"Conceptualising Social Media Content as a Real-time Proxy to Estimate Human Compliance with Non-pharmaceutical Interventions During a Public Health Crisis"

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CHAPTER 1 INTRODUCTION AND BACKGROUND

1. Introduction

Since December 2019, the whole world has been fighting the Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2), popularly known as the 'COVID-19' pandemic. The disease has resulted in global health and economic crises (i.e., "global pandemic"). The health crisis brought about by COVID-19 compelled governments and health authorities worldwide to reduce the virus's spread to people's health and safety. However, lack of accurate and specific treatment or medication/vaccinations and high transmissible nature (W. Wang et al., 2020), epidemiologists and scientists have urged governments to employ preventive measures to keep the outbreak under control.

Motivation

In response to this, countries worldwide have executed various Non-Pharmaceutical Interventions (NPIs) as protective/preventive measures to avoid or minimise the infection and reduce the burden on healthcare (Fisher & Heymann, 2020; Prompetchara et al., 2020). However, still, governments and authorities are facing challenges even these restrictions are imposed. The number of cases of infection, hospitalisations and mortality rates varies depending on a government's COVID-19 response, the resilience of the health system, prevalence of co-morbidities among people in a country, economic conditions, and socio-cultural factors. These factors influence people's behaviours. "For example, R_0, the reproductive number, which captures the infectiousness of the pathogen, is typically measured from the growth of the epidemic and is harder to estimate once non-pharmaceutical interventions (NPIs) are in place. Similarly, changes to R0 for evolved SARS-CoV-2 variants are difficult to ascertain given simultaneous changes to behaviour and interventions" (Baker et al., 2021).

At the time of crisis, the government and authorities face challenges to manage those crises due to change in people's behaviour. Many interacting components in society motivate behavioural changes in people that influence or affect the compliance measures (NPIs) while responding to COVID-19. Behaviour change adds difficulty for epidemiologists to capture the picture of the feedback-loop between human behaviour and infectious disease (Vespignani, 2009). Therefore, it creates challenges to governments and PHAs to measure the effectiveness of those mitigation/compliance measures and understand what motivates or demotivates the public to follow/ avoid those NPIs. Thus, people's behavioural factors are the most crucial factor in understanding while studying the effectiveness of mitigation measures. Thus, in this study, I investigate what behavioural factors play an essential role in understanding individual behaviour that determines the likelihood of engaging in preventive behaviours following those NPIs.

Research Question

In this research, I aim to answer, 'What behavioural indicators can be observed on social media as a proxy to estimate people's compliance with counter/mitigation measures to a public health crisis?' People's expressions of their values and beliefs can help understand how people may react to countermeasures during a pandemic or epidemic. Furthermore, examining people's behavioural responses can help researchers better understand what factors influence individuals to follow or avoid NPIs. Even though scientists have been developing models over the past year, they have focused on addressing the world's most urgent and practical questions about COVID-19. However, techniques that can be used to predict how individuals will react to government imposed NPIs in the event of a public health emergency are still needed.

This research will provide insights into how people react to NPIs and how people adopt them. Authorities can use behavioural responses to gather information on people's attitudes,

awareness, and behaviour over the NPIs and pandemic by collecting health information from different sources in real-time. Tracking public behavioural responses in real-time using traditional and social media platforms will help authorities understand people's responses to NPIs better and inform parameter estimation for epidemiological modelling related to behavioural variables. And will also allow authorities to develop a surveillance platform that can monitor the spread of the COVID-19, provide insights into the effectiveness of NPIs and strengthen or improve the epidemiological modelling. As a result, knowing or understanding the public's attitude, behaviour, and ability/inability to follow countermeasures is essential in determining the success or failure of such actions. This will allow them to develop the proxy measures and understand the impact of those interacting components in the epidemic model responsible for affecting the public performance of protective behaviour (compliance measures). Furthermore, these proxy measures would allow the government, public health authorities, epidemiologists, among others, to explore the behavioural artefacts that could be used to estimate and measure the compliance related to the NPIs during COVID-19 and similar crises to improve epidemiological modelling. Thus, understanding people's behaviours helps scientists and epidemiologists obtain a clearer idea of how people react to NPIs, vaccine rollouts, and perceived risk during a pandemic.

Bradley et al. (2020) outlines that public performance of protective behaviours in COVID-19-CLD is impacted either by interacting components such as stigma, trust in public health authorities, the effectiveness of crisis communication, public awareness, perceived risk, accountability of authorities. However, I find there are still some intermingling components on an individual level, such as the ability to follow those measures (cost, time, convenience, etc.) that impact a population-wide approach in the COVID-19 Casual Loop Diagram (COVID-19-CLD).

In this paper, I presented a revised COVID-19-CLD and explained how social media content as a real-time proxy to estimate human compliance with NPIs during a public health crisis using Twitter hashtags across Nepal and New Zealand. I analysed the effectiveness of NPIs over the spread of disease too. It also looked at constructs of the HBM and COVID-19-CLD in the context of infectious diseases to understand behavioural responses with a synthesis of a systematic literature review that gives a clear picture from an individual level to a population level.

This study found that people's responses such as anger, support, fear, outrage, avoidance, regret, indifference, ignorance, and shock can be used as a behavioural indicator as a proxy to estimate people's compliance with counter/mitigation measures a public health crisis. Thus, understanding people's values and beliefs from individual perspectives guide us to understand how people react to the countermeasures during a pandemic and how they can influence the epidemic models.

CHAPTER 2 FOUNDATIONS AND RELATED WORK

Foundation and related work guide

Health Belief Model (HBM)

To understand individual behavioural responses in context of infectious disease (Individual based approach)

COVID-19 Causal Loop Diagram (COVID-19-CLD)

To understand the interacting components of a COVID-19 CLD looking into public health behaviour and its impact in public health indicators(Population wide approach

Non-Pharmaceutical Interventions (NPIs)

To understand different types of interventions/ compliance/ mitigation strategies implemented across the world at the time of COVID-19 outbreak.

Use of Foundation of related work

These foundations/ concepts provides guidelines to look into interacting components in a COVID-19 CLD through the lens of HBM during media content analysis. And look into various popular NPIs during the COVID-19 to analyse the effectiveness of those NPIs on the spread of the disease

Figure 1: Flow chart represents the foundations and related work and their uses during this research

The flow chart guides to the foundation and related works that were used during this research.

2. Foundations and Related Work

The foundation for this research is centred on the Health Belief Model (HBM), a COVID-19-related Causal loop diagram (CLD), and non-pharmaceutical interventions (NPIs). These foundations/concepts provide directions for examining interacting components in a COVID-19 CLD during media content analysis through the lens of HBM. During COVID-19, investigate a range of popular NPIs to see how successful they are at preventing disease spread.

First, HBM was used to understand the behavioural responses at an individual level in the context of infectious disease, looking into various constructs of HBM. Similarly, the COVID-19-CLD would aid in understanding the interacting components of COVID-19-CLDs exploring public health behaviours and their impact on public health indicators at the population level. Understanding behavioural responses at an individual and a population level give better insights into how people respond to the disease, NPIs, governments, and authorities during the pandemics. Furthermore, knowledge of non-pharmaceutical interventions (NPIs) will aid in understanding the various types of interventions/compliance measures used around the world during the COVID-19 outbreak and their effectiveness in reducing disease spread.

2.1. Non-pharmaceutical Interventions (NPIs)

Non-pharmaceutical interventions (NPIs) are techniques or strategies for preventing the spread of an epidemic disease without pharmaceuticals or medical treatments. The popular NPIs imposed are lockdown, social distancing, wearing face masks, restrictions on travel and gathering, quarantine and isolation, and contact tracing. In the absence of medicinal countermeasures to stop the disease from spreading, policymakers must rely on NPIs to control and mitigate the disease's effects (Cheatley et al., 2020). People who follow NPIs will prevent themselves and others from contracting and spreading the flu or other epidemics. NPIs can be used to control infectious disease outbreaks and pandemics in various ways, including personal protection, population containment, and environmental controls. Following the spread of

COVID-19 and previous flu or epidemics, different NPI methods have been used worldwide, such as internal containment and closure, border restrictions (mandatory quarantine, screening), international travel restrictions, economic policies, and health system policies such as public information campaign, testing policies and contact tracing (Askitas et al., 2021; Bin Nafisah et al., 2018; Kasting Id et al., 2020; Suess et al., 2012). Researchers at the University of Oxford and Blavatnik School of Government have launched COVID-19 Government Response Tracker to track and compare government responses to the government's tackling the COVID-19 outbreak worldwide (Prall, 2020). This first-ever developed tool helps researchers understand the impact of those NPIs on the rate of infections and help identify what causes governments to implement stricter or less strict measures (Prall, 2020). This tool collects publicly available information on 11 indicators (Prall, 2020) using the COVID-19 Government Response Stringency Index (Prall, 2020) to compare and measure the effectiveness of the government's responses with those counter NPIs. From the query (non-pharmaceutical interventions) AND (COVID-19)), I got 610 results together, including all abstracts and titles. After making the query explicit to COVID-19 related NPIs, 53 results were found. Countries worldwide have implemented different NPI measures to understand the different indicators that influence NPI measures. Hence, these indicators played a crucial role while studying, predicting, and formulating new policy measures in response to the COVID-19. Some of the most popular and used NPIs are highlighted in table no.1 that are implemented across the globe during epidemics like SARS, COVID-19, Influenzas, among others (Askitas et al., 2021b; Awaidy & Mahomed, 2020; Bin Nafisah et al., 2018; Kuiper et al., 2020; Prall, 2020).

2.1.1. Popular NPIs

NPIs	Descriptions	References

Contact Tracing	Individuals, organisations, public transportations, etc., are encouraged to keep a record of their travel.	[1]
Restrictions of non-essential business	All businesses and services that are not maintaining primary functions (for instance, food retailers, supermarkets, pharmacies) in the community are closed.	[2]
Closure of schools/ education institutions	All educational institutions closed or moved entirely online.	[3]
Closure of Workplaces	All non-essential businesses and services closed. Individuals no need to travel to the workplace but can work remotely or work from home.	[4]
Closure of public transports	All public transportations closed except for essential workers to travel with limited lift on the ban.	[5]
External border restrictions	All land borders are closed for international travellers.	[6]
Cancellation of public events	All public events, including music festivals, festivals, games, cultural programs, etc., are completely banned.	[7]
Restrictions of mass gatherings	The gathering of many people is cancelled (for example, sports, concerts etc.).	[8]

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[1] *Concepts and Studies about Contact Tracing were found in Aleta et al., 2020; Bachtiger et al., 2020a; Eames & Keeling, 2003; Fahey & Hino, 2020; Huerta & Tsimring, 2002; Jalabneh et al., 2020; Martín-Calvo et al., 2020; Plank et al., 2020; Thayyil et al., 2020; Walrave et al., 2020b, 2020a; Yadav, 2021; Askitas et al., 2021; Bin Nafisah et al., 2018; Kasting Id et al., 2020; Suess et al., 2012; Prall, 2020).*

[2] *Papers highlighted about restrictions on non-essential businesses refered are N. M. Ferguson et al., 2020; Aleta et al., 2020; Almeida, 2020; Cheng et al., 2020; Chernozhukov et al., 2021; Dave et al., 2021; Gianni De Fraja et al., 2021; Jalali et al., 2020; Kamga & Eickemeyer, 2021; Oliver et al., 2020; White & Hébert-Dufresne, 2020; Rubin et al., 2009, Prall, 2020.*

[3] *Rubin et al. (2009), Egger et al. (2012), N. M. Ferguson et al. (2006), Cheatley et al.(2020); Auger et al.(2020), Bin Nafisah et al. (2018a, 2018b), Cauchemez et al. (2009) and Prall (2020).*

[4] *Askitas et al. 2021b), Awaidy & Mahomed (2020), Bin Nafisah et al.(2018a), Kuiper et al.(2020) and Prall (2020).*

[5] *Askitas et al. 2021b), Awaidy & Mahomed (2020), Bin Nafisah et al.(2018a), Kuiper et al.(2020) and Prall (2020).*

[6] *Askitas et al. 2021b), Awaidy & Mahomed (2020), Bin Nafisah et al.(2018a), Kuiper et al.(2020) and Prall (2020).*

[7] *Rubin et al., 2009, Askitas et al. 2021b), Awaidy & Mahomed (2020), Bin Nafisah et al.(2018a), Kuiper et al.(2020) and Prall (2020).*

[8] *Swati Gupta et al. (2021), Binding (2020) and Rubin et al. (2009)*

Restrictions on movement (non-essential), i.e., stay at home order	People's movements are restricted during this phase with stay-at-home-order. Have some limited exemptions such as essential travel for groceries.	[9]
Social distancing	Recommended distancing between people around the supermarkets, public transportation, schools, and workplace.	[10]
Internal border restrictions	People's movement is restricted based on geographic locations. (For example, People are restricted to travel in/out of Auckland during the lockdown in Auckland in February 2021)	[11]
Declaration of emergency	Government announces the state or nation in an emergency where people are expected to follow the government's orders.	[12]
Curfew	Complete restriction on people's movements, gatherings. However, could have exemptions for essential purposes within a designated time.	[13]
Public Awareness Measures	The information-sharing campaigns by the government, public health officials to aware people of the virus, give	[14]

[9] *Swati Gupta et al. (2021), (Binding, 2020), Askitas et al. (2021), S. Lai et al. (2020) , Rubin et al. (2009)*

[10] *Bowman et al., 2021;Askitas et al., 2021b; Banerjee & Nayak, 2020; Castex et al., 2020; Cheatley et al., 2020; Courtemanche et al., 2020; S. Lai et al., 2020; Almeida, 2020; El-Guebaly, 2020; Gianni De Fraja et al., 2021; Haug et al., 2020; Huang, 2020; Martín-Calvo et al., 2020; Regmi & Lwin, 2021; Tang et al., 2020; Cobb & Seale, 2020; Courtemanche et al., 2020; Gupta et al., 2020; Kamga & Eickemeyer, 2021; Qian & Jiang, 2020; Teslya et al., 2020; Hornik et al., 2021*

[11] *S. Lai et al., 2020; Rubin et al., 2009, Askitas et al. 2021b), Awaidy & Mahomed (2020), Bin Nafisah et al.(2018a), Kuiper et al.(2020) and Prall (2020).*

[12] *X. Huang et al., 2020), Lee et al. (2020) and Sutton et al. (2020)*

[13] *Swati Gupta et al. (2021) and Binding (2020), Valencia et al. (2020)*

[14] *Aledort et al((2007), Cheatley et al. (2020), Rubin et al.(2009), Haushofer et al. (2020), Nasser Al-Suqri et al.(2021), Bikbov & Bikbov (2020), Fisher (2020) and Quinn et al. (2013).*

	details of an everyday situation and further initiatives to be imposed etc., are shared.	
Quarantine/Isolation	People's movement is restricted by encouraging them to stay-at-home in contact with symptomatic or confirmed cases. In addition, the quarantine of all travellers from another country in the nation has to stay in quarantine.	[15]
Testing policies	People are encouraged to test if they have been in contact with confirmed cases or asymptomatic cases or was there in the location where the case was confirmed. Individuals are required to have tested before the travel.	[16]
Lockdown	Governments have announced that country to go into lockdown, closing its border, restrictions on movements, travel, closure of non-essential business, closure of public transports, cancellations of mass gatherings/ events, etc. (can have some flexibilities for essential workers and businesses)	[17]
Economic support programs	Governments have announced economic support programs to support their fellow citizens. (For example, the wage benefit in New Zealand and Stimui checks in the USA is	[18]

[15] *Tang et al. (2020), Rashid et al. (2015), Lunn et al.(2020), Kristin,(2021), Bonnett, (2020), Asia Pacific Report (2021) and Ministry of Health NZ (2021)*

[16] *Binding (2020) and Ruktanonchai et al. (2020)*

[17] *Ruktanonchai et al., 2020; Allen, 2021; Ashraf et al., 2020; Askitas et al., 2021b; Awaidy & Mahomed, 2020; Barro, 2020; Bjørnskov, 2021; Bonaccorsi et al., 2020; Bonardi et al., 2020; Born et al., 2021; Cheatley et al., 2020; Daoust et al., 2020; Domenico et al., 2020; Flaxman, Mishra, Gandy, Juliette Unwin, et al., 2020; Flaxman, Mishra, Gandy, Unwin, et al., 2020a, 2020b; Geoghegan et al., 2021; Goldstein et al., 2021; Goolsbee & Syverson, 2020; Gray et al., 2020; HIRSCH & PICCINELLI, 2020; Hoertel et al., 2020; Hoffman, 2020; Hsieh et al., 2020; Huber et al., 2021; Karatayev et al., 2020; Kuiper et al., 2020; S. Lai et al., 2020; López & Rodó, 2020; Mazza et al., 2020; Molina et al., 2021; Perra, 2021; Piccinelli & Hirsch, 2020; Probst et al., 2020; Röst et al., 2020; Salje et al., 2020; Shahnazi et al., 2020; Sibley et al., 2020; SITTO & LUBINGA, 2020; Su et al., 2020*

[18] *Alpert & Boyle, (2021), Pramod (2020) and Shearer & Tetlow, (2021).*

	popular economic support programs.) Canada, Singapore, Australia, India, European Union	

Table 1: Examples of Non-Pharmaceutical Interventions (NPIs)

2.1.2. Examples of epidemiological models

Governments across the globe developed and used different epidemiological models to understand and forecast the COVID-19 pandemic due to novelty, lack of accurate treatment/medication. Some of the popular models used across the globe are listed below. (Refer Perra, 2021[19], Jansson, 2020[20,21] for detailed information)

i. SEIR/SIR models are a popular epidemiological modelling technique that divides an estimated population into different groups ("compartments"), such as "susceptible," "exposed," "infected," and "removed/recovered," and then applies a set of mathematical rules about how people move from one compartment to another, based on assumptions about the disease process, social mixing, public health policies, and other factors (Firth-Butterfield & Rao, 2020; Jansson, 2020; Michaud et al., 2020).

