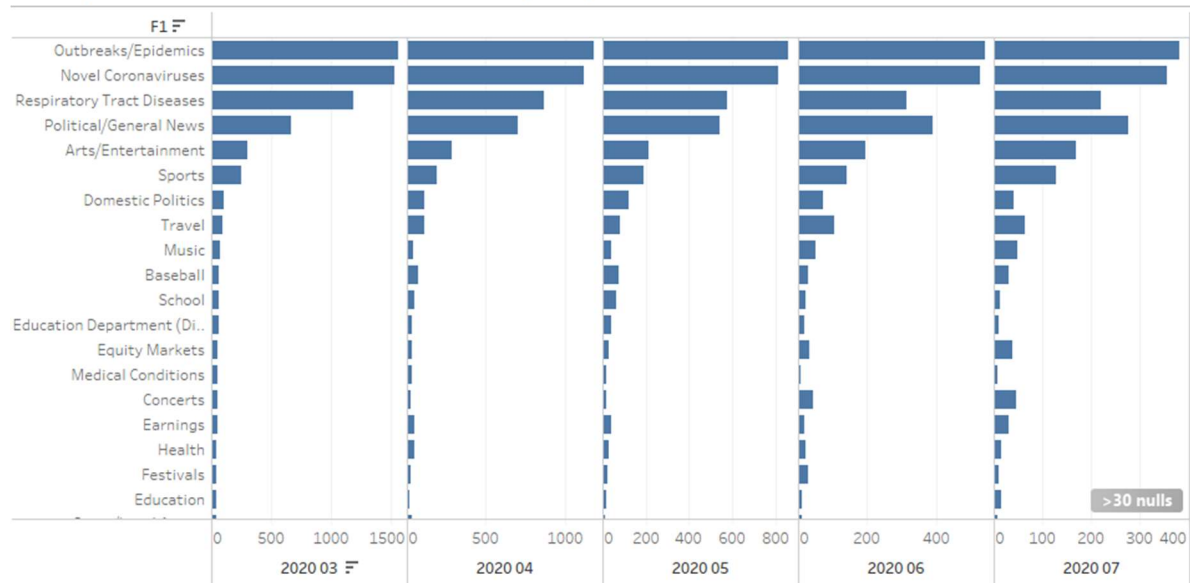


Figure 10: Liberty News COVID-19 articles by topic according to Factiva

Liberty News stands out in this study since they have the greatest number of industry specific articles that are about the pandemic, rather than the economy. The articles may be related to specific industries (Figures 10 and 11) but are largely focused on the health aspects of the pandemic, as opposed to *The Globe and Mail* where the articles may have contained "COVID" as a keyword but was about the economic impact of the pandemic on the sector, not about the health impacts of COVID-19.

Liberty News "COVID" containing articles by Industry

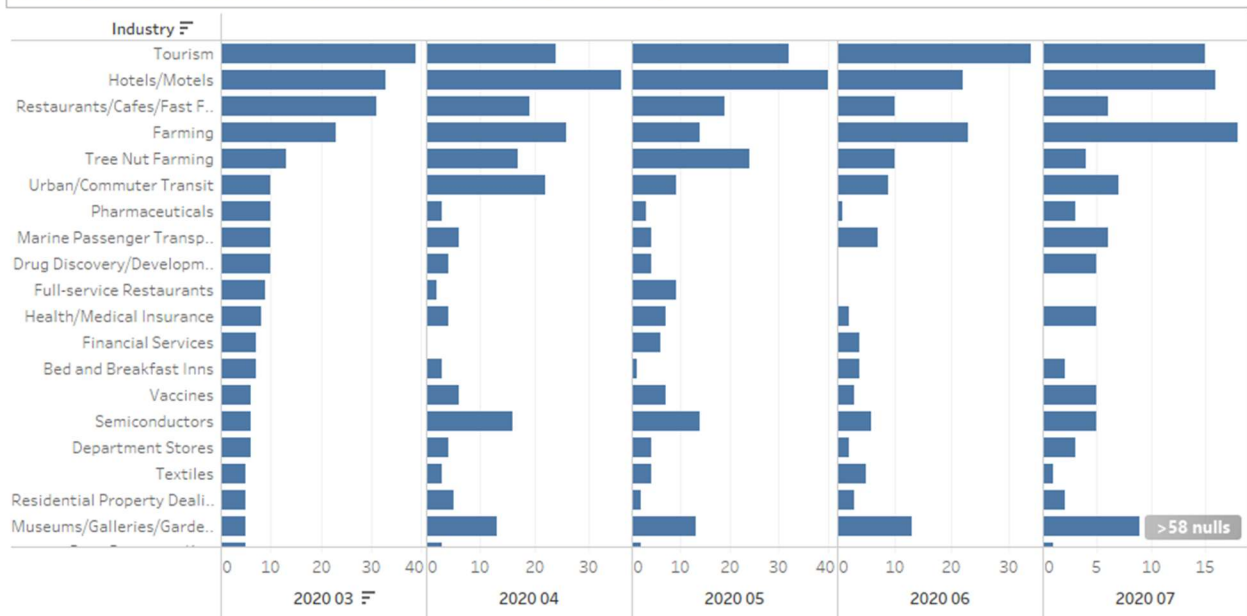


Figure 11: Liberty News COVID-19 articles by Industry according to Factiva

The landing page of Taiwan's *Liberty News* on March 18, 2020, only featured one article related to Business and Economic news. Space was more prominently given to health and political news.

Figure 12 Liberty News Online Landing Page Sample (March 18, 2020)

When comparing *The Globe and Mail* and *Liberty News*, the subtext is very different. In *The Globe and Mail*, COVID-19 is treated as an economic problem first and foremost. In *Liberty News*, COVID-19 is discussed as a health and social problem before economic issues. Out of 2861 articles about COVID-19 in March of 2020 in *The Globe and Mail*, the top industry, oil, and gas, had 120 related articles. In contrast, *Liberty News's* 3241 articles in the same period about COVID-19, the top industry got mentioned only 39 times and a total 409 articles categorized by Factiva as being industry related (Table 13). This suggests that rather than writing about how COVID-19 is impacting industry, *Liberty News's* articles are centered around the disease in and of

itself without an economic context. This would be consistent with the small random sample headline analysis. Out of the 25 random COVID-19 headlines, Taiwan's *Liberty News* featured only 4 business/economy related articles. This is in line with the overall Factiva data with relatively few industry-related articles featuring the keyword "COVID" (which would also include "COVID-19"). Quantitatively, *Liberty News* dealt with COVID-19 issues the most and prioritized health related articles, emphasizing its importance by article placement as well. *Sing Tao Daily* and *The Toronto Star* both fall somewhere in between *Liberty News* and *The Globe and Mail*.

The high levels of masking traveled outside of Asia to the diaspora in Markham. *Sing Tao Daily* and *Liberty News* both discussed COVID-19 in relation to health ritualistically. Whereas *The Globe and Mail's* ritualistic treatment of all issues largely distills down to economic ones. The treatment of COVID-19 in *Liberty News* is the kind of foregrounding that Blue (2019) would want to see happen to science in media. Regardless of the exact issue, simply talking about science and health beyond "special interest" makes it an issue of importance to people in general, which will help with the retention of science related news in general.

Table 13: Summary of Newspaper coverage focus

	Globe and Mail	Toronto Star	Sing Tao	Liberty News
Political Focus	Center Right	Centre Left	Centre Right	Centre Left
Articles Containing keyword	2861	3486	2872	3241
Major Pandemic focus	Impact of pandemic on business issues such as inflation and energy prices	Pandemic impact on health, nursing homes, politics	How businesses cope with pandemic	Health impacts of pandemic.

Table 17 summarizes how the different newspapers framed the pandemic differently. The difference in coverage tone between the two languages and the correlated difference in infection rates points to the media mediation that Koeber (2020) says is “central to establishing our shared meanings” yet is rarely framed so importantly. (Koeber, 2020, p. 494). This study shows that the media is not only reporting the news but plays a central role in what Koeber calls “the very construction of crises” (Koeber, 2020, p. 494). The media has an influence on disease spread itself with how it chooses to report on COVID-19. Media must be cognizant of this impact and how they can save lives.

Chapter 6: Put it on Repeat!

Media mediates not just by the content they publish but simply by how often they repeat something. Repetition is ritual communication. The repetitions stresses importance simply by putting it in front of a reader often. Taking a step back from how COVID-19 was covered by the different newspapers, this chapter addresses a simple quantitative study of how often masking was encouraged by a media outlet and how often it was discouraged and if the higher rate of masking in Markham is related to more promotion of masking in Chinese language media. For the purposes of this discussion, a mask is any face covering that covers the nose and mouth as recommended by Dr. Theresa Tam, Canada's Chief Public Health Officer in November of 2020 (Plana,2020).

Ritualized importance

Building on the ideas of Gwendolyn Blue (2018), foregrounding should be a ritualistic part of science communication – repeated normalization of scientific information that makes people receptive to it when it is important information presented to them. The treatment of masking by *Sing Tao Daily* and *Liberty News* was more than a constant reminder to wear a mask, it created a social standard. It was communicated not just by the words on the page, but by the constant repetition of its importance, like saying a prayer or singing a hymn every week. The Chinese language media was consistent in this promotion of masking right from the start of the pandemic. This consistency, as a form of media mediation, played a role in the Chinese diaspora,

turning to it as a source of information and a conduit for trusting the advice that came from Hong Kong and Taiwan since both places had relatively low pandemic rates compared to Canada. Articles that discussed COVID-19 talked about masking as a matter of course.

The media coverage in Chinese focused on the pandemic not the economy and emphasized the importance of pandemic compliance for health reasons, not economic impacts of the virus. The rates of voluntary compliance to masking measures shows that it was not just mandates and rules that affected them, but this kind of consistent messaging likely had an impact on pandemic views and habits. Media framing is the emphasis of certain values or facts that will push people to think about an issue in a certain way. Political scientist, George Lakoff, calls them “mental structures that shape the way we see the world” (2014, p. xi). Lakoff goes on to describe frames as our “cognitive unconscious” (Lakoff, 2014, p. xii) and what is often known as “common sense” (Lakoff, 2014, p. xii). Entman (1993) describes frames as “call[ing] attention to some aspects of reality while obscuring other elements, which might lead audiences to have different reactions” (p. 55). McCombie, Shaw, and Weaver (2013) describe media framing as the second level of agenda setting in describing its impact on media coverage. They called a frame “a central organizing idea...for making sense of relevant events” (McCombie et al., 2013, p. 6).

In the case of *The Globe and Mail*, according to this analysis, the central organizing idea is the “infinite growth economy” – the need for constant year over year

increases in production and profits. It is the underlying truth to their reporting that goes unquestioned. In the case of their COVID-19 coverage, the constant reference to the economy builds the “cognitive unconscious,” as Lakoff describes it. It becomes common sense that the issue of obvious utmost importance is the economy. Repeatedly linking over half of COVID-19 articles to the economy reinforces the impact that COVID-19 is having on a thing that should be of prime importance. As Entman puts it, this calls attention to the economy, making issues that affect mostly the wealthiest strata of society a collective problem that should concern us all. Organizing COVID-19 around the economy helps readers interpret the pandemic through the lens of the wealthiest among us. Cancelled flights and missed international business meetings, something that impacts only a small fraction of society, are now issues that every wealth class must consider in their COVID-19 response or at least for which they are expected to have sympathy. Even in something like a global pandemic, with millions of deaths around the world, the bulk of their coverage is focused on the economic, not human impacts of the disease.

The Globe and Mail's coverage of COVID-19 is not unique in its ability to frame and set the agenda around wealthy interests. Other examples were noted on social media in June of 2023 when Western media breathlessly covered the sinking of the Titan submersible with 4 billionaires and a researcher on board (BBC News24, 2023; McKinley & Woods, 2023; Ortiz, 2023). *The Globe and Mail* covered this topic 24 times in the month of June 2023 (Found using the keyword “Titan” on Factiva, excluding

unrelated articles). Within days of the Titan's demise, a ship carrying an estimated 700 migrants sank off the coast of Greece. Despite the casualty rate of over 100 times that of the Titan, the incident earned one article (plus one letter to the editor) in *The Globe and Mail* in June of 2023 (Found using the keyword "migrant" on Factiva, excluding unrelated articles) (Globe 2023) . The interests of one class of people are communicated as naturally more important than the other simply by the repetitive coverage. The death of hundreds of migrants is not considered important enough to be newsworthy.

As George Lakoff explains in his brilliantly titled book *Don't think of an elephant* (2014), negative framing is still framing. Any type of coverage of the migrant ship disaster is a reminder of its existence, the existence of drastic inequality and any number of problems in the world. The lack of coverage intimates that this event may best be ignored by *The Globe and Mail's* target audience. The Titan coverage on the other hand normalizes extreme wealth. The analysis shows it is fair to say that *The Globe and Mail* normalizes extreme wealth and centres its coverage over the desire and needs of the upper class of society. This framing is done not just with COVID-19 but on a consistent basis, rendering the frame familiar and repeated in other areas as well. Regular readers of *The Globe and Mail* will naturally have a distorted view of the world centered where the problems and needs of the elites become their own. In the case of COVID-19, economic issues superseded health ones in *The Globe and Mail* and by

extension, to their readers. The focus on economic issues over health ones mediated the COVID-19 response in a manner that negatively impacted masking compliance.

Normalization of wealth is part of the frame building described by Scheufele (1999) and is also part of the media mediation in this crisis that Koerber (2020) feels is under appreciated. These ideologies centered around the importance of economic growth (elite interests) form the basis on which a *Globe and Mail* reader can make sense of the world. The outcomes in the audience are the attitudes and behaviour toward any given issue. On the other hand, normalization of issues such as public health or climate change are not given the same treatment. The ritualization of these other issues will go a long way toward not only building back scientific trust among readers, but also re-prioritizing issue salience.

The importance of economic issues over public health ones was visible in multiple dimensions in Vaughan, where English language media dominated. In interviews with participants from Vaughan, 4 of them said that government COVID-19 regulations were “too much” compared to 0 in Markham. Small businesses were a major concern of lock downs along with vaccine mandates for those who thought regulations were excessive. The major reason for these concerns over regulations was the impact on small businesses. “When they started locking down places and started messing up small businesses again, I decided it was a little too far” [Participant 53, personal communication, 28 March 2023]. Given *The Globe and Mail's* position as Canada's largest circulation newspaper, the influence that it has on the overall English-speaking

population is considerable. This framing of not just COVID-19, but virtually all issues around economic interests would have deep impacts over the world-view of readers. The intense focus on economic issues overshadowing other issues places the economic needs of the corporate class above the basic needs and health needs of the population. This intense focus on economic issues over public health costs lives. The greater infection rates in Vaughan compared to Markham were not a function of wealth, but of behavioural decisions. As will be seen, the population in Markham was heavily influenced by media that promoted the wearing of masks while mainstream Toronto media did not. Corporate media's role in pandemic behaviour deserves to be scrutinized before the next major outbreak. They did not simply report on the pandemic; they mediated it by how they chose to cover it.

Masking Coverage in major Chinese Language vs English media

Given how much more Markham resident, and Chinese Canadians in general masked, it is worth looking into how Chinese language media and English language media may have differed in how masks were covered in the early days of the pandemic. During this time, there was a lot of confusion. The World Health Organization (WHO) did not declare a pandemic until January 30, of 2020, 6 days after Wuhan went into lockdown (WHO, n.d.). Politicians and public officials around the world scrambled to

explain to their citizens what was happening and to help them prepare for what was to come. This put many aspects of crisis communication to the test.

The media cannot alone be blamed for mask reporting as they were indeed following the advice of both the WHO and Canada's Chief Public Health Officer (CPHO) at the time. Despite the WHO's official advice not to mask, public health agencies in Hong Kong, Taiwan, and Mainland China, among other countries were all advising the use of masks during this period and their media faithfully reported it as such. This difference is where we can see the role of media mediation and where technology plays a crucial role in this information dissemination, all impacting the overall infection outcomes. Many research participants from this study have chat groups that are mostly restricted to family and friend circles and the information passes from those who read the news in another language into these chat groups to the rest of the group. Looking at the big picture of how information flows from source to audience, this is another step in the multi-step flow of information and now passes through both political borders and language barriers. Information flow also has an impact on how people respond to a crisis, beyond the policies and laws implemented locally. Based on data collected from observations, interviews with Chinese Canadians, and media analysis, information from Hong Kong seems to have a stronger mediating effect over behaviour than information from domestic sources in the COVID-19 crisis.

Wanting to know the mediating effects of different media, this study looked simply at whether the local English speaking news sources or the Chinese language ones from

abroad more frequently promoted mask wearing during the initial, critical stage of the pandemic. This study examined HKCNA and The Canadian Press as two comparable newswire agencies. This study also compared *The Globe and Mail* and *The Toronto Star* to *Sing Tao Daily* and *Liberty News* for March 2020 as a control check to see if there was consistency between wire agencies and corporate media reporting, using the same methodology of judging whether an article was for or against masking.

Findings indicate that the English language sources had much more negativity towards masking both in absolute terms and as a percentage of articles. Out of all the Chinese language sources, only a single article could be classified as giving negative masking advice while the overwhelming majority were neutral on masks (Table 18).

Table 14 Samples of Asian and English Canadian Coverage

Source	Neg	Neutral	Pos	Total
Sing Tao	0	33	37	70
Liberty News	0	55	24	79
HKCNA	1	147	56	204
Canadian Press	11	84	18	113
Toronto Star	6	10	3	19
Globe and Mail	8	14	5	27

The Chinese language publications overwhelmingly supported people masking during the pandemic. The only article in the search that cast any kind of negativity over the usage of masking was on the 24th of March 2020:

“至於在健身室內佩戴口罩與否，則要視乎健身時的強度而定，中等強度以上如果戴上口罩阻礙呼吸通氣量，容易引致不適或暈眩。在疫情期間，美國運動醫學學會

指出，由於高強度歇力性運動易使免疫力短暫下降，所以抗疫期間進行健身活動，以中等強度較為適合，並建議健身人士作出平衡及調節” (雷雄德, 2020)

Translation -

As for whether to wear a mask in the fitness room, it depends on the intensity of the exercise. If the intensity is above moderate, wearing a mask will hinder breathing and ventilation, which may easily cause discomfort or dizziness. During the epidemic, the American College of Sports Medicine pointed out that since high-intensity intermittent exercise can easily cause a temporary decrease in immunity, moderate intensity fitness activities are more suitable during the anti-epidemic period, and it is recommended that fitness practitioners make balance and adjustments.

Sing Tao Daily's most doubtful coverage of masking in the above paragraph explains that while doing high intensity workouts, athletes may feel dizzy as masks do indeed impede airflow. However, their solution is to tell people to moderate their workouts, not forego the mask. The mask is centered as something that is non-negotiable. Workouts can be modified to accommodate the mask, not choosing whether or not to mask based on one's workout regimen.

On the 20th of March, in *Sing Tao Daily's* entertainment news article talks about actress Selena Lee's attempts to return to Hong Kong. Lee is a Hong Kong born actress who holds Canadian citizenship. Explicitly, Lee criticizes Canadians for not wearing masks in public.

“李施嬅在加拿大拍劇，惟當地劇組因疫情以致暫時停工，施嬅卻撲不到機票返港，唯有滯留當地，她繼續在社交網透露現況報平安，前晚還上載自己在加國街頭的自拍片段，表示仍努力撲機票返港，坦言在香港家居隔離比較開心。她又指加拿大沒人戴口罩出街” (Sing Tao, 2020B)

Translation

Lee Sze-Wah is filming a drama in Canada, but the local crew has temporarily suspended production due to the epidemic. However, Sze-Wah could not find a flight ticket to return to Hong Kong, so she had to stay in the country. She continued to reveal her current situation on social media and reported that she was safe. The night before, she uploaded a video of herself in Canada. In the self-portraits on the streets of Canada, she said that she was still trying to save money for air tickets to return to Hong Kong and admitted that she was happier in isolation at home in Hong Kong. She also pointed out that no one in Canada wears a mask when going out on the streets.

Lee's hardship of finding a mask is one of the reasons she feels unsafe and wants to return to Hong Kong. In addition, since people are not wearing a mask, this makes her even more at risk and she would rather take her chances in a dense city like Hong Kong than in an unmasked one. Masking is written about as though it is an obvious solution and those who do not adopt mask wearing are strange outliers. This article implies that

not wearing masks is a bizarre habit fraught with risks and is a behaviour looked down upon.

When comparing *The Globe and Mail* to *Sing Tao Daily*, the tone toward masking is distinctly different. *Sing Tao Daily* refers to masks in a manner that is very matter of fact. For example, this line from March 1

“將隨准考證按每位考生考試日數派發口罩” (Translation: Face masks are distributed to every student). (Sing Tao, 2020c).

At no point does the coverage express doubt over the utility of masks. Handing out masks, using masks and making masks are part of coverage as though masking is a natural state of affairs. Contrasting that to *The Globe and Mail*, on March 5, 2020 Andre Picard, a well-known health writer, published a piece about the utility of face masks and how they are one sided in nature. On the 14th of March 2020 in a piece titled “How to talk to kids about coronavirus; Start by gauging what they know about the virus and what they’ve heard at school or from friends” (*Globe and Mail*, 2020) the advice is given not to wear face masks unless explicitly told to or have special circumstances requiring one.

Q&A

'Who do masks protect: the wearer or other people?' André Picard answers your questions on face masks and more

Masks principally protect other people, not the wearer. As the saying goes: "Your mask protects me, my mask protects you."

ANDRÉ PICARD >

PUBLISHED MARCH 5, 2020

UPDATED JULY 2, 2020

Figure 13: Screen capture of Globe and Mail Andre Picard on Masks July 2, 2020

The Globe and Mail already got Canadians to think about masking in terms of being sick, doing it for the sake of others, not about yourself (as seen in the headline in Figure 13), and something that is unnecessary. These sentiments were not shared by *Sing Tao Daily*. Those who read turned to *Sing Tao Daily* for information (as some members of the Chinese Canadian community did), would be expected to have an entirely different attitude towards masking than those who turned to *The Globe and Mail*. *Sing Tao Daily*, in fact, mocked Canadians for not wearing masks (as Selena Lee did). In the early stages of the pandemic, little was known about the virus and people relied on news agencies for accurate information. In the end, the world turned to masking as a strong preventative measure, but the tone was already set before the protocol was recommended. Even after public health officials officially changed advice in Canada, *The Globe and Mail* continued to question masking with information such as "The public needs to understand as well that mask-wearing can prevent them from infecting others

more than it can protect the wearer from infection” in a column by Andre Picard on April 7th, 2020 (Picard, 2020).

The difference in coverage of masking was quite stark from both a quantitative and qualitative perspective. In terms of quantity, the Chinese language media talked about masking and health issues far more frequently when compared to their English language Canadian counterparts. In the context of Markham and Vaughan where Markham has a large Chinese speaking population that consumes Chinese language media, the effects are visible in the voluntary masking rates observed 2 years into the pandemic after the removal of masking mandates. As Blue (2019) suggests, this is the kind of ritualistic foregrounding that prepares people to receive scientific information.

The Chinese language media examined in this study was consistent in promoting mask wearing, never sowed doubt about the efficacy of masking, and perhaps most importantly, prioritized public health over economic issues in their coverage. The repetitive nature signals not only the importance and salience of the issue, but the trust that various writers put into the topic. The emphasis of the different papers can partially explain why participants in Vaughan expressed concerns about too much government action harming businesses while participants in Markham largely expressed concerns about the inadequate government response. Putting the masking message on repeat was form of media mediation that impacted pandemic response behaviour. The repetitive messaging about mask wearing is a form of media mediation that, in the case of the Chinese community in Markham, correlated to higher levels of mask wearing.