   Example: NZ's Compartmental SEIR Model from covidsim.eu. (SEIR model) (Jansson, 2020), Columbia University Severe Covid-19 Risk Model (& mapping tool (SEIR model), Imperial College "non-pharmaceutical intervention" (NPI) Model (SEIR model), Age-stratified discrete compartment model in Switzerland (Balabdaoui & Mohr, 2020) and University of Pennsylvania Covid-19 Hospital Impact Model for Epidemics (CHIME) (SIR model) (Michaud et al., 2020).

ii. Based on assumptions and rules about things like the individuals' movement and mixing patterns, other activities and risks, and the health strategies and policies in place, agent-

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[19] *This paper outlines all models in brief with countries and types of models applied in response to COVID-19.*

[20] *https://jamesjansson.medium.com/covid-19-modelling-is-wrong-f7246e3dc396.*

[21]*https://www.weforum.org/agenda/2020/05/covid-19-coronavirus-models-data-behaviour-infection-death-rate-flatten-curve-policy/*

based models (ABM) build a virtual community and track the interactions and resulting spread of disease among individuals ("agents") in that community (Jansson, 2020; Michaud et al., 2020). In other words, ABM captures the evolution of the virus's spreading patterns at the level of single individuals.

Example: COVID-19 Model from North-eastern University, Fogarty International Center, Fred Hutchison Cancer Center, University of Florida and others (Michaud et al., 2020).

iii. Curve-fitting/extrapolation models, which is also known as statistical models, infer disease patterns in a given area by first evaluating the current situation and then applying a statistical estimate of the possible future epidemic route based on past experiences and assumptions about the population, transmission, and public health policies in place (Adams, 2020; Firth-Butterfield & Rao, 2020; Michaud et al., 2020). Thus, statistical models help capture the evolution of the epidemic, inferring key parameters and behaviours from the data.

Example: Institute for Health Metrics and Evaluation (IHME) Covid-19 Model, Los Alamos National Laboratory Confirmed and Forecasted Case Data Model (Michaud et al., 2020)

iv. Metapopulation models are based on a network of subpopulations that use modelling on specific cities, regions or countries connected by mobility (Perra, 2021). This model gives a better picture of the spreading patterns within specific subpopulations and gives broader prospects of the spread.

Example: This type of epidemic model (metapopulation) (Perra, 2021) is used in Canada (Karatayev et al., 2020), Poland, Spain (Aleta et al., 2020), the USA (Lau et al., 2020), Hungary (Röst et al., 2020), and Sweden (Sjödin et al., 2020).

When forecasting and making predictions, the model parameters are crucial. However, to make estimations and forecasts, the various models rely on different parameters. Therefore, there is no perfectly accurate model for predicting and forecasting COVID-19 patterns. Furthermore, forecasting and predicting become challenging when the behavioural responses of people change. For example, people's behaviours change when they see others following or avoiding NPIs when they see previous NPIs were effective or ineffective in controlling the spread, uncertainty about the duration of mitigation measures, and when they see catastrophic epidemiological situations. Thus, changes in behaviour, on the other hand, may affect the main parameters used in COVID-19 models.

The epidemic models are generated using available data we have and predictions about disease progression. These models highlight various potential outcomes, leading policymakers, and citizens to alter their behaviour, resulting in a dramatically lower number of deaths than initially predicted. Countries around the world may have used the same or different parameters for similar models. It depends on their approaches. From pieces of literature and public health services websites (Adams, 2020; Firth-Butterfield & Rao, 2020; Government of Canada, 2020; Jansson, 2020; Michaud et al., 2020; Public Health Agency of Canada, 2021; Shinde et al., 2020), I have gathered some of the model parameters can be found in **appendix A** that are used in the forecasting models during COVID-19.

To understand a better picture of the impact of NPIs, I looked into the two categories. Even though the impact can be broadly looked into different aspects, I excluded other aspects such as the impact of NPIs on medical practices, vaccinations, health, and wellbeing. However, I looked into the effects of NPIs on spreading and behaviours. In general, the papers that focus on quantifying the impact of NPIs effect on COVID-19 spreading and behavioural aspects were looked at.

2.2. Health Belief Model (HBM)

One of the sociopsychological health behaviour theories proposed by Irwin M. Rosenstock, Godfrey M. Hochbaum, S, Stephen Kegeles, and Howard Leventhal at the US Public Health Service in the 1950s Health Belief Model (Carpenter, 2010; Glanz et al., 2008). This model was developed to explain and predict health-related behaviours. The HBM is still one of the widely used theories in health behaviour research, suggesting that people's beliefs about health problems, perceived benefits of actions and barriers, and self-efficacy explain engagement (or lack of engagement) in health-promoting or health-averse behaviour. A stimulus, or cue of action, must also be present to trigger health-promoting or health-averse behaviour. First, this model was applied to explore various health-related behaviours of Tuberculosis (TB) patients, such as screening for the early detection of asymptomatic cases and willingness for immunisations (Becker, 1977; Janz & Becker, 1984).

This model has also been applied in different epidemics such as Influenzas, SARS-CoV and Ebola to help public health authorities and researchers understand patients' responses to the disease's symptoms and compliance with medical regimens and lifestyle adaptation. Moreover, it also helps to understand behaviours related to chronic illness, which may require long term behaviour maintenance in addition to initial behaviour change. According to HBM, individuals are more likely to adopt a behaviour if they perceive an adverse health outcome to be serious, perceive themselves to be vulnerable/susceptible to it, perceive the advantages of behaviours that minimise the risk of that outcome to be high, and perceive the obstacles to adopting those behaviours to be minimal/low, according to the model (2010, Carpenter). Therefore, the HBM can help understand and study the likelihood of people's healthy behaviour engagement. The constructs of the HBM are useful because they allow health authorities, researchers, and epidemiologists, among others, to predict engagement in health-related behaviours (Becker, 1977; Janz & Becker, 1984; Mukhtar, 2020; Rosenstock, 1974). Furthermore, this model helps

health authorities, researchers, and epidemiologists analyse behavioural patterns (Becker, 1977; Janz & Becker, 1984).
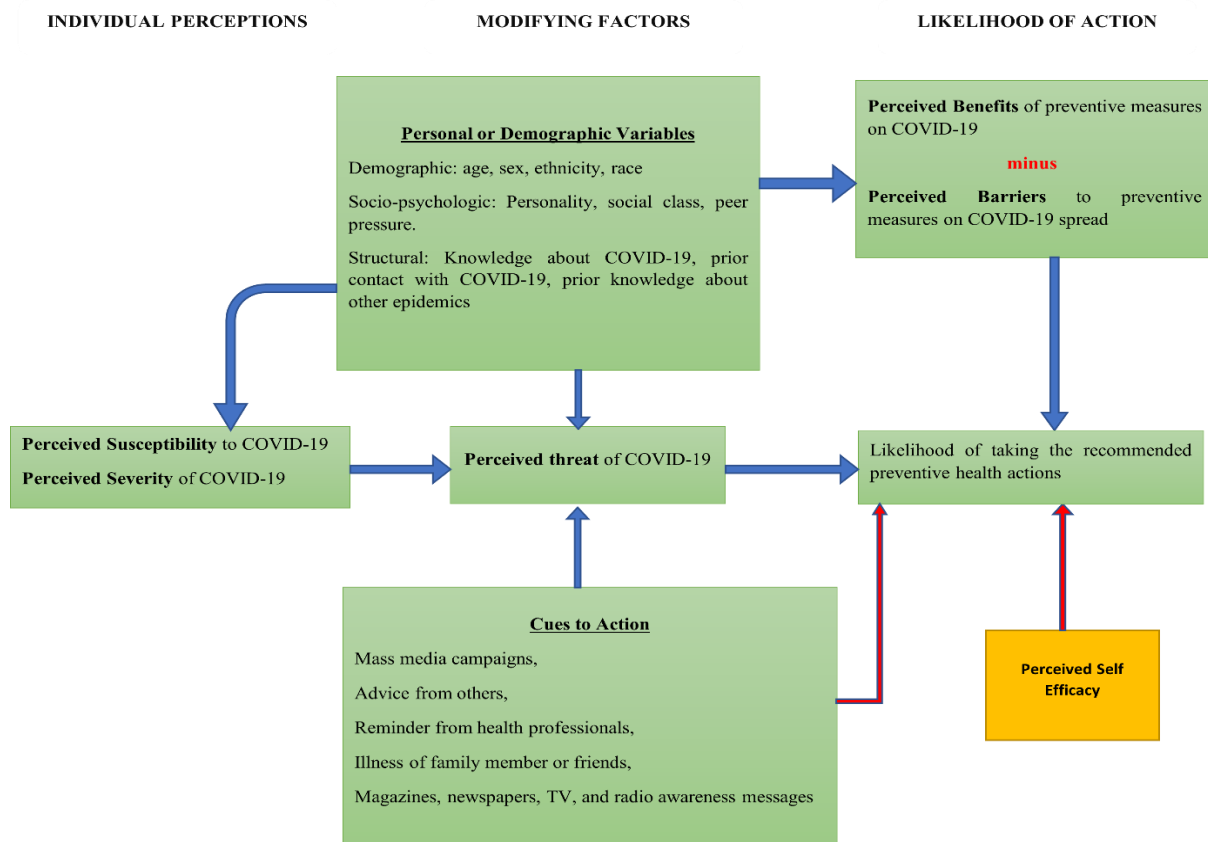
Figure 2: Health Belief Model, adapted from Janz & Becker (1984)

2.2.1. HBM Constructs

2.2.1.a Perceived Susceptibility

Perceived susceptibility refers to an individual's/people's subjective perception of the risk of acquiring an illness or disease. A susceptible person perceives themself to be at the risk of getting infected with the disease or more likely to get the disease, i.e., COVID-19. There can be wide variation in people's feelings of personal vulnerability to an illness or disease. Individuals who believe they are vulnerable/susceptible to a specific health issue are more likely to participate in behaviours that reduce their risk of developing health issues, according to the HBM (Rosenstock, 1974). Additionally, those who perceive themselves that their actions and behaviour could impact others and

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catch disease or illness are more likely to participate in preventive behaviours for the safety of others and is assumed to follow government or public health authorities' communications. However, people with lower susceptibility may deny that they are at risk of contracting a particular illness to others due to their ignorance and indifferent behaviours (Rosenstock, 1974). These kinds of individuals pose a risk of transmission of disease. They are the ones who are likely not engaging in preventive behaviours and not following safety measures recommended by the government.

2.2.1.b   *Perceived Severity*

Perceived severity refers to a person's feelings on the seriousness of contracting an illness or disease or leaving the sickness or disease untreated. A wide variation in a person's feelings of severity depends on various factors such as the pain and mortality rate of the disease, transmission power of the disease, the medical treatment, newness of infection, the impact of the disease (disability) as well as social consequences (for instance, family life, social relationships) (Wayne W. LaMorte, 2019). HBM predicts that the perceived severity depends on the people's perception of either the disease having a high mortality rate or low mortality rate or whether the disease/ illness is hazardous or not very dangerous and whether transmission power is high or low (Abraham & Sheeran, 2014; Janz & Becker, 1984; Rosenstock, 1974; Wayne W. LaMorte, 2019). For instance, an individual may perceive that COVID-19 is not pathologically severe; however, they sense that there would be a severe economic impact on their family as a result of being unable to go to work for multiple days throughout the sickness or being unable to go to work being in isolation or quarantine. Therefore, they may perceive COVID-19 as a severe illness. Some individuals perceive the seriousness of COVID-19 as higher or some as lower. This wide variation in a person's feelings of the severity of disease or illness will determine the likelihood of

engaging in healthy behaviour, determining the people's protective behaviours. These healthy behaviours will reduce the severity of the disease (Abraham & Sheeran, 2014; Allcott, Boxell, Conway, Gentzkow, et al., 2020; Glanz et al., 2008; Rosenstock, 1974).

Some researchers have added the perceived threat in Health Belief Model (HBM) in their studies (Glanz et al., 2008). Perceived threat is the combination of perceived susceptibility and perceived severity that predicts; higher the perceived threat means higher the likelihood of engagement in health-promoting behaviours (Rosenstock, 1974).

2.2.1.c   *Perceived Barriers*

Perceived barriers refer to the individual's feelings about the obstacles associated with performing a recommended health action. The likelihood of engaging in healthy behaviour is affected by perceived barriers. The persons' estimation of the challenges to engaging in healthy behaviour depends on various factors even though they perceive a health condition/ disease/ illness as threatening and believe that a particular action will effectively reduce the threat. But the barriers may prevent the engagement in health-promoting behaviours. After the outbreak of COVID-19, governments across the globe brought in several approaches for preventing the spread. However, there have been some challenges regarding these approaches.

The factors that act as a perceived threat are inconvenience/ difficulties of following health instructions (stay at home), danger (for instance, the side effect of medicines/ vaccines or any medical procedures), expenses and discomfort (for example, emotional upset, pain) involved in engaging in such behaviour. Some individuals may find it difficult to follow the instructions to prevent COVID-19 or may not have the patience to follow the preventive instructions. For example, staying at home may not be followed

because that individual's daily life will be impacted economically, or they cannot afford the cost of preventative measures (Arjun Ojha, 2021; Subedi & Jha Kumar, 2020).

2.2.1.d   *Perceived Benefits*

Perceived benefits refer to people's perception of the effectiveness of the various actions available to reduce illness or disease threat (or to cure sickness or disease). After accessing the importance or effectiveness of such action, the HBM predicts that the individual's involvement in healthy conduct to mitigate disease risk or cure the disease will be dictated by perceived benefits. For example, if an individual perceives that the spread of COVID-19 can be reduced by washing hands, mask-wearing or social distancing, s/he would follow the preventive measure to reduce its spread. However, such particular action depends on that person's individual belief that that particular action will reduce susceptibility to a threat or decrease its threat or seriousness. These factors will determine either they are likely to engage in such preventive behaviours or not.

2.2.1.e   *Cues to Action*

Cues to action is the impetus needed to trigger the decision-making process to accept a recommended health action (Wayne W. LaMorte, 2019). HMB postulates that a cue or trigger is crucial for promoting engagement in health-promoting behaviours (Abraham & Sheeran, 2014; Carpenter, 2010; Glanz et al., 2008; Rosenstock, 1974; Wayne W. LaMorte, 2019). Cues to action can be internal or external. Internal cues to action are also known as the physiological cues from the symptoms, pains or discomfort related to the disease or illness (COVID-19 symptoms such as coughing, fever, the new loss of taste or smell, shortness of breath or difficult breathing) (Centers for Disease Control and Prevention, 2021). In contrast, external cues can be environmental or surrounding events. Those external cues can be information received from nearby

people (about the seriousness of the diseases, sickness of own family members or relative), the media (traditional or electronic), the health care providers, public health authorities or the government itself that encourages people to engage in preventive behaviours. The cues' intensity to action depends on perceived susceptibility, severity, barriers and benefits (Rosenstock, 1974).

2.2.1.f   *Self-Efficacy*

Self-efficacy refers to the level of a person's confidence in their ability to perform a behaviour successfully. This construct was added to the model most recently in the mid-1980 (Glanz et al., 2008; Rosenstock et al., 1988). Self-efficacy is a construct in many behavioural theories related to whether a person performs the desired behaviour (Wayne W. LaMorte, 2019). This construct was added in HBM in 1988 to explain individual differences in health behaviours better. From several research, it was found that self-efficacy was a key component of health behaviour change in an individual. Schmiege et al. also highlighted that self-efficacy is a powerful predictor than beliefs about future adverse health outcomes (Schmiege et al., 2007). Perceived self-efficacy can positively or negatively affect health-related behaviours (Schmiege et al., 2007; Wayne W. LaMorte, 2019). For example, if the COVID-19 patients think s/he can follow every preventive instruction against the disease (i.e., COVID-19)., then s/he will engage in performing preventive, protective behaviours.

In addition to these constructs, there are numerous modifying factors in the HBM. Those modifying factors can be demographic variables such as gender, age, education, ethnicity, race, sociopsychological and structural variables (knowledge about the disease or prior contact with the disease, etc.), among others (Rosenstock, 1974).

2.3. Causal Loop Diagram

Causal loop diagrams (CLDs) are visualisation tools that explain the behaviour of a system showing causal relations between interacting components. A causal loop diagram consists of closed cycles within the diagram, which are also called reinforcing or feedback loop connected by nodes and edges. Nodes are generally used to represent the variables and edges to show the connection between variables. They show how changes in one component cascade to others' changes and back to itself, potentially affecting the entire system's status through feedback loops (Bradley et al., 2020; Krickwood, 1988). Arrows with +/- represent the polarity, i.e., either positive (if the cause increases, the effect will also increase compared with the situation where the cause did not change) or negative (if the cause increases, the effect will decrease compared with the situation where the cause did not change) (Binder et al., 2004, p6).

Figure.3 represents an example of CLDs representing interacting components in a society responding to COVID-19 (Bradley et al., 2020). The feedback system, which combines causal loop diagrams and feedback loops, would help study and understand public health concerns that are difficult to understand using traditional epidemiological models (*Systems Science / Columbia Public Health*, 2019). Principles of system dynamics from engineering were used to identify the connections between changing system structure and system behaviours (Andersen & Richardson, 1997). CLDs are popular in business, engineering, health and sciences. For example, business motivation models (Bridgeland & Zahavi, 2009a), business simulation (Bridgeland & Zahavi, 2009b), complex human-natural systems (Moallemi et al., 2020), systems engineering (B. Lyu et al., 2018), software and information systems(Franco et al., 2018), public and private sectors (Pagoni & Patroklos, 2019), health and sciences (Waterlander et al., 2020; Sharareh et al., 2016).

In public health research on dengue fever, pneumococcal infections, and HIV AIDS, systems dynamics modelling was used (Homer & Hirsch, 2006). A CLD diagram can be used to understand better unit interdependence, reciprocal interaction, information feedback systems, and circular causality, as well as the flow relationships of the virus's spread and its effects on other components (Ackermann et al., 2010; Andersen & Richardson, 1997; Homer & Hirsch, 2006). For this research, I refer to the COVID-19 CLD to study public behaviours and their impact on public health indicators. Here, I have divided the above CLD into two halves 1). Public Health Indicators and 2). Public health behaviours. Public health indicators are those interacting components that are measurable and that are traditionally covered by parameters in epidemiological models that are relatively straightforward to estimate (e.g., household size from official census data).
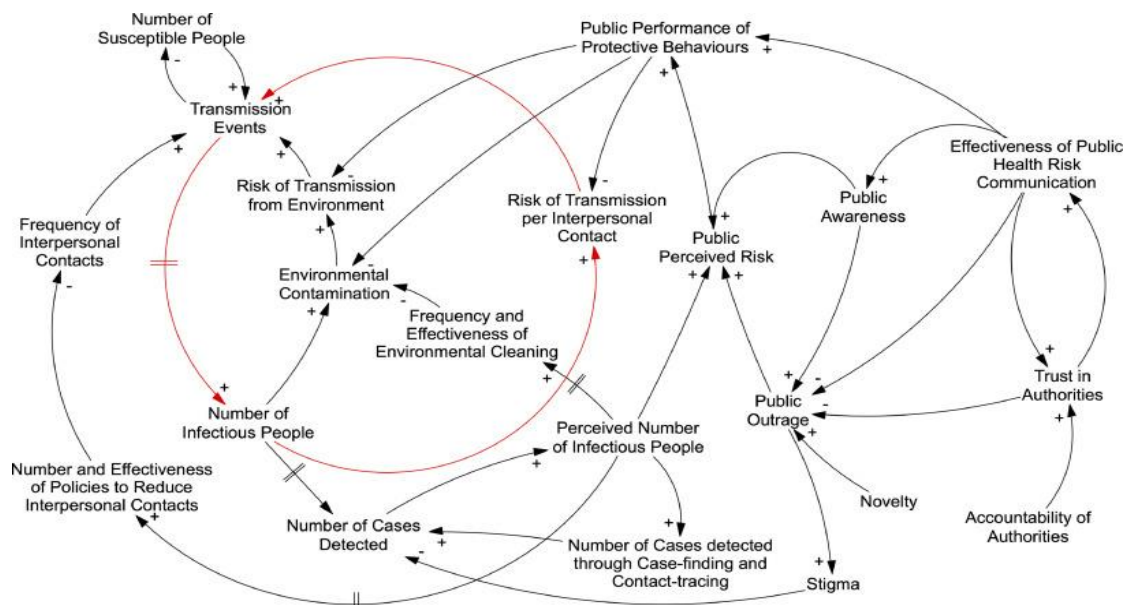
Figure 3:An example causal loop diagram illustrating some of the interacting components in a society responding to the threat of COVID-19. (Bradley et al., 2020).

Arrows with +/- represent the polarity, i.e., either positive (if the cause increases, the effect will also increase compared with the situation where the cause did not change) or negative (if the cause increases, the effect will decrease compared with the situation where the cause did not change, // represents delay)

In contrast, the other half is related to public health behaviours which I consider essential to study to see their impact as an interacting component in a society responding to the threat of COVID-19. These components are the health behaviour constructs found in COVID-19 CLD responsible for causing impact in the feedback loop.

For instance, in figure 3, a reinforcing feedback loop is responsible for causing exponential growth in the number of infected people (in red) and the interacting components with arrows (in black). The risk of transmission depends on the public performance of protective behaviour. The causal loop diagram above shows that the public output of protective behaviour reduces transmission risk (represented by the – sign). However, the opposite may be true: a reduction in public protective behaviour may increase transmission risk, which is not depicted in the CLD example above.
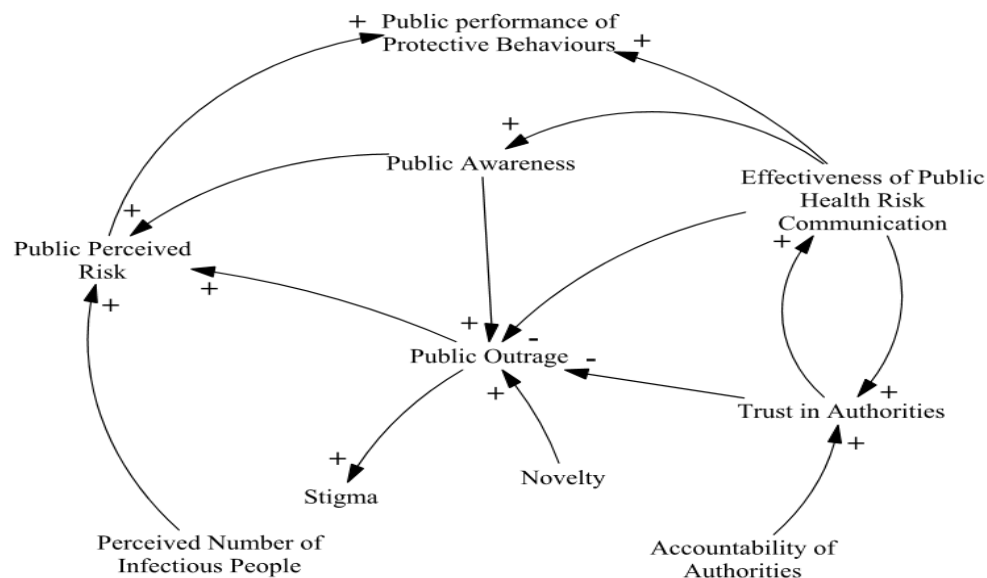
Figure 4: Constructs of Public Health Behaviours separated from COVID-19-CLD

Arrows with +/- represent the polarity, i.e., either positive (if the cause increases, the effect will also increase compared with the situation where the cause did not change) or negative (if the cause increases, the effect will decrease compared with the situation where the cause did not change)

To better understand the picture of the reinforcing loop, the risk of transmission that is also referred to as the primary reproduction number, i.e., R_O It should be known. R_O is seen as a background factor rather than a virus trait, arising from a long chain of dynamic interactions involving components that are otherwise seen as remote or disconnected, such as stigma, public confidence in health authorities, health communication effectiveness, and so on (Bradley et al., 2020). Estimations of the essential reproduction of a disease or risk of transmission (R_O) depend on the number of observed cases and the assumed generation interval (Cepelewicz, 2021). The generation of an interval is the amount of time when one individual is infected and when they infect the following person (Cepelewicz, 2021). This time will allow epidemiologists or public health authorities to understand the outbreak's scenario and intensity. The higher the R_O means faster the growth rate and faster the spread, however, the generation of intervals allow a better understanding of how quickly one infection leads to another (Cepelewicz, 2021).

The feedback loop in the CLD (*figure 3*) explains how interacting components affect the virus's spread. The number of infected people increases when the public has low trust in the health authorities or government, and the stigma is higher. Stigma is interrelated with other factors. When the public alarm about the novel hazard and trust in authorities is lower, outrage may increase stigma. Therefore, reduce the detection of infected people. These interacting components can reduce or increase individual and societal response intensity while curtailing the virus's spread.

Furthermore, risk communication's effectiveness also influences people's capability and motivation to perform protective behaviours. Information/ communication flow plays a crucial role during a crisis. In a pandemic, delays in information flow and proper corrective steps to stop the spread would minimise complex systems' controllability (Bradley et al., 2020). When there is a time lag between the accurate measurement of being infected, becoming infectious

or new infections, being detected, and introducing control measures, then the actual number of cases could not be precisely measured (Bradley et al., 2020). Rapid outbreaks can result from time delays in recognising new infections, implementing proper countermeasures, complexity, effectiveness, and overreaction towards countermeasures. To be efficient, more effective, and robust countermeasures are needed than those were used previously. The risk of transmission increases when people disobey public health authorities or government advice, when preventive strategies are weakened, or when the ability to test and track new cases is impaired (Bradley et al., 2020). This scenario will reduce the number of infectious people in the system, resulting in more outbreaks.

2.3.1. COVID-19-CLD Constructs

2.3.1.a Stigma (S)

Negative prejudice against individuals with physical, behavioural, or social characteristics is called stigma(Barrett & Brown, 2008). Previously, outbreaks of influenza (H1N1), bubonic plague, Asiatic flu, Zika virus, HIV-AIDS, tuberculosis, SARS, and MERS were linked to stigma and prejudice against specific populations(Aris-Brosou et al., 2017; Fischer et al., 2019). Although the current COVID-19 pandemic is wreaking havoc worldwide, there are growing reports of stigma and prejudice directed at COVID-19-affected communities and populations (Devakumar et al., 2020). The medical persons reported social stigma and rejection cases and even quarantined individuals or those infected or suspected with COVID-19 (Barrett & Brown, 2008; Imran et al., 2020). The presence of significant stigma among COVID-19 patients can influence their willingness to participate in protective or preventive behaviour (Imran et al., 2020). Infectious disease stigma can make it challenging to follow healthier habits, leading to more severe health issues, continuing disease transmission, and difficulty managing outbreaks (Fischer et al., 2019).

According to a recent report, the stigma associated with COVID-19 discourages people from taking precautionary measures such as wearing masks, finding adequate health care, seeking COVID-19 tests, and disclosing their contacts if they test positive (Devakumar et al., 2020; Imran et al., 2020). These stigmatised behaviours can affect participation, so lowering COVID-19 stigma is essential for controlling the virus's spread. At this time, stigma is being generated and shared through social interactions, with remarks like "virus carrier/spreader," group labelling, and linking those with the prevalence of disinformation and conspiracy theories to COVID-19 patients (Barrett & Brown, 2008; Devakumar et al., 2020; Imhoff & Lamberty, 2020).

2.3.1.b Public Outrage (PO)

Early risk communication researchers discovered that two main components shaped risk acceptability: hazard and outrage (Malecki et al., 2020). The hazard is described as the number of people who are exposed, contaminated, and become ill. When a public health emergency arises, such as COVID-19, risk communication's effectiveness is crucial to alleviate public concern, fear, and confusion regarding the disease, its origin, symptoms, and treatment. COVID-19's novelty has caused indignation among the public. Outrage is measured by how the general public and patients respond to the risk reduction communications delivered by public health authorities and the government. Immediacy, ambiguity, familiarity, personal control, scientific uncertainty, and confidence in public health authorities, governments and related institutions, and media influence risk is messaging perception and response (Malecki et al., 2020). Outrage factors influence the public's ever-changing perception of COVID-19 danger. Personal mitigation strategies such as wearing facemasks and social distancing among the general public are shaped by adherence to, and overall

acceptance of those personal mitigation strategies are impacted by hazard and outrage and cultural and economic background (Malecki et al., 2020).

2.3.1.c Public Risk Health Communication (PHRC)

Public Risk Health communication plays a crucial role in health care and the public health system. Public risk health communication is a subset of healthcare in which physicians use communication methods to inform and influence public decisions and behaviour to promote public health. It is the study and practice of transmitting promotional health information, such as public health campaigns, health education, individuals' exposure to, search for, and use of health information and relationships between a doctor (health authorities) and a patient (Office of Disease Prevention and Health Promotion, 2010). Health knowledge distribution aims to increase health literacy and, as a result, influence personal health decisions. The necessity of effective health communication (i.e., risk communication) is noticed during this time of Pandemic (SARS-CoV-2, COVID-19 pandemic) for mitigating the public health risk (Erinoso et al., 2021) associated with it. The effectiveness of risk communication during pandemics has played a vital role in influencing people's capacity and motivation to perform protective behaviours that somehow control the spread of the COVID-19 (Bradley et al., 2020). During the rapid spread of COVID-19 social amplification or risk increased due to increased communication of risk by a socially shared message. Misinformation or misleading information, stigmatised messages, communications about the values and trust in the government, in science, in medicine, in enforcement authorities, in the police was noted during this pandemic from various social media (Abrams & Greenhawt, 2020; Bastani & Bahrami, 2020; Cuan-Baltazar et al., 2020; Devakumar et al., 2020; Ho et al., 2020; Kuika Watat & Moukoko Mbonjo, 2020; Y.

Li et al., 2020; Y. Lu & Zhang, 2020; Pennycook et al., 2020; Scherer & Pennycook, 2020). That is why the effectiveness of health communication is prevalent during the pandemic. Effective communication played a pivotal role in minimising the risks associated with the unavoidable clustering of people in public places and other activities capable of not only driving the spread of the disease but also inflating the number of cases and fatalities from COVID-19 in Nigeria since the government eased COVID-19 lockdown steps (Chile & Akwagyiram, 2020). Effective risk communication is now needed to create the public performance of protective behavioural interventions that help prevent disease transmission and protect people's health and safety.

2.3.1.d Trust in Authorities & Accountability of Authorities (TA & AA)

Trust and accountability play a role in forming a realistic risk assessment of the disease. These two factors aid in deciding the effectiveness of countermeasures by evaluating the risks and benefits associated with the crisis, which dictates the probability of public health authorities and the government adopting the prescribed behaviour. Their confidence heavily influences people's risk perceptions of the disease in others. Hearing, reading, and responding to public health messages require a high level of trust (Khosravi, 2020). This has resulted in a growing dependency of effective risk and crisis communication on the method of receiving information and the level of trust in the government during th/e pandemic period (Khosravi, 2020). On the other side, the issue of misinformation and disinformation spreads across social media, resulting in further false speculations (Wise et al., 2020). Furthermore, it would be difficult to encourage people to participate in protective activities if they are disengaged due to factors other than genuine low risk or inability (Wise et al., 2020) to adopt such recommended measures. Such people may be unconcerned about the pandemic since they are unaffected personally. Consequently, epidemiological models used to predict

the impact of behaviour-focused approaches on disease transmission should account for such disengagement (Wise et al., 2020). Preparedness for pandemic with various countermeasures (Bachtiger et al., 2020a; David Williams et al., 2021; Y. Li et al., 2020; Sibley et al., 2020; L. Zhang et al., 2020), government policies (Bachtiger et al., 2020a), communication and information shared by authorities and government plays an essential role in shaping the behaviour of people towards prevention (Jose et al., 2021; Bachtiger et al., 2020; Barrett & Brown, 2008; Bootsma & Ferguson, 2007; Bradley et al., 2020; Bunker, 2020; Han et al., 2020; Ho et al., 2020; Jovančević & Milićević, 2020; Kuika Watat & Moukoko Mbonjo, 2020; Laato et al., 2020; Lin et al., 2020; Malecki et al., 2020; Nasser Al-Suqri et al., 2021; Silver & Hyman, 2020; Vinck et al., 2019).

2.3.1.e Public Perceived Risk

People's subjective assumptions about the characteristics and magnitude of risk are referred to as risk perception (Brewer et al., 2004; Godovykh et al., 2021; Kasting Id et al., 2020; Slovic, 2016). Risk perceptions differ for actual risks due to several affective (for instance, emotions, thoughts, moods), cognitive (such as the gravity of events, media attention, risk-mitigating interventions), contextual (for instance, availability of alternative information sources, framing of risk information) and individual (for example personality traits, prior experience, age) factors (Godovykh et al., 2021). In health and risk communication, risk perception is critical because it decides which hazards people are concerned about and how they react. Two factors influence public perception risk, i.e., Outrage and Hazards (Covello et al., 1998; Gorman, 2013; Sandman, 1987; Slovic, 2016). Along these, social, cultural, economic, and political factors affect how people perceive risk (Gorman, 2013; Slovic, 2016; Slovic et al., 1985). According to Slovic et al. (1985), the risk characteristics itself also affect individual perception of risk

such as voluntariness of risk, immediacy of effects, knowledge about the risk, control over the risk, newness common-dread, and severity of consequences.