Trust in Mainstream Media

Whether or not media's influence has an effect on behaviour also has a lot to do with whether or not people trust the information sources that they are reading. There was not a large difference between Markham and Vaughan when participants were asked to rate their trust in the media on a scale of 1 to 10. Vaughan averaged 7.0 while Markham averaged 7.5. We know from the literature that distrust in media and authorities will lead to higher rates of noncompliance (Pak et al., 2021; Saechang et al., 2021; Siegrist & Zingg, 2014) so while this finding is in line with the general trend, it would not necessarily explain the large difference in COVID-19 infection rates. The lack of difference in their trust ratings in the media they consumed indicates that the influence of the media consumed in each community would be relatively consistent. Therefore, the findings from the media comparison would be consistent with the trust findings in the community. Relative trust is about the same, so the larger factor is the information within the media that is consumed.

While recruiting participants, there were several people who did not believe that COVID-19 existed and rated trust in media as a 0 when asked (only one of these participants were included in this study because of the lack of complete information and not all living in Vaughan). There is a stark culture difference between Vaughan and Markham observable on the streets. In Markham, fewer people did not wear masks and many said they felt uncomfortable to be in public spaces without a mask because of that culture.

Trust in the media can be influenced by many factors and is not necessarily an indicator of lack of belief in COVID-19. In the Chinese Canadian community, this is highly influenced by the experience of living somewhere where the stark differences between having a free press, such as in Taiwan and previously Hong Kong, and somewhere that does not, like China. Particularly in for those from Hong Kong, in recent years had to witness liberties get curtailed, watching news organizations get raided (Davidson, 2021), and having draconian laws being passed to limit freedom of speech (BBC News, 2020b), there is a skepticism in Chinese news, that has a rub off effect on their perception of Canadian media. Participant 60 said “I’m exposed to Chinese media – aware of censorship. Makes me think if Canadian government news is censored or not. Makes me skeptical. I always want to do my own research” (Participant 60, personal communication, 21 Apr 2023). This skepticism may have been helpful in this case as the advice from the government changed from asking Canadians not to wear a mask to recommending wearing a mask (CBC, 2020). Uncertainty from the changing advice may have created a skepticism in the government combined with the news sources in Asia to contribute to a higher level of masking.

For the most part, participants from both Markham and Vaughan expressed they still had faith in Canadian media. The larger differential in this skepticism of news is between age groups. Nearly 85% of participants under 40 felt that there was bias in their media sources whereas about 75% of participants over 40 perceived biases. Part of the bias is certainly the news source as younger people are more likely to get their

news from social media and other difficult to verify places. However, there is also more skepticism from this age group about mainstream media sources generally.

Ironically, the exposure to social media (and likely education about being aware of fake news on the internet) has made the younger generation more aware of bias from mainstream news. Participant 17 pointed to bias because corporate news has a corporate agenda. "There's definitely biases - feel like sometimes the reporters or producers have an agenda. Coming from their perspective as well. Their perspective is diff, doesn't mean it's wrong. But there is bias" (Participant 17, personal communication, 9 Dec 2022). One participant shared her notes from a high school class about how to spot fake news and look for biases. It was the older population that was more likely to explain that social media would have biases, but not mainstream news. Participant 34 said "some sources are more trustworthy than others. Television and radio are the most trustworthy. They are from known reporting sources. Social media is a bit unknown so less for social media, a 6 for them" (Participant 34, personal communication, 30 January 2023). When asked "do you feel there are biases in your media sources?" Participant 34 said "In Social Media yes, not so much in Radio or on TV" (Participant 34, personal communication, 30 January 2023).

This type of response was quite common during this study. There is a belief that news media provides unbiased information with very little understanding or deeper analysis about how the consumption of news media affects their world views. The fish in water analogy from Marshall McLuhan would be most appropriate to describe this trust.

There is simply a lack of any other environment to perceive media any differently. This, however, was not universal.

Participants who were immigrants were also more likely to perceive bias based on life experiences, particularly those from China or Hong Kong. Nearly 90% of participants from Hong Kong or China said they perceived bias in news media compared to about 75% of non-Chinese respondents in this study. “For example, BBC, I’ve always been listening to BBC my whole life. Recently, [they are] extremely biased. We only hear negative news from their aspect, when it isn’t going the way it planned. Even in India it is state run we only get to hear what is good about what is happening” (Participant 22, 12 December 2022).

Racism directly affected participant 22 who was very aware of other forms of media bias as a result of seeing the bias in the reporting on their own community. The perceived bias likely comes from seeing multiple forms of media from different countries and seeing how differently news can be reported. The findings in the media comparison are a small example of how that bias can look for a topic that was, at the time, fairly universal – the pandemic. The exposure to other sources of news and perspectives alone alerts one to inherent biases even if the reporters are doing their best to be objective. This awareness of bias was more prevalent in participants who were immigrants. These perceived biases in the news media erode the trust that Ladd (2012) and Warren (1999) believe is an important part of a functional society. They believe that people have to have faith in the information that they are receiving. Because the

Chinese Canadian community is acutely aware of censorship and see how news differs between places like China and Taiwan, they are very sensitive to media bias that could ultimately impact the trust that they put in the information that they get, even from Canadian sources.

When put into the context of the differences in coverage between the Toronto based English language newspapers and Chinese language newspapers from Hong Kong and Taiwan, it is not difficult to understand why the Chinese Canadian Community reacted to the pandemic with skepticism toward the Canadian response. Economic coverage dominated *The Globe and Mail's* coverage of the pandemic and was strongly represented in *The Toronto Star's* coverage as well. Putting economic issues at the forefront set the tone for what was important – money, not lives. The coverage in Western media also stereotyped masked Asians as the face of COVID-19 (Choi & Lee, 2021) making them uncomfortable reads for the community. The Chinese Canadian community has good reason to turn to foreign sources of information, not only to avoid racist reporting, but to find health information that newspapers in Toronto were not covering in favour of economic news. People wanted to know what they were missing beyond inflation figures and oil prices so turned to other sources, and, as a result, followed the public health advice from other regions. In the future, Public Health officials must be aware of the impact of foreign media on diasporic communities and how this adds to the difficulty of reaching these communities. Many communities could be getting information that is different from the official government information distributed

domestically. Public Health should also be aware of how local newspaper coverage focused on economic issues could undermine their efforts to get a future pandemic under control. Despite these findings, participants had lower perceptions of bias among corporate and mainstream news sources than they did other sources of information. “I think that it’s impossible to remove bias but places like *The Globe and Mail*, *CP 24* will try to give you information with as little bias as possible” (Participant 36, personal communication, 21 Feb 2023).³

Corporate media enjoys a very good reputation for the most part amongst participants in the study. Though some people, particularly newer immigrants to Canada do perceive bias, many do not see this bias despite the evidence from the media study. The good news is that younger participants were more likely to perceive bias in their media sources. When asked if there were biases in his media sources, Participant 17 said: “There are definitely biases. I feel like sometimes the reporters or producers have an agenda coming from their perspective as well. Their perspective is different, does not mean it is wrong. But there is bias” (Participant 17, personal communication, 9 December 2022).

Not everyone perceives the bias of corporate news media, particularly if they have limited exposure to other news sources or have taken for granted the information

³ Please note that going forward; to avoid over interpreting and misinterpreting participants, quotes have not been edited and may contain grammatical errors.

that they receive to be true. Even if information is true, as participant seventeen pointed out, the perspective could be different, something not universally appreciated. The coverage in *The Globe and Mail*, in particular, is concerning given its vast reach across Canada. This bias for the economic over health impacts of COVID-19 likely influenced people's attitudes toward the disease, minimizing its health effects. Exposure to multiple sources of information and multiple viewpoints regarding COVID-19 and mask wearing had a positive role to play in the heavily Chinese population of Markham. Ladd (2012) was correct in saying that having a vast array of media choice is better for people when they can make good decisions about what information to accept or reject. However, it is still concerning that many participants, particularly the older generation interviewed did not express any feelings of bias from their information sources and accepted it at face value. In the case of COVID-19 in Markham, distrust of news and having a wide array of news sources resulted in higher levels of masking.

Chapter 7: Social Media and the Influence of Technology

At the start of the COVID-19 pandemic, Twitter usage increased as people turned to social media platforms to find information about the rapidly spreading disease.

Accounts like the World Health Organizations gained large followings during the early days of the pandemic (Johnson, 2020). Institutions such as the US Centres for Disease Control, The World Health Organization and people such as Canada's Chief Public Health Officer (CPHO) all had Twitter accounts that grew large followings during the pandemic. Twitter saw record growth during the pandemic (Johnson, 2020) as people flocked to the site for information. Checking Twitter for information became its own ritual of sorts. This chapter explores how social media can mediate a pandemic and the tools that communicators can potentially employ to achieve better compliance.

During the pandemic, many people found out about the shutdowns and mask mandates through Twitter (now X) before it was available on more traditional news sources. Some of this came via journalists, but many times from institutional or political twitter accounts. Twitter's influence is undeniable and its reach formidable. Twitter is not only a tool used by journalists and politicians to disseminate information, but it can also influence users in other directions as well. Exposure to Twitter has been shown to impact journalistic practices which then influence wider, mainstream news coverage (McGregor, & Molyneux, 2020). However, unlike traditional media sources which merely disseminate information, Twitter is an interactive site that allows users to respond to posts. Users can either respond directly to Tweets or post new ones on the topic. If this

data is harvested, it could become a valuable source of information on how the public is responding to pandemic policies in close to real time. This backward and forward nature of Twitter allows a look at what multi-step flow of communication looks like in an online world. Beyond the original multi-step flow of communication model, contemporary communication should consider how audience changes between the online and offline world and the impact that this has on crisis response. Understanding how information flows with new digital technology tools available to us helps us understand how social media influences pandemic behaviour. It is also important to keep in mind that social media is not the only peer-to-peer information sharing tool available. People have small family and friend chat groups that proved influential and also had a hand in stopping disinformation.

The one step flow of communication from content generators to readers is like a hypodermic needle where information is blasted out from a single location and absorbed by the public from whatever initial source that may have been whether it is mass media like television or historically, the town crier (Bennett and Manheim, 2006). During the 1940 U.S Presidential election, Paul Lazarsfeld, Bernard Berelson, and Hazel Gaudet studied how people were influenced to vote. To their surprise, the mass media had a less immediate effect than was expected. They then hypothesized that mass media was first consumed by what they called “opinion leaders” and then spread to others who may not consume media as much as “opinion followers”. The implication of this is that, for

most people, information is first read and interpreted by opinion leaders before it reaches them.

Katz's looked further into this theory by reviewing four studies on this topic. He found that influence tended to stay within homogenous social groups. The idea that the upper classes had influence over the lower classes only held true for political issues, and not things like fashion or movies (Katz, 1957). In 1976, Robinson criticized the two-step model as being overly simplistic. The media, the original source of information, was simple enough, but the influencers and particularly the receivers were a murky, ill-defined group. Robinson said that "some 68 percent of opinion givers also received opinions, compared to only a 26% receiving rate among those who had not given opinions" (Robinson, 1976, p. 311). In other words, there was a strong overlap between those who gave and those who received opinions and it was not as clear-cut as the original two-step model suggested. There is significant back and forth of opinion sharing and is better conceptualized using a multi flow and even multidirectional model.

Looking beyond the class structure that Katz studied, Weiman (1982) viewed the two-step model from the perspective of marginalized people. There are those in in group and out groups. Weiman writes that "the original Two-Step model, modified into the multi-step model, should include the distinction between intragroup flow and intergroup flow" (Weiman, 1982, p. 771). Weiman postulates that between groups there is a lot of horizontal cross flow of information between receivers, not just influencers. Personal ties mean that there is also an upward flow of information. The two-step model

needs to be thought of not just in terms of influencers and receivers; it also includes the bidirectionality of information flows. Studying the issue further, Deutschmann & Danielson (1960) found that people discussed news with each other but this does not necessarily imply that their initial source of information came from the people they discussed it with. Even if the information flow is, as Lazarsfeld predicted as a two-step outward flow, this adding, subtracting and confirming of information has an impact on opinion.

It is important to note that the two-step flow model was originally formulated in an era before television and the internet. The two-step flow fell under heavy criticism and eventually completely out of favour partly due to a lack of empirical evidence (Choi, 2015). As technology develops, new communication media are framed by a different flow of communication than originally envisioned. With new technologies come new opportunities to once again study the intricacies of and revise the two-step model of communication. In 2012, Stansberry studied the online networks of young cancer patients and found that none of the one step, two step, or multi-step models accurately described how information flowed in their online communities. Unlike previous studies, newer multi-step flow theory research can make use of a trove a data that previously did not exist thanks to massive social media networks. The models privileged mass media and information as coming from a centralized source. In her research, she found that information took a more networked approach in distribution and none of the traditional information flow models worked in this case. The online cancer community is a very

niche community of people looking for something specific to their needs, which is unlikely to be the same in other, less specialized communities.

What could not be studied in the real world in the latter half of the 20th century takes on a different tone in the 21st century in the online world. Sujin Choi (2015) looked at the Twitter habits of two well defined political groups in South Korea. Using the information flows on Twitter, Choi empirically tested the two-step flow hypothesis. By mapping the information flow within these groups, Choi identified distinct opinion leaders who accounted for most discussions from a top-down flow and user to user flow. An interesting finding of Choi's is that opinion leaders not only disseminated information outward but mentioned other users to engage non-opinion leaders. Successful engagements created an upward flow of information, reinforcing Weinman's earlier theory of upward information flows within the two-step model. The distinct information flow patterns confirmed the presence of two step information flow in the virtual world along with its bidirectional flow patterns.

Su has a different opinion on the two-step flow of information in the internet age. Su studied the two-step flow model using data collected from Weibo, China's microblogging service (Su, 2019). Su thinks that, far from leading opinions, opinion leaders generally reinforced the opinions of what is happening on social media. Interestingly, Su says that "opinion leaders are relatively effective at reinforcing the Weibo community's subjective assessment (e.g., attitudes and emotional responses) of the Tianjin explosion, but have no effect changing the community's objective

assessment of who is at fault” (Su, 2019, p. 509). At least when it comes to social media, Su says that opinion leaders are better at galvanizing the community’s opinion than they are at meaningfully changing opinions. Setting opinions still requires other actors and mediators.

Katz (1957) found that opinion leaders had high incidences of being those who travelled out of town for work and were high consumers of media. Using Twitter (X) as a study medium, Choi (2015) found that opinion leaders had high frequencies of hyperlinks and were frequent tweeters. These are similar characteristics between the virtual and real world. In both the virtual and online world, opinion leaders were not the same as content creators. In the original two step model opinion leaders were not those who created news and information; this also held true in the virtual world. Opinion leaders galvanized opinions created by content creators.

In the time since Stanberry and Choi’s work, communication tools have evolved as have information flows. By 2020, when the pandemic hit most of the world, the smart phone saturation in Canada hit an estimated 31.38 million people (Statista, 2023) out of 38 million Canadians; over 80% of Canadians had a smart phone. In communities like Markham and Vaughan that have above average incomes, the expected penetration rate would be higher. In the early days of the internet, when young people were hogging the family phone lines to get onto chat groups, we were happy to find other fellow early adopters of technology and were quite happy to talk to anyone. By 2020, this is no longer the case as even grandmothers share their cookie recipes on YouTube and use

technology to talk to grandkids. Even since Choi's work in 2015, those who use the internet have expanded, changing how online spaces are used. These online spaces are not restricted to social media as more and more people create private online spaces consisting of small, intimate groups. While social media still dominates public online spaces for information and idea sharing, private chat groups have become very important and influential factors in information dissemination. In both Stanberry and Choi's models, it is assumed that the person receiving the information from the various platforms is the end user. By using interviews, this study looks at the interface between the online and offline world in terms of how information travelled in the diasporic community.

It is so loud in here, what did you say?

Despite the consolidation of the news industry in Canada in the early 2000s, leaving fewer news outlets operating (Sparks et al., 2006), Canadians in 2020 faced more choice than ever in terms of where to get news from thanks to technological advances. Though there may be fewer outlets locally producing news, people can access news from abroad very easily. The format they choose to access news in can vary as well. Some people still use traditional means like newspapers and radio, but many people have turned to social media, web browsers or search engine news feeds. There are so many media options, it becomes hard to distinguish the signal from the noise. Tables 19 and 20 list the various media that participants in this study listed as

sources of information, the different media platforms and content generators they use.

The information overload is particularly difficult for the younger generation that depends on a plethora of online platforms that provide more information than they can process.

Table 15: List of Media platforms used by participants

Media platforms used as reported by participants
Google News
Instagram
Tik Tok
Reddit
Rumble
Bitchute
Youtube
Facebook
Twitter
Private Subscriptions
Microsoft News
Linked In

Table 16: List of Media sources used by participants

Media sources used as reported by participants
CP24
Newstalk 1010
CTV
CNN
City TV
Global
Economist
BBC
CBC
Italian News

York Region News
6 Buzz
AM 680
Toronto Star
National Post
Sing Tao
Ming Pao
51.ca
NOW News
Breakfast TV
Financial Times
Washington Post
NYT
Globe and Mail
Global News
Liberty News

Asking participants how they get their information, there was not much difference between Markham and Vaughan overall but there was a noticeable difference between younger and older participants. Participants under age 40 tended to rely less on media formats such as television and radio, with only one single participant saying they received information from the radio (usually while getting a ride from a parent). Only a single participant said they still used a newspaper as well. The bulk of participants under age 40 relied on social media as a news source. This result is unlikely to be unique to Markham and Vaughan as researchers have also found that older people are more likely to receive news from television than younger people (Skarpa & Garoufallou, 2021) in Greece.

In this study of Markham and Vaughan residents, younger people were more likely to say that they got their news from family or friends, with one person saying they would get no news if not for friends or family sharing it with them. The decline of physical newspapers was very apparent with very few people mentioning them as a news source. Television based news also saw a generational divide. Younger people's exposure to television was mostly what could be considered "accidental" rather than them seeking it out; usually chancing upon it when other family members are watching, or seeing in the doctor's office etc. Younger people were also more likely to perceive bias in their media than older people in the Markham and Vaughan study. In terms of actively seeking COVID-19 information, in studies in the United States, older people were less likely to seek out COVID-19 related information than younger people despite being at higher risk of the disease as information avoidance increased with age (Nolte et al., 2022). While younger people were less likely to get incidental information related to COVID-19, they were more likely to seek it out on their own though this does not hold true across the political spectrum with conservatives being less likely to seek out COVID-19 information (Reisdorf et al., 2021).

Given how much misinformation and disinformation exists, the lack of active information seeking among the older age group is concerning because active information seeking is associated with disease prevention according to a study done in China (Li & Zheng, 2022). This indicated that older people were less likely to actively seek out information and tended to believe the information that they received and were

also less likely to challenge the information received. Whatever they heard first was the advice they stuck with, which is dangerous in a situation like COVID-19 when information about the virus was changing on a near constant basis. Without active information seeking, it becomes difficult to challenge first impression bias. Having accurate information from the start is very important for this group in order to avoid first impression bias (Hirshleifer et al., 2021) but the changing COVID-19 advice during the first several months created a difficult situation for this group. This is again a concern given the bias against the general use of masks uncovered in *The Globe and Mail* given its reach and status as one of Canada's largest distribution newspapers. Not only did older readers get information against masking at the start of the pandemic, but they were also less likely to actively search for second opinions beyond what was presented to them, condemning them to following what would become inaccurate pandemic advice as recommendations shifted.

Younger people who use social media are also more likely to rely solely on social media for information (as opposed to some middle-aged people who used it more as a supplementary source of information) according to the participants. Young people had no other sources of information and relied on what others posted whereas the slightly older demographic used social media to confirm what they saw elsewhere. However, the younger, more internet savvy group of participants often checked the information against other sources, including friends and family. Participant 4 in Markham, for example, has a friend she consulted.

I think, just because of the pandemic I've been talking to my best friend a lot more about this kind of stuff... She's tired from talking about it all day. This is because she's in public health. I know that when I call public health the Covid line, I know they stick to their guidelines, because I'm sure liability issues, right? And sometimes I'll ask them a really specific question, and they would giggle and say, 'I know what you're asking, but I cannot say.' ...because she's my friend, she'll try to explain it. ... so, I do listen to her quite a bit. I know how she thinks because I know her. That's part of the trust (Participant 4, personal communication, 7 October 2022).

This attitude toward checking was found in both Markham and Vaughan. In Vaughan Participant 42 said, "I will search things up myself I want to look more into it."

Bias in the feed

Based on the Markham and Vaughan interviews, there appears to be an increasing awareness, particularly among younger people, that the information that reaches them is filtered either by the people they follow or the algorithms in newsfeeds. However, this awareness of COVID-19 does not necessarily translate to any meaningful solutions. Methods to get a range of news and opinions by digital means remains elusive, particularly with algorithms tailoring feeds.

I think that because I read things mostly online, I tend to silo on sources or what's fed to me are sources that match my belief systems. Things that I don't agree

with [such as] Fox news or right leaning politics I don't tend to consume as much because I don't agree with it (Participant 11, personal communication, 1 November 2022).

Participant 11 was highly aware of their news preferences and the internal biases their leanings created on the types of news and information that they naturally tend to seek out. However, human bias was not the only bias that participants were aware of. "I think the algorithm shows you what they want to show you. Like they show other people the same thing, it gets cycled to you eventually" (Participant 44, personal communication, 2 Mar 2023). Participant 44 was very aware of the biases that computerized algorithms gave them and the type of news that they tend to get because of it.

News filtering and relying on social media platforms also leaves officials at the mercy of large technology companies. This happened to *Drive BC*, an information system run by British Columbia's Ministry of Transportation. They discovered their own vulnerability to the whims of technology platforms during the wildfires of 2023 when the new owner of Twitter, Elon Musk, put in new policies on tweet limits. It hampered the government agency's ability to disseminate wildfire information in a timely manner (CBC, 2023). The Canadian Government's new laws forcing major technology companies to compensate news organizations will cause new upheavals in how Canadians get their news and information (Mundie, 2023). Officials will need to be mindful of the impact that the changing technology landscape will have on their ability to

get information to the public, particularly the younger generation who are early adopters of new media platforms. Media mediation is not restricted to the content being produced but also by how content arrives to the reader.

Sources such as *Google News* and other news aggregators were important for the under 40 age group (Table 21), and this group would be more likely to look up other information. They were also aware that algorithms played a role in curating their news. Participant 41 was particularly aware about algorithm bias when she said “I am a little more aware about the content I am following. I routinely cleanse out who I am following if it gets too biased.” Although many people do depend on platform-based sources of information, there is some awareness that the algorithms can drive biased information in their direction. It is important for people to be constantly aware of these biases that algorithms will want to show them. Even if they are inside of these echo chambers, it is still important to have this awareness if there is any chance of stepping out of them. Based on these interviews, it appears that most people are using social media as a tool with a healthy appreciation of its flaws, mitigating the risk of being stuck in echo chambers and also providing evidence to support both Dubois and Blank’s (2018) and Bruns’ (2017) theory of an overstated echo chamber effect.

Table 17 News Media source preferences

	TV	Newspaper	SM	Internet	Friends/Fam	Radio
Age 39 and under (N = 33)	11	1	23	15	5	1

	33%	3%	70%	45%	15%	3%
Age 40 and over (N = 28)	16	3	10	18	2	6
	57%	11%	36%	64%	7%	21%

The interviews in Markham and Vaughan revealed that thanks to the internet, group chats, and social media, information travels fast and from a myriad of sources. The digital communication tools did not necessarily work in the favour of public health officials during the COVID-19 pandemic.

Public officials should keep age and media patterns in mind as they try to get their pandemic response messages out. A few implications from these findings:

1. Young people are less likely to see television commentary so expert advice, in particular any kind of visual or in-depth analysis will not be seen by this demographic unless it is presented in another form.
2. Older people, less likely to question the information that comes to them, are less likely to further seek out information. First impression bias will be a major factor in this group. Early advice needs to be accurate.
3. Young people who rely solely on social media may not see the information, particularly algorithm driven platforms. Officials will need to understand the various platforms and break through these algorithms.