It is well understood from previous pandemics that the effectiveness of measures/interventions aimed at slowing the spread of these diseases is dependent on the public's accurate perceptions of personal and societal risk factors (Dryhurst et al., 2020). These interventions can be pharmaceuticals or non-pharmaceuticals, and they can affect the spread of pandemics by altering people's behaviour (public performance of protective behaviours) (Bavel et al., 2020; Christian Jasper C. Nicomedes, 2020; Dryhurst et al., 2020; Epstein et al., 2008; Funk et al., 2009; Reluga, 2010; Wise et al., 2020). COVID-19's high transmission rate, lack of accurate pharmaceutical care, and lack of vaccines/medicine have all presented significant challenges to the disease's management (Abdulamir & Hafidh, 2020; C. C. Lai et al., 2020; Xu et al., 2020). Non-pharmaceutical interventions (NPIs) have been introduced in countries worldwide to combat the threat of COVID-19. Even though NPIs were introduced to stop the virus from spreading, the effectiveness of those NPIs recommended by PHAs and governments is dependent on public willingness. One of the most challenging tasks is persuading individuals to take the PHAs' recommended preventive measures. Besides many factors, people's risk perception of the pandemic contributes to increased public participation in adopting preventive measures.
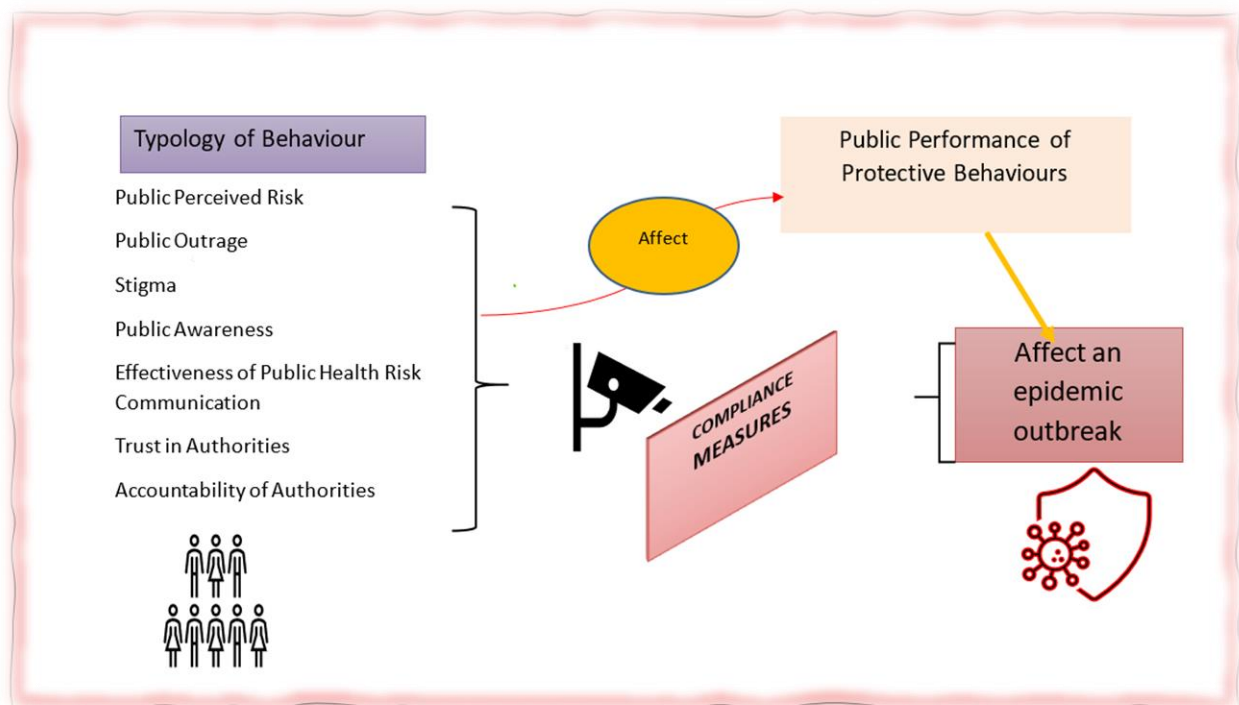
Figure 5: CLD's behavioural typologies' impact on countermeasures that affect an epidemic outbreak

The effectiveness of risk communication, knowledge disseminated by PHAs and the government, and the media play an essential role in raising public awareness about disease risk (Bradley et al., 2020), contributing to adopting preventive behaviours. Furthermore, people's fear of contracting a disease can affect their risk perception of a pandemic, as can their confidence in public health authorities, government, scientists, politicians, and the media (Azlan et al., 2020; Bradley et al., 2020; Bunker, 2020; Chan et al., 2020; Erinoso et al., 2021; Franzen & Wöhner, 2021; Gul, 2021; Khosravi, 2020; Lieberoth et al., 2021; Mintrom & O'Connor, 2020; Niu et al., 2021). The nation's response to the pandemic, as well as their efficiency in dealing with it, is influenced by the answers to the following questions: how concerned are people about the virus, how seriously do they think the pandemic is, how likely do they think they, their families, or friends will catch it within the next few days, and the level of worry about the virus, and how the government is responding to the virus (Thomas, 2020). These factors are also critical in deciding how the pandemic will spread and

how people will adhere to protective compliance measures, whether pharmaceutical or

non-pharmaceutical (Gorman, 2013; Thomas, 2020).

CHAPTER 3 METHODOLOGY
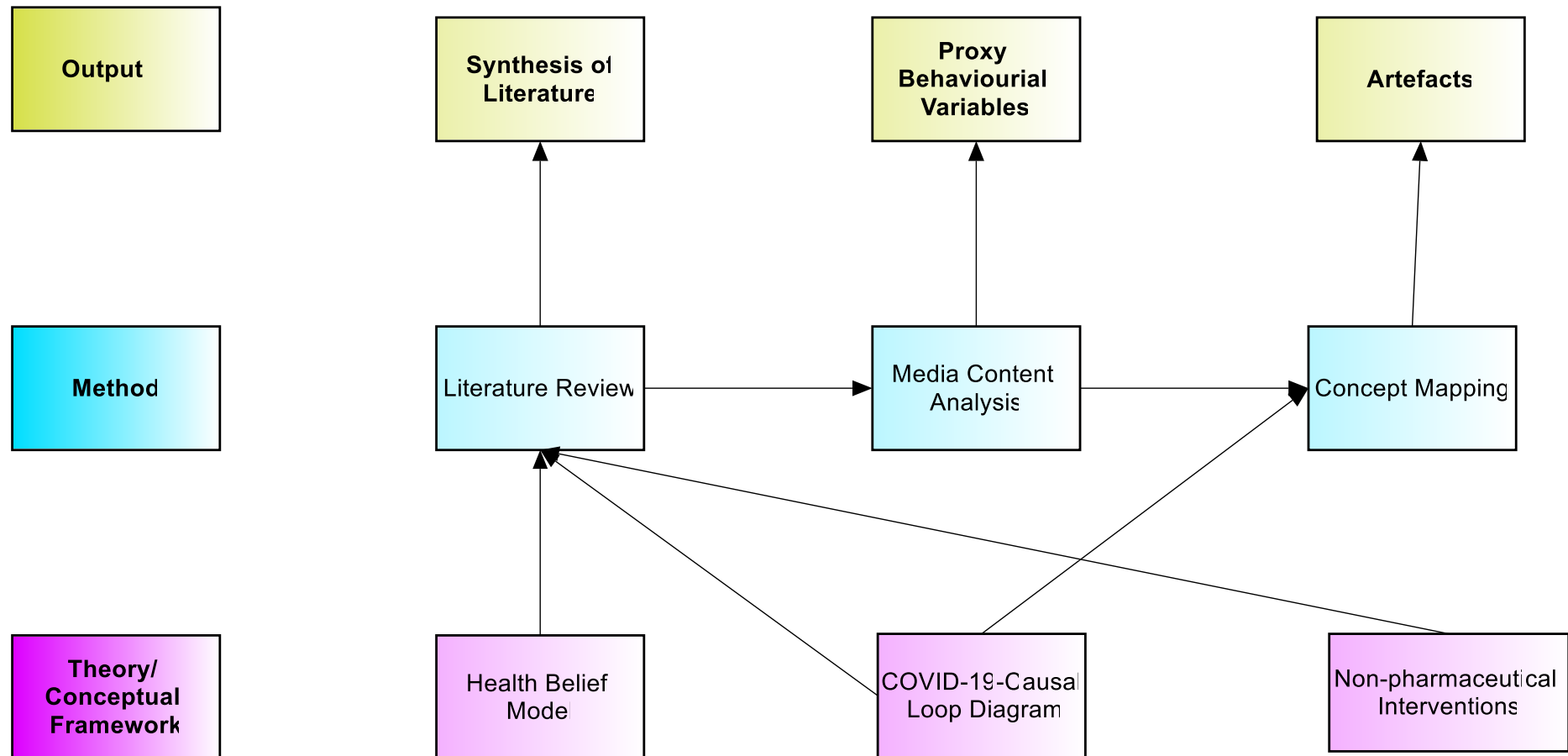
Figure 6: Flow Chart for Methodology used and output

3. Methodology and Artefact Development

In this paper, I used a synthesis of the systematic literature review discussing people's health beliefs and behavioural changes towards infectious diseases and emergency responses towards those with a view of informing contagious disease modelling, research, and public health practice. In addition, I did a systematic literature review to assess the application of HBM in different diseases to understand and developed artefacts that can explain how to estimate compliance with lockdown measures during COVID-19 to improve epidemiological modelling.

3.1. Study Design

During the initial phase, I searched for relevant literature using the query code "COVID-19" on Google Scholar. I found 147,000 records; then, I opted to use PubMed to conduct the literature search with the inclusion and exclusion approach. I found 79,573 results in PubMed. The considerable number of matches and diverse papers challenged finding relevant papers, so I applied the inclusive and exclusive systematic scoping approach. Apart from these, I found some important, relevant documents or information searched from medRxiv, Journal of International Medicine, Journal of Infection, Health Communication, PLoS ONE, Policy Design and Practice, American Journal of Infection Control, Journal of Infection Control Medical Virology, and other databases. In total, 664 papers were analysed, and among them, 302 papers were assessed for the eligibility criteria after removing duplication and that meet exclusion criterion. I have reviewed the papers that have applied the Health Belief Model (HBM) to influenza, COVID-19, the Ebola virus, and so on Health Belief Model, COVID-19, behaviour analysis of COVID-19 transmission and prevention with Health Belief Model, precautionary behaviour, and response to infectious diseases such as SARS-CoV, MERS-CoV, HIV AIDS, Influenza (H1N1), Zika Virus, Tuberculosis, bubonic plague, Asiatic flu, and Ebola were among the search categories. During the literature review, the search strategy was

implemented at the beginning of the study using the inclusion and exclusion approaches. I

discarded the duplicate papers and research that were focused outside epidemics/ pandemics.
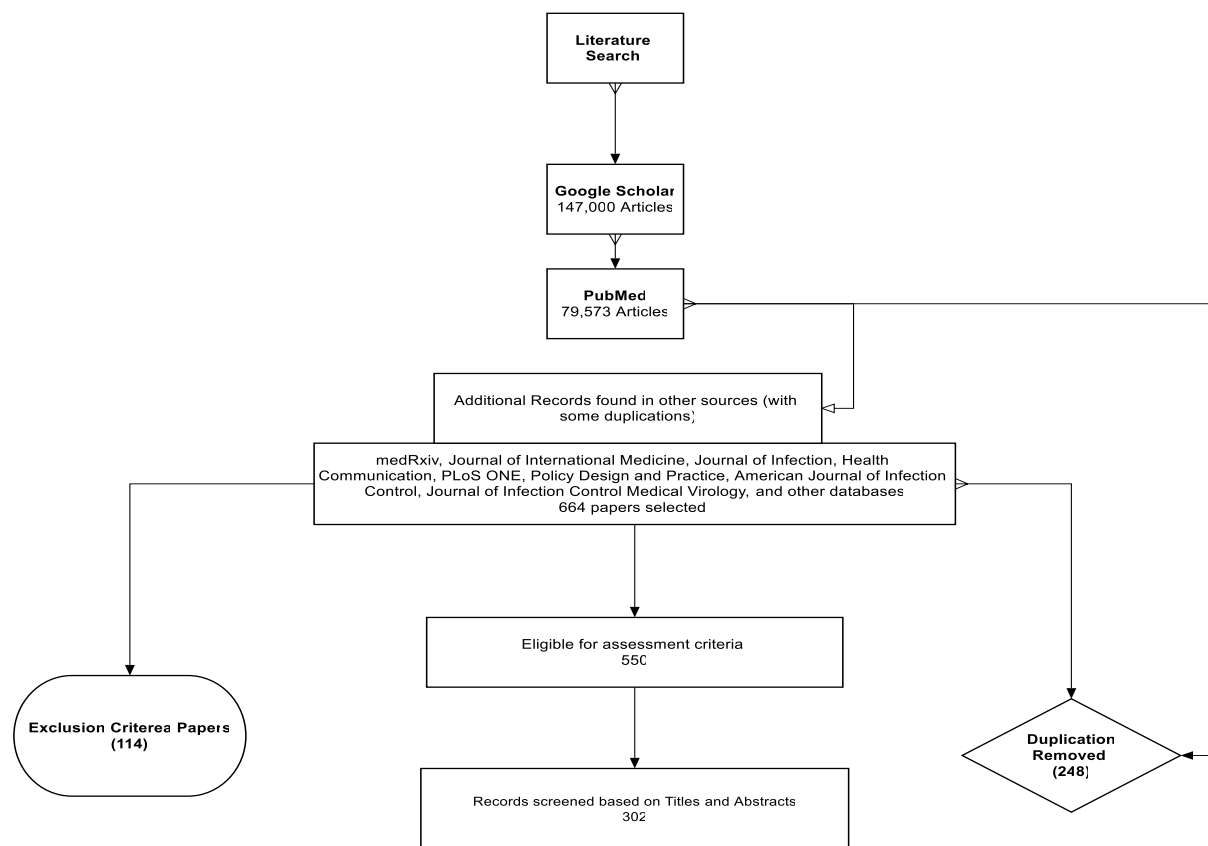
Figure 7: Flow Chart for paper assessed during Literature Review

Keywords used during the literature search

1. Health behaviour theories

2. Health Belief Model (HBM)

3. Health Belief Model and infectious diseases or SARS or HIV-AIDS or Influenza or

   Zika Virus or Ebola.

4. Health Belief Model and Corona Virus (COVID-19))

5. Health Belief Model and COVID-19 and precautionary behaviours and response.

6. Response to infectious disease and the Health Belief Model.

7. COVID-19 and Stigma.

8. Stigma in infectious diseases or Stigma in SARS or Ebola or COVID-19 or Tuberculosis or AIDS.

9. Non-pharmaceutical Interventions (NPIs) and COVID-19 response.

10. (COVID-19 and Non-Pharmaceutical Interventions (NPIs))

11. ((Non-pharmaceutical interventions) OR (Behavioural aspects of compliance to non-pharmaceutical interventions))

12. Government Interventions and COVID-19.

13. Preventive Health Behaviours and COVID-19 and HBM Model.

14. Crisis Communication and Public Perception of COVID-19.

15. Infectious disease outbreak related stigma and discrimination during the COVID-19.

16. Modelling compliance with COVID-19 and prevention guidelines

17. System dynamics

18. Causal Loop Diagrams

Table 2: Queries applied using keywords to search for related literature

3.2. Inclusion and exclusion approach

With the help of the inclusion approach, I filtered the research and studies that have applied HBM to all the disasters and emergencies preparedness; studies conducted across the globe; articles and information published on authentic journals, public health, and government sites; studies conducted on any diseases epidemic preparedness applying the HBM models. However, multiple health behaviour theories were used in various diseases such as Ebola, influenza, SARS-CoV-1, MERS, etc. Besides, experiments using HMB helped researchers better understand people's intentions to change behaviours and the factors that affect their desire to do so. Hence, I used HBM as a primary keyword to search different literature pieces with these proven advantages. The articles or research were searched until the recent date (March 17, 2021); hence, there was no restriction on the search's date. However, this study

intended to use the Health Belief Model and Causal Loop Diagram to answer the above research question in the case of COVID-19 only. Therefore, other behavioural theories were excluded during the systematic literature review.

3.3. Media Content Analysis

In the second phase, I conducted a behavioural media content analysis to examine people's verbal and behavioural responses to the COVID-19 and NPIs. During this phase, I attempted to study numerous texts to assess behavioural data, reduce it, and produce behavioural artefacts using HBM and CLD concepts mapping. In health and clinical research, media content analysis has become increasingly popular. During a disease outbreak, people will read a health article published or broadcast differently than other times. Thus, the audience interpretation throughout this time will be useful to gain diverse perspectives of those audiences before and during the time of disease outbreak.

Furthermore, media content analysis also gives a better picture of audience characteristics such as age, sex, race, ethnicity, education levels, and economic status to explain how that specific content has affected them. Furthermore, media content analysis will aid in the understanding of current media credibility perceptions, implying that a report or information published in a specialist scientific or medical journal or media channel will have greater credibility than a report or information published in general sources. Finally, this approach helped to understand the behavioural responses and reactions towards specific content (for example, COVID-19, responses towards people's behaviour and response for NPIs, response towards authorities, governments, and information received, among others).

First, I have collected the Tweets using R with Rstudio version 4.0.2, then applied systematic review of media stories using purposeful sampling (typical case) technique to do media content analysis because looking into the behavioural responses (expression of anger, fear, outrage,

complaints, supports to any incidents or actions/behaviour, etc.) from peoples about COVID-19 around them could produce a better picture to create behavioural artefacts. Media content analysis for this research focuses on New Zealand and Nepal, having contextual knowledge about these countries. Relevant and highly visible tweets with hashtags (#) are sources for tweets relevant to COVID-19 collected and analysed with a qualitative narrative approach (Soar et al., 2020).

Then, the duplication of tweets and retweets were removed manually in a word file. Here vulgar words and personalized conversations found during the analysis are taken out for privacy and ethical concern. Finally, the tweets gathered are listed in *Appendix B*. After finalising the tweets, those tweets were analysed and coded using NVivo 12 plus software version manually. The media analysis is listed in *Appendix D*.

Tweets collected using hash tags (#) in context of New Zealand

> #Covid19nz, #coronavirusnz, #lockdownnz, #NewZealandlockdown, #FlattenTheCurveNZ, #selfisolationnz, #stayAtHomeNZ, #nzlockdown

Tweets were collected using hash tags (#) and @ in the context of Nepal[22].

> #CoronaNepal, #COVID-19Nepal, @kathmandupost, unscriptednepal, bbcnepali, PahiloPost, RepublicaNepal, NepaliTimes, tweets handled by a reporter of the Kathmandu post with @tkp, @thehimalayan handled by The Himalayan Times, @NepaliTimes handled by NepaliTimes.com, KanakManiDixit

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[22] Here Tweets are collected from tweets handled by The Kathmandu Post, The Himalayan Times, NepaliTimes (authentic newspaper), renowned journalist or reporter where people are found actively tweeting, retweeting, liking, and commenting those tweets.

3.4. Artefact Development

In this study, a system dynamics approach is used to study the impact of behavioural factors or responses on the spread of COVID-19 and to understand the people's expression of their beliefs, values, and perceptions through their posts on social media (tweets) about the situation and responses that can have different effects on controlling the outbreak as well as see how effectiveness could be the NPIs that were imposed by authorities. Here system dynamics helps to understand the relationships between the structure of a system and the resulting dynamics behaviours generated through multiple interacting feedback loops (Sterman, 2000).

CHAPTER 4 RESULTS
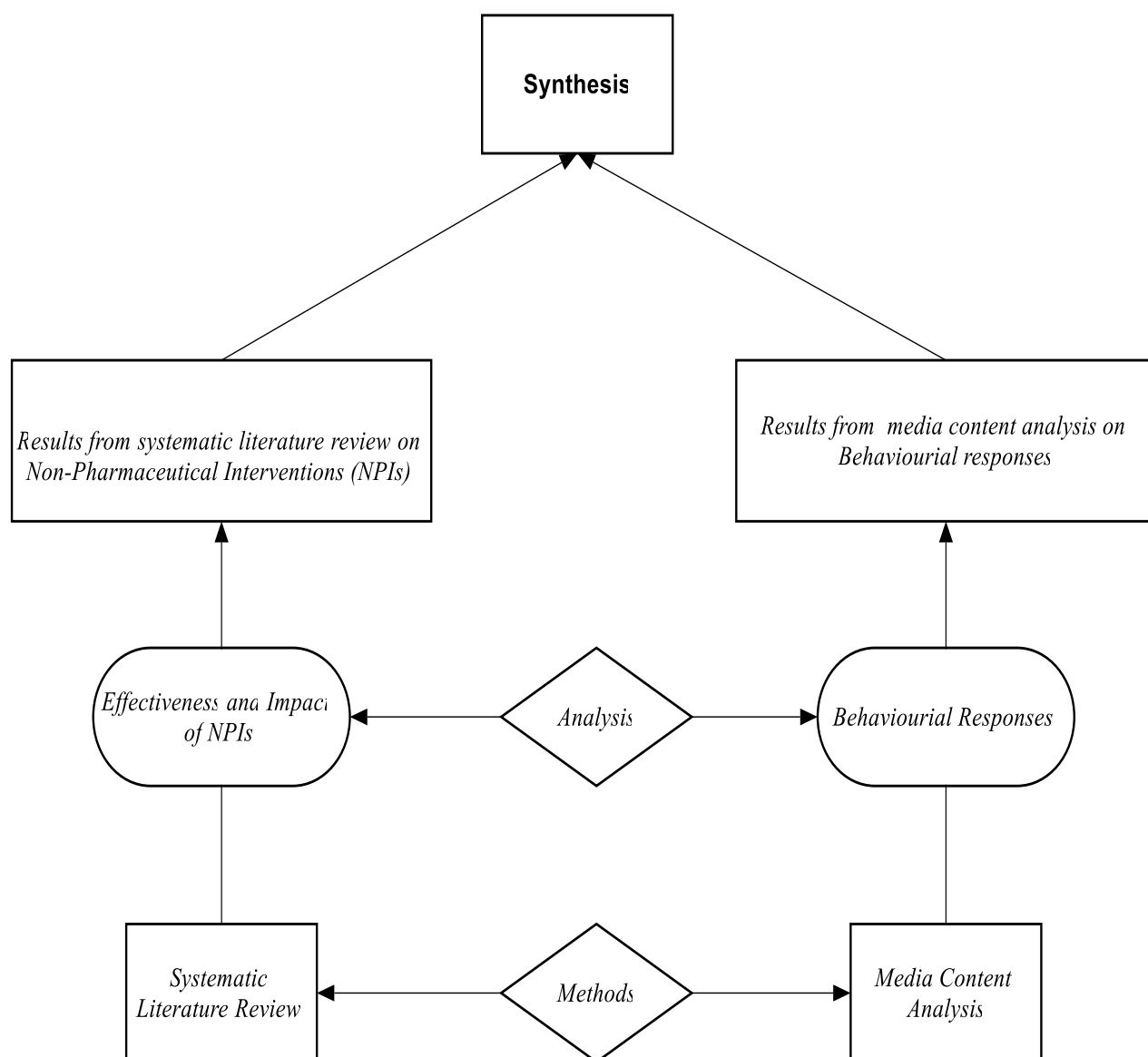
Flow Chart: **Flow chart represents the process taken during this research.
Sysnthesis of results derived from systematic literature review and media content analysis.**

Figure 8: Flow chart of the Result section

4. Results

The contribution of my analysis is twofold. First, in this paper, I summarised the results from the systematic literature reviews. Here, I report on results from an investigation of the effect of non-pharmaceutical interventions on the spread of the disease. In the second phase, I did a systematic media context analysis of behavioural responses after tweets using Tweeter analytics using R studio. Then the tweets were coded across the constructs of HBM and COVID-19 CLD in NVivo software manually and created an artefact of a new feedback loop.

4.1. Results from systematic literature review on Non-Pharmaceutical Interventions (NPIs)

The results presented so far in this section are related to NPIs. Here in this section, I have looked into the popular NPIs during the COVID-19 and analysed the effectiveness of those NPIs from the perspectives of the impact on the spread of the disease. Therefore, I want to concentrate on the effects of NPIs as virus countermeasures in this segment, looking at papers that examine the effect of NPIs on the spread of COVID-19.

While reviewing the impact of NPIs on COVID-19 spreading, the studies conducted in China (Kraemer et al., 2020; Pan et al., 2020; Tian et al., 2020), South America (González-Bustamante, 2021), Australia (Costantino et al., 2020), Bangladesh(Rahman et al., 2020), Netherlands(Kuiper et al., 2020), New Zealand (Valencia et al., 2020), Puerto Rico (Valencia et al., 2020), Taiwan (Hsieh et al., 2020), United States (Auger et al., 2020; Jalali et al., 2020; Kissler et al., 2020; White & Hébert-Dufresne, 2020) about the measures focused on those specific countries were observed. Furthermore, articles that highlighted the effects of NPIs on disease (Baker et al., 2020; Huh et al., 2020; Kozlakidis et al., 2020) were focused. Similarly, numerous notable studies, including Atkeson (2021); Bonardi et al.(2020); Cheatley et al. (2020); Flaxman et al.(2020a); Dehning et al. (2020); Hsiang et al.(2020), have empirically examined the effect of government-mandated non-pharmaceutical interventions (NPIs) in

reducing COVID-19 transmission, and many of these studies argue that these NPIs had a significant impact on the disease's transmission rate in the early stages of the pandemic (Atkeson et al., 2020).

According to research by Askitas et al., 2021; Bin Nafisah et al., 2018; Kasting Id et al., 2020; Kuiper et al., 2020; Suess et al., 2012, early implementation of NPIs is beneficial, and people's behavioural responses to those NPIs are particularly relevant during times of crisis. While studying the disease's effects on NPIs, countries that enact specific intervention steps are likely to reduce the risk of transmission that they have recently adopted. In Oman (Awaidy & Mahomed, 2020) and the Netherlands (Kuiper et al., 2020), an intense and intelligent lockdown significantly impacted preventing a large-scale COVID-19 outbreak. For instance, the impact of travel bans to and from mainland China in Australia (Costantino et al., 2020) and New Zealand (Jefferies et al., 2020) was effective while reviewing the historical mobility data. During the initial analysis, it was found that the travel ban at the early phase has played a significant role in reducing the number of infected cases coming from China which is also considered an epicentre of the outbreak (Costantino et al., 2020; Jefferies et al., 2020). Similarly, at the personal, community, and governmental levels, Taiwan has implemented NPIs such as social distancing, regular handwashing, personal protective equipment (PPE), cancelling events, avoiding mass gatherings, closing facilities, etc., enacting national or provincial lockdown. Based on historical evidence from the Taiwanese influenza season, the preventive method of mass masking and universal hygiene at the start of the COVID-19 pandemic resulted in a 50% reduction in infectious respiratory diseases (Hsieh et al., 2020).

During the initial COVID-19 outbreak, White & Hébert-Dufresne, analysed how widely used epidemiological modelling metrics (declaration of emergency, reducing gatherings, school closures, restaurant closures, restricting companies, and stay at home mandates) differed by the state in the United States (2020). The number of detected cases and the course of early detected

cases were discovered to vary significantly between states. According to an analysis of research protocols, initiatives, and population characteristics, the disease dynamics were most closely correlated with NPIs behaviour during the early phase of the epidemic. Additionally, the states with a low tolerance for deviance from applied NPIs laws saw a quicker disease spread than those introduced early (White & Hébert-Dufresne, 2020). Finally, I highlighted some of the popular NPIs used worldwide and their effectiveness and impact.

4.1.1.a Lockdown

During the recent COVID-19 pandemic, the term "lockdown" became prominent. The word "lockdown" refers to government policies that implemented various non-pharmaceutical measures (NPIs). When other types of NPIs, such as mandatory closure of non-essential businesses and facilities, social distancing, mask-wearing, stay-at-home orders, closure of public transportation, travel restrictions, meeting restrictions, border closures, to name some, it is challenging to identify lockdown. Allen referred that lockdown does not apply to instances of "isolation" in which a country could participate in inadequate border closure to avoid trans-border transmission, followed by a mandatory lockdown to eradicate the virus in the domestic population and then perpetual isolation the population was vaccinated entirely. New Zealand, Australia, and other island nations (like Samoa, Tonga, Cuba, Jamaica, Iceland) have followed this policy (p.3). Governments used lockdowns all over the world to help flatten the COVID-19 transmission curve. Essentially, lockdowns are thought to be a way of reducing the coronavirus's reproduction/replication number (Allen, 2021). COVID-19 has been around for a year, and thousands of papers, articles, and studies have been written highlighting the advantages of the NPI initiatives that have been introduced. However, there are a few articles that are solely focused on lockdown.

After analysing the papers in my collection, I discovered that lockdown could not be analysed separately, and its efficacy is even more challenging to distinguish from others. A COVID-19

response team from Imperial College of London measured the benefits of lockdown by looking at the number of occupied ICU beds (N. Ferguson et al., 2020). While Atkeson, 2021, looked at regular cases and deaths. It was difficult to assess and study all aspects of lockdown within the time constraints. Nevertheless, a lockdown was an essential factor in reducing the spread of COVID-19 events. Bonardi et al. (2020) emphasised the effectiveness of lockdown in preventing disease transmission and reducing death rates (after about 30 days), estimating that lockdowns had prevented about 650,00 deaths worldwide.

Similarly, Gianni De Fraja et al. found that lockdown's impact helped reduce the pandemic's occurrence. They pointed out that the daily reproduction number peaks around ten days and fade away around 20 days. However, they did point out that the initial impact cannot be repeated over time: after 120 days of continuous or discontinuous lockdown, the answer flattens out to the point where, even at its peak, it fails to reduce the spread substantially. Additionally, the same study found that early in the pandemic, restrictions played a part, but it was a temporary effect that would be difficult to reproduce in the future. Now when it comes to the infection level in the environment. When the level of infection is high or infected people are often circulating (Allen, 2021), lockdown becomes successful and meaningful when people follow it.

Analysing the most cited paper that highlighted the advantages of lockdown, it was claimed that the immediate response to the enforced lockdown plays a vital role in reducing transmission speeds, reproduction number (R_t)[23], assessing lockdowns across eleven European nations, and citing that "lockdowns have saved 3 million lives in Europe." (Flaxman, Mishra, Gandy, Unwin, et al., 2020). Similarly, different authors have also highlighted the benefit of

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[23] The reproduction number Rt is an estimate of the rate of spread of COVID-19 and can be defined as the average number of secondary infections that is generated by a primary infection.

lockdown in their studies, stating that lockdown effectively reduced daily cases (Allen, 2021). (see, for example, Born et al., 2021; Courtemanche et al., 2020; D. M. Dave et al., 2020). Though experimenting with the lockdown's efficacy across various states, D. M. Dave et al. (2020) found no overall impact at the state level separately in Texas. However, they discovered a 19-26 percent drop in cases in total states due to urban lockdowns. The lockdowns have slowed the spread of the virus, but the restriction is the only choice available to policymakers (Hirsch and Piccinelli, 2020). For example, Greece, Portugal, and Austria have effectively reduced the infection curve, i.e., decreased daily cases. These countries tended to have dealt more efficiently with their outbreaks by keeping the number of cases minimum. The graph below shows how the number of regular cases in Greece has decreased since the lockdown was imposed. The left chart (absolute values) depicts the pattern of daily new cases. In contrast, the right chart (log scale) depicts a logarithmic scale that allows for a better comparison of trendlines across counties and depicts daily deaths and new cases. This achievement is based on a scenario where all schools are closed, events are halted, land borders are closed, non-essential movements are prohibited, and non-essential shops are shut down.
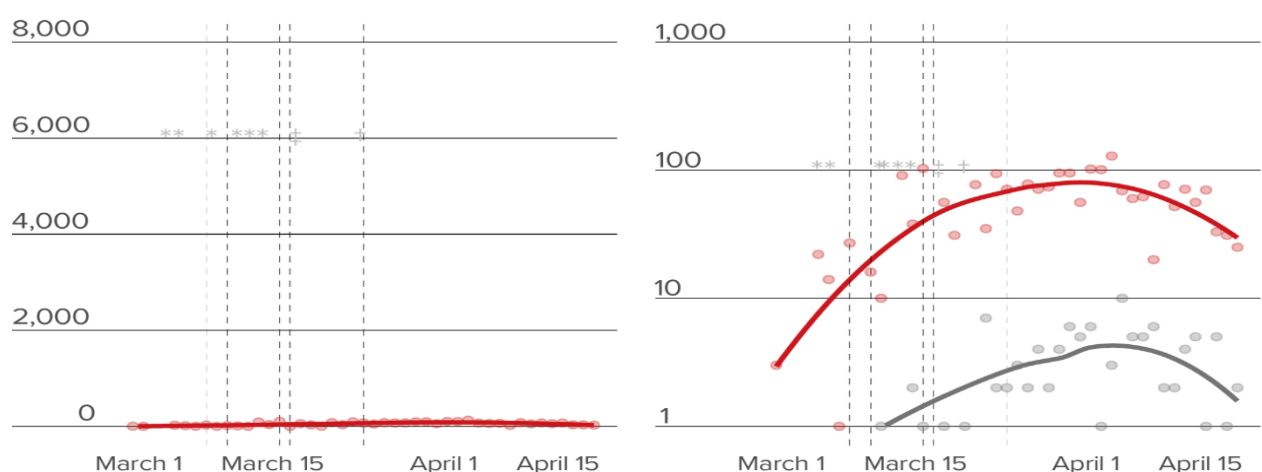
Figure 9: Number of daily cases in Greece (Piccinelli & Hirsch, 2020b)