Transnational media stepped through chat groups

In 1978, Gene-Zucker found that media can have large influences on people, particularly when an issue is new or unheard of (Gene-Zucker, 1978). When COVID-19

first started to spread, it was indeed a new issue upon which media could have a profound effect on. The sources of news people consumed affected their pandemic decision making (de Vries et al., 2022; Park et al., 2021). Notably, Americans who relied on Fox News for information were less likely than those who watched CNN to take COVID-19 precautions and were more likely to engage in behaviours deemed riskier in terms of disease avoidance (Zhao et al., 2020). Similarly, when Canada's two largest circulation newspapers, *The Globe and Mail* and *The Toronto Star* focus the narrative of COVID-19 around economic issues, that will have a lasting impression about the most important impact the disease brings. Health and wellness in this case came secondary to economic concerns. The influence that the media narrative had should not be ignored.

Technology has enabled people to get their information from anywhere, complicating what was once a more straightforward public information dissemination process. Rather than a television capable of just a handful of channels, people can now access literally thousands of information sources at any given time, diluting the penetration of any single media source. In the case of Markham and Vaughan, this study noted a large amount of information coming from Asian sources instead of domestic, Canadian sources.

To understand the potential mediating effect that foreign information sources may have on diasporic communities, it is important to look at the reasons these diasporic communities turn to foreign media. These communities are particularly susceptible to foreign media not only because of language preferences, but also the desire to avoid

feeling marginalized by mainstream media (Staiger, 2005). In the Chinese Canadian community, transnational media has a strong audience. One reason for this is that mainstream media tends to other minorities by rendering them invisible or reduced to a trope (Staiger, 2005). This tendency pushes minority consumers to seek media that better reflects them, often in their own language. In Canada, Mao (2015) found that “Chinese migrants prefer Chinese newspapers and websites for government/policy information and life information rather than English newspapers and websites” (113). The growth of internet access has made it easy to always access Chinese language news and information on phones and computers with access available in virtually any location. This ease of access makes it important to understand how receiving a news source from abroad might affect the diasporic community’s response to local COVID-19 measures and instructions.

This work done in this dissertation found that newer Chinese Canadians looked at Chinese language media for information on COVID-19. However, during the pandemic, it was not Canadian-based Chinese media that dominated among the diaspora, it was media from Hong Kong or Taiwan that largely flowed in this diasporic community. Many people wanted information close to the source of the outbreak that they believed would be faster and more accurate. Critically, the influence of transnational media is heightened by the way information flows from family and friends who see the news in Asia and share it with chat groups. The information then continued to flow into tight groups within the diasporic community. While there is still some reliance

on local news, ethnic newspapers, most newcomers now maintain close ties with family thanks to technology and readily accessible news sources from their homeland. When asked about their preferred sources of news and information, participants listed a wide variety of sources. Found in the original Mamuji et al. (2020) study, preference of information source differed by time in Canada, age of the participant, language proficiency and acculturation (Lee et al., 2021). In general, newer immigrants and those less proficient in English tended to prefer information sent over social media by friends and family, and news stations from abroad as well as local ethnic media, while participants who were Canadian-born, or had been in Canada from a young age preferred more mainstream domestic news sources, television and radio.

The preference for participants with closer ties to Asia for Asian-based news sources had the benefit of being aware of COVID-19 sooner than those without close ties to Asia, reinforcing the importance of having friends and family share information with them from abroad. Some participants were aware of the virus as early as December 2019, before news organizations in Canada started reporting about COVID-19. Chat groups such as WhatsApp and Weibo featured heavily as a source of information in these interviews for participants that were newer to Canada. “If [mom and dad] feel it’s important they’ll send us a message. Their media comes from Canadian TV or Wechat group” (Participant 14, personal communication, 8 November 2022). The information that came through could be from domestic or international sources, but importantly, it was shared with family quickly through these groups.

However, like all social media, information from chat groups was not always deemed to be trustworthy. Nevertheless, it was still an important part of the community from both an information and social connection standpoint. In general, the information coming from social media, though an important vector of fast and timely information, is not always well trusted compared to other sources of information. “Some sources are more trustworthy than others. Television and radio are most trustworthy. They are from known reporting sources. Social media is a bit unknown so less (trust) for social media” (Participant 34, personal communication, 01 Dec 2022).

Despite the two-year gap in interviews, this finding among these participants correlates well with the findings of Mamuji et al. from 2020.

I used to get a lot of news from WeChat, just from what all my family would send me. Of course, that itself is a real problem because you're getting news from social media, right? So, what's released through social media, what's released through the CCP (Chinese Communist Party) party and then what ends up being read by me. I would say it's half and half split right now because I want to know what's going on in Beijing where I still have family and what's going on here a little bit. I try to check both when I can, but then there are so many opposing views to like... I will be on the phone with my family, and we'll talk about how effective specific masks are. (Participant 6, Mamuji et al., 2020 dataset)

Mamuji et al. highlights the importance of having close ties to Asia in receiving timely information from abroad. Chinese Canadian immigrants who recently arrived in Canada

were quick to receive news about COVID-19. An example of this phenomenon was from as early as December 24, 2019, when one participant in the Mamuji et al. study recollected the following:

When [did] we start realize [sic] COVID-19? The information was passed on the news channel or at least the news network in Taiwan. I remember vividly at the Christmas eve [sic]. There were government information saying that we need to be worried about police starting on January just right after the election. January 11, Taiwan is starting to go into lock down. (Participant 31, Mamuji et al., 2020 dataset).

This news predates the earliest reporting by *The Canadian Press* of a yet to be named respiratory illness emerging from Wuhan by one week. On December 31, 2019, *The Canadian Press* carried the headline “China investigates respiratory illness outbreak sickening 27” (Canadian Press, 2019). This is the earliest reference to the COVID-19 by the Canadian Press according to the Factiva database. By having information from abroad, Chinese Canadians found out about the illness sooner than Canadians who relied on mainstream sources of news in Canada. This study also points to technologies such as Weibo, WeChat, and WhatsApp playing a large role in mediating how Chinese Canadians now received information. In the Markham and Vaughan study, approximately 80% of participants reported being in some kind of family or friend group chat. Unlike social media, these chat groups tend to be tight knit circles

of friends and family usually known to the user, not online strangers so they will often contain people trusted by the participant.

Group chats can stop disinformation

Chat groups were also important in stopping or limiting disinformation. When asked if they had a trusted resource they turn to for information, around 70% of participants said yes. Not all information coming from the chat groups was trusted or straightforward. In some cases, information shared on some groups would raise eyebrows in confusion, particularly from extended family in large groups. There would often be a family member who participants did not fully trust to share accurate information. However, the bulk of participants said they trusted their various chat groups because of the tight-knit and known nature of the groups and how they contain friends they can rely on. Participant 51 said:

News gets sent through group chats. I trust them. Mostly because I've been able to verify most of the news that is shared. Eventually I get to see it on the internet or hear about it on the news one way or another. Mostly information that is shared, I trust. (Participant 51, personal communication, 03 March 2023).

Participant 51 had trust in the information from groups because they had been able to triangulate the information from other sources. The information had largely proved to be valid, solidifying her trust in it. Participant 53 said: "I try to see validity of statement. I'll trust what my parents say. If it's school related, I'd trust friends in chatgroup. Anything

apart from school I'd like to check with parents or online sources" (Participant 53, personal communication, 28 March 2023). The personal connection between friends and family added to the trust that participant 53 put into the information. Knowing the perspective of friends and family also helps with trust. Even if the person receiving the information knows that the sender, if biased, knowing their biases increases the trust put into the information. Participant 57 said "When it comes to my family, I usually take what they say at face value. I lived with them all my life I know their biases and I can take what they say into account" (Participant 57, personal communication, 06 Apr 2023).

Even if these chat groups have questionable information, the nature of knowing the people in the chat means that the person is trusted to be well intentioned, even if the information is not. "I wouldn't say trustable, but I do have people in my group chats that I know they won't share with me disinformation or something they don't understand themselves" (Participant 24, personal communication, 27 December 2022). The family chat groups served as sources of information that was among the factors that gave the Chinese Canadian community a head start on pandemic mitigation behaviours. Critically, they were sooner than the rest of Canadian society to start masking (Mamuji et al., 2020) and stayed masking for longer. Since the information that the Chinese Canadian received supporting masking more than what was being reported in English language, Toronto-based media, it is logical why there were higher rates of anecdotal and observed masking behaviour in Chinese Canadian heavy Markham compared to Vaughan. The difference in masking behaviour shows how non-Canadian sources of

information has a large influence in diasporic communities as news and information from abroad was heavily circulated in chat groups and its pandemic advice followed within the Markham community.

These chat groups were also important for people during the early stages of vaccination. When vaccines first became available, they were described as the “Hunger Games” in reference to the popular book and television series where people had to fight each other for food (Da Silva, 2021). As a result, many people had turned to social media to find access to vaccine information and look for locations that had vaccine supply. Information was then shared to chat groups to help friends and family secure vaccine appointments. Participants 40 and 60 were among those who discussed using these chat groups to help source a vaccine.

It could be anything that goes through there. Might be news on certain things about COVID or vaccines. Yeah, some of that news might come up. Like when we were looking for where to get the vaccine, we'd share locations that seems to have spots. (Participant 60, personal communication, 21 Apr 2023).

Having chat groups with localized information was a useful source of information for participant 60. Those in their chat were from the local area and were able to share relevant information quickly to help secure vaccines.

Things evolved quickly, and especially at the outset of the declaration of the pandemic. We were actually out of the country. And so, we had multiple group chats with people sending us information. But I think that was more at defined

points, like at the start of the pandemic. Another big kind of point at which text message was way to deliver news was when vaccine rollout was happening. It was like trying to win the lottery to get an appointment. (Participant 40, personal communication, 23 Feb 2023).

Not being in the country and feeling cut off from local information, participant 40 took advantage of the information that came through chat groups to know what was happening domestically. When they tried to get information about vaccines, they also found that having messages from friends in highly localized groups helpful in securing a vaccine. Participant 46 had a similar experience with securing information from chat groups.

We have group chats with our family, with certain group of friends, with certain cousins. Information will fly around these groups. Info now is more like “did you hear?” During COVID it was a lot of information on like latest updates, you know, where to get your vaccine like stuff like that. (Participant 46, personal communication, 21 Mar 2023)

These participants relied on the chat groups as information sources to help secure vaccine appointments when they were difficult to obtain. Having this network proved to be an important aspect for people to both obtain and share information. The influencers within the groups would also use these groups to push information to affect behaviour change that they wanted to see among their own friends and family.

[I] have family group chat. I used to share news, but not anymore. At time I was criticizing whole pandemic and trying to share my honest opinion and possible insight from media. At the time I was too focused on whole problem. How it originated, was vaccine safe or not. Or different things like test. Like for example on flu, they verified that rapid test was not fully accurate. (Participant 29, 25 January 2023).

Participant 29 wanted to share what he thought was his well-researched and honest opinions about the vaccine and the pandemic as a whole. It may not have been well received, but the chat groups were channels where he could share and try to influence others on his views about the vaccine.

On the whole, the chat groups, particularly those with chat groups that included family and friends from Asia were an important vector of information dissemination that helped keep the Chinese Canadian community safe. Participants who knew about the virus sooner due to their close ties to their homeland also took it more seriously by researching, buying masks, or stocking up supplies in preparation for a lockdown. This was reflected in the early information gathered by Mamuji et al. in 2020.

I actually think the Chinese people in this instance have done it early because they can see the news from China [...] they can see how serious it is. So, they may say to wear the masks early, you know, that they are fighting over masks, fighting over the hand sanitizer and they have a type of awareness that they better protect themselves [sic]. (Participant 83, Mamuji et al., 2020 Dataset).

Mamuji et al., also found that hearing about the virus through the media lens of Asia gave participants a better view of the situation than simply through Canadian media alone.

Chinese community on Wechat group believed the threat was real. Information in those groups were very different from public media. News inside those networks said Wuhan was really bad. News covered up by [the] government. Be aware of that. (Participant 51, Mamuji et al., 2020 Dataset).

Chat groups are a powerful median for information flows. The information could come from platforms such as Twitter or Instagram, already going through an influencer step that Choi found in 2015. Then that information again gets reinterpreted and filtered again into these hyper local, but very influential chat groups, creating multi step, information flows that have been filtered by generally trusted people who are in the group. Most interesting was how tight the chat groups were. Information from Chinese sources stayed within the social circles of Markham, for example. The information stepped from social media or traditional news media into these tight, and generally trusted chatgroups. Most critically for the Chinese Canadian population in Markham was that some of the information that flowed through these groups came from news sources in Asia that had more timely access to what was happening in Wuhan and had media that constantly advised mask wearing.

The preference for foreign based media by some members of the community created a micro community within Markham where foreign Chinese language media

became highly influential. A few key people get information either by reading it from these foreign based websites, or it gets sent to them from overseas friends and family. It then gets passed within tight, trusted circles inside the community. In Markham and Vaughan, roughly 80% of research participants were part of some sort of family and friend chat group either on WhatsApp, WeChat, Signal, or some other group messaging application. These group chats are often an early form of information seeking for users.

The make-up of chat groups can vary, but there was one consistency among them, they were made up of people known to the participant. Some chat groups were made up of extended families and some made up of more immediate family members. Participant 37's group chat was composed of their family from abroad. "I have a family group chat with mom and siblings in Cambodia. I have a few different group chats for different sets of friends" (Participant 37, personal communication, 21 February 2023). Participant 25 was in a similar situation but in this case, the trust was lacking. "We have groups of friends mostly in India. We form some groups and exchange ideas and information sometimes... I don't trust those sources. They've been forwarded a hundred times" (Participant 25, 16 January 2023). In some cases, groups were formed suddenly during the pandemic out of necessity. "Yes, that [group] was created when my mom was gone during the pandemic. [It] started because we weren't able to visit her. (Participant 48, personal communication, 13 March 2023). Some family chat groups did not extend beyond "What do you want for dinner?" type of messages while others, particularly ones with extended family overseas spread information very quickly, from overseas into

families living in the diaspora. From those groups, information will then be spread to more localized groups. People reported having different chat groups with different groups of people, and sometimes even within groups of people, chat groups could be organized by topic. These family and friend chat groups are spaces where experts can safely share information.

Yeah. My family is quite small – just 10 people. Usually the elders, mother-in-law, father-in-law, mom and dad rely on Chinese mainstream media for information that's what they can read. That includes TV and radio for latest news about pandemic. For my sister-in-law, brother-in-law they are older than me in their 40s. Their sources of info also mainstream, CBC, CP24, my brother-in-law is really into reading science journals. Don't know where he accesses it, but he shares scientific journals in our family group. Blogs – I see that information being shared. (Participant 9, personal communication, 25 October 2022).

In the case of participant 9, information comes from Chinese language sources and gets shared to the family chats despite not everyone knowing the Chinese language. The information is interpreted and contextualized by those who do (in this case, the family elders). This is particularly important for members of the diasporic community who are born in Canada and have less exposure to Chinese language media. In this case, their elders share the information about masking and tell them to mask as well.

Having information sources alone is insufficient without confidence in it. About 80% of participants in Vaughan found that confidence through a trusted resource in their

social circles that they turn to either as an information source or to seek clarity on news and information that comes their way. In Markham, roughly 60% of participants said the same. People were better able to make judgment calls about the veracity of a piece of information based on the source, since these chat groups largely contain people, who are known to users compared to social media in which users are often strangers to each other.

My social circle yeah. Like I said if people sent articles, I read them and take it with a grain of salt and try to do research. If I do trust the person, I will take what they say at face value. There are people if it comes from you can trust. When it comes to my family, I usually take what they say at face value. I lived with them all my life I know their biases and I can take what they say into account.

(Participant 57, personal communication, 6 Apr 2023)

Not everyone shared that sentiment. Participant 53 was more discerning about who to trust but their parents (family) was still a trusted source.

Don't always trust it, especially if eye catching. Something abnormal especially if title is meant to spark reaction. I try to see validity of statement. I'll trust what my parents say. If its' school related, I'd trust friends in chatgroup. Anything apart from school I'd like to check with parents or online sources. (Participant 53, personal communication, 28 March 2023).

Social media users have the ability to choose who to follow and that usually aligns with their interests and views. Algorithms will also feed users posts they will likely respond to.

However, in small circle chat groups, one is less able to choose who to follow once they enter the group and so far, there are no known algorithms interfering with private chats. This gives chat groups more ability to share diverse opinions particularly among family groups that may have a range of viewpoints.

Aside from family groups, groups may be born out of common interests, people having taken a class together, or somehow people just randomly having become friends in real life. What became clear from my interviews though was that these groups differed very much from social media in that they were all known entities within a group that formed the most important basis of trust within the group. "Yes. I would trust everybody in this chat. It's very clear it's always well intentioned. Group of mostly school friends, high school friends and we've kept in contact" (Participant 41, personal communication, 23 Feb 2023). Similarly, participant 11 trusted information from groups because her friendships are based on the same foundations of trust. In other words, friendships extend into these virtual spaces. "[Information is] trusted based on the foundation of our friendship. I've known friends for many years and been through many phases of our lives together so there are many I feel I can trust. (Participant 11, personal communication, 1 November 2022). These small friend groups have a dampening effect on the echo chambers of social media. This also highlights the effect of two step information flows as the more informed members pick and choose which articles and pieces of relevant information to share with other members of the group. These chat groups, particularly friend ones, tend to have discussions about issues

among friends who trust each other. Disinformation has a better chance of getting exposed.

I have a close group of friends whose views I trust. They did their research. They have a lot of sources. They have a lot of discussions. One friend went to York. [He's] very involved with economy. We go to and discuss in a chat group. On WhatsApp and Instagram. (Participant 5, personal communication, 11 October 2022).

The discussions within the friend groups were an important part of their social activity and building that friendship. Younger people used these groups for gossip that was still an important part of friendship and trust building. Participant 57 said about friend groups “Normally not much news related stuff on there, more day to day. In high school it was big and hot topics. The fact we kind of shared in that uncertainty it got talked about quite a bit” (Participant 57, personal communication, 6 Apr 2023).

Participants 5 and 57 were both recent high school graduates and in the early phases of their university education. This age group had many discussions that took place in these chat groups with close friends. Particularly during shut down when nobody could leave the house, these types of discussions are what teenagers might have had in a different era when they took their parents cars and snuck a cooler full of beer to a campfire. When these opportunities were taken away, these discussions moved into an online world, but that online world was less populated by strangers than popularly portrayed, it was instead populated by friends in a digital resemblance of

something to a campfire chat. These friend chat groups, particularly among younger people, looked more like the networked diagrams that Stansberry found in 2012. Information flows from multiple sources with a lot of back-and-forth discussions that have become an important source of information and for the younger generations, important in their growth and opinion forming.

These were the personal connections that people had with each other during the lockdown phase of the pandemic. These were individuals who they know in real life and can have some sort of connection within the digital world. Digital spaces, particularly social media platforms tend to be thought of as public spaces. Increasingly, information is shared in private digital spaces that are removed from the public realm. Social media is already filtered and interpreted by algorithms and “power users” who share a lot and have a large number of followers. What is apparent is that for most people, the echo chambers theorized by Sustain (2001) is mediated by chat groups of friends and family that forces exposure to other information sources as theorized by Dubois and Blank (2018). Taking information from the public realm of social media to the private realm of chat groups filters it again into smaller, trusted groups. Having family and friend groups that exist in the real world with online world presence is an important guard against disinformation with people who can trust each other based on their real relationships. This likely had a big influence in pushing pro masking sentiments in the heavily Chinese Canadian population of Markham given how different local media was in terms of masking advice.

The stark difference in the information that people receive is making it difficult for people to have a consistent base of information to share with each other. Interviewees that expressed skepticism about science interviewed in this study did not trust mainstream media. Their preferred sources of information were YouTube, Rumble, and BitChute. Both were vaccinated by force because they did not have faith that the vaccine would be safe, and in the case of this study, both lived in Vaughan. This observation is consistent with findings of a large anti vaccination presence of YouTube (Yiannakoulias, 2019). Craig Silverman from BuzzFeed news reported in 2021 that prominent right-wing personalities moved over to Rumble due to their status as a relatively unknown platform and modest content moderation (Silverman, 2020). Likewise, BitChute, a streaming platform from the United Kingdom has also attracted conservative leaning users for the same reasons (Maxwell, 2017). Because of the lack of moderation, disinformation can run rampant on these sites leading to a finding between reliance on social media for news and anti-vaccine sentiments (Burki, 2020b; Benoit & Mauldin, 2021). However, social media use does not necessarily create anti-vaccination sentiment. Research interviews suggests that the number of people who use social media is far greater than those who share anti vaccination sentiments. In addition, most social media users highly discriminate against the original source of information and most social media users have secondary sources of information. Participant 60 ranks the trustworthiness of information by source. Participant 60 said “If I recognize it, like CP 24, 8 or 9. Random site I don’t trust it. Half of them I wouldn’t trust. CP 24 – 8 it’s at

least something I know. If I haven't heard of it, a 2 or 3 (Participant 60, personal communication, 21 Apr 2023). Legacy media still retains trust based on name recognition.

Most users of social media use it as an aggregator for use, and, particularly among younger users, are very discerning about putting faith in information that comes across it. In my research, I found that social media use in and of itself was not indicative of anti-vaccination or anti masking sentiment. In fact, social media was an important information source for many people, including those who supported vaccination and masks.

I read online news as well as some social media, like Instagram...so sometimes there are certain media outlets I might follow, for example, like CBC... or one in New Zealand, so it'll be on my fee normally. Then, then most times I'll just kind of Google the site itself. (Participant 13, personal communication, 3 November 2022).

Participant 23 was particularly attracted to the news focus that some social media platforms could offer.

When I first started Twitter, it was only for the sake of news. Lots of news sources. I didn't interact with other posts apart from liking or retweeting. I haven't made an echo chamber of things I just want to see. It's diverse from international and global sources. I prefer it to Instagram or Apple news. Twitter is free. No paywalls. It's not so mean focused. It's news focused. Has a serious news angle

when it wants to as opposed to Instagram which is entirely visual based

(Participant 23, personal communication, 23 December 2022).

However, Participant 30 was very aware of the misinformation that could come through social media and the dangers of relying on it too much. “Social media sometimes can be misinformed. So as long as they have a specific link assigned, I will click on that link and verify the information myself. Through more credible sources” (Participant 30, personal communication, 29 January 2023). In both Markham and Vaughan, participants reported using social media such as Twitter, Instagram, and Facebook as news aggregators. Many used these platforms to follow mainstream news outlets. As much as platforms contained some amount of disinformation, most respondents were aware of disinformation on these platforms and had various strategies to safeguard against them. Some would scroll through comments to look for links to other information sources, some people would search for links to other sources while others simply checked that the information came from a verified source. Note that some of these interviews were completed before Elon Musk’s takeover of Twitter and subsequent removal of the verifications and increased volume of disinformation. Participants were also acutely aware of who was sharing the information. Participant 24 said her trust “depends on the person sharing the news article is a factor as well” (Participant 24, personal communication, 27 December 2022).

Disinformation absolutely exists on social media platforms such as Twitter (x) (Benoit, S. L., & Mauldin, 2021), but chat groups of friends and family have a large

dampening effect on its effectiveness because of having trusted people within them. This study agrees with Dubois and Blank (2018) who feel that the echo chamber effect is overstated because the reality is that very few people are stuck exclusively on a single platform in a single form of media. In many cases, the wide variety of media, and in chat groups with trusted friends in family in particular, exposes people to several viewpoints that help with correcting disinformation and dampening the echo chamber effect. This is not only helpful in stopping disinformation, or at least slowing its spread, it was important because of the differing views on masking offered by corporate media in Toronto and Chinese language media in Hong Kong and Taiwan. Having chat groups as a tool in spreading the different viewpoints towards masking proved important in encouraging mask use in the Chinese Canadian community. This likely saved lives by reducing the number of infected by COVID-19.

Media choice is making it hard to have a shared reality

Despite the checks and balances of having trusted resources within chat groups, the sheer volume of information available makes it incredibly difficult for a large number of people to have the same information sources. As such, their socialization, how they see and perceive the world may be entirely different from their neighbours. Higgins defines socialization as “individuals adopting the values and beliefs of their group, and when it is effective people end up wanting to behave as others want and expect them to behave” (Higgins, 1996, p. 3). Media is used to create a shared reality for social

response requires communicators to target audiences with information suitable for their knowledge and attitudes (Higgins, 1992). Media mediation tells us what is acceptable, what is not and what norms are. These social norms are becoming more disparate. Having the plethora of information available to us is changing the nature of media's role in creating a shared reality. Using the microcosm of Markham and Vaughan as a case study, this work argues that technology has made it more difficult, not easier to create shared realities among a population. Though people naturally want to create shared realities for feelings of community and social connections (Andersen & Przybylinsk, 2018; Echterhoff et al., 2009; Higgins et al., 2021), the abundance of media availability is making this increasingly harder as news and media one consumes can be entirely different from a neighbour's news.

When asked where their news and information came from in Markham and Vaughan, between the respondents, they had listed over two dozen major content sources (such as the *New York Times*, *Globe and Mail*, *Sing Tao*, *BBC*, *Ming Pao*) and a dozen different content distribution platforms (Twitter, Reddit, Google News, Facebook) (Tables 19 and 20). When asked for their favourite social media accounts that they follow, none of the participants mentioned the same accounts. In addition, algorithm fed news creates a different experience for each user and depending on who they follow what they "like" and interact with on their chosen platforms, they will have a very different information consumption experience than a friend or neighbour, despite being geographically in the same community. Neighbours may not have a common

reference point in terms of media and no longer have a shared reality when it comes to media consumption. This creates a difficult environment for public officials to get information out to local populations and their perceptions of an event may be entirely different.

Most of the participants' favourite influencers were related to hobbies and pastimes, such as sports. During the pandemic, some participants said they had followed the social media accounts of doctors and other medical professionals. Participant 39 likes "KLW World news, M101 News, I do also sometimes look at Sir Swag News" (Participant 39, personal communication, 23 Feb 2023). These news outlets are very niche (KLW YouTube has less than 14,000 subscribers as of 20 October 2023) and targeted towards young men. Other members of his own household are disconnected from the media he consumes but, according to him, have tried to persuade him to change these media influenced views. The plethora of choice in media content and the rise of influencers has made common media consumption a near impossibility, particularly among the younger generation that has grown up as "digital natives" who are used to choice and have no need or desire to consume media that does not suit their interests.

This divergence of a shared reality was evident during the interviews when participants in Vaughan and Markham started listing different information sources and different opinions in terms of how dangerous COVID-19 was. Some participants wore

masks and got every vaccine available, while other participants said it was no more dangerous than a cold. Participant 17 believed that masks would offer protection:

I feel like I want to be more protected. I don't want to pick up anything from anybody else. Whether its COVID or flu or anything. I don't know everybody in a space so I don't know their practices are so I just want to protect myself.

Generally, in a large crowd like transit, concert, airplane, sporting event.

(Participant 17, personal communication, 9 December 2022).

Meanwhile, disinformation was so rampant that many people believed that masks were dangerous or ineffective, prompting major news agencies to debunk the myths (AlJazeera, 2023; Reuters Fact Check, 2021). COVID-19 was the biggest news story of the times and affected people around the world. More people were affected globally than by any other event in living memory, yet the information that people were receiving about it was very different despite living geographically close to each other. This difference came down largely to the vast array of media choice and content availability due to technology. Though Ladd (2012) would celebrate the lack of gate keepers controlling the news, the lack of having control over what information people received created harm because of the disinformation made available by the internet. The pandemic has officially infected 750 million and killed 7 million people globally (as of May 7, 2024, as reported to the WHO). Despite being such a major event, people received very different instruction about how to avoid it, and what to do once one had it. This media comparison component of this study alone highlighted the stark difference

between Chinese language media originating from Hong Kong and Taiwan and English language media from Toronto. The plethora of choice in media sources, platforms, and content creators to follow makes it increasingly hard for the bulk of the population to have a shared reality over difficult issues that require action from everyone. It is also difficult for people to know what advice to trust and what to ignore.

Sending out a press release is no longer sufficient for reaching and motivating the bulk of the population. It is unlikely to be dependable going forward as the younger demographic ages and more people have switched to newer, more diverse forms of media. Of the 18 participants under age 30 in this study, only 3 had listed any forms of traditional media as a source of information. While officials can create social media accounts on various platforms (at great expense to maintain), there is little assurance the messages will reach their intended audience. As of May 19, 2023, Dr. Theresa Tam's (Canada's Chief Public Health Officer) official Twitter account had 301k followers, a sizeable following yet still less than 1% of Canada's population.



Figure 14: Screenshot of Dr. Theresa Tam's Twitter Account taken in 2023

The intense media competition and content creation is a challenge for communicators trying to get a message across. Residents in Markham and Vaughan, despite being in adjacent communities, followed different health behaviours. This was a common finding of Mamuji 2020 study when participants said they received information from friends and family overseas. Participant 51 from the Mamuji study was adamant that the information received within the Chinese community differed from Canadian media:

Chinese community on Wechat group believed the threat was real. Information in those groups very different from public media. News inside those networks said Wuhan was really bad. News [was] covered up by [the] government. Be aware of that (Participant 51, Mamuji. 2020, Dataset).

How the Chinese community perceived the pandemic was different from how the non-Chinese community perceived it. Right from the start, the pandemic was very different for the Chinese Canadian community than the rest of Canada thanks to chat groups such as WeChat and WhatsApp that connects friends and family over long distances. The Chinese community was very quick to adopt masking and maintained high masking rates through the pandemic. In the field observation in June of 2022, Markham had masking rates over 90% while Vaughan was below 30%. Though not as strikingly different, the Chinese community in Toronto also had higher masking rates than the non-Chinese community. Since this observation is not unique to Markham, the likelier explanation is the information that the Chinese community received led them to adopting pandemic avoidance behaviours earlier than the mainstream media.

The irony of the global village is it makes getting information to local communities much harder. There are so many media choices and only so many hours in a day that people need to pick and choose what media to pay attention to and what to ignore. That choice is often made for them thanks to friends and family sending 'cherry picked' information along and computer algorithms tailored to a user's interests. In some cases, people choose to ignore the media all together. Two participants said they only get media from word of mouth and don't look at any news themselves. The news that people get even about the same topic, can be different enough that people's perceptions can be entirely different. The Chinese Canadian community, having access to, and choosing to accept Chinese language media from abroad perceived the risks

and actions to take against the virus differently than the community in Vaughan that did not benefit from the same foreign media influences.

Chapter 8: Trust in Science, Climate Change, and Vaccines

In Chapter 6 we discussed how trust in media impacted people's pandemic behaviour. This chapter looks at other aspects of trust, particularly how trust in government, science, and even family can impact their decision to wear a mask or vaccinate against the pandemic.

How much trust one has in their neighbours and their governments can vary from place to place. The World Values Survey (WVS), "a global network of social scientists studying changing values and their impact on social and political life" (WVS, n.d.) uses questionnaires from 1981 to 2008 to measure trust within a country. The WVS allowed for a broad analysis of trust across many geographical regions, languages, and religions. There are factors that cross countries and continents that impact trust. Communism for example is associated with lower levels of trust (Inglehart, 1999). Yet despite being communist, China had high levels of public trust like many other historically Confucian societies (Inglehart, 1999). This cultural influence of Confucianism was a stronger indicator of trust than the form of government. How much trust one has in their neighbours and their governments can vary from place to place. The WVS allowed for a broad analysis of trust across many geographical regions, languages, and religions. They found that there are factors that cross countries and continents that impact trust.

While there are strong correlations between Confucian societies and trust, it is a little harder to understand how that trust translates when members of that society

become a diasporic population elsewhere. It is difficult to know how their new environments, evolving cultural practices, and new systems of government will impact traditional notions of trust. These surveys are not able to tell us whether Confucian based diasporic communities carry that trust over to their new society and new systems of governance.

Despite the lower compliance rates and higher COVID-19 infection rates in Vaughan (see Chapter 4: Observations, participant and demographic information), significant differences in levels of trust either toward media or government in Markham and Vaughan did not appear from these interviews. However, people in Markham were more likely to complain that the government either acted too slow or did not go far enough in its COVID-19 response. As the government tried to communicate the risk of COVID-19, they were met with various challenges such as battling disinformation (Evanega et al., 2020), economic consideration (World Bank, 2020), and the still unknown nature of COVID-19 at the start of the pandemic (Koerber, 2020).

Knowing how much trust people put in their governments is particularly important during a pandemic because trust is highly linked to compliance such as vaccine uptake (Larson et al., 2018; Ozawa et al., 2016; Uttekar et al., 2023). During the H1N1 pandemic, those who had higher levels of public trust were more compliant with public health recommendations (Siegrist & Zingg, 2014). Siegrist & Zingg (2014) found that the decision to get vaccinated was highly influenced by one's trust in their authorities. People who trusted "the authorities were more likely to adopt recommended behaviour

such as getting vaccines compared with people who did not trust the authorities” (Siegrist & Zingg, 2014, p. 27). During the 2018-2019 Ebola outbreak in the Democratic Republic of Congo, low institutional trust was associated with a lower likelihood of taking preventative measures against Ebola, accepting a vaccine, and seeking professional medical care (Vinck, et al., 2019). The lack of trust in science created a crisis in 2003 in Nigeria when five states banned the use of polio vaccines (Chen, 2004; Obadare, 2005). The evidence suggests that getting general public compliance for behaviours such as vaccination or following instructions in a disaster management situation is nearly impossible without trust that the authorities will provide good instructions with the best of intentions, trust that neighbours will also follow instructions and behave in a way that is fair and equitable, and that the information one is receiving is correct and accurate.

While scholars such as Warren and Van Aelst stress the importance of social trust and media trust in functioning democracy, what unexplored remained why distrust manifested in such different ways in Markham and Vaughan despite a similar level of trust in government and media. When asked whether participants felt that the government response was sufficient, too much, or not enough, the spread within both Markham and Vaughan was very similar (Table 21). In the Markham and Vaughan study, two years into the pandemic, while the bulk of residents thought that the government did their best given the circumstances, Markham residents were also more likely to criticize the government response as slow. The nature of the distrust in the two communities

differed in that in Markham the distrust was largely over the competency of officials in charge, not their honesty, particularly in the early days of the pandemic. Participant 13 (Markham) represents this sentiment well.

I would say [the government response was] insufficient. For example, earlier in the pandemic, 2020 or 2021 when pandemic was still reaching its peak, I felt they removed the mask mandate a bit too early. Especially in schools. I think that the vaccine roll out was a bit slow to begin with where I felt it was a bit difficult for a lot of people to access their first dose (Participant 13, personal communication, 3 November 2022).⁴

These findings echo the findings of Mamuji et al (2020) when they found that Chinese Canadians in the Greater Toronto Area did not trust the advice given by Canadian officials. There was a sense of lament that action was not taken earlier and a sense that the government missed precious time. In Vaughan, there were four participants who said that the government response was too much, such as participant 39. "Regulations before caused people and businesses to almost shut down. It was an invasion of rights. It was overbearing" (Participant 39, personal communication, 24 Feb 2023).

Table 22: Participant opinion Markham and Vaughan over severity of government response

Opinions on Government Response		
Markham	Not Enough	7
	Sufficient	12
	Too Much	0
Vaughan	Not Enough	12
	Sufficient	14
	Too Much	4

The two communities mostly supported the government response. Some people in Vaughan talked about government overreach. However, no one in Markham spoken to as part of this research complained about the government being overbearing. In fact, it was the opposite, they thought the government did not enough fast enough (though many in Vaughan also thought the response was slow, they were also more likely to complain of overreach). The difference in perception could be attributed to several factors, one being the difference in news coverage that those in Markham received largely due to Chinese language media from overseas). Markham residents had less confidence in the government response than Vaughan residents and as a result took actions such as mask wearing early. Residents in both Markham and Vaughan took in mainstream sources of news such as *The Globe and Mail* and *The Toronto Star*. However, the large Chinese speaking population in Markham had a strong presences of Chinese language sources such as *Sing Tao* and other Chinese language sources. This media comparison examines how Chinese language media and English language

Media in Toronto differed in their coverage and if that may have had a role in the different pandemic behaviour patterns.

As the world becomes more technologically advanced, science plays a greater and greater role in our everyday lives. Whether we like it or not, science will have an impact on us from drinking water standards to satellite television. However, science denialism continues to be a problem despite the widespread access to information on the internet (Jylha et al., 2022). Acceptance of science has influences far beyond just the understanding of science. COVID-19 showed us how important science became in battling a disease that affected the entire globe. However, not everyone was open to accepting pandemic guidelines and vaccines. Political leanings and religiosity influence whether people accept certain sciences including climate science and vaccines (Rutjens & Sutton, 2018). Many facets of our lives are governed by science and the findings and conclusions reached by science – whether water is clean enough to drink, whether particular chemicals are safe enough to use, the list of science’s influences on our lives is long. Losing trust in science means that the jobs of government officials becomes harder, particularly during a pandemic if parts of the population become suspicious of the advice given.

As two large threats facing the world, this study was a good opportunity to investigate the interconnection between attitudes toward science, COVID-19, and climate change because of how they similarly affect a large number of people. The two issues have striking parallels and significant influence on each other (Khojasteh et al.,

2022). Both these issues have “major implications related to the economy, energy, technology, environment, food systems and agriculture sector, health systems, policy, management, and communities are detailed via a review of existing joint literature.” (Khojasteh et al., 2022, p. 1). Because of these interconnected issues, Khojasteh et al. believe that “global decision-making and collective action” will be necessary to tackle both issues (Khojasteh et al., 2022, p. 9), Global decision making and collective action requires political cooperation on a world-wide scale. Other studies have already found that ideologies and political orientation were a stronger indicator about climate science acceptance than scientific knowledge and education (Hornsey et al., 2016). The final question asked in this study asked participants to rank their trust in academia and scientific journals and rate how important climate change is to them. These results are put in the context of their COVID-19 actions.

Some good news for science from this study is that science has an incredibly high trust rating. When asked to rank trust in peer reviewed literature, there was hardly any difference between Markham and Vaughan. Both ratings came in around 8 out of 10 on average. Paradoxically, even those who did not believe in climate change (rated it a 1 or lower) rated trust in science highly. There was a trust in the methods of science, if not for the people who carried it out.

Likewise, participant 39 (Vaughan) defended giving the Climate Crisis a “0” in importance with

What is considered climate change today I do not believe in it. I believe it is more of a farce. I do believe in protecting the environment. I believe nature is important. I believe people should be more connected to nature. But climate change itself is I think it is being presented. The information is being manipulated and cherry picked as if man is the one stirring up nature. I do believe that man and people contribute to harming the environment, chemicals and plastics and fossil fuels and carbon emitted to the air. Destroying the ozone layer by sending up rockets. I don't believe it is anything compared to nature itself. Strengthening of the sun, magnetic field, solar flares. I think the effects of humankind are negligible compared to that that's why I don't place any importance into climate change. (Participant 39, personal communication, 24 Feb 2023).

Yet when asked about what how much he trusted academic and peer reviewed papers, the same participant said

Although there may be some accidents or sometimes people make mistakes and make a false conclusion, but people who have done research into different topics they know that they are doing. Peer reviewed articles are pretty important that's where the facts are. (Participant 39, personal communication, 24 Feb 2023).

Interestingly, when presented with the information that climate change is supported by academic literature, Participant 39 said:

I think they are taken out of context, presented in manipulative manner to serve any agenda that you would want. Sometimes even scientists themselves are paid

off by organizations like not for profits and other groups. There's nothing I can do about that. Science must be unbiased. (Participant 39, personal communication, 24 Feb 2023).

When asked about the importance of climate change, participant 39 rated it a 0.

The single most surprising revelation was that participant 39 rated his trust in academic journals at a 9 considering how his views about climate change and vaccines are in direct opposition to accepted science.

Although there may be some accidents or sometimes people make mistakes and make a false conclusion, but people who have done research into different topics they know that they are doing. Peer reviewed articles are pretty important that's where the facts are. (Participant 39, personal communication, 24 Feb 2023).

When I pointed out that the majority of scientists believe that climate change is caused by humans, and since he trusted scientific journals, why he didn't trust climate science, Participant 39 said:

I think they are taken out of context, presented in manipulative manner to serve any agenda that you would want. Sometimes even scientists themselves are paid off by organizations like non for profits and other groups. There's nothing I can do about that. Science must be unbiased. This doesn't apply to every climate change peer review journal because it is a hot topic. It can change a lot. I do trust peer review journals, just that sometimes they can be manipulated by people because people are not perfect, and some people can also be corrupt. That

applies to all peer review journals. While true I am placing more emphasis on climate change ones, it is a hot topic. A contested field heavily influenced by external factors like funding. Even someone presenting research they have to get paid at the end of the day and they are influenced by money. Though I doubt that most of them are being influenced by exterior motives, it is more likely. I believe they are more likely to be paid off. I bet most of them are stand up people. I just think they are wrong on their science. (Participant 39, personal communication, 24 Feb 2023).

There was a rational reason why climate science is exempted from the trust placed in other scientific journals. Participant 39 maintains his confidence in the scientific process and is confident in his understanding of it. Outside of these chosen aspects of science, he holds science in high regard. This participant also did not believe in mask wearing and was a strong advocate against mandatory masking.

Other participants who refused vaccinations or denied that the climate crisis existed expressed similar sentiments. For almost all respondents, science enjoyed a good reputation as being mostly reliable. Even those who reject scientific consensus believe that they are on the right side of science. Participant 39 express, the problem lies not in science, but in the scientists or external factors outside of the scientific method.

Participant 6 (Markham) also ranked climate change importance very low while ranking trust in scientific literature highly. Hers is a different rationale. She felt she was

not informed about climate change enough to rank it as important but still felt that information coming from scientists was generally trustworthy. She was masking until mandates were removed and at the time of the interview, only continued to mask in clinical settings or around high-risk seniors.

There was no lack of access to scientific information on the part of the participants who rank climate change as low importance and deny its existence. They expressed knowledge and possessed information about the topic at hand. In fact, they had more to say about the topic than most other participants. They also believe they are on the right side of science. Science has a strong reputation leaned into for their beliefs. From our conversations, they also actively seek out information, this is very different from participant 6 who said climate change was not important to her out of ignorance). Common between these two participants was also the belief that there was an “agenda”. These interviews reinforce the findings of Hornsey et al., (2016) in that information and knowledge was less a predictor of climate science refusal than political ideology.

Participant 39 highlights the futility of changing minds with information alone. The participant expressed knowledge about scientific journals (unlike participant 6). Having scientists shout louder is not going to work in these instances. The participant had an ability to parlay scientific “facts” very confidently and eloquently and it was clear that he was well read on anti-science literature. He was absolutely sure that they understood science both as a concept and the methods employed in the scientific method. Science,

even among those that reject its findings, enjoys a good reputation. Science as a concept and ideal is still highly valued even by those who reject the findings or choose to ignore them. There is optimism that science can regain its status as a trusted form of knowledge and information for potential action.

When asked the question about how important climate change was to participants and how much they trusted academic journals, there were clusters of those who had did not think climate change was important yet highly trusted academic journals and a cluster of those who thought climate change was of utmost importance yet place only moderate trust in academic journals. This underscores that understanding the ills of climate change does not translate to wanting to take action against it (Hornsey et al., 2016). There are many other factors beyond understanding the impacts of climate change that will compel one to find it an important issue.

There is evidence that perceptions of climate change have a lot to do with where one lives, one's social status, and how one makes a living (Krange, et al., 2019; Hultman & Pule, 2019; Roco et al., 2015). Both Krange et al. and Hultman & Pule found a high correlation between wealth and a belief in Western hegemony to be linked with climate change denial. However, belief in climate change still correlates to trust and post material values (Vainio & Paloniemi, 2013). Sixteen participants in total ranked climate change below a 7 (out of 10) for importance. Of those, only 2 denied climate change entirely and both were white and male. In a socioeconomically similar demographic like Markham and Vaughan where everyone lives in a suburban environment, though the

source of one's income was not directly asked, nearly all participants enjoyed a middle class to upper middle-class income. Socioeconomics played a minor role in these interview responses.

It is important as scientists and communicators that what we communicate often assumes that those listening will share similar values as the person doing the communicating. For example, preventing mass death may not be as universally shared as an important value as one might think. As Lakoff said in *Don't think of an elephant*, people react to values, not facts (Lakoff, 2014). This is corroborated by the findings in the interviews. Many of these values are pushed upon by the media that people consume. The constant bombardment of economics as an issue of primary importance in Toronto's media will likely impact how people view issues such as climate change and the lost lives associated with it.

Participant 59 thought climate change is important but needed to be balanced against other issues.

We see how the weather is changing; things are different than they used to be.

We are going towards something that we do need to change to veer into the right direction. Not the highest thing. There are other issues as well like housing, poverty, food availability (Participant 59, personal communication, 21 April 2023).

In a similar vein, Participant 31 also believes that while climate change is important, there are more important domestic issues to tackle first.

So, on a global scale I think it's important because we are dealing with global warming right now. It's a big issue a lot of species are dying off because of it. On a more micro scale I think there are more important issues to be deal with in Canada and Ontario. Such as healthcare and rising costs of living (Participant 31, personal communication, 29 January 2023).

These issues are beyond the circle of immediate needs for both these participants. Participant 59 in particular has a household income of over \$100,000 per year. In fact, many of the participants who voiced concern about poverty, housing, and food availability issues came from high income households. These people are concerned about the well-being of others, beyond themselves, but have prioritized economic issues, like those prioritized by Toronto based media.

Many participants understood the need for climate action but felt unequipped to take action, hence ranked the importance low.

Now with a daughter, I definitely care about it. I really do try. Husband less so. Struggling with no good alternatives, try to make the best choice. Electric cars are just as bad because of resources used to make them. We want to make the right choices but struggle how to (Participant 3, personal communication, 06 October 2022).

Feeling like the issue was beyond their influence also caused participants to rank the issue low.

I just don't see enough of it mattering in the short term. It's an important issue to fix. But at my level I don't know if there's anything I can do directly. I understand it's important, but it's not affecting me directly. (Participant 60, personal communication, 21 April 2023).

Unlike COVID-19 that had very direct and personal actions and impacts, climate change leaves people feeling like they lack agency:

I remember a scientist said with all the scientific research, it boils down to one thing, human greed. All the scientific evidence is great, but ultimately it is those things that led us where we are today. It's a deeper issue. More than scientific issue and it's out of my control Therefore I can only control myself. Control my spending. Which kind of company we can support. (Participant 38, personal communication, 22 Feb 2023).

Climate change and COVID-19, while both problems affecting the global community differed largely in the amount of influence people had over the issue. Wearing a mask to prevent illness was within the control of individual participants whereas stopping fossil fuel extraction was not.

Some participants who fully understood the dire situation of climate change had a fatalistic view. Take the case of participant 7. When asked about taking COVID-19 precautions, they complied with the law but did not take any more precautions because "If you're meant to die, you would die" (Participant 7, personal communication, 19 October 2022). They continue:

I'm neutral on this one. For past 2 years when people were at home it might have helped. No change has made any impact. For climate change that's been with us since forever. It's not one day or two days. (Participant 7, personal communication, 19 October 2022).

Participant 7 ultimately said she was comfortable with the idea of famine and death as it was simply part of fate. Much like how *The Globe and Mail's* coverage of COVID did not focus on health impacts of the disease, its coverage of climate change is similarly focused on political events, not ecological or environmental impacts (Stoddart et al., 2016). The similar attitudes toward climate change and COVID-19 were unlikely to be coincidental. The media coverage impacts how these issues are perceived and having a major national newspaper emphasize economic impacts of events sets the stage for those issues to overshadow the other consequences of said events. These interviews also support the work of Oreskes and Conway (2011) as the anti-climate change arguments they revealed coming from the fossil fuel industry persists.

I remember going through school and doing research and really relying on it. Majority of our Information came from. Then the professor showed us a ted talk who talked about how there was a peer review article that was published and then found out he lied. Then it became a problem of authenticity. (Participant 26, personal communication, 17 January 2023).

Since it is also undermined by how it gets reported in the news. The sensational reporting and changing advice undermine science as a whole. "I would trust it [science].