When opposed to the situation in the United Kingdom, the virus spreads later, and prohibitions or NPI interventions are enforced later than in most other European countries. According to Hirsch and Piccinelli's study, the United Kingdom has difficulty controlling the virus or flattening the curve, depicted in the diagram below.
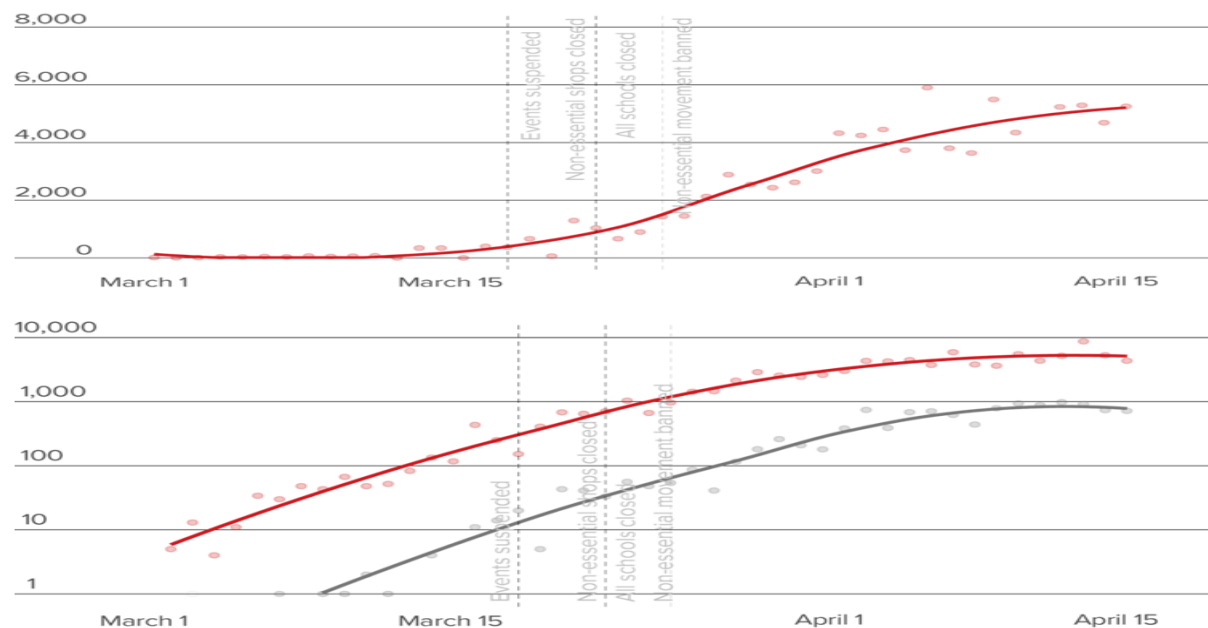
Figure 10: Cases in the United Kingdom (UK)in Absolute and log values (Hirsch & Piccinelli, 2020)

According to Gianni De Fraja et al., 2021, lockdowns minimise the spread of the virus and the number of deaths associated with it. Similarly, Bjørnskov (2021), in cross-country analysis of mortality rates against the lockdown, the findings of the papers suggest that more severe lockdown policies have not been associated with lower mortality rates. Similarly, variation amongst counties in the US, where over one-fifth had no lockdown, shows no lockdown impact, which means lockdowns are ineffective at reducing COVID-19 related deaths. This means the lockdowns have not worked as intended, or there is no difference in mortality rates between lockdown- vs- non-lockdown geographic locations. Banerjee & Nayak (2020) made an exception, looking at county-level mobility data in the United States and doing a difference-in-difference study between counties with and without lockdown. They concur a positive impact of lockdown, but their data only covered the timeframe from February 1 to March 31,

2020. Most states without mandatory lockdowns had almost no infections during this time. As a result, the cross-sectional study has a significant endogeneity problem. Thus, the lack of response is being blamed on the lack of lockdown, when in fact, it is most likely due to the virus's absence. Alternatively, Goolsbee & Syversonn (2020) used cellular phone location records and found that voluntary self-lockdown explains the majority of the enormous change in behaviour during the early stages of the virus's spread; however, they did not find proof of considerable temporal or spatial shifting in response to shelter-in-place policies (p.12). On the other hand, Z. Lin & Meissner (2020) demonstrated that the lockdown effect was minor and that fewer workplace experiences resulted in increased residential activity. They also discovered that standard shocks have a more significant impact than lockdown shocks in the United States.

I noticed that epidemiological models must include endogenous human behaviour to account for individuals' private and voluntary responses to danger. This shows that in response to increased transmission risks, people make voluntary decisions to limit their contact with others, resulting in an important feedback mechanism that influences future cases and deaths (Allen, 2021; Chernozhukov et al., 2021). Acemoglu et al. (2020, p.40) emphasised that model simulations that ignored voluntary behavioural responses to information on transmission risks would over-predict the future number of cases and deaths. Meaning that all the studies were focused on the assumption that lockdowns are non-voluntary responses; therefore, from Acem oglu et al.'s explanations, the epidemiological model should also consider this voluntary behaviour of people. Allen differentiated voluntary and mandated lockdown effects in studies that differed in data, locations, methodology, and authors. However, all found that mandated lockdowns have only a minor impact and that voluntary changes in behaviour account for most changes in events, transmissions, and deaths. The beneficial effect fades over time. In their research, Gianni De Fraja et al. (2021) found that NPIs' contribution to reducing COVID-19-

related fatalities is substantially reduced after four months of strict lockdown. Part of the waning effect of quarantines may be due to rising non-compliance with mobility controls, as shown by our estimates of a diminishing effect of lockdowns on actual mobility steps. However, they also discover that a decrease in illegitimate mobility negatively impacts health outcomes, implying that lockdown fatigues could have introduced additional barriers to containment policies. Also, the nature of lockdown impacts people's behaviour on engaging in health-protective behaviour. However, the more challenging the lockdown, the less efficient it is; partial lockdowns are just as effective as stricter ones but at a lower cost (Bonardi et al., 2020). There is no universal approach to how we represent the benefit of the lockdown. So, I have analysed some of the NPI countermeasures below.

4.1.1.b School Closure

During an influenza outbreak, school closure successfully minimise spread and delay the epidemic's peak by a week or two (Bin Nafisah et al., 2018; Cauchemez et al., 2009; Egger et al., 2012; N. M. Ferguson et al., 2006). In a study of the relationship between state-wide school closure and COVID-19 incidence and mortality in the United States, researchers discovered that school closure was linked to a substantial decrease in both COVID-19 incidence and mortality. By correcting for other state-enacted policies and testing rates, the incidence and mortality associated with school closure were isolated to the greatest extent possible during this study. The researchers discovered that school closure was linked to lower COVID-19 incidence and mortality. As a result, it appears that closing schools may be a successful way to stop COVID-19 from spreading and preventing deaths in potential outbreaks (Auger et al., 2020). School closures are most successful for infections with a low rate of spread, according to Jackson et al., 2014, when introduced in the early stages of an attack and when attack rates are higher in children than in adults. Barro (2020), on the other hand, demonstrated early in the pandemic that school closures had little effect on total mortality during the second phase of

influenza. A report on the effectiveness of social distancing strategies to curb the spread of COVID-19 found that even though schools are closed, diseases continue to spread across the household and community layers, making it difficult to contain the outbreak (Martín-Calvo et al., 2020).

4.1.1.c Social distancing

Social distancing becomes one of the popular NPI after the spread of COVID-19. World Health Organization recommended social distancing to prevent the spread of the coronavirus by maintaining the social distance between people (1-2 meters) at work, school, stores, public transports, and wherever possible (World Health Organization, 2020). Social distancing measures are the mitigating approach focused on curtailing the spread of the virus and reducing the burden or reducing healthcare demand. Self-distancing is also another approach where interactions are removed in the community plus workplace layer (Tang et al., 2020). Research and studies worldwide showed that social distance and other associated countermeasures were effective and beneficial during the COVID-19 to limit the spread of the virus (see, for instance[24]).

However, Martín-Calvo et al. highlighted that self-distancing and school closure at 90% of adoption are viable strategies for reducing the epidemic's impact, but only if used for a more extended period in figure11. The researchers also discovered that school closures had little effect on containing the virus's spread. Infections can occur in homes and the community even though schools are closed. Social distancing interventions played a significant role in reducing people's contact, and they had a more significant impact on the suppression of outbreaks (S. Lai et al., 2020). Social distancing alone is not enough to contain the spread because it is

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[24] *These researches showed that social distance and other associated countermeasures were effective and beneficial during the COVID-19 to limit the spread of the virus (Almeida, 2020; El-Guebaly, 2020; Gianni De Fraja et al., 2021; Haug et al., 2020; Huang, 2020; Martín-Calvo et al., 2020; Regmi & Lwin, 2021; Tang et al., 2020; Cobb & Seale, 2020; Courtemanche et al., 2020; Gupta et al., 2020; Kamga & Eickemeyer, 2021; Qian & Jiang, 2020; Teslya et al., 2020).*

associated with other measures such as restriction on travel/ movement and restriction on gathering. However, when there is detection and isolation of symptomatic or confirmed cases related to COVID-19, social distancing is effective (S. Lai et al., 2020). Passive social distance strategies are also ineffective in containing the epidemic, implying that active strategies are needed. Large-scale testing, remote symptom monitoring, isolation, and contact tracing are only a few examples (S. Lai et al., 2020).

Similarly, it was discovered that the mandated social distancing approach has more impact than volunteer ones. However, the volunteer response is more significant (Sumedha Gupta et al., 2020), consistent with the previous findings from the influenza interventions (Aledort et al., 2007). However, there are challenges and limitations in evaluating the effectiveness of social distancing. And there are limited papers that have focused on this. For example, one of the challenging tasks to measure the social distancing rule in dense locations is often violated. In addition, contact tracing is complex, making it difficult to estimate the effect of the social distancing rule on COVID-19 incidence (Askitas et al., 2021a).
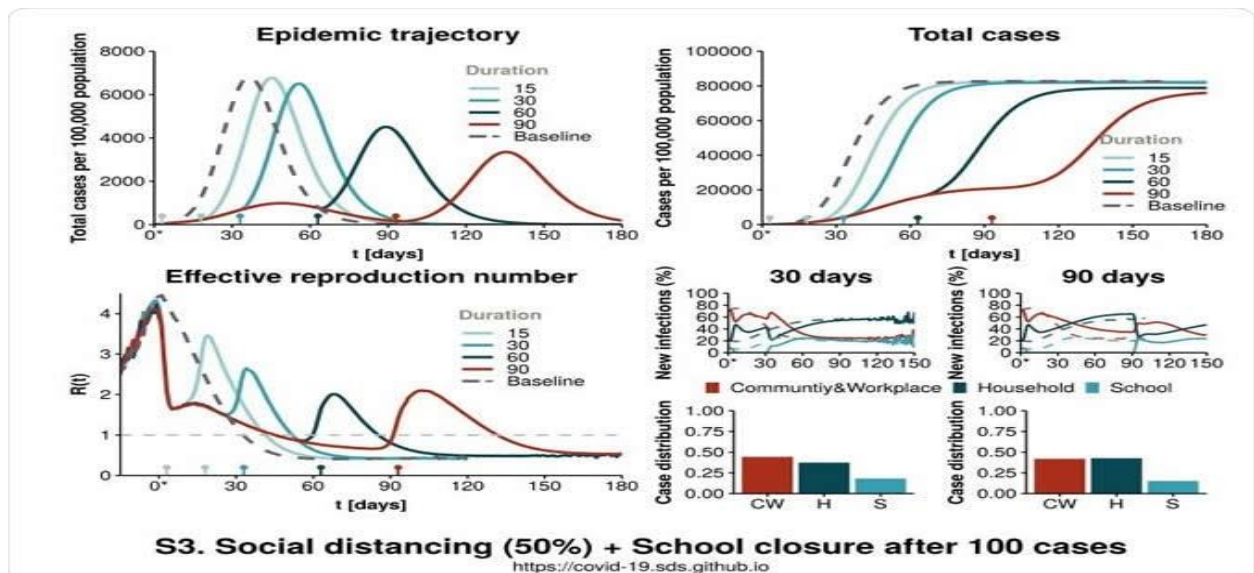
Figure 11:Evaluation of Social distancing and school closure's impact in COVID-19 incidence (Martín-Calvo et al., 2020)

4.1.1.d Travel Restrictions

Travel restrictions came as one of the NPI countermeasure approaches to prevent or delay the transmission, entry of the disease into the territory or location. Travel restrictions are one of the common NPI around the world with flexible or tighter policies. Travel restrictions and other travel-related measures such as screening at the checkpoints or entry points on highways, airports, or any entry ports during the disease outbreak to contain the spread of the virus at a community level or in another country were seen as those NPIs. Restriction on movement during curfew or lockdown, non-essential travel (for grocery or movement for essential workers), stay at home order, voluntary or legally mandated isolation or quarantine upon arrival into a new country, and border closures. While researching the efficacy of travel restrictions in previous studies using my sample paper by Mateus et al., I discovered that the impact is limited. They are often used in conjunction with other countermeasures, making it difficult to determine causal effects (2014). Furthermore, I discovered that the consequences of these national and international restrictions are typically measured using mathematical models. This measurement is not always precise or capable of measuring effectiveness; however, it does necessitate the perfect timing of such measures' implementation.

Similarly, I found that Askitas et al. used a conceptual framework to examine the impact of each intervention on pandemic control, based on their effects on human mobility behaviours consistent with time-use and epidemiological factors using daily data from 175 countries (2021). They discovered that cancelling public events, enforcing restrictions on private gatherings, and closing schools and workplaces significantly reduced COVID-19 infections, even after correcting other parallel lockdown policies. Restriction on internal travel and public transportation had a negligible effect because the previously listed initiatives, which were enforced on average earlier, had already restricted human mobility. International travel restrictions, on the other hand, although implemented early, had only a short term effect, failing to prevent the outbreak from becoming a pandemic due to negligence of people (Askitas et al.,

2021). Correspondingly, a study on the Wuhan lockdown found that the late-stage lockdown, which included travel restrictions, did not prevent the virus from spreading from Wuhan but did prevent cases from being transported to a larger region (S. Lai et al., 2020). Also, to study the impact of interventions, including travel restrictions after the spread of COVID-19 in China, I found a paper that focuses on COVID-19 mobility in China, a study on real mobility data from Wuhan and comprehensive case data including travel history to elucidate the role of case importation in transmission in cities across China and to ascertain the impact of mobility data regulation. It was discovered that after the early introduction of control steps, case transmission decreased, and growth rates in most of the locations were negative. To support this evidence, Kucharski et al. also emphasised that the introduction of travel control measures in Wuhan, China, reduced the median daily reproduction number of viruses (2020). However, where the controls were not in place (i.e., outside of Wuhan), there were still indicators of local transmission. Besides, I reviewed previous research to learn more about travel restrictions. I came across a research paper by Poletto et al., which stated that a 60% reduction in airline passenger traffic from Ebola-affected West Africa was estimated to have prevented the spread of the Ebola virus to other continents by 2-30 days.

Furthermore, during the influenza season in the United States, travel restrictions postponed peak mortality by 16 days. Askitas et al. also emphasised the effectiveness of international travel restrictions in reducing virus incidence about ten days after their implementation, for a period of two to two and a half weeks, before they lose their effectiveness. They also discover that an international travel control's short-term impact is consistent with previously presented evidence during the early stage of the COVID-19 outbreak (see Chinazzi et al., 2020).

4.1.1.e Stay-at-home-order

Stay-at-home-order restricts people's movement, work or school closures, mass meeting restrictions, suspension of public events, and private gatherings in recent times. Stay-at-home

restrictions were found to minimise COVID-19 exposure, causing people to limit their travel or stay home unless necessary. However, due to limited public transportation and shared mobility facilities, people opted for other alternatives such as private cars or bicycles during the early stages of implementation. These spillover effects have affected people's mobility, and people have begun to break the stay-at-home interventions. This intervention takes longer to get incidence below the reference period, and once they do, their effect becomes negative and substantially different from zero within a short period (Askitas et al., 2021). When the level of infection is high and infected people are often circulating, then mandated lockdown with stay-at-home order becomes successful and meaningful when people follow it. However, it is senseless to have stay-at-home order when the fraction of the population is infected, which is less than 1%, as in many places in Canada (Allen, 2021).

Furthermore, there is less evidence supporting that this countermeasure successfully contains the spread because people may ignore the stay-at-home order's mass gathering restrictions organizing home parties or any functions. Since social distancing is based on voluntary responses, surveillance is difficult most of the time, especially in densely populated areas. Furthermore, neither regulation nor voluntary social distancing rates account for a significant portion of geographic variation. Allcott, Boxell, Conway, Ferguson, et al. (2020) found that lockdowns have only a minor impact on COVID-19 transmission rates in their analysis of variance in stay-at-home orders across the United States. They also pointed out that the cities hardest affected by the pandemic are dense and crowded, which is consistent with the findings of Atkeson (2021). However, these NPIs depend on an individual's behavioural responses (Sumedha Gupta et al., 2020).

4.1.1.f Mask wearing

Diagnostic uncertainties with lack of proper medication, unproved effectiveness of vaccinations, mask-wearing become famous after the spread of COVID-19. Mask wearing was

controversially discussed regarding its effectiveness in reducing the spread of respiratory infections before the COVID-19 pandemic; however, the scientific data and evidence have compelled people to follow this preventive approach. Community mask-wearing helps to reduce the spread of infection mainly from the infected person and reduce the mask wearer's exposure to the infection. Therefore, mask-wearing became a hot topic to discuss in recent times about its effect on COVID-19 infection risk. As a result, epidemiologists have undertaken several research to investigate its impact on infection. In this section, I would want to focus on studies that have been explicitly completed on COVID-19 mask use.