But till last week, pasta wasn't good for us. Now the other day [they say] that it's good for us because it has vitamins in it. Glass of wine was good for us. Now it's not" (Participant 46, personal communication, 21 March 2023). There were a variety of reasons why academic journals did earn high marks for them. In one case, trust had been eroded. In another, inconsistency, at least in how science is reported, led to many doubts. Some gave very good reason to doubt science and it was clear from our conversations that not everyone had a clear understanding of the scientific method or how these academic journals worked, yet that did not impact their perception that climate change was extremely important. There was not a clear correlation between lack of understanding and ranking climate change as unimportant. It is also important for people to know how research is funded. Knowing that science is untainted by interests was an important factor in its trust.

I would put [academic journals] as the same as any media outlet. Research process between journalism and academia is similar. Just at academia level there's an ethics group and ethics board. They can talk to you about the funding, ethics. We don't have a concrete ethics body, but we do have a code of ethics that everyone tries to stand by. Journalism and academic complement each other in a way and we need both to function as a society. I wouldn't even either a perfect 10 or even a 9 though. (Participant 23, personal communication, 23 December 2022).

As far back as 1993 Gerald Holton lamented the anti-science movement and the lack of literature around this growing problem (Holton, 1993). The body of work has since increased but remains relatively thin compared to other fields. In his book, Holton blames the lack of scientific literacy for the growth of the anti-science movement. This view meant that better understanding of science would mean greater importance put on the recommendations of the scientific community, whether it came to climate change or mask wearing, but this research does not support Holton's philosophy that better scientific literacy would mean better compliance with scientific recommendations. These interviews conducted in Markham and Vaughan support the notion that belief in climate change is rooted in far more than the understanding of the crisis and is deeper than a general anti science movement. We need to turn to thinkers like Massimo Pigliucci (2005) who grounds scientific understanding into theology to communicate climate change.

Pigliucci does not see low scientific literacy rates as an issue in the anti-science movement, something supported by these interviews in Markham and Vaughan. Rather than fighting anti science sentiment with more education, Pigliucci argues that a lack of scientific education isn't the problem. "What we can and need to do—urgently—is to promote a wide, interdisciplinary effort to educate scientists, science educators and the public at large about the science–society–religion triangle and the borders between each faction" (Pigliucci, 2005). Pigliucci places the burden of responsibility for fighting anti-science onto the shoulders of scientists and their responsibility to understand

religion effectively reaches out across the aisle. Rather than forcing the population to understand scientists, Pigliucci wants scientists to understand a broader population. This study has heard the voices of many people who may not fully understand the scientific method but who at least claim to understand the consequences of climate change and still, they do not value taking action highly. In almost all those situations, they have cited other issues that are battling for a similar set of resources. For the most part, scientists do not suffer from a trust problem, but we suffer from a values problem. How much people trusted in science came secondary to how people felt about an issue. Not everyone shares our values and even if they do, that is not the basis on which we are communicating with them. Having Holton's wish come true of increasing scientific literacy is a project that has been going the opposite direction for years and will take a long time to turn around. If we have any hope of addressing climate change, we need to take Pigliucci's approach and learn to speak about values, not only facts. When fundamental values differ, scientists can either accept the consequences of those different priorities or reach out to the values. What these interviews illustrate is the importance of trust like Warren (1999) and Schneier (2012) say. It is this trust that enables the functioning of society and the adoption of pandemic behaviours requested by authorities. Media needs to play a more helpful role in the communication of matters of scientific consequence. *The Globe and Mail*, though not the only offender, was particularly problematic in its COVID-19 coverage as revealed in the media comparison

of this study. Their climate change coverage follows a similar trend according to Stoddart et al. (2016).

Where media can make the biggest difference is in communicating the values within each science or disaster related story. When news media focuses on politics, not the consequence of climate change, politics becomes the most important issue. When the media focuses on the economic consequences, not public health or lives lost to COVID-19, that is the story that becomes important. Scientists, public officials, and officials managing the disaster should not have to fight the media bias toward economic issues when dealing with life threatening events.

Reasons for vaccine hesitancy

Convincing people to get a vaccination against COVID-19 proved to be a challenging task given the newness of the vaccine type and the misinformation about vaccination. People's trust in science impacts willingness to get vaccinated (Larson & Mnookin, 2016; Reiss, 2022). At the start of the pandemic, a large survey in Canada found that as many as 15% of Canadians were refusing to take a vaccine and 20% were unsure about it, with many believing that COVID-19 was not a serious health threat (Owens et al., 2020). In addition, vaccine hesitancy was associated with beliefs in conspiracy theories as well as age, ethnicity, and political affiliation (Burns et al, 2024). It is therefore in the public interest to foster overall trust in science and scientists. Fostering trust in science and scientists is important not just for emergencies but overall

public health. Thankfully, the majority of participants in this study are vaccinated. Out of 63 participants, only 1 remained unvaccinated against COVID-19 as of April 2023. The definition of fully vaccinated was those who received two or more vaccines against COVID-19 as per the requirements set in Ontario at the time (Ontario, 2021). The good news vaccine story is that vaccine mandate and social pressure worked to get the majority of people vaccinated. Not everyone wanted to get vaccinated, understands how vaccines work, or even trusts in their governments enough to get vaccinated, but the desire to continue participating in the activities they are accustomed was a primary driver for vaccinations. A total of 3 participants said they were vaccinated against their will (2 from Vaughan, 1 from Markham). In these cases, they were pressured by family or needed it to maintain their jobs. The interviews yielded several recurring reasons for vaccine hesitancy among participants in this research.

Fear

The one vaccine resister could be categorized as scientifically hesitant. Participant 29 lives in Vaughan and is a recent immigrant from Italy. What's more, both his grandparents died of COVID-19 during Italy's early wave of COVID-19. Despite this, participant 29 was still hesitant to get vaccinated.

I was confused about the whole thing. I wanted to wait for a bit before getting vaccinated thankfully. I wanted more information about what is going on. It was a reliable thing to do or not. I'm always curious to know if it is safe or not. Want to

know it's a good thing before testing it on myself. (Participant 29, personal communication, 25 January 2023).

Participant 29 did a lot of reading and research on the topic and his fears did not dissipate. Participant 29 did not deny the fact that COVID-19 exists, or his responsibility to keep others safe from COVID-19. Until mandates were removed, he diligently wore a mask. When asked if he felt responsible for keeping others safe from COVID-19 he said "Yes. For sure. I am careful if someone has COVID or they might be infected or have symptoms." (Participant 29, personal communication, 25 January 2023). At no point did participant 29 say that COVID-19 doesn't exist or that it was merely a cold. He took COVID-19 seriously, understood that it has the potential to kill, and still that did not overcome his fear of a new vaccine. Participant 29 also has a lot of trust in academic journals. He rated his trust of academic resources at a 9. Participant 29 was not distrustful of science, but fear is not easily overcome by the information available to him. Based on conversation, participant 29 did indeed read a lot about vaccines. He looked up information and even "warned" others against the dangers of vaccines. He differed from the other two anti-vaccination participants in that he did not hold the same world views about climate change and adherence to conspiracy theories.

Distrust of government

One of the participants in this study could be categorized as a conspiracy theorist, however, it should be noted, that he had received 2 doses of the COVID-19

vaccine. As Warren (1999) points out, social trust is imperative for a functioning society. When that trust breaks down, officials will find it harder to convince people to do what is asked of them whether during the best of times or during a pandemic.

Participant 39 (Vaughan), was a participant I would categorize as a conspiracy theorist. Participant 39 is a young man used to digital media did not hesitate to speak over an electronic platform. YouTube and Rumble are the two primary sources of information for this participant, and he ranks their trustworthiness at an 8. His favourite channels to follow include KLV World news, M101 News, and Sir Swag News – none of which are credible sources of information.

Participant 39 is not part of any chat groups and has no one in his life he feels is a reliable source of information to turn to. He felt that the vaccine got rolled out too quickly and COVID-19 as not particularly dangerous. Participant 39 shared with me an incident in which he felt he was mistreated due to his refusal to wear a mask. He was in a place of worship with his family when the following incident took place.

They have persisted and nagged about putting on a mask. When I refused and presented a reasoning, they insisted. We had to agree to disagree. They tried to push me out one time but did not escalate afterwards. Not physical. Verbal confrontation. I did not leave. But they did bring in someone to talk to me. And we were having an argument in the middle of practicing worship. That was out of the ordinary. I would think it was also unnecessary. It was disturbing myself and my

family and others for no reason. They did not pull me out of area to talk privately.

(Participant 39, personal communication, 24 Feb 2023).

He acknowledges that there were requests to wear masks that he ignored, but since he believed masks were not effective, his response is that he should have been asked to wear one. He is however vaccinated thanks to his parents and vaccine mandates.

I remember when they required people to be immunized to attend school. That was weird. Really weird. That was one of the factors that convinced my parents to take the vaccine. It was being pushed by the government. I was upset about that. Neither myself nor my parents thought about taking the shot before. We never even took a flu shot. Not seldom. Why take it? We get it every year. It's not too bad. You're older and stronger now. One guy pushed all children to get immunized, I got the shot. I could not refute them because they are my parents. Even if I protested their word, is law. Especially, I was under 18 at the time. If I could make my own choices. And not a minor at the time, I would have not gotten immunized. (Participant 39, personal communication, 23 Feb 2023)

Participant 39 was both angry at his parents but also knew that they loved him and had his best interests at heart when they forced the "misguided" vaccine onto him.

I was angry at my parents. I can't do anything about it. Being angry doesn't do me any good. I love them. Though they may not always have the correct thoughts. Maybe they are misled. They don't believe true is true. We don't agree to everything. They are my parents; I have to forgive them. They had my best

interests at heart. I think when they heard there was a new infectious disease coming around and it came from abroad and unknown in lethality, and last time it was SARS that spread in 2003. They were concerned. They listened to the government because they had more knowledge on that and had more sources to draw from. But I think they had my best interests in mind since they were just trying to protect me and my family. (Participant 39, personal communication, 23 Feb 2023)

Having a loving family and friend network is likely the best fight against this type of conspiracy theory misinformation (Hettich et al., 2022). While not everyone can be reached out to this way, Participant 39 did the right thing and found solace in the love from his family, despite the conspiracies that he takes in from media.

Conspiracy theories also existed in China about the role of Western countries in the virus. Participant 58 shared with me her experience about vaccine conspiracy theories from China as a course of her work as a vaccine advocate.

I had reverse discrimination. A bunch of mainland Chinese patriots telling me the vaccines were engineered by western world to depopulate the Chinese race and by promoting such vaccines I am making an enemy out of China as I am a culprit of the western world to depopulate the Chinese race. (Participant 58, personal communication, 11 April 2023).

Conspiracy theories cross cultures and there's no reason to believe that some cultures would be more immune to them than others. None of the participants in this study

expressed these views, nor would they likely speak to me as a researcher from a Western institution. The reasons for vaccine hesitancy given support the importance that trust plays in vaccine uptake as found by Ozawa and Stack (2013) and specifically with the COVID-19 vaccines

Drivers of vaccine uptake

Despite all the reasons people had for avoiding the vaccine, various factors pushed people toward getting the shots. Markham and Vaughan are relatively high-income areas and have high post-secondary education rates (Statistics Canada, 2016). There were people who understood the science behind vaccines and articulated the benefits of them. However, there were other important drivers of vaccine uptake even when participants themselves were negative or ambivalent toward getting the vaccine. Authorities acknowledged the breakdown of trust during the COVID-19 pandemic (Estabrooks et al., 2020) and the need to restore it in the public. The lack of trust, particularly in the black community, was blamed for low vaccine uptake in some areas (Warren et al., 2020). Many minority communities have good, entrenched reasons to be wary of authorities. Betrayals such as the infamous Tuskegee study when black participants were intentionally infected with syphilis (Thomas & Quinn, 1991), or the intentional pollution of Grassy Narrows with mercury (Vecsey, 1987) caused irreparable harm between minority communities and government authorities. Much of this distrust continues. Researchers found that high correlations between high public perceptions of

risk and high levels of distrust (Lofstead, 2005). This distrust could be directed to government and authorities or social distrust of each other.

In Canada, distrust of the vaccines was largely a result of safety concerns, skepticism towards political motivations to vaccinate the population, the lack of legal liability for vaccine producers, lack of trust for authority figures such as the CEO (Chief Executive Officer) of Pfizer, and scientific illiteracy (Griffith et al., 2021). Somewhat unique in the COVID-19 pandemic was the demographic that distrusted the COVID-19 had a strong correlation with political affiliation with US Republicans being less likely to get vaccinated than their democratic counterparts (Khubchandani et al., 2021). This points to vaccine hesitancy as not just an issue of mistrust of authorities, but political ideology also plays a role. Vaccine hesitancy was overcome in many cases by forces like peer pressure and vaccine mandates were quite effective even among the unwilling.

Peer and Family Pressure

Peer and family pressure played a role in a number of people's decision to get vaccinated. The mentality of "everyone else is doing it so that I should too" was strong for some participants.

Husband wants to get vaccinated, everyone did it. We didn't have to line up. So, whatever comes. At time COVID situation was bad, death rate was high.

Everyone was doing it, I may as well. Plus, if we want to travel just in case. It was

more for convenience. (Participant 7, personal communication, 19 October 2022).

The pressure exerted by friends and family was strong for Participant 63 but so was the desire to participate in society. Losing access to travel or simply going out to eat was enough of a threat.

Peer pressure. I probably wouldn't have done it if it wasn't for my wife and some other people in my family talking about it. It was that time there was a lot of pressure. Concerns down the line if I could get into other countries or even just restaurants (Participant 63, personal communication, 21 Jun 2023).

Both of these participants expressed an indifference to receiving the vaccine, but agreed to do it because of family members, in these cases their spouses. In this case, family pressure worked. The mandates were also very effective. There is a trust among family that is very influential for vaccine uptake. This is the same family pressure that existed for mask wearing in the Chinese Canadian community. The chat groups exerted family pressure for people to wear a mask. The family chat groups were not only important information vectors, but they were also important in creating family networks that pressured pandemic behaviours.

Trust in family

For some participants, trust in their family was enough to get a vaccine. No amount of peer or family pressure would make a difference if there was not a

fundamental level of trust. They may or may not understand the science behind vaccinations, or even have put much thought into getting vaccinated, but there is trust in a family member's advice to get it proved sufficient, even without the pressure. "I usually trust in vaccinations and my parents. I and my sisters have no reason to distrust (them). It's there for our benefit and they wouldn't offer it if it wasn't. I don't want to get sick. (Participant 54, personal communication, 30 March 2023). Participant 28 did not have reason to distrust and went along with what the rest of the family was doing. The trust in family was enough to convince them to get vaccinated without hesitation. "I didn't really think about it much. I honestly believed in COVID and thought maybe the vaccine will help. I didn't put too much thought into it. My whole family got it" (Participant 28, personal communication, 24 January 2023).

Even without fully understanding vaccines, their mechanisms, or even the reasons behind getting the vaccine, these participants had put faith in the fact that their family members were getting it. There is an inherent trust in their families to look out for their best interest. As more friends and family are influenced by Chinese language media that promoted mask wearing and wrote about the ills of the disease, more people would have been moved toward taking self-protective behaviours such as vaccines.

Participant's Desire to participate in society or travel

After the vaccine passports came into effect in Ontario when everything from restaurants to museums required proof of vaccination status to gain entry, the desire to participate in society was a large driving force for many participants.

When asked they decided to get a vaccine, participant said, "Getting on a plane. We needed it to get on a plane to Hong Kong. Two shots for plane." (Participant 19, personal communication, 11 December 2022).

In addition to health reasons, Participant 56 wanted to go resume social activities. "I also wanted to go to restaurants." (Participant 56, personal communication, 4 June 2023). These responses are good indicators that Ontario's vaccination policies worked. People may not have cared to get a vaccine, but the desire to return to "normal" or go back to doing things like dining out drove their vaccine decisions. When it came to choosing between not participating in society or not getting a vaccine, these participants chose to get vaccinated. Family pressure, peer pressure, and mandates all had strong influences in getting people to take the vaccine. The Chinese Canadian community had an advantage in this aspect because of the desire to travel. The normalization of masking in Asia and the strict vaccination requirements meant that people in the diaspora who wished to travel to Asia needed to meet the vaccination requirements of the destination country. The vaccine requirements of other countries proved to be a factor in vaccination uptake diasporic communities.

Fear of getting the virus

Fear of getting virus was a driver for vaccine uptake especially among those who had people known to them die from COVID-19. Participant 40 became afraid when someone her own age died. Their own vulnerability came into focus when it happened to someone close to age and health died.

I had a conversation while walking the dog. Let's see what happens by certain amount of time. I wasn't feeling particularly vulnerable at that point. I was working remotely. What sealed the deal was a sister in laws friends was exactly my age caught covid from father in palliative care and died within 4 days of getting it.

That was eye opening. I think the unknown of vaccine compared to dying, for me that was it. March 2021. Anything that guarantees I'm not going to die is a good thing. (Participant 40, personal communication, 23 Feb 2023).

Participant 25 did not need to have someone they knew personally die but knowing that people of similar age passing was enough.

It was initially the fear of the unknown. If you vaccinate yourself, you can protect yourself in public areas. Just the fear of getting it, of being sick and dying at our age, that's what we are most concerned about. (Participant 25, personal communication, 16 January 2023)

Information about others dying from COVID-19 encouraged these participants to get the vaccine. Knowing that other people had died from the virus was an effective motivator for vaccine uptake. This is an exact corollary of vaccines becoming a victim of

their own success where people have long forgotten how deadly or debilitating diseases that have essentially been eradicated were (Janko, 2012; Sandman et al., 2021). The emotional response of fear proved effective for these participants. While people's privacy needs to be respected, letting people know about deaths from COVID-19 beyond the statistics is an effective communication strategy for vaccine uptake. In this case, outlets like *The Globe and Mail* did readers an injustice when they focused their reporting on the economic, and not health impacts of COVID-19. Not only were health impacts diminished, steering the focus away from health impacts of the virus takes the attention away from the death and health consequences of getting virus, thereby reducing the fear. Instead, the fear became focused on economic issues that became paramount.

Trust in Media

Media trust is very important as discussed in 5 and 6, the different types of media intake had an influence on pandemic decision-making. There were participants who got the vaccine because of the media surrounding it. Participant 41 heard about the vaccine through social media and other news outlets.

I chose to get vaccinated because what I was hearing from Instagram and news in general it was one of the few ways to protect ourselves from COVID other than wearing masks and staying distant. It was just a matter of doing what we could to try not to get it. (Participant 41, personal communication, 23 Feb 2023).

Participant 20 has inherent trust in science and media. When the media recommended masking, that was sufficient. “I trust the science. Listening to the radio and newspaper. It was highly recommended as the best way to prevent this” (Participant 20, personal communication, 14 Dec 2022).

The constant media attention around vaccinations had an impact on these participants and encouraged them to get vaccinated. This consistency of media messaging is the kind of foregrounding that Gwendolyn Blue (2019) means about ritualizing science communication. Consistency is an important part of ritual communication. This also means that had Toronto based media outlets been early and consistent with the masking message, infection rates would likely have been lower. Trust in media meant that the Chinese language influence gave the Markham community an early warning advantage that those who relied on Toronto-based media did not have.

Trust in the science

By far the most cited reason people got vaccinated was a trust in the science behind vaccines. People generally had faith that scientists knew what they were doing and had their best interests in mind, even if they did not understand how vaccines themselves worked.

I felt it was best way to protect myself, my family, the community. If I got COVID, I wouldn't be as sick. I know vaccines reduce your illness, but they prevent from

getting further sick and spreading it. Most important to protect myself, my family, and community at large. We also see that vaccines work. (Participant 17, personal communication, 9 December 2022).

Participants who had reported having underlying risk factors were also keen to take the recommended health advice.

I did trust the science. I didn't have severe health issues that might trigger a negative response. I felt I was able to do so. Also, to protect myself and get into idea of herd immunity to slow down virus. (Participant 24, personal communication, 27 December 2022).

Participant 18 also had a parent die from COVID-19 and that reinforced the need to mask. "Because I believe in medicine. I believe in vaccines. I saw how detrimental COVID was and to be honest my dad passed from COVID." (Participant 18, personal communication, 9 December 2023).

The overall pro-masking sentiment was echoed by many participants in both Markham and Vaughan. This sampling may be biased on the whole since Markham and Vaughan are both highly educated demographics, and those willing to speak to me were also biased toward being educated. However, the trust in science, even without direct understanding of it, was cited even by some with only high school educations. Though the public education of how vaccines work is an important public health measure, maintaining this trust in scientists is crucial. To maintain this trust, Lexchin et al. (2020). calls on governments maintaining higher levels of transparency about members of

vaccine task forces like Canada's COVID-19 vaccine taskforce (Lexchin et al., 2020). Without that transparency, public trust in science and scientific institutions are at risk.

Lower levels of risk acceptability for children

Levels of trust and risk acceptability often change when children are involved. Many parents would take risks upon themselves that they may not allow for their children. One mom expressed vaccine hesitancy regarding getting a vaccine for her daughter, but she was vaccinated herself.

For my daughter I was 90% sure, I was gonna get it. But I was kinda worried because you read stories about how you know kids in Hong Kong have the hearts inflammation. But I actually spoke to my doctor friend that night. I remember clearly because my dad didn't really want my daughter to take it to get more information on the risks involved and to me, I eventually figure that the risk of for getting COVID like you know a new variant that might be dangerous is higher than the risk of taking the vaccine so I let her get the best thing.

(Participant 3, personal communication, 6 October 2023).

She is not alone in COVID-19 vaccine hesitancy for her child. A study in China found that vaccine hesitancy among parents was higher for their kids than it was for themselves (Zhang et al., 2021). Parents are willing to accept certain risks for themselves that they would want to safeguard their children against. This is important to keep in mind that parents demand higher standards of risk mitigation for young children.

The information targeted at parents needs to keep in mind that messaging may need to be different for parents.

Fear and government distrust were the two main factors that caused vaccine hesitancy. In the Chinese community, the Canadian government was not trusted to manage the pandemic adequately, therefore people took preventative actions based on information received from Chinese language sources and advice from friends and family. Trust was lost during the initial phase of the pandemic because of the changing health advice. The stark difference in how governments in Asia and Canada handled the pandemic led to many people losing confidence in the Canadian government's ability to manage COVID-19 in the eyes of the Chinese community. This distrust led to higher levels of self-protection measures such as masking and social distancing. However, the same distrust of government from participants in the Vaughan community led to lower levels of pandemic instruction compliance.

The interviews in Markham and Vaughan show that mandates are an important part of public health compliance. While there is a small number of people who disagreed with the intrusive aspect of vaccine passports and mandatory vaccinations, the bulk of participants got vaccinated. The number of people who wanted to participate in social activities and travel like going to restaurants and getting on airplanes is indicative of the effectiveness of the vaccination mandates. For diasporic communities, the public health policies in their nations of origin clearly had an influence since people wanted to travel to visit friends and relatives. Even for those who were ambivalent about getting a

vaccine got vaccinated. Trust itself proves to be a strong factor. If not trust in scientists, then trust in family and friends became an important factor, again giving credence to the importance of social trust. Having consistent messaging about the pandemic and reporting on the pandemic, not just the economic impacts of it are an important factor to building that trust and media has a strong role to play in trust building

Chapter 9: Feelings Matter

Parents of young children and school teachers spend a lot of time helping young people managing their emotions. My children have been taught to categorize their feelings into zones. When they are in the “red zone”, they remove themselves from the group and can go calm down in a corner. Adults are expected to manage their own emotions but the reality is that how people feel will impact how they respond in any situation, let alone a pandemic or crisis. The media created stigma and bias in some of the population, impacting how people felt about mask wearing. This stigma not only jeopardizes one’s physical health by increasing the risk of contracting COVID-19, it also increases the risk of mental disorders, particularly in minority populations (Wu et al., 2020). How media and public officials present information will also dictate the emotional response such as feelings of anger or fear, of which it may be worth tracking now that technology tools for us to do that exists. We explore those possibilities and look at how scientists can communicate in a way that validates emotions for better compliance.

Feelings of Stigma

Both politicians and news agencies had a hand in fueling stigma against Chinese people and mask wearing in general. Brazil’s President had called mask wearing something only used by ‘viado’, “a pejorative term primarily used to refer to gay men and boys” (Cowper-Smith et al., 2022). In one swoop, President Bolsonaro denigrated both the LGBTQ community, a group he openly reviles (Cowper-Smith et al., 2022) and

downplays the severity of the pandemic. He was not alone in the downplaying the stigmatization of the disease. The President of the United States of America called the disease “kung-flu” and the “Chinese virus”, belittling the disease and linking it to Chinese people (Halpern, 2020) that would lead to an increase in anti-Asian hate crimes across the United States (Han et al., 2023). News media added their share to the anti-Asian sentiments growing around the world. At the start of the pandemic, news agencies referred to COVID-19 as the “Wuhan Virus” (John & Guy, 2020; Nature, 2020), or “China Virus” (BBC, 2020; Moritsugu, 2020). Masked Asian faces quickly became symbolic of the crisis quickly spreading around the world and with this, incidents of anti-Asian racism spiked during the COVID-19 pandemic (Chen & Wu, 2021; Cheng et al., 2021; Edara, 2020; He et al., 2021; Wang, 2022). Asians were twice as likely as their white counterparts to experience COVID-19 related discrimination (Wu et al., 2020). Incidents ranged from online harassment (He et al., 2021) to medical discrimination (Santos et al., 2021). Asian Canadians reported incidents of harassment for wearing a mask at the start of the pandemic with the stigma having an impact on decisions about whether to wear a mask (Mamuji et al., 2020). The perceptions of threats formed in groups are known to have adverse effects on the non-ingroup perceptions of quality of life and health (Abuelaish, 2023; Major & Schmader, 2018).

When it came to instances of stigma in Markham and Vaughan, unexpectedly, the largest demographic to experience stigma, or negative experiences while mask wearing were white women in Vaughan. The incidents of racism and stigma against

Asians at the start of the pandemic (Cheng, et al., 2021; He et al., 2021; Santos et al., 2021) made this an unexpected result. In this case, stigma was not tightly defined for participants. Any incidents when participants were made to feel uncomfortable because of their masking decisions were considered stigma and participants themselves decided if it qualified as stigma. These interviews point out the fact that feelings of stigma affected mask wearing decisions. Of the participants who reported experiencing mask stigma, 4 were in Markham (2 Chinese women, 1 South East Asian woman, 1 South Asian man) and 8 were in Vaughan (5 White women, 1 White man, 1 Black man, 1 Latino man). Note that one of these instances of stigma was for not wearing a mask.

Markham

In Markham, the stigma related to mask wearing was relatively mild compared to their counterparts in Vaughan. The stigma was mostly restricted to stares and questions about mask wearing that made people feel uncomfortable. “Once in a while I get a strange look in certain areas, [it is] personal kind of feeling but nobody has said anything” (Participant 12, personal communication, 2 November 2022). The stigma also seemed to happen from outside of the Asian community and in some cases, directed at Asians.

Yes, especially when masks came off. People would stare at me asking why I’m wearing a mask. At beginning of COVID didn’t get that when everyone was wearing masks, ... I heard what happened in whole foods how people were

waiting in line, a bunch of Asians got verbally attacked by people. Didn't happen to me, but I live across street from whole foods. Hearing about it, felt like eyes were on me. I wear scrubs a lot so people see me in scrubs, people are staring at me and makes me feel uncomfortable. Knowing about these experiences affected me that way. (Participant 4, personal communication, 07 October 2022).

In the case of one participant, the stigma came from family living in the United States. "American friends don't understand why people wear mask. Some people in my family don't like masks. There's the feeling of 'why are we doing this?'" (Participant 5, personal communication, 11 October 2022). The most concerning stigma related to mask wearing came in the very early days of COVID-19 and from our own government. Not only did public health agencies promote not wearing a mask, but Participant 58 was threatened with legal punishment should they take COVID-19 safety precautions.

Well, when we first were aware of COVID, there was a movement of don't wear masks, when you wear a mask people think you have COVID. I was affected by that because I was an early adopter of mask and other protective measure. I felt pressure to not wear mask. Second front was from the government. At start of COVID I had to talk to one of the ministries informing them we could no longer run one of the rehab groups. I was told I needed to be ready for a race system lawsuit. The change in service modality was also initiated by clients. (Participant 58, personal communication, 11 April 2023).

The stigma in Markham was limited to what could be called microaggressions.

Vaughan

In Vaughan, where overall rates of masking were lower, more participants felt like they had been stigmatized in some way or another because of their decision to wear a mask. For the most part, the uncomfortable encounters are limited to looks that made participants feel uncomfortable.

I guess more recently if I'm wearing a mask and nobody else is wearing a mask. Nobody says anything you feel people looking at you "why are you wearing a mask" a lot of people feel that COVID is over. (Participant 18, personal communication, 09 December 2022).

Participant 17 expressed feelings of judgment from others for wearing a mask.

If somebody would come to my door and make a delivery. They would ask "oh you're still wearing a mask is everything ok". I feel like they were judging me because I wore a mask. I think the other judgment some people had when things started to open up and people were going to restaurants more and I wasn't going. They didn't say it but I think there was underlying judgement. Whether it was expressed or just implied. (Participant 17, personal communication, 9 Dec 2022).

Participant 31 in Vaughan also noted the same microaggression as their counterparts in Markham. In this case, the feelings of stigma were restricted to a look. "Nowadays if I'm wearing a mask some people might look at me funny, but I haven't experienced anything where people outright say mean things to me or ask me why I'm

wearing a mask” (Participant 31, personal communication, 29 January 2023). Beyond the looks received by people in Markham, one participant in Vaughan reported having people try to convince them to remove their masks. “Sometimes clients will get into conversation trying to get me into taking off my mask. Or get into conspiracy theories. But never any disrespect towards me” (Participant 26, personal communication, 17 January 2023). This is of particular concern because this person was a healthcare worker. Healthcare workers being pressured to take off masks can put a large number of vulnerable people at risk.

These incidents would also be categorized as microaggressions. The request to take off the mask is a step further than any participants reported in Markham. However, in two incidences, there were verbal altercations related to mask wearing.

Believe it or not I’ve been called names. Like very offensive comments. “I’m a disease carrier”. I have been getting customers out of the blue they just make me feel uncomfortable and tell me I’m a disease carrier because COVID originated from China. (Participant 30, personal communication, 29 January 2023).

Parents had a particularly difficult task dealing with stigma as it affected their children and have them continue masking despite the comments. “One of my children has mentioned sometimes somebody at school would mention why you’re wearing a mask that’s so stupid. We have a conversation about why that’s important” (Participant 16, personal communication, 7 December 2022). Both Participants 16 and 30 are of Chinese ethnicity that was the cause of the stigma and aggression towards them.

Despite the expectations of finding more stigma in Markham than Vaughan based on anti-Asian racism during COVID-19, the high masking rates in Markham make others feel comfortable wearing a mask and decreases the odds of having someone so vehemently against a mask they would choose to say something. Being part of the mask wearing majority created a more comfortable environment for mask wearing and being part of the majority, there was less stigma associated with it.

Vaughan on the other hand, maskers are in the minority within that community. Minority groups are more likely to experience stigma. With a larger number of people wearing masks, participants were more comfortable wearing masks and less likely to experience stigma as they were part of the mask wearing majority. The role that media played in creating an atmosphere of stigma for Asian around the world, including Canada cannot be ignored. It had an impact on stigma Chinese Canadians felt and their decision to wear a mask for protection. Media has a responsibility to not stigmatize a community in their reporting. They failed in this task particularly during the initial stages of COVID-19.

In a role reversal, Participant 39 felt stigmatized against for his refusal to wear a mask.

Places of worship. Stores. They have persisted and nagged about putting on a mask. When I refused and presented a reasoning, they insisted. We had to agree to disagree. They tried to push me out one time but did not escalate afterwards. Not physical. Verbal confrontation. I did not leave. But they did bring in someone

to talk to me. And we were having an argument in the middle of practicing worship. That was out of the ordinary. I would think it was also unnecessary. It was disturbing myself and my family and others for no reason. They did not pull me out of area to talk privately. Rest of my family was masked. (Participant 39, personal communication, 23 Feb 2023).

While many felt the harassment of wearing a mask, a participant who was unmasked felt stigmatized for not wearing a mask. Participant 39 is among the reluctantly vaccinated and a consumer of news from Rumble, YouTube, and Sir Swag, media sources known for disinformation. While mainstream media had a sizeable role in creating stigma against Asians through their reporting, online sources of (dis)information played a role in masking reluctance that created feelings of stigma and resentment when asked to mask.

Masking sentiments within Chinese community

The Mamuji et al. (2020) found a notable difference amongst participants was that the attitude toward mask wearing was quite different when examining Chinese Canadians who were born in Canada or had been in Canada for 15 years or longer versus those who had arrived more recently. As they point out, the diaspora is not homogenous. Consider this woman in her 50s who has been in Canada over 40 years and gets her news primarily from Canadian broadcasters. She said “No. I never wear masks. I’m sorry. No, I don’t wear a mask. Unless public health makes that mandatory, I

don't think I need to wear masks” (Participant 10, Mamuji et al., 2020, Dataset). This sentiment was common among participants who had arrived in Canada very young or were born in Canada. Their information sources were more restricted to Canadian and other Western sources, and they had much greater faith in Canadian officials. Researchers noted that among the non-mask wearers, all said they would follow public health directives should that advice change. This is a strong indicator of both the effectiveness of ritualizing masking coverage in Chinese language media as Blue (2019) suggests we do and the trust that is placed without tight information circles as news gets circulated.

Normalized mask wearing inside the Chinese Canadian community was critical for the proliferation of this behaviour. People felt comfortable wearing masks and stayed within their communities where people also wore masks. Having access to media from Asia made mask wearing natural. Stigma that resulted from media that stigmatized mask wearing. If major newspapers in Canada had normalized mask wearing like the Chinese language ones did, this stigma would have decreased for members of the Chinese Canadian community outside of their local neighbourhood. This is another reason that papers like *The Globe and Mail* and *The Toronto Star* need to prioritize coverage of pandemic related health issues over economic ones. Media has a lot of influence over people’s behaviour and they failed to responsibly use that influence to lower death rates in this pandemic.

Using Social Media in an Emergency

Social media proved an important information tool during the COVID-19 pandemic. It was not only a way for friends and family to stay connected, but it also allowed officials to spread information quickly and became a resource for people seeking health advice and vaccines. Since social media will not go away in the foreseeable future. It is incumbent upon communicators and officials to use the tool in the most effective means possible. Using these tools to find out how many people are feeling about the pandemic, masking directive, or vaccines can give the kind of feedback that is useful for real time message adjustments.

From this study, we know that know that the Chinese community had an advantage with early information; they first started with trying to prevent the spread of disease within Canada. The data gathered by Mamuji et al. in 2020 sheds some light on what the community did with this information. When the country went into lockdown, many people, not just the Chinese Canadian community started exhibiting pro social behaviours just as Heide found in other emergencies. People did things like make masks for others, deliver food to those less mobile. “And my cousin in Edmonton is now sewing and she's amazing. Like she's the genius in sewing. So, she's making face masks” (Participant 13, (Mamuji et al., 2020, Dataset).

...one of our church members also created a group on Facebook and opened it up so anyone can join, and one of the ideas was really “Hey, how about if people want to contribute some money we'll take care of their lunch or something for

some of the front lines workers in some of the nursing homes and some of the areas” and so where she thought she might get a few people and be able to provide one meal for them. We’re talking one meal we’re talking about I think \$400 worth of food for one shift. We ended up with something like five shifts worth of people just giving money to do it. So, just trying to provide those needs and go a little bit above and beyond and then the neighborhood being right by the hospital as well, I know that they’ve also in the neighborhood have organized rallies around the hospital and things like that for the workers there. People have really just stepped up for each other. (Participant 15, Mamuji et al., 2020 dataset).

These pro-social behaviours were largely uncoordinated. In the early days of the pandemic, many people simply tried to help where they could. The messaging to avoid mask wearing was likely to avoid anti-social behaviours such as hoarding that would deprive healthcare workers of PPE. The pro social behaviour of the communities in this case, and as Heide (2004) points out, in general, is underestimated. In the case of COVID-19, planning for the anti-social behaviour in this case likely cost authorities credibility.

Participant 77 from the Mamuji study in the early days of COVID-19 was frustrated because of the lack of mask wearing awareness in February of 2020 and took matters into her own hands writing educational pieces on mask wearing. By doing this, Participant 77 was exhibiting pro-social behaviour, trying to get fellow citizens educated

about risks and doing something about it. "There was an article that I wrote regarding people should start wearing masks. And the government should be actually telling people to at least accept people to wear masks. And that was mid-February" (Participant 77, Mamuji et al., 2020, Dataset). Whether despite or because of the lack of confidence in government, people took it upon themselves to help each other in ways that were unanticipated. This "unanticipated" behaviour has been found by Heide to be entirely consistent in disaster situations (Heide, 2004) and he argues it should be considered and planned. The collective making of masks, donations of food and supplies for healthcare workers shows that initially telling people that masking does not work (Howard, 2020) was likely unnecessary and may have contributed to the refusal of mask wearing. While conserving supplies was a necessary priority, the about face eroded confidence in the organizations leading the pandemic response. This may have been better handled by preparing for people's best, as opposed to the worst side in a pandemic and using social media as a tool to encourage pro social behaviour as well as coordinate the efforts. However, those efforts would be much better handled if authorities knew what people are thinking and feeling about the pandemic. In light of this, a small feasibility study looked at the general population of Twitter (X) users to see if it is possible to make use of new digital technology tools to determine overall sentiment towards pandemic instructions.

Sentiment Analysis Feasibility Study

The issue around masking provoked strong sentiments in people, as reflected by the tweets on Twitter (now known as X). Negative emotions are exploited by populist parties in their political appeals (Widmann, 2021). COVID-19 communication went far beyond typical science communication - teaching about insects and asteroids. COVID-19 communication invoked strong emotional responses that can be exploited politically (Donovan, 2021). Managing these strong reactions is something closer to political communication that scientists and public officials increasingly need to be aware of.

Given the importance that social media played in the COVID-19 pandemic, public health officials should assume that they will continue to play an important role going forward both for disseminating information and disinformation. This study investigates the feasibility of using digital technological tools to analyze social media posts and give public health officials information about how the information they are sharing is being received across social media platforms. This study is only looking at the feasibility of the AI (Artificial Intelligence) digital technology tool as a concept. Future studies will have to break down the findings by region and finer timelines, perhaps even with the computing power of an hourly analysis. By taking advantage of AI tools, many of which are currently free or inexpensive to use, this study looked at the feasibility of using these tools to evaluate public sentiment about COVID-19 so that communicators may be able to better respond to in real time. This study used IBM (International Business Machine) Watson's Natural Language Processor (NLP) to categorize tweets containing

the words “mask” or “covid” under one of the emotion categories available at the time – anger, disgust, sadness, fear, or joy. This study found that the AI tool had roughly 85% matching sentiments compared to manual judgements of tweet analyses, an acceptable compatibility rate. Over the first several months of the pandemic, this analysis clearly shows that fear and anger increased on Twitter as it related to masks and COVID. This fear and anger coincided with shutdowns and mask mandates as it spread across the English-speaking world. As more regions went into lockdowns, and then extended lockdowns, the fear and anger on Twitter grew.

Over the summer of 2020, Black Lives Matter protests coincided with COVID-19 lockdowns (Gottbrath, 2020) and there was an increase in anger on Twitter. On one side of the political spectrum, protestors were reminding each other to wear masks for safety. Tweets such as this one posted in June by a Twitter user were angry but were also pro masking. People were angry at others for not masking.

ATTENTION: If you or a loved one has been refused entry to a private business for not wearing a mask, and you would like to explore legal options to protect your CONSTITUTIONAL RIGHTS, my lawyer friends and I are happy to explain just how fucking stupid you are. Pro bono! (Anonymized Twitter user, June 29, 2020).

Sarcasm is an element that as of the technology available when this study was done, is very difficult to evaluate.

On the other side of the political spectrum, people were angry that gatherings were being allowed to take place despite pandemic shutdowns and restrictions for businesses. Some people like this user were angry and resentful that they had to wear a mask, calling the pandemic a hoax.

Regardless of what you believe when it comes to #COVID19 but I'm fucking pissed! If I don't wear the stupid mask, I can't do business, I become homeless, and ride public transportation! I don't care for this hoax, if I can't be free to do as I wish, it's not worth it! Nothing is! (Anonymized Twitter use, Aug 30, 2020)

Since anger was linked to distrust in the COVID-19 pandemic (Erhardt et al., 2021), the increase in anger during the pandemic increases the likelihood that pandemic instructions will not be followed. The anger was also indicative of the divisions within society and the added complexity of managing the pandemic.

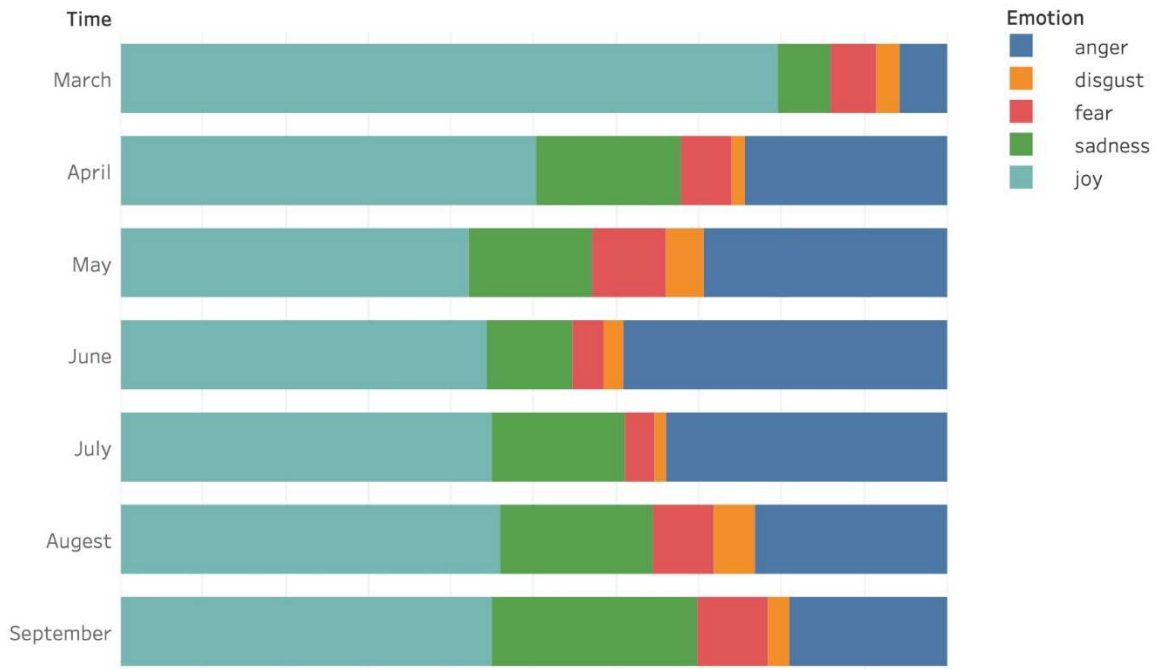


Figure 15 Sentiment for "Mask" on Twitter March to September 2020 done by IBM's NLP

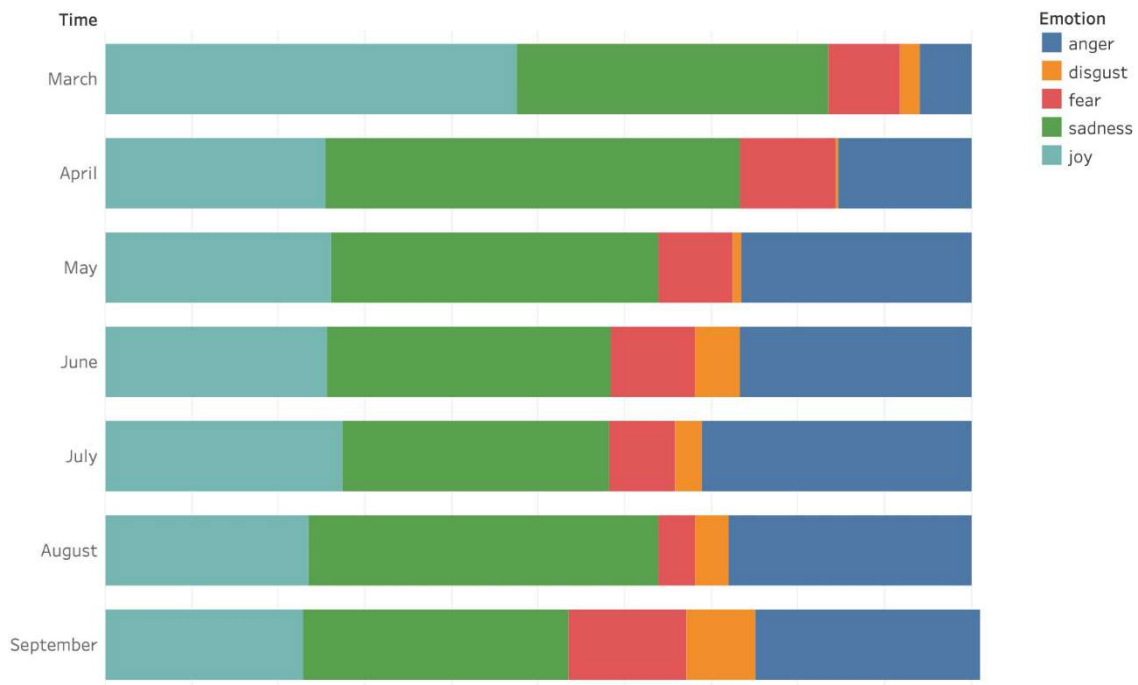


Figure 16 Sentiment for "COVID" on Twitter March to September 2020 done by IBM's NLP

Figures 15 and 16 show the how sentiment changed month to month. Fear, the blue bar, grows steadily in the summer and starts to decline in July and August for 'mask' and 'COVID' respectively. Below is a brief timeline of major COVID events leading into the summer of 2020. The initial fear in the early months grew into anger as more and more restrictions were put into place in the English-speaking world. That anger did not start to dissipate until later in the summer as restrictions started to ease.

Using AI (Artificial Intelligence) tools to analyze sentiment of posts on social media is a fast and low-cost method for communicators, politicians, and health officials to get a sense of what the population is feeling and the likelihood of broad compliance

of public health rules, especially compared to more traditional methods such as telephone surveys. Social media is broadly adopted and the ability to do a similar analysis across multiple platforms will give a useful public sentiment proxy. This information then has the potential to inform officials on how to adjust their instructions of the messaging. This study shows the ability of these technology tools to give communicators useful information. How exactly it can be used is a topic of further study. Though Twitter is no longer a platform where this type of analysis can be done to the removal of academic access and all third-party APIs (Application Programming Interfaces), using Natural Language Processors for real time sentiment analysis of other text-based platforms is something that authorities could consider in future for during an emergency.

Given how widespread turning to social media for information became during the pandemic, it behooves us to find ways to glean information from it in ways that will help public health officials prepare for future pandemics. Ali and Kurasawa were correct when they called social media both a blessing and a curse (Ali & Kurasawa, 2020). Despite the disinformation that existed on social media, it also became a place of great strength as people got together to try and help. Information moved through social media into localized chat groups. Participants reported using social media as a vector to organize food deliveries and mask making during the lockdown period. Social media will not go away before the next emergency. Understanding their influence and utility will be advantageous to officials before the next situation arises. Making use of AI digital tools

will allow for more effective use of social media platforms. This feasibility study shows that sentiment analysis is already advanced enough to be usable for quick analytical work and officials will be able to connect sentiment trends to specific events that will allow communicators to know how their messages are being received.