People who live in more COVID-19 severity regions or people from the most infected regions are more likely to wear masks than less severe regions. Compared to persons who did not wear masks during high-risk exposures, those who said they always used a mask had a higher than 70% lower chance of illness (Doung-Ngern et al., 2020). A study conducted by Y. Wang et al. (2020) in Beijing households found that wearing a mask reduced the probability of secondary infection by 79%. In 15 states, masking measures resulted in a 2% reduction in the incidence of new diagnoses and a 21-day reduction in the rate of new diagnoses (W. Lyu & Wehby, 2020). Hatzius (2020) reported that mandatory masking avoided illnesses and deaths, and it could avoid additional lockdowns in the future. Furthermore, with a 15% increase in masking, projected potential GDP savings of $1 trillion (5 percent GDP) are possible. Similarly, Doung-Ngern et al. (2020) and Payne et al. (2020) discovered that wearing a mask reduced the incidence of infection by 77% to 70% in a study of self-reported mask-wearing people who were exposed to the risk of case respectively. Additionally, research in Kansas counties found that required mask-wearing in public decreased the case rate per 100k individuals by 0.08 in counties where masks were imposed but increased by 0.11 in counties where masks were not imposed (Van Dyke et al., 2020). After complete implementation of the mask-wearing policy, the Mass General Brigham health care system in Massachusetts projected a weekly drop-in

new diagnosis among health care employees of 3.4 percent (X. Wang et al., 2020). Similarly, in Germany, a daily drop-in new diagnosis of 1.32 percent was observed after the public wearing masks became mandatory (Mitze et al., 2020). Karaivanov et al. (2020) in Canada likewise observed a weekly decrease of 25-40% in new diagnoses using mandated indoor masks. Other studies have also found the effectiveness of masks in reduce of infection of COVID-19 (Brooks & Butler, 2021; Kim et al., 2020; Lindsley et al., 2021; Ueki et al., 2020; Worby & Chang, 2020; Karaivanov et al., 2020).

On the other hand, there can be differences in people's perspectives on mask-wearing. A study by J. G. Lu et al. (2021) found that people who live in collectivistic regions are more likely to wear masks as a precautionary measure than in individualistic regions. Additionally, people from the collectivistic region adopted mask-wearing behaviour for group-oriented concerns or a common good approach (Kasting et al., 2020; J. G. Lu et al., 2021). In contrast, where individualistic culture and individualistic liberty is valued over communal wellbeing (for example, in the USA), mask-wearing is resisted (Kasting et al., 2020). Therefore, these cultural beliefs (either collectivistic or individualistic) influence an individual's attitude to wear a mask. 64% of people who did not wear masks indicated that they do not wear masks as 'it's their right to wear a mask or not' or 'they feel uncomfortable to wear a mask' (Vargas & Sanchez, 2020). Following mask mandates worldwide, there have been anti-mask rallies in the United States and Germany, where protestors chanted "Masks are muzzles" (BBC, 2020; Stewart, 2020; J. G. Lu et al., 2021). Some expressions were shared after the masks were mandated in the USA. Popular examples include, "Mandatory masks are a critical predicate conditioning us to accept abuses of our liberty," columnist Molly McCann (Relman, 2020). President Donald Trump shared a tweet that argued that the mandated use of face masks represents a "culture of silence, slavery, and social death" (Relman, 2020). Conservative columnist Lee Smith shared McCann's piece on Twitter and wrote, "Masks aren't about public health but social control (Relman,

2020). However, in countries where mask-wearing is common, there is less opposition (for example, in Japan, China, South Korea, Nepal) (Kasting et al., 2020). Besides cultural differences, political affiliation has a significant impact on mask-wearing. People who are inclined towards republic or people in republican states are less inclined to wear a mask than those from democratic states. The study by Kasting et al. (2020) illustrates that people's political leaning or affiliation impacts mask-wearing. Besides these education levels, population density, per capita income, and government stringency levels, among others, impact the use of masks among people (J. G. Lu et al., 2021).

It is also one of the complex tasks to measure or quantify the effectiveness of mask-wearing because mask-wearing is adopted along with other NPIs such as social distancing, hand hygiene (U.S. Centers for Disease Control and Prevention, 2020). Therefore, the accurate efficacy of masks on the spread of disease is difficult to quantify during this analysis.

4.1.1.g Contact Tracing

Contact tracing is a widely adopted surveillance system that helps governments identify, monitor, evaluate, and handle people exposed to novel infectious diseases (Jalabneh et al., 2020). It helps to protect uninfected individuals by not letting them get near to infected individuals and their contacts while enabling precautionary actions by symptom reporting. Also, stochastic analysis and real-world experiences have proved the usefulness of contact tracing approaches (Eames & Keeling, 2003; Huerta & Tsimring, 2002). For prompt reporting of infected cases and alerting mass people in real-time, digital contact tracing apps that use the "proximity tracking" (Jalabneh et al., 2020) feature came as the best alternative over manual contact tracing (MCT) in this unprecedented time. Digital contact tracing technologies (DCTT) are used in public health surveillance to support rapid reporting, data management, and analysis to improve the efficacy of the health system (Thayyil et al., 2020). Contact tracing played a significant role in reducing cases in New Zealand, where it also allowed relaxed population-

wide social distancing measures (Plank et al., 2020). Contact tracing often aided quarantine or isolation; when people developed COVID-19 symptoms, they began quarantine or isolation at home, in hospitals, or specially equipped facilities. I discovered limited data when searching through papers that focused on the effectiveness of contact tracing. Although the usefulness of digital contact tracing is yet to be proved, with limited real-world evidence, they help trace probabilities and quarantine effectiveness. Plank et al. (2020) finding that recursive contact tracing increased the probability of elimination from 90% to 95% when uptake is high and quarantine is efficient. It also helps to reduce the spread of COVID-19. Globally there are 47 contact tracing apps developed by different countries with different features during this analysis. However, no countries have achieved success; to be deemed successful or have maximum effectiveness for contact tracing, it should be adopted by 60-75% of a country's population (Thayyil et al., 2020). Research in the United Kingdom revealed that 60% of people are prepared to use an app-based contact tracing service, which is similar to these findings but significantly less than the smartphone user uptake required for an app-based contact tracing service to be an effective intervention in an epidemic (Bachtiger et al., 2020, p.3). These findings also showed people's responses towards the contact tracing app.

4.1.1.h Quarantine or Isolation

Quarantine (or isolation) is a complementary step used worldwide to test, track and isolate the suspected cases, and limit the spread of the virus in the community (Tang et al.,2020). It is either recommended or mandatory with some flexibility which can be specified and unspecified, and it depends on the policy and actions of a government. International travellers (either residents or non-residents), for example, must be quarantined in New Zealand for 14 days at designated authorised locations upon arrival, with two tests within that period, and can only leave if tested negative. The government advises people who have come into contact with COVID-19 to test and isolate at home or designated facilities. Managed quarantine services at

the airport associated with international travel also came into practice to stop the spread of the virus at a community level that came with international travel.

I discovered limited data when searching through papers that focused on the effectiveness of isolation/quarantine. Isolation and quarantine have become hot topics of discussion in recent times during the outbreak of the virus. The strict border restrictions and quarantine requirements played a significant role in maintaining the COVID-19 free nation with monitor COVID-19 cases related to international travel at MIQ or border (33 cases) and community level cases (0 cases) as of April 25, 2021 (Ministry of Health NZ, 2021) in New Zealand demonstrate this. Through maintaining strict border restrictions and quarantine requirements, New Zealand has mainly remained COVID-19 free, barring occasional rapidly controlled incursions related to the infection of border workers. The fact that the MIQ and community level cases vary proves that quarantine/or isolation measures played a significant role in containing the virus's spread.

New cases reported during the past 24 hours		0
	At the border	33
	In the community	0
Active cases	Under investigation/other	0
	Total	33
Most recent case reported		23 April 2021
Most recent case reported due to community transmission (spread within our communities)		28 February 2021

Figure 12: COVID-19 case at Border and Community level, New Zealand (Ministry of Health NZ, 2021)

Likewise, during previous studies, few outbreak models (Rashid et al., 2015) have shown that quarantine reduces the daily peak case, which lowers the attack rate and slows the spread of the disease. It is only possible when there is a high degree of compliance with the recommended policies, such as contact tracing and isolation or quarantine, will they be successful in reducing the virus's spread rate in the population. According to a previous study published in 2006 by

Fergueson et al., voluntary self-isolation played a significant role in lowering the peak infection rate from 1.9 percent to 1.5 per cent or even lower to 0.1 percent related interventions. Barro, in contrast, demonstrated that early on in the pandemic, isolation orders had little effect on total mortality during the second phase of the Spanish flu.

Many studies have highlighted the challenges of quarantine and isolation measures. Isolation or quarantine steps are complicated by the financial cost and psychological, legal, and ethical concerns. Moreover, isolation is likely to cause depression and mental problems, necessitating additional resources such as setting up support lines, providing guidance, assisting people in making plans, encouraging texts and phone calls, and maintaining some routine (Lunn et al., 2020). The space and availability of MIQ facilities and their cost are some of the hot topics of debate. For instance, some issues found in the New Zealand government maintained MIQ facilities. The cost increment (Kristin, 2021), lack of government planning (Bonnett, 2020), lack of proper surveillance (Asia Pacific Report, 2021), the standard of MIQ facilities (Asia Pacific Report, 2021), breach of quarantine facilities (Asia Pacific Report, 2021) and proper evaluation of exemptions (Kristin, 2021) requests came into a report. However, there have been only a few studies conducted. Hence, a more comprehensive, in-depth evident review is needed to highlight the efficacy of quarantine/isolation that can give reliable insights to the authorities. The recent introduction of quarantine-free travel between Australia and New Zealand (Ministry of Health NZ, 2021), which began on April 19, 2021, has modified the isolation/quarantine restrictions. As a result, such relaxed/ flexible NPI methods must be highlighted to impact potential effectiveness.   In the future, a new quarantine strategy may be used as the recent one between Australia and New Zealand, such as quarantine free Trans-Tasman bubble, quarantine non-vaccinated individuals, people from high-risk countries or regions, people in critical health situations, and so on.

4.1.1.i Public Information Campaign

During epidemics, information campaigns are required, including correspondence about the nature of the disease, its symptoms, preventive measures to be taken, and the responsibilities of individuals and public health agencies, including medical staff and government officials. Following the spread of COVID-19, countries worldwide held regular media briefings to share the most up-to-date details about the situation (risk of infections) and the expectations that fellow people should meet (preventive measures). This not only saves lives but also helps to maintain a country's social, economic, and political stability in times of crisis (WHO, 2018)

Previous research has found that policies that provide the public with simple, consistent information influence people's preventive behaviour (Rubin et al., 2009). Such campaigns concentrate on the realistic steps people can take to reduce their risk while still maintaining confidence by openly addressing the current state of awareness, preparedness, and resources available to combat the outbreak (Aledort et al., 2007; Cheatley et al., 2020). Emphasizing the effectiveness of recommended measures and the potential duration of the outbreak could help enhance enforcement even further (Rubin et al., 2009). Rubin et al. highlighted that during A/H1N1 influenza (swine flu) outbreak in the UK, few people changed their public perception studies associated with swine flu in 2009. Furthermore, the authors suggest that convincing the public that the threat is confirmed may be a more pressing task for the public health agencies than reassurance. This scenario was noticed during the COVID-19 outbreak when people do not know the exact nature, symptoms, treatment, and preventive measures to follow. Public awareness initiatives can only serve as a medium of communication. However, they also aid in determining what causes are linked to adaptive behaviour changes in the general public, which can assist communicators in developing more efficient public health messages (Rubin et al., 2009). Understanding how the public reacts to news of a possible pandemic will also help researchers figure out how to encourage behaviour change during the early stages of a future epidemic.

Looking into the evidence on the effectiveness of such information campaigns, I find a few studies highlighting it. While looking into those few papers, I found that public information campaigns shaped by an individual's perceived risk can affect whether people change their behaviour after the campaign. An effective campaign is a proven example of a successful approach when people follow preventive behaviour to reduce the virus's spread. Haushofer et al. (2020), for example, discuss the effectiveness of various "light-touch" approaches that remind people to do health-prevention routines or facilitate psychological effects that help people stick to them. Text messaging was used to improve adherence to antiretroviral drug use in Kenya, and emotional messaging improved hygiene by increased handwashing in India, according to previous research (Nasser Al-Suqri et al., 2021). Text messaging techniques were used similarly by countries that had early success in suppressing the COVID-19 virus, such as Taiwan and South Korea (Bikbov & Bikbov, 2020)

According to the study, the effectiveness of such programmes can be improved by using credible spokespersons (Cheatley et al., 2020) such as public health experts, social media influencers, and public figures as role models who can help the authorities disseminate accurate and reliable information in ways that help rather than impede pandemic management (Nasser Al-Suqri et al., 2021). For example, in New Zealand, Dr Ashley Bloomfield, the director-general of health, who has expertise in crisis management (Fisher, 2020), is used as a spokeswoman in the 1 PM briefing to persuade people to follow health officials' advice. When there was a SARS outbreak in 2003 in Singapore, the government used public information campaigns as a containment strategy to follow communication campaigns in different languages (Tamil, Malay, Chinese, English) (Quinn et al., 2013). This can be seen in the present scenario and sign language in their daily media briefings and another second language. These analyses pointed that public health campaigns are necessary during the time of pandemics or

epidemics. However, its effectiveness as an NPI measure is not studied in detail, so it has made me challenging to highlight the effectiveness of those campaigns.

4.1.1.j Genome Surveillance (Genome Sequencing)

Besides these, genome surveillance has been famous for test, trace, and isolate approaches worldwide. Researchers have established countermeasures against the virus, such as diagnostic tests and vaccines (Corman et al., 2020), and determine transmission and evolution dynamics as the virus spreads globally, attributable to timely sequencing SARS-CoV-2, i.e. COVID-19 and rapid data sharing (Geoghegan et al., 2021). To detect the SARS-CoV-2 virus strain, the RT-PCR test was started by laboratories to isolate positive and negative COVID-19 tests and later started genome sequencing (*paper highlighting on genome sequencing*[25]). To date of this study, 49 countries have used genome sequencing to assess the COVID-19 virus strain. Countries such as the United States, the Netherlands, the United Kingdom, and Australia, as well as Iceland (Furuse, 2021) and New Zealand (Geoghegan et al., 2021; Whitcombe et al., 2020), excelled in their sequencing efforts (SARS-CoV-2 genome sequencing data can be found in a database of GISAID). India, Thailand, Congo, Brazil, and Senegal, all low- and middle-income nations (Furuse, 2021), also performed well. However, I could not find records about the countries with a higher number of cases but did not perform genome sequencing. So, I find it challenging to support the fact that genome sequencing is a practical approach. However, the discovery of genomes that influence infection susceptibility to COVID-19 and disease severity to COVID1-9 is a critical move towards risk stratification, individualised care strategies, therapeutic and vaccine production, and deployment. The estimate of exposure, infectivity, and test accuracy of COVID-19 to demonstrate the feasibility of detecting host genetic factors correlated with susceptibility and intensity, genomic surveillance often plays a

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[25] *Paper that highlighted about Genome Sequencing Giandhari et al., 2020; Korber et al., 2020; Speake et al., 2020; Tessema et al., 2020; Whitcombe et al., 2020).*

role during the containment of the virus spread (Y. C. Lin et al., 2020). Genome surveillance aids authorities in testing, tracing, and isolating (TTI). Phylogeographic analysis using the genome sequence techniques provides valuable information about viruses, such as transmission dynamics, source of the virus, i.e., from where and when the virus is imported and how it has spread (Fauver et al., 2020, Woroby et al., 2020). This method may also aid in identifying mutations that influence the virus's pathogenicity and infectivity (Korber et al., 2020) and COVID-19 risk stratification and individually tailored care methods that can identify critical and non-critical individuals at the time of transmission at a particular place. Genome surveillance can also provide time for other preventive measures to be implemented.

Following the testing of a case linked to COVID-19 exposure, the government used genome surveillance to track down clusters of cases and isolate them as soon as possible to prevent the virus from spreading in the population. It was clear that the New Zealand government effectively eliminated and controlled the virus using scientific resources (Geoghegan et al., 2021), genome sequence surveillance (started in March 2020), and a strict country-wide lockdown with the virus elimination strategy. Genome sequencing helped identify the infection and provides a unique opportunity to study antibody persistence from natural infections and vaccines in the absence of immune-boosting from COVID-19 re-exposure (Geoghegan et al., 2021; Whitcombe et al., 2020). Similarly, genome surveillance was also used in Australia (Speake et al., 2020) and 12 African countries (Giandhari et al., 2020; Korber et al., 2020; Tessema et al., 2020). This helped the government develop new NPI plans and policies by combining genomics with epidemiological data (Geoghegan et al., 2021) in real-time and monitoring local transmission chains. There could, however, be some difficulties. Due to a lack of knowledge on individual-level exposure, low population-level exposure rates, high infectivity, and unreliable, low-sensitivity tests, studies to identify genetic variation contributing to COVID-19 infection susceptibility are largely impractical. Y. C. Lin et al.

highlighted that rather than sampling test-negative controls, and it is desirable to carefully select and classify controls with a high likelihood of exposure (for example, frontline staff or household members with positive cases) with better results. The test-and-trace strategy, as well as people's behaviour influenced by government capabilities, resources, policies, and acts, have an impact on genome sequencing and surveillance.