Information from around the world is coming through highly localized chat groups that potentially compete with information from domestic officials. There is intrinsic value in building local information channels beyond traditional corporate media outlets that can reach these groups directly. The use of community and friend-based groups means that if information can be targeted at community hubs, such as church groups or business associations, it has a good chance of being shared inside diasporic circles since the information is coming from known, trusted sources. There is so much diversity of media that getting a message out broadly is becoming increasingly difficult. It will be important to make use of social media platforms. The digital technology tools available will also make it easier to know how people are feeling about pandemic instructions and give decision makers low cost, and fast tools to gauge the public reaction. Social media will be unlikely to go away. It will be prudent to make the best use of it.

Mass Applied Science Communication Strategies

Knowing how people are feeling is an important part of managing a crisis. For their part, the technical experts should have a better appreciation for the public sentiment before trying to communicate their findings or advice for better reception.

Doctors and medical researchers, who appeared in the media discussing COVID-19, were caught off guard by the hostile reactions, in some cases death threats, that they received (Bennett & Perez, 2020; Saltman, 2020). This was particularly notable for women in high profile positions (Deliso, 2020). The abuse was not reserved for COVID-19 alone, a physician got death threats for posting a TikTok (a video sharing social media platform) video about getting vaccinated (Simpson, 2020). The backlash against doctors in Hong Kong took a different tone as it was the government who acted against their open criticism of the government refusing to fully close their borders (Lau, 2020; Parry, 2020). The political nature of that response is beyond the scope of this dissertation. This will focus on the public backlash that doctors in Canada had received due speaking about COVID-19. The reactions differed heavily from the warm receptions that beloved scientific figures in popular culture like David Attenborough or Bill Nye generally receive.

Mass applied science communication on the other hand is the science that we want to communicate in order to push the general public into taking certain actions or adopting certain behaviours. The inherent political nature of disease control (Chattu et al., 2021; Harper & Parker, 2014) and in particular COVID-19 (Koerber, 2020) needs to be recognized and addressed when providing information to the public. Mass Applied Science communication differs from some of the previously discussed forms of science communication in that it while it has defined goals such as policy or behaviour change or risk acceptance, it lacks clear definition on audience and stakeholders, in that it

generally is a large audience and could be defined as “everyone” with little exaggeration. Some examples of this would be informing the public about the risk of smoking, the benefits of childhood vaccines, the risks of climate change, or how COVID-19 is spread. The scientists doing the communicating have an action or set of actions they would like either the general public or politicians to take. There needs to be a communication of risk and outcomes that affect a broad swathe of people, generally so broad that it becomes difficult to clearly define stakeholders or find people unaffected by the science being communicated. The inability to define clearly draw boundaries around affected people and tailor stakeholder messaging is what makes MASC particularly challenging. The messaging is meant to cross political and territorial boundaries and requires the actions or cooperation of a large number of people. In the case of smoking or vaccinations, communicators telling the general public about them wanted specific actions taken – people to quit smoking and get themselves and their children vaccinated. In the case of acid rain, the Helsinki Protocol (UNCE, n.d.) aimed to reduce Sulphur Dioxide levels that required people to petition their governments for regulation. It was an issue that affected many people across many territorial boundaries.

Svante Odén

In 1967, the “father of acid rain”, Swedish scientist Svante Odén published a piece titled “The Acidification of Precipitation” Dagens Nyheter, a leading Swedish daily newspaper (Sundqvist, 2011). Odén lacked the scientific evidence needed to draw firm

conclusions about the impacts of the acidified rain, instead of publishing in a scientific journal, he presented his findings for a lay audience by painting a picture of the outcomes. Sundqvist (2011) considers this an example where the public was well served by scientists and politicians alike. He notes that Odén wrote in the daily directly, without going through handlers or any type of political censorship that could cast doubt on the integrity of what he was presenting. Odén may not have known the outcome of bringing this issue to the public, but from his actions, both in choosing to publish directly in a widely circulated newspaper and his contributions to a government report that would be published later (Sundqvist, 2011), one can surmise that he had hoped for widespread knowledge of the issue to bring about political action to reduce acid rain.

Consider how Odén's direct outreach to the public without censorship contrasted with the political the perceived political interference at the WHO. At the start of the COVID-19 pandemic, the WHO had trouble brushing off accusations of being under China's heavy influence (Griffiths 2020; Mazumdaru, 2020). Among participants in the Chinese Canadian community this manifested as a lack of trust in the organization. Several participants expressed doubt in the organization's impartiality, making their advice less effective than it otherwise could have been. The political interference tainted the trust that people put in science and scientists tackling the pandemic. Participants were getting advice from officials that differed from the scientific advice they were getting from medical professionals. Consider this quote from Participant 17 in which she states that her confusion resulted from getting advice from a friend in the medical

profession that was inconsistent with the advice from Dr. Theresa Tam, Canada's Chief Public Health Officer at the time of the pandemic. "I had a friend who was a doctor, and she said, Grab yourself a box of masks. Get yourself some masks. But the government was saying, you know Dr. Tam, but she was saying, not right now" (Participant 17, personal communication, 9 December 2022).

The medical advice given by officials did not match the advice given privately by professionals. The filtering of advice through a political body eroded the trust that participants would have otherwise had in the institutions giving pandemic advice. American Centre for Disease (CDC) control also suffered from accusations of political interference. In July of 2021, CNN reported on direct political interference with the CDC's weekly reports (Stracqualursi and Homes, 2021). When scientists are suspected of having their work interfered with, it erodes the trust in the results and recommendations that they have to offer.

Rachel Carson

Rachel Carson was a pioneer in her field and a woman who should be considered the mother of mass applied science communication. Carson was an outspoken critic of indiscriminate pesticide use and its impact on wildlife and human health. Carson had a purpose to her writing and media appearances – she was determined to stop the widespread use of Dichlorodiphenyltrichloroethane, a pesticide that was harming birds and children alike, commonly known as DDT. Carson won the

fight against DDT when it was banned in the United States in 1972 (CDC, n.d.b). Key to Carson's success was her framing of the issue as moral one when she wrote: "The question is whether any civilization can wage relentless war on life without destroying itself, and without losing the right to be called civilized" (Carson, 1962, p. 99). The intricacies of the science were ignored in favour of the moral arguments.

Consider how newspapers such as *The Globe and Mail* effectively framed COVID-19 simply by extensively covering it as an economic issue. They were not the only ones as many major media outlets and organizations also spoke about COVID-19 in economic terms. Canada's *Canadian Broadcasting Corporation* (CBC) carried the headline "How COVID-19 has changed Canada's economy for the worse — but also for the better" (Evans, 2020). In the United Kingdom, the venerated BBC carried the headline "Coronavirus: How the pandemic has changed the world economy" (Jones et al., 2021). Media around the world had framed a deadly health issue in economic terms while scientists continued to frame it in scientific ones. As a result, politicians like Dan Patrick, Lieutenant Governor of Texas would go on television and say that grandparents would be willing to die for the economy (Knodel, 2020). The economy was framed by Patrick as being more important than the lives of the elderly.

This loss by the chemical industry to Rachel Carson would not be one the industrialists take lightly. This is not just about losing the right to spray a single chemical but rather the idea of government control of industry (Oreskes & Conway, 2011). There are many websites that now compare Carson to Hitler such as Pesticide Truth that is

easily searchable by any search engine with eye catching titles such as “Pesticide Truth” (Pesticide Truth, n.d.). In these anti Carson websites (easily debunked by most first year science students), facts are stretched to turn her environmentalism into an instrument of mass murder claiming that the banning of DDT caused malaria to spread, killing millions. Carson’s success is being reframed as that of a murderer, not someone that should be celebrated nor emulated. Carson’s posthumous defamation speaks volumes to her effectiveness at MASC. It also speaks to a darker side. These websites are not about Carson or DDT specifically, it is to cast doubt on science in general according to Oreskes and Conway (2011). When the entire field of science is in doubt, then it becomes harder to regulate based on it. Likewise, there was no shortage of misinformation about COVID-19 on the internet (Cuan- Baltazar and Perez, 2020; Evanega et al., 2020; Roozenbeek et al., 2020; Tasnim et al., 2020). Unlike Carson when the misinformation came after she had successfully banned DDT, the misinformation around COVID-19 was happening as the pandemic was in the early stages of spread and needing authorities to combat it quickly in an environment where confidence in science had already been weakened thanks to years of corporate sabotage. This is the environment that doctors and scientists had to work in as they tried to warn people about COVID-19, what to do, and how to handle it.

The political backlash that doctors received for talking about COVID-19 publicly shows that it was more than a scientific issue. This was reinforced by the media coverage in *The Globe and Mail* that emphasized the economic impact, not health

implications of the disease. Much like acid rain, DDT, tobacco, and plastic pollution, there are political and financial interests that do not exist on the same scale as other scientific issues such as teaching about black holes or at home science experiments. The experience from COVID-19 communication shows that MASC should be thought of separately from traditional science communication methods and should be considered a closer cousin to the field of political communication given the threats that doctors faced and the disinformation in the field. Applied science communication often has facts, or as Al Gore put it, “inconvenient truths” that can take on a very political nature (Gore, 2006). Both Odén and Carson use an apocalyptic framework similar to that of *An Inconvenient Truth*. According to Spoel et al. (2008), the success of this framework relies on “simultaneously engendering fear that the scenario may occur and, in response to this fear, hope that it can be avoided and a sense of commitment to take the steps necessary to avoid it.” (Spoel et al., 2008, p. 71). Spoel et al. partially credits the success of Gore’s *An Inconvenient Truth* to presenting “abstract information that it presents as emotionally stimulating as possible.” (Spoel, et al, 2008, p. 71). The emotional stimulation moves the information beyond the presentation of facts.

In the case of COVID-19, the narrative was spun as scientists were still busy understanding the virus. News outlets like *The Globe and Mail* got ahead of the science framed it as an economic issue. When the Lieutenant Governor of Texas went as far as stating that grandparents like him would be willing to die for the economy (Knodel, 2020), the framing was set – self-sacrifice for the sake of the economy was needed.

Unquestioned was the value of saving the economy over lives. While scientists were still studying exactly how effective mask wearing was, the question was no longer relevant to many. Death for economic prosperity celebrated. Meanwhile, mask wearing was presented as an issue of personal freedom and choice with headlines such as “At what point should personal freedom yield to the common good?” (Wagner, 2021).

Much like political communication, MASC, because of the nature of soliciting behaviour or policy changes, will invoke strong emotions because it may have economic consequences. Because MASC involves behaviour change or policy changes, naturally there will be resistance from those who do not want to do things differently or those who have vested interests in the existing policies. There are many barriers for effective applied science communicators to overcome in order to be effective. Adding a step to Bruin de Bruine’s (2013) model for effective science communication, which is to go beyond understanding what people already know, is to get a handle on how people feel about the topic. STEM (Science Technology Engineering and Math) fields should include public communication elements as part of their education. Any professional may be asked to comment publicly about STEM issues as technology plays an increasingly large role in everyday life. Those professionals should be prepared for political and social media backlash that did not exist for previous generations of STEM professionals.

Chapter 10: Discussion and Conclusions

Limitations

Speaking to the unvaccinated proved to be difficult. As of August of 2022, York Region in Ontario boasted an 88% vaccination rate for residents over the age of 5 (Comeau, 2022). Outside of children under the age of 12, the lowest vaccinated age group are those aged 18-29 at 85% (Comeau, 2022). All other age groups are over 90% vaccinated (Comeau, 2022). However, this study had limited success in getting unvaccinated people to speak to me. A representative sample would be approximately 6 unvaccinated participants, but this study includes only one.

There may be several reasons for this. During in-person recruitment activities, several people spoken to said they knew of unvaccinated friends and neighbours but they would be unlikely to be willing to speak. When asked why, one woman said that this group has been attacked so badly they would not admit to being unvaccinated outside of their trusted circles. Two unvaccinated individuals spoke to me during my recruitment activities, but stated they would not speak saying that people were silly if they thought COVID-19 was real. Trust is likely a problem among this crowd, as discovered via the man who was forced to get vaccinated to keep his job. Cold emails, on street introductions, and referrals from known acquaintances – these methods are not methods where trust had been successfully built in the anti-vaccination community. This requires a separate, deeper research project specifically delving into these communities.

Safety was another factor in the lack of success in speaking to unvaccinated people. During recruitment sessions, there were indeed people who self-identified as not being vaccinated. This was done by yelling out anti vax rhetoric such as “the government is controlling us”. It felt unsafe to further approach and engage. On one occasion, while soliciting participants, a man yelled “You don’t want to know what I think about COVID”, when engaged further with “Yes, I would” he continued with conspiracy theory rhetoric. In the end, he did not agree to be interviewed.

As of August 9, 2022, in every age group over 12, at least 90% of the population has been vaccinated except for those 18-29 of which only 85% have received at least 2 doses of the vaccine (Comeau, 2022). Despite the high-profile protests in Ottawa and on social media, this indicates that overall, the unvaccinated population is smaller than social media would lead us to believe. One participant (a healthcare provider) did recount stories about clients who felt uncomfortable learning that he was vaccinated. They did not leave their treatment sessions, but most did not return for further care. So, while this relatively small group of people does exist, it is difficult to get them to speak openly about their views.

Further Work

Social Media Analysis

This study was limited by the infancy of AI NLP (Artificial Intelligence Natural Language Processing) technology at the time of study. It was very limited in emotional

range. Sadness, joy, anger, fear, disgust, is not a particularly wide range of emotions that adequately capture the emotions of all tweets. Many tweets were simply whimsical or people feeling annoyed. It did not fit well into any category so forcing one of those emotions felt limiting to the bot. As AI technologies develop, there will be opportunities to use tools to aid in studying public sentiment for the purposes of emergency response communication. This study should be seen as a proof of concept for future utility by communication professionals.

The sentiment analysis showed how angry and fearful people were in the early months of the pandemic. Tweets containing the words “Mask” and “COVID” grew sharply in negativity until the fall of 2020. The abuse that doctors and scientists took both online and offline was also beyond the expectations of most people. No doctor expected death threats after appearing on television to talk about COVID-19. Most doctors and scientists focused on the technicalities of the disease, how it spread, how it attacked the body, and either failed to understand and address, or simply ignored the political implications of their findings.

The potential of using AI digital tools to assess what the public is feeling or thinking is large. These tools are already in use by corporations to manipulate purchasing decisions. This feasibility analysis using IBM’s NLP and Twitter shows that there is already enough accuracy for real time feedback that communicators can use to gauge public sentiment in the future. There is an opportunity for emergency response managers to further study and develop these tools for broader real time monitoring.

Small Circle Newsletters

From the amount of disinformation and misinformation existed during COVID-19 and even other disasters such as Hurricanes Helene & Milton that caused local residents to be wary of first responders (Golden, 2024; Hsu & Thompson, 2024), there is a need to cultivate a sense of trust from the news sources and the person sending the information. Since there are high levels of trust in small chat groups, it will be worthwhile to do a future study on utilizing community newsletters as sources of information dissemination for issues such as climate change or pandemic information. Based on the level of trust within small chat groups, one could surmise that small community newsletters written by people known to the recipient are read by a tight circle of people with at least a similar interest. Studying the trust levels that people have in these community newsletters and whether or not frequent mentions of issues have any impact on readers will help with emergency and pandemic outreach strategies particularly as corporate media loses public trust. Presumably, they will be a good outlet for information since they have localized reach and high relative readership rates. Cultivating a network of community newsletters may be a good strategy for officials as they prepare for the next emergency.

Other languages

This study only investigated a majority Chinese Canadian community and contrasted it to one that is composed of less recent immigrants to Canada. It would be

interesting to look at how other communities and their COVID-19 infection rates. Putting that into the context of media and whether they consistently covered mask wearing will give researchers a better picture of the larger effect of media coverage and pandemic behaviour. While it is not possible to go back and collect perishable data, it is still possible to compare how media handled masking in their respective home countries and compare it to Canadian news and look for correlations in terms of infection rates, data that is still available.

Discussion

This work has demonstrated the relationship between Chinese language media and its portrayal of COVID-19 as a public health threat, its constant pro masking message and the act of putting on masks in the large Chinese community in Markham. Media is not only responsible for reporting on a crisis, but it has a hand in the health outcomes of its readers as well, something that has been understudied (Koerber, 2020). Media needs to acknowledge its role and influence in a pandemic beyond simply reporting the news, they mediate the outcome.

Returning to the key questions that drove this research:

- 1) What roles do Chinese culture and cultural influences play in decisions to wear masks, get vaccinated, or follow social distancing protocols?

- 2) How does Chinese language media portray masks, vaccines, and COVID-19 protocols compared to English speaking corporate media?
- 3) Drawing on the examples the comparison of these two communities provides, how can digital communication technologies be used to influence behaviour in future emergencies?

The key aspects of these questions can be summarized as:

- 1) The trust within the Chinese community of the information that they were receiving was high. The prior experience of SARS led many community members to not only start masking early, but they also repeated shared information about masking and that information became trusted sources within closed family and friend chat groups. Though the sharing of information is not unique to this community, their source of information was different from mainstream Canadian community.
- 2) The Chinese language media analyzed in this study was consistent in its advice of mask wearing. The media also covered the pandemic in terms of health impacts more than economic impacts, differing sharply from the English language media analyzed in this study. The consistent messaging about mask wearing became trusted information, compared to the wavering advice in Canada.

Social media can be a good proxy for how the general population may be responding to the pandemic. The ability to harness this data has potential to provide very fast and low-

cost feedback to professionals managing the ongoing disaster. With the understanding that one of the drivers of trust within small chat groups is the intimacy of knowing the sender, professionals should start harnessing community contacts and newsletters as means to disseminate information on a localized, but trusted level.

Foregrounding science

COVID-19 had a huge impact on the global economy (Bagchi et al., 2020; Sattar et al., 2020; McKee and Stuckler, 2020; Priya et al., 2021; World Bank, 2020). As doctors and scientists matter-of-factly talked about the need to wear masks, stay home (and by implication does not go out and spend money), those with vested financial and political interests were on the attack. Disinformation became a pandemic of its own and doctors were threatened into silence (Limb, 2021). For many doctors and scientists, this would be the first time they engaged in mass applied science communication or MASC – communicating their findings to change real world behaviour and public policy. The resistance to their messaging was beyond their expectations and preparedness level.

As we now have the benefits of hindsight, whether we are science communicators by training or a scientist pushed into a media appearance, or a public official, we need to be prepared for the political backlash of communicating science. The most important aspect of mass applied science communication is not just trust in science itself, but societal trust in general. That trust needs the help of politicians and media to build and maintain. This study shows that media messaging from Hong Kong

and Taiwan had impact on the Chinese Canadian community that consumed that media and implies that media that emphasizes health and scientific aspects of an issue can help a community accept the advice of the scientific community. The way that masks were written about in the two newspapers studied from Hong Kong and Taiwan reinforced the importance of masking and the health impacts of the virus. The Chinese language media in this analysis kept masking in the news, they wrote about it as though it is no big deal, simply a part of everyday living, and never questioned its utility. The mask coverage echoes Carey's ritual communication theory in that the act of normalizing masking signified its importance without further explanation. Simply repeating the importance of masks and having people wear masks was enough to signify its importance in society. The constant foregrounding of masking and the impact that it had on the Chinese Canadian community supports Blue's (2019) belief that foregrounding science in the media will have an overall acceptance in and trust of science and their related issues.

The Flow of Trust in Chat Groups

Trust was lost during the pandemic due to the changing advice about masking and vectors of disease spread as scientists uncovered more information. Though the science and official advice may change as research and information came in, leaders needed to be upfront about policies and more important why policies are in place. Moreover, the ease of which information could be contradicted online, in some cases by

credible sources led to confusion and furthered the doubt in many people's minds. In the case of COVID-19, well respected doctors and scientists who grew large social media followings such as Dr. Lucky Tran and Dr. David Fishman openly contradicted the CDC and other official health agencies on social media (Tran, Fishman Twitter, 2020). Health agencies in other parts of the world such as Taiwan and Hong Kong also gave advice that was contradictory to the WHO and CDC. The general population was confused by the constantly changing, and at times conflicting advice coming from different health agencies and medical professionals that all seemed credible. Conway and Oreskes (2011) demonstrated how confusion is enough to seed doubt, the precursor to the disbelief that permeated through this pandemic. The conflicting advice also led to measurable rates of anger and fear as Dunn et al. (2005) believe reflect an overall state of social distrust, something that Warren warns will adversely affect social cohesion and compliance. The question then became a matter of choosing which credible health agency to put trust into and which ones to disregard, something that has longer term consequences when trust is lost. The fortitude of those who refused to mask highlighted the reality of McIntyre's post truth era. The facts were secondary to the belief.

In addition to gaining and retaining trust, political leaders and public officials need to understand how trusted information flows to users and how best to make use of small community news sources that are highly trusted by their users. Diasporic communities may not be as attuned to local media as authorities may hope. Many will be getting

information from foreign sources in their own languages that may have information that differs from local sources. Small chat groups were highly influential during this pandemic, spreading information quickly and broadly. If we extend the findings of Choi (2015) from Twitter into these smaller, more intimate groups, we understand why a handful of trusted resources in a group could be so influential. These small groups were a source of vital information about masks, where to get vaccines, and even when to stay home. Vitally, it spread health information from Taiwan and Hong Kong into the Chinese Canadian community very quickly with the effect of increased masking rates. Information would flow from a family or friend from abroad and spread through networks quickly particularly if they came from trusted sources such as an influential friend or family who may be a doctor, scientist, or someone known to be particularly attuned to news. Political leaders and public officials should maintain, build and maintain relationships to diasporic communities with key people such as those who run community or club newsletters who are known and trusted within communities. The prevalence of information flowing through chat groups suggests that the small, intimate nature of these information sources could be a trusted source. This will help relay information into hard-to-reach diasporic communities. Social media already saw a lot of ad hoc organizations during this pandemic. Having authorities do this type of reach out into smaller, trusted networks will help information flow through sources that people trust and respect in hopes of higher compliance levels.

Laying the groundwork for trust in science and scientist and a higher level of faith in expertise will take time and effort from multiple segments of society. The first must come from the media and their help with the ritualization of science in their everyday reporting. Repeating mask wearing was highly effective in Hong Kong and Chinese Canadians benefitted from it as well. Second are scientists and science communicators themselves and the understanding that applied science communication needs to operate with discipline akin to political communication. Simply explaining a concept devoid of the context in which we live created a backlash. As the shutdowns continued, fear and distrust grew as people became more concerned about other COVID-19-related issues such as the economy. Newspapers need to carry science stories not as a matter of special interest, but as a matter of course like the way business and economy is presented in *The Globe and Mail*. Since stories need to be promoted from special interest side panels to main stories that are simply assumed to appeal to everyone if there is to be long term foregrounding. *Sing Tao Daily* and *Liberty News* did a much better job of covering the pandemic from a public health point of view compared to *The Globe and Mail*. Despite its similar business focus, *Sing Tao Daily* still discussed issues in terms of protecting public health, not protecting the economy the way *The Globe and Mail* did. Never were readers led into questioning mask wearing nor were economic issues made more important than public health ones. Making a scientific story as part of the front page daily, according to Gwendolyn Blue's (2019) idea of foregrounding, serves two major purposes that was demonstrated by how *Sing Tao* and *Liberty* carried

COVID-19 stories. It laid the groundwork for what is important – COVID as a disease and public health as an issue. The effectiveness of repeating the issue of mask wearing could be seen in masking rates that carried over to the Chinese diasporic community in Markham. By routinely covering masking the way that business issues are covered in *The Globe and Mail* communicates that the issue is an important one, shared by everyone, just like those who do not own stocks cannot help but know what the stock market is doing due to newspaper coverage. It also educates people in the area of science even if they do not fully understand every article in question. This is an important aspect of rebuilding the loss of trust between science and scientists in the Exxon Mobile era of fossil fuel disinformation (Oreskes and Conway, 2011). However, better media means little if it is not disseminated effectively. This study found that in both Markham and Vaughan, micro-online communities as friend and family chat groups were important during the pandemic as a source of reliable information. Because these chat groups were made up of people known to users, unlike typical social media, the information that came through these tight groups was more trusted.

The way that information flows has changed how authorities must think about how to communicate and disseminate information to targeted groups. In a place with large groups of immigrant populations, we must consider the impact that foreign instructions and information has on local populations. The advice and instructions coming from Canadian officials will be compared and contrasted with those coming from other people's home countries in a language they may be more comfortable with. If this

advice conflicts, this could potentially be a problem for local authorities. In the case of the Chinese Canadian community, we were fortunate that the advice called for stricter isolation and masking measures than local authorities and lower infection rates suggests that it influenced the community. Public officials will need new strategies to reach out to diasporic communities in the current media environment where traditional dominant voices have been muted by the immense media options that the internet has made available. The prevalence of small family and friend chat groups and the position of trust that they largely hold should be utilized by communicators particularly when reaching out to diasporic communities.

Science is Political

Scientists were put in very uncomfortable roles as COVID-19 morphed from a scientific issue into a political one as economies started to suffer from stay-at-home orders. Scientists themselves should have training not just in communication in and of itself but need more education in the philosophical aspects of their craft and the political and social implications of what they do – something generally ignored by most science and engineering programs. Rarely are scientists asked to consider the social implications of their work. Heeding the warnings of historians like Eisenstein (1979) may have helped many scientists during COVID-19 as they asked people to stay home. A better appreciation for people and politicians will protect their interests would help scientists and public health officials as they delivered their otherwise sound scientific

advice. If more scientists and doctors approached their COVID-19 advice from a social, not just technical, and scientific perspective, the backlash may still have been there but may have taken a different form if people's fears and insecurities got addressed. Carson (1962) and Odén (1968) understood that their scientific findings had political implications. They spoke about the value of the work that they did. The values, not the science behind mask wearing needed emphasis.

The reality is that as more and more of our everyday living becomes dependent on science and technology, there is no longer such a thing as a politically neutral scientist. By definition, findings and outcomes will have some sort of political implication whether it is on agriculture, water standards, or even just whether certain materials are toxic. Those findings will drag science, and in many cases scientists, into the political realm. The philosophical and political training in the sciences is increasingly becoming a necessity to navigate the realities of the world embracing technology that plays large roles in daily lives from health sciences to machine learning. Scientific programs should have more humanities as part of their educational training to help scientists, engineers, and doctors understand the political roles that a technologically advanced and highly interconnected society will need them to play. In an environment where politically neutral scientists can no longer exist, it is then incumbent on scientists to understand and take on the political roles that the profession will demand.

Expanding the spheres of influence

If we take the finding from this study and apply it to the socioecological model of health, contemporary communications have made those spheres worth rethinking. In its most basic form, the socioecological model of health looks at the different influences that have an impact on an individual's health. First conceptualized by Urie Bronfenbrenner in the 1970s, it was later formalized in the 80s (Kilanowski, 2017). This socioecological model of health centers around the individual, first with their skills and knowledge. The second sphere of influence is the sphere of interpersonal relationships—that is friends, family, and social networks. The third sphere of influence lies in organizations and institutions such as one's school and workplace. The fourth sphere of influence is the community, including the physical space of one's surroundings, access to parks and built form designs and whether they facilitate relationship building. The final sphere lies in public policy, there are normally referred to as national, provincial, municipal laws (Dahlberg and Krug, 2006).

Due to telecommunication technology advancements, the interviews in Markham and Vaughan from this study suggest the need to think about this model differently now that information can be accessed by virtually anyone, anywhere with an internet connection. Based on this study, sphere two, the interpersonal should also include not only our friends in person, but the virtual friends, and contacts we make online who influence our world views and media intake. This work showed the substantial influence that people we may have little physical interaction with can still hold large influences

over our thoughts and opinions via chat groups and even social media. This sphere needs to include seldomly seen family from abroad who can instantly send information to our phones and computers. While the definition of family may be fixed, how we define friends and friendships has changed in the information age when people can have remarkably close relationships with people they have never met.

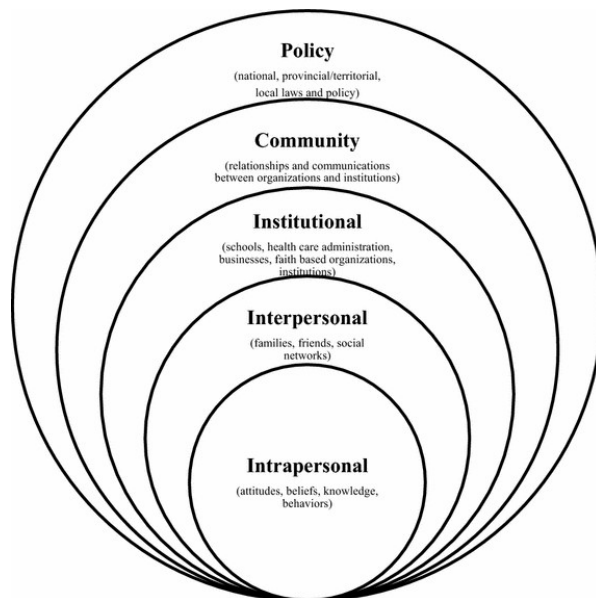


Figure 17: Socioecological model source: Ma et al., 2017

Requiring more rethinking is the indirect influence of the largest policy sphere in the socio-ecological model (Figure 17), a model used to understand the relationships between personal and environmental factors. While local laws such as masking requirements certainly have a large impact on individual health, the policies outside of the immediate territory of residence have had a larger impact due to increases in global travel (Becken & Carmignani, 2020). Laws in other countries had influences over individual health in Canada that grows with global air travel growth in our post

multicultural times. For example, when someone wanted to travel to another country, they may need to get a vaccination to comply with laws in their destination country. Moreover, we discovered through our interviews that the distrust the Chinese Canadian community had in Canadian officials to handle the pandemic led some member of the Chinese Canadian community to set up their own community level COVID-19 protocols based on best practices in Taiwan from information that came from abroad. Because of communication technologies and globalization, the sphere of influence in the socioecological model deserves to be expanded to include these factors. These broad influences also point to the challenge for local authorities will have penetrating into diasporic communities with strong global news media availability and a weakened local media influence.

Whatever the next disaster that strikes, officials should keep in mind that the information they disseminate will be mixed not only with disinformation, but also legitimate and possibly conflicting information from officials in other jurisdictions. It will be hard to reach everyone with local information. Laying the groundwork to rebuild trust in science and creating networks of localized information outlets are two long term strategies that officials should start implementing now.

Capitalizing on Pro Social Behaviour in the next Emergency

By fostering a deeper trust in science with the help of media, finding pathways to communicate within diasporic communities, and communicating the science within ways

that address political beliefs, we can capitalize on pro-social behaviour in the next emergency. As Heide (2004) points out in his review of disasters across the United States, the anticipated anti-social behaviours such as rioting or panicking rarely take place. People are surprisingly resilient; their goodwill is rarely accounted for in disaster planning. Planning for anti-social behaviour by advising against mask use to preserve the stock for medical workers, then switching the narrative was a costly mistake in terms of credibility of public compliance. The initial advice did not anticipate that people, including those in both Markham and Vaughan, would take actions to help the community. People voluntarily stepped up to do things like food deliveries and mask making. Had those actions been coordinated by a centralized agency, it would have been far more effective. The mask making could have been better organized in terms of materials and distribution. Planning and preparing for pro-social behaviours, such as the ones participants in this research project exhibited would have made the jobs of scientists and doctors easier as they tried to communicate the risks and response of COVID-19 to the general public. One of the most important takeaways from this study for public officials is the number of people who tried to help their communities in some way. Whether it was making masks or delivering food, people exhibited pro-social behaviours in the ways that they thought were helpful. Without centralized organization, these ad-hoc efforts were not utilized optimally. These efforts could have been put to better use had they been accounted for in a concerted manner by officials with planning. While public officials do an excellent job anticipating and planning anti-social

behaviours such as looting and rioting, similarly, pro-social behaviours should be planned for, coordinated, and maximized for efficiency. Both Markham and Vaughan participants complained that the ad hoc efforts in the early days of the pandemic resulted in overlapping efforts in some cases and in many others, people wanting to, but not knowing how to help. Having someone dedicated to receiving volunteers and donations will contribute greatly to community building, rebuilding trust in an online world that has disconnected us from our local communities and using all the resources available to us during an emergency. If we can increase the interpersonal trust and trust in science and scientists delivering the message so people are more willing to engage in pro-social behaviours, effectively communicating the science to local groups in ways that address political positions means that any calls for volunteers will have broader reach and higher likelihoods of response. Our efforts to overcome the next pandemic will be made easier if we can put more effort into utilizing the resources within communities and spend less effort fighting distrust.

Before the next pandemic, it will be important to reflect the mediating role that media played in COVID-19. Chinese people were no less susceptible to COVID-19 but took precautions almost immediately. The experience from SARS certainly left a lasting impression. However, it cannot be attributed to SARS alone as currently, masking as a habit has not persisted in Canadian culture, despite the loss of lives during COVID-19. Constant media messaging about mask wearing, consistent, unwavering advice from public officials all contributed to an atmosphere that encouraged mask wearing. Writing

about the COVID-19 pandemic in terms of health impacts and not just economic ones brought the disease to a personal level and put in readers' minds that people and health were more important than money and the economy. Media does not merely report on a pandemic; it will affect its outcome.

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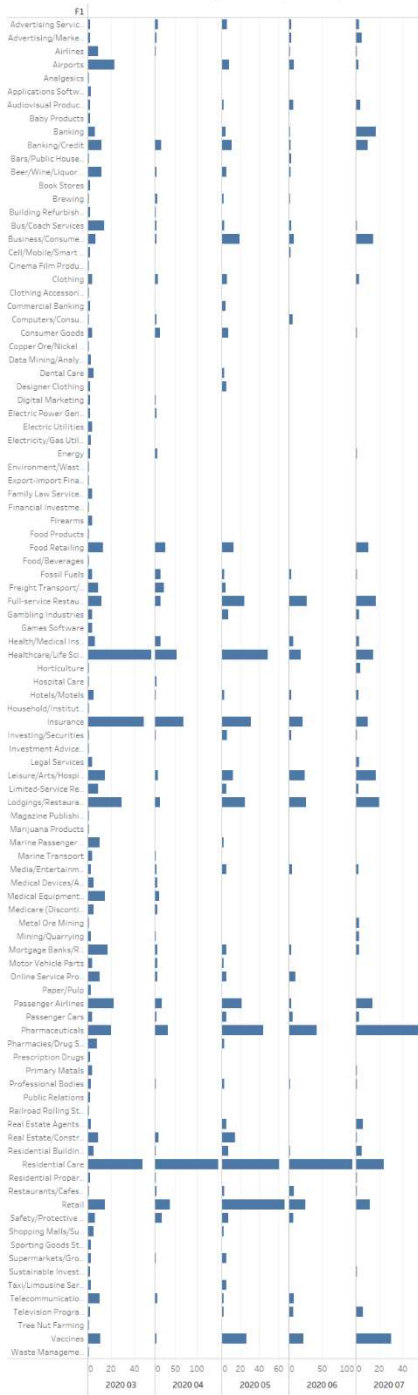
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Appendices

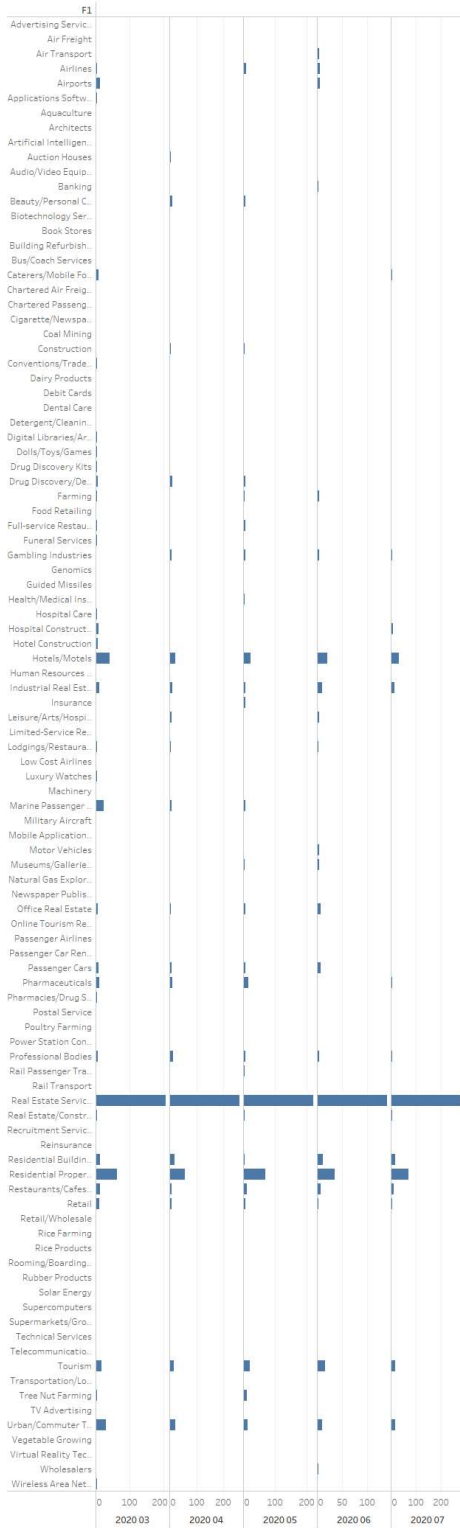
Appendix A: Detailed graphs of Factiva data

Toronto Star "COVID" containing articles by Industry



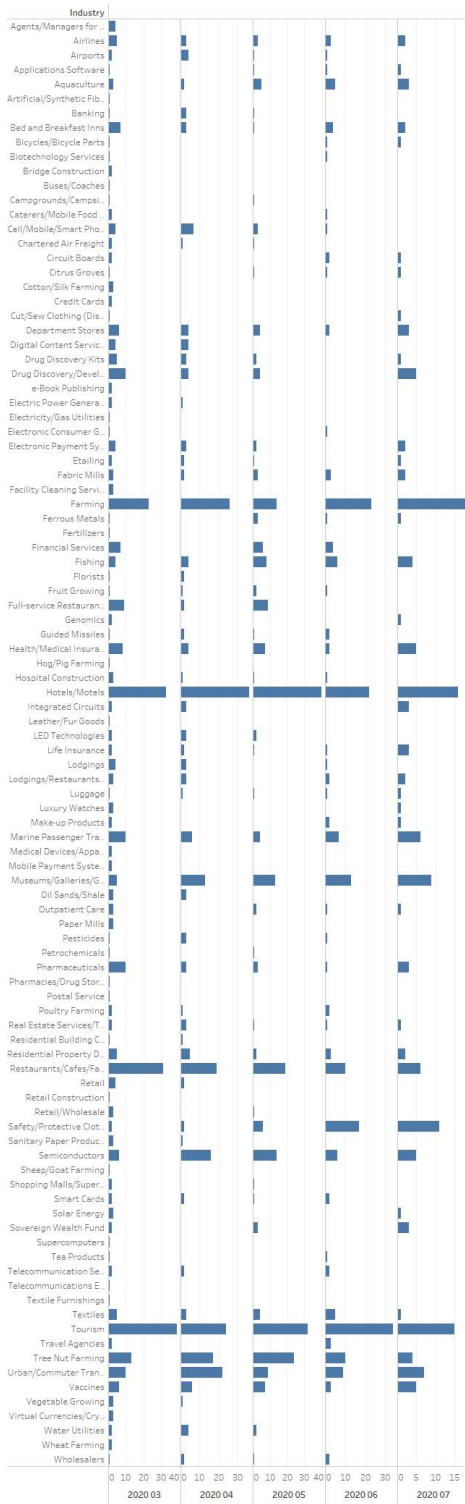
Sum of 2020 03, sum of 2020 04, sum of 2020 05, sum of 2020 06 and sum of 2020 07 for each FI.

Sing Tao "COVID" keywords by Industry



Sum of 2020 Q3, sum of 2020 Q4, sum of 2020 Q5, sum of 2020 Q6 and sum of 2020 Q7 for each F1.

Liberty News "COVID" keywords by industry



Appendix B: Interview Questions

The effects of culture and cultural media on COVID-19 community response

Semi Structured Interview Questions

Inclusion Criteria

Lived in Vaughan/Markham at least one year.

18 years+

Demographic information

Name, age group, income bracket, gender, Number of people in household, City, ethnicity.

Media use

Where do you get most of your information?

How trustworthy is your information source? 1-10, why?

Do you think there are biases in your media sources? Do you consult government sources (websites, press conferences, etc.)?

Do you consult other sources such as medical professionals, publications, and websites?

What kind of social media do you use? (Twitter, chatgroups, Facebook)

Do you have any favourite tweeters/writers/podcasters?

Family and Friends

Are there other sources you rely on (such as community, friends, family, more for your information)?

How do you communicate with friends and family?

Are there trusted resources in your social circle you turn to? Why do you trust them?

COVID views and habits

Have you had COVID? Approximately when?

Are you vaccinated/boosted?

Why or why not?

Do you wear a mask in public space? Why or why not?

Is there anyone in your household you consider “high risk” for COVID? What protective measures does your household take?

Do you feel responsible for keeping others safe from COVID?

Do you prefer businesses that have mask mandates?

Have you experienced any stigma related to COVID?

Have you experienced any stigma related to mask wearing?

COVID in the community

What kind of COVID precautions exist in the places near you, or where you like to shop?

Do you think that existing gov regulations are sufficient/too much? (Both now and historically)

Other Issues

How important do you think tackling climate change is? 1-10

Why?

Do you trust academic resources such as peer review journals? 1-10

Why?

Appendix C: Ethics Certificate



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Certificate #:	STU 2022-084
Approval Period:	08/05/22-08/05/23

ETHICS APPROVAL

To: Terri Chu
Graduate Student of Communication & Culture
terrichu@yorku.ca

From: Alison M. Collins-Mrakas, Director, Research Ethics
(on behalf of You-ia Chuang, Chair, Human Participants Review Committee)

Date: Friday, August 5, 2022

Title: **The effects of culture and cultural media on COVID-19 community response**

Risk Level: Minimal Risk More than Minimal Risk

Level of Review: Delegated Review Full Committee Review

I am writing to inform you that this research project, "**The effects of culture and cultural media on COVID-19 community response**" has received ethics review and approval by the Human Participants Review Sub-Committee, York University's Ethics Review Board and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines.

Note that approval is granted for one year. Ongoing research – research that extends beyond one year – must be renewed prior to the expiry date.

Any changes to the approved protocol must be reviewed and approved through the amendment process by submission of an amendment application to the HPRC prior to its implementation.

Any adverse or unanticipated events in the research should be reported to the Office of Research ethics (ore@yorku.ca) as soon as possible.

For further information on researcher responsibilities as it pertains to this approved research ethics protocol, please refer to the attached document, "**RESEARCH ETHICS: PROCEDURES to ENSURE ONGOING COMPLIANCE**".

Should you have any questions, please feel free to contact me at: 416-736-5914 or via email at: acollins@yorku.ca.

Yours sincerely,

Alison M. Collins-Mrakas M.Sc., LL.M.
Director, Office of Research Ethics

Appendix D: Informed Consent Form

The effects of culture and cultural media on COVID-19 community response

Date: 30 April 2022

Study Name: The effects of culture and cultural media on COVID-19 community response

Researcher: Terri Chu:

Ph.D Candidate, York University, Communication and Culture

Terri.chu@yorku.ca

Purpose of the Research:

This study explores the impact of communication on COVID-19 responses in Markham and Vaughan. The goal of this study is to better understand how emergency management and public health can reduce misinformation, be more effective in their communication about science, and reduce the fear and anxiety in public health disasters.

This research will be done by interviewing participants over Zoom or if preferred, another video conferencing platform. Results will be analyzed and used as part of a PhD dissertation and may be presented in other academic publications, conferences, and reports.

What You Will Be Asked to Do in the Research:

You will be asked to schedule a computer mediated or telephone or in person interview (situation permitting) with the research. You will be asked to consider and sign this informed consent form prior to the interview. It is estimated that interview scheduling and the informed consent procedure will take 15 minutes. You will be asked to participate in an interview asking questions about your experiences with COVID-19 and what you understand about it, your preferred information sources, and your opinion of other science and social issues. Estimated time for the interview will be 45 minutes. There will be no inducements and no financial compensation provided.

Risks and Discomforts:

We do not foresee any risks or discomfort from your participation in the research.

Your participation in this study represents minimal risks. However, the researchers ask you to be aware that reflecting upon situations as related to COVID-19 or otherwise can potentially create emotional discomfort. The researchers have received training in and have reviewed the basic principles of recognizing mental stress for persons experiencing disaster and crisis. If in the event, it is observed that a participant is experiencing emotional discomfort, the interview will cease. Please be aware that in the Greater Toronto Area, emotional support services are provided by agencies such as the Toronto Victim Services 24-hour crisis Hotline (Contact 416-808-7066).

If you believe that reflecting on your COVID-19 social impact experiences would be emotionally disturbing to you, please do not participate in this research. If the researchers determine that an interview is becoming emotionally disturbing to a participant, the interview will cease.

Special Note on COVID-19 Risk Mitigation: During the time period when this research is active, there may be situations of varying risk to individuals from community spread of COVID-19. Therefore, this project strictly abides by Public Health Agency of Canada guidelines as related to social distancing to stop the spread of infection. Interviews will be head virtually.

Benefits of the Research and Benefits to You:

Your participation in this research will accrue no benefits to you. Overall, this study can potentially have societal benefits to reduce COVID-19 and science misinformation risks by understanding how social countermeasures can act to reduce impacts of future emergencies.

Voluntary Participation and Withdrawal:

Your participation in the study is completely voluntary and you may choose to stop participating at any time. Your decision not to volunteer, to stop participating, or to refuse to answer particular questions will not influence the nature of the ongoing relationship you may have with the researcher or the nature of your relationship with York University either now, or in the future. In the event you withdraw from the study, all individually associated data that was collected from you will be immediately destroyed wherever possible.

Confidentiality:

All information you supply during the research will be held in confidence and unless you specifically indicate your consent, your name will not appear in any report or publication of the research. Data will be collected by handwritten notes and digital audio recording and held in strict confidentiality. Once this study is completed, your data will remain confidential and be safely stored in a secured physical and/or electronic repository at York University. Confidentiality will be provided to the fullest extent possible by law.

Your data will be safely stored in a locked facility and all data will be stored in a password protected separate hard drive and only the researcher will have access to this information. Data will be destroyed by the completion of the research and no later than December 31, 2027.

This study will use the Zoom to collect data, which is an externally hosted cloud-based service. When information is transmitted over the internet privacy cannot be guaranteed. There is always a risk your responses may be intercepted by a third party (e.g., government agencies, hackers). Further, while York University researchers will not collect or use IP addresses or other information which could link your

participation to your computer or electronic devices without informing you, there is a small risk with any platform such as this of data that is collected on external servers falling outside the control of the research team. If you are concerned about this, we would be happy to make alternative arrangements (where possible) for you to participate, perhaps via telephone. Please contact the researcher for further information.

Recordings (audio/video) will be saved in a password protected file to research team members' local computer, not the cloud based service.

Please note that it is the expectation that participants agree not to make any unauthorized recordings of the content of a meeting / data collection session.”

Questions About the Research?

If you have questions about the research in general, or about your role in the study, please feel free to contact Terri Chu terri.chu@yorku.ca or Anne MacLennan amaclenn@yorku.ca. Further information can be obtained from the Dept of Communication studies at York University cmctgpa@yorku.ca.

This research has received ethics review and approval by the Human Participants Review Sub-Committee, York University's Ethics Review Board and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines. If you have any questions about this process or about your rights as

a participant in the study, please contact the Sr. Manager & Policy Advisor for the Office of Research Ethics, 5th Floor, Kaneff Tower, York University (telephone 416-736-5914 or e-mail ore@yorku.ca).

Legal Rights and Signatures:

I _____, consent to participate in The effects of culture and cultural media on COVID-19 conducted by Terri Chu. I have understood the nature of this project and wish to participate. I am not waiving any of my legal rights by signing this form. My signature below indicates my consent.

Signature _____

Date _____

Participant

Signature _____

Date _____

Researcher

- **Additional consent for Audio Recording**

I consent to audio recording of my interview.

Signature _____
Participant Name

Date _____