However, some research suggested that genome sequencing was efficient. However, I discovered that some countries have a higher number of cases but few, if any, sequence data, making it difficult to determine the efficacy of genome sequencing[26]. Due to the complicated and costly monitoring mechanism, lower-income countries do not have the capacity to monitor themselves, according to Sara Jerving (2021). Along with the travel restrictions imposed by COVID-19, sample packages sent to laboratories in other countries must be rerouted to other labs rather than the labs allocated to them in the network, posing additional challenges (Jerving, 2021). Furthermore, a significant gap was discovered in Pacific Island nations, Central Asia, and the Middle East (Jerving, 2021), where countries had not submitted samples for genome sequencing. In addition, more sequencing sample data from around the world.

4.2. Results from media content analysis.

This study's primary goal was to understand better people's behavioural responses to pandemics related to government-imposed NPIs. NPIs have been proven to be a highly effective component in the public health response to infectious disease outbreaks. Epidemiological models applied by governments vary in sophistication; nevertheless, due to a lack of detail in model parameters that are affected by nonpharmaceutical behavioural interventions, those

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[26] *Changoiwala, P. (2021, June 28). A Lack of COVID-19 Genomes Could Prolong the Pandemic | Quanta Magazine. Quanta Magazine. https://www.quantamagazine.org/a-lack-of-covid-19-genomes-could-prolong-the-pandemic-20210628/*

models struggle to depict a complete picture of the likelihood of NPIs to support the suppression and/or elimination of disease spread. Furthermore, the models usually assume that individuals completely follow (or do not follow) the NPI approaches imposed by the government or authorities. But in contrast to these assumptions, our lived reality paints a more nuanced picture about the extent to which people are likely or unlikely to follow NPIs, suggesting a need to estimate behavioural responses and changes in behavioural responses over time at much finer granularity to improve model accuracy. Real-time analysis of the responses from people on social media such as Twitter, Facebook, Reddit, We Chat towards NPIs, and public health crisis can help as proxy variables to analyse public health behaviours (as an interacting component in a society responding to the threat of an infectious disease like COVID-19) and their direct or indirect impact on public health indicators.

This section summarises the results obtained from media content analysis using the popular and most used tweeter hashtags (*mentioned in the Methods section earlier*) across New Zealand and Nepal. The manual comparison and analysis of those tweets and codes thoroughly from the perspectives of COVID-19 CLD, HBM Constructs and took a referenced of codes from previous literature and summarised them as generalised behaviour codes to be precise and consistent while coding (*attached analysis in Appendix*). First, health behaviour responses were coded using the constructs from an HBM perspective and a COVID-19 CLD responsible for causing impact in the feedback loop (figure 3). Second, I analyzed how public health behaviour responses from the perspectives of HBM impact COVID-19 CLD and are responsible for causing an impact on the feedback loop at a population level and creating a revised version of COVID-19-CLD, a new artefact (i.e., figure 19).

The chart represents the frequencies of those codes coded during the media content analysis. The most frequent codes (i.e., *shown above as Codes Terms used in Analysis*) found are public outrage, lack of accountabilities of authorities (or related with delay in pandemic responses or lack of preparedness or resources of authorities), lack of effective public health risk communication, lack of public awareness from COVID-19-CLD and perceived barriers, perceived benefits, lower perceived threats, cues to actions, self-efficacy were among the most frequently coded HBM constructs during analysis.

Behavioural response in media content analysis indicates that in the feedback loop, authorities' accountability, trust, public outrage, stigma, perceived barriers, public health risk communication, public awareness, and perceived benefits are the constructs that have the maximum impact on public health behaviour (influence on people's motivation and willingness to engage in preventive behaviours). At the individual level, perceived benefits, perceived barriers, perceived threat, perceived severity, perceived susceptibility, and cue to actions influence the COVID-19 CLD at a population level and the epidemic models used by governments. Individual responses and behaviour will impact the model, either directly or indirectly, at the population level. When there is a lack of awareness, education, practical capacity to comply, and proper counsel on COVID-19 at an individual level, it may be a barrier to population-wide COVID-19 prevention efforts. When people have adequate knowledge of the COVID-19 mitigation compliance measures, the capacity to comply with those measures, or a perceived clarity of those measures as a result of mass media campaigns, newspaper, TV,

and radio awareness programmes, and health professional awareness, they are more likely to comply. As a result, individuals and populations are more prone to follow NPIs and are more likely to be influenced. However, when these characteristics are lacking, it has a negative impact on people at both the individual and population levels, affecting epidemic models.

First, from media content analysis, behavioural traces demonstrated that trust and responsibility influenced people's beliefs and behaviours. These two components aid in determining the effectiveness of countermeasures and encouraging people to follow (or disregard) preventative health advice or compliance measures (NPIs either advised or imposed). People observe to what extent people thought the overall approach taken by authorities was consistent and adequate, influencing people to comply with those compliance measures.
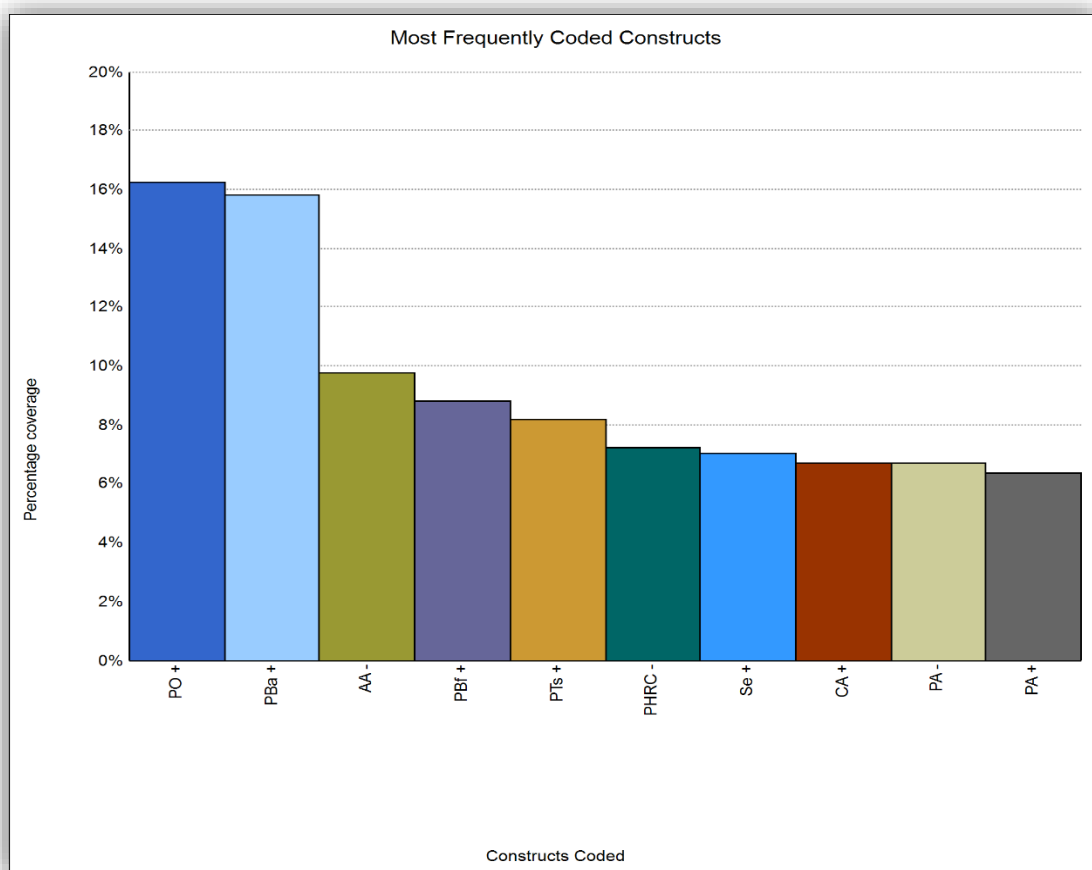
Figure 13: Most frequently coded constructs

This act as a barrier and/or benefit to preventive measures on COVID-19 spread in the individual level from the viewpoint of HBM and influenced by trust in authorities and accountability of authorities from COVID-19-CLD at the population level. Figure 14 explains the relationship between these.

From behavioural reactions observed in media content analysis, it revealed that people are influenced to breach the rules or not follow NPI measures set by governments when they feel weaker responsibility of authorities and distrust authorities (because of authorities' negligence), resulting in transmitting the virus at the community level, raising public outrage. Thus, authorities' failure to respond appropriately, i.e., corrective actions and their carelessness during pandemic management, create a barrier to COVID-19 prevention at both the individual and population levels. This reduces the controllability of the dynamic system that is presented in figure 3. Tweets below show the reactions and show how they impact the loop presented in figure 14.

Figure 14: Impact of Trust in Authorities and Accountability of Authorities on Individual Response towards NPIs,

'When the political party gatherings are to be held, they do not acknowledge the health threats', 'Many people on social media expressed their frustrations at the lack of social distancing during the inauguration led by Prime Minister',

'government officials and politicians themselves have been organising public gatherings and rallies. So, ordinary people also have stopped taking precautions.'

'*** Words mean nothing, actions mean everything. Where is the action? If listening is all we should do, then it's no wonder NZ voted back in this liar of a pm',

'Very little has been said about testing, even though testing has been key in all the countries on top of this pandemic. Decisions have been made late and are now making New Zealanders more financially reliant on the government than ever before'

'*** Pretty sick of your horrible decisions; this isn't about keeping us safe. This is about social control and manipulation. Your gov is horrible, and you're an embarrassment'.

Therefore, when trust and accountability are lower, the situation changes; people perceive reduced trust and accountability as barriers to preventive measures. This makes people believe that more sick and suspicious persons around them haven't been tested or isolated and that there's a higher risk of COVID-19 because of a lack of resources, causing outrage. When the perceived barriers to COVID-19 prevention measures are reduced, the perceived threat of COVID-19 in individuals is lower, and people may begin to ignore authorities' recommendations, resulting in more public outrage. This tweet shows how lower TA and AA creates outrage and act as a barrier to preventive measures on COVID-19.

"The country is ill-prepared to handle the pandemic of this scale", "This is a result of ignoring investment in health infrastructure not only by the incumbent government but also by previous ones, and all are responsible for this", "We don't have enough testing kits left; Government does not provide enough kits".

These tweets explain that lack of resources/ preparedness has restricted getting/ seeking proper health care, which has acted as a barrier to preventive measures on COVID-19 at individual and population levels. Figure 15 shows how TA and AA influence the feedback loop.

Here + represents higher or increases and - represents lower or decreases and // represents lack or delay. For example, When there is delay or lack then benefits will be lower, barriers and outrage will be higher.
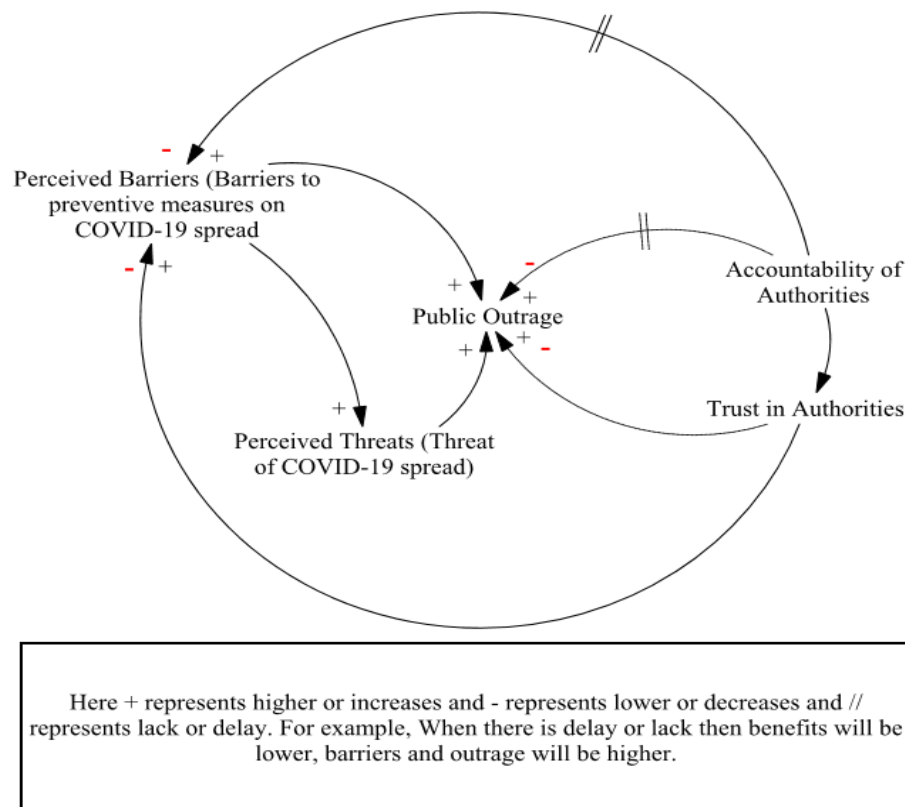
Figure 15: Presents how Individual perception about perceived barriers and threats create outrage in society

On the other hand, it was found that when people are confident (due to higher accountability of authorities, prompt response, planning, and trust in authorities) in the elimination approaches adopted by the government or authorities, and they have a clear perception and knowledge about the current measures. As a result, people are found to be supportive, confident in following NPIs even people have some barriers as well reduce public outrage among people. Tweets below represent these findings where TA and AA played a role in lowering the barriers and raising the perceived advantages of COVID-19 prevention measures. This can be seen in some behavioural responses such as:

'I think that having a further one to two weeks at L4 I would support. It is hard financially, but I am behind the elimination strategy the NZ govt is attempting."

"Sitting here feeling relieved and pleased that we are in lockdown for another week. So proud of our PM and all NZers. Also madly liking the sage reckons of my pocket friends..",

The above responses showed that even people have financial barriers to follow the lockdown. However, due to confidence in the elimination strategy adopted (trust in authorities, accountability of authorities), people have higher compliance or support for further extension of lockdown. This influences individuals to promote altruistic behaviours (self-sacrificing their behaviours for the benefit of others) to follow the NPIs or recommended behaviour for the benefit of others, which can positively influence other people in society. Here, these altruistic behaviours and actions from an individual act as benefits of preventive measures on COVID-19 from the HBM perspectives and get influenced by TA and AA from COVID-19 CLD at a population level. In addition, these behaviours triggered at the individual level reduces the barriers of preventive measures on COVID-19 spread through promoting engagement in healthy behaviour following NPIs. Meaning when trust and accountability are higher, perceived barriers to COVID-19 prevention measures are lower, and people's perceptions of COVID-19 threat are lower (due to restrictions imposed), resulting in minimal public outrage. This makes people perceive a higher number of infected and suspected people roaming around them who are not even tested or isolated. Therefore, people perceive there is a higher threat of COVID-19 and follow NPIs. These behaviours will influence people to follow advice from others and authorities, get tested, report symptoms or seek medical treatment when required. Thus, authorities' responses, trust and accountability eventually, whether direct or indirect, influence people to follow advice from authorities, get tested, report symptoms or seek professional advice or receive adequate treatment in time, or adopt the government's advised preventive behaviours.

These interacting components from the COVID-19 CLD loop influence individual behaviours to engage in preventive measures, influencing public health behaviours and public health indicators in the feedback loop. This means when an individual has higher perceived susceptibility, severity, the higher perceived threat of COVID-19, have enough awareness at an individual level (cues to actions), trust authorities and are confident in authorities about the pandemic responses. Those people are more inclined to follow the rules or preventive behaviours. These categories of people often share positive information and messages that reduce the outrage in the community and influence others to follow preventive measures. However, some tweets seem to create outrage in social media and influence other people, as well. This example represents such influential behavioural responses due to lower risk communication or ignorance of an individual.

"New Zealand forcing COVID-19 patients into 'quarantine facilities,' health chief announces— So, New Zealand is sending COVID-positive people and their families to concentration camps".

"Nope, not going to happen. If you give me a good reason to use such an app and suggest it, I'll use it. But I won't be forced to use a tracing app."

These tweets can influence others not to use contact tracing apps and quarantine facilities or breach the quarantine rules, resulting in a further outbreak in society and creating outrage. These can be due to lack of proper information or widespread misinformation in public about the government or distrust towards government/ or any leader. These kinds of tweets or responses in social media created barriers. They created a situation of outrage towards the government, which influence others at a population level to follow preventive measures in COVID-19 spread.

Second, media content analysis revealed the most notable constructs that interplayed were public health risk communication, public awareness, public outrage, stigma from COVID-19 CLD, perceived barriers, perceived threat, and perceived severity from HBM. Here it was found that public awareness (PA) and public health risk communication (PHRC) has an impact on public outrage (PO) and stigma (S). People's outrage grew due to a lack of adequate public health risk communication and awareness in people, which also evoke stigmatised behaviours against the infected, suspected, or group of people from vulnerable groups, vulnerable communities, or the origin of the spread. People's desire to engage in preventative behaviours was influenced by public health risk communication and public awareness. For example, when people have adequate risk communication or information about the pandemic, people are more likely to engage in preventive behaviours and follow NPIs when they know about diseases, symptoms, impacts, and hazards. Enough risk communication and awareness influence people to follow NPIs and preventive behaviours such as getting tested, doing contact tracing, or isolating when they got the disease and seeking advice from others. However, when adequate risk communication and awareness are absent, it acts as a barrier to preventive measures on COVID-19. People are influenced not to follow NPIs/preventive behaviours, i.e., no test, contact tracing, symptoms reporting, not seek advice and spread misinformation). Figure 16 explains how interacting components influence on NPIs.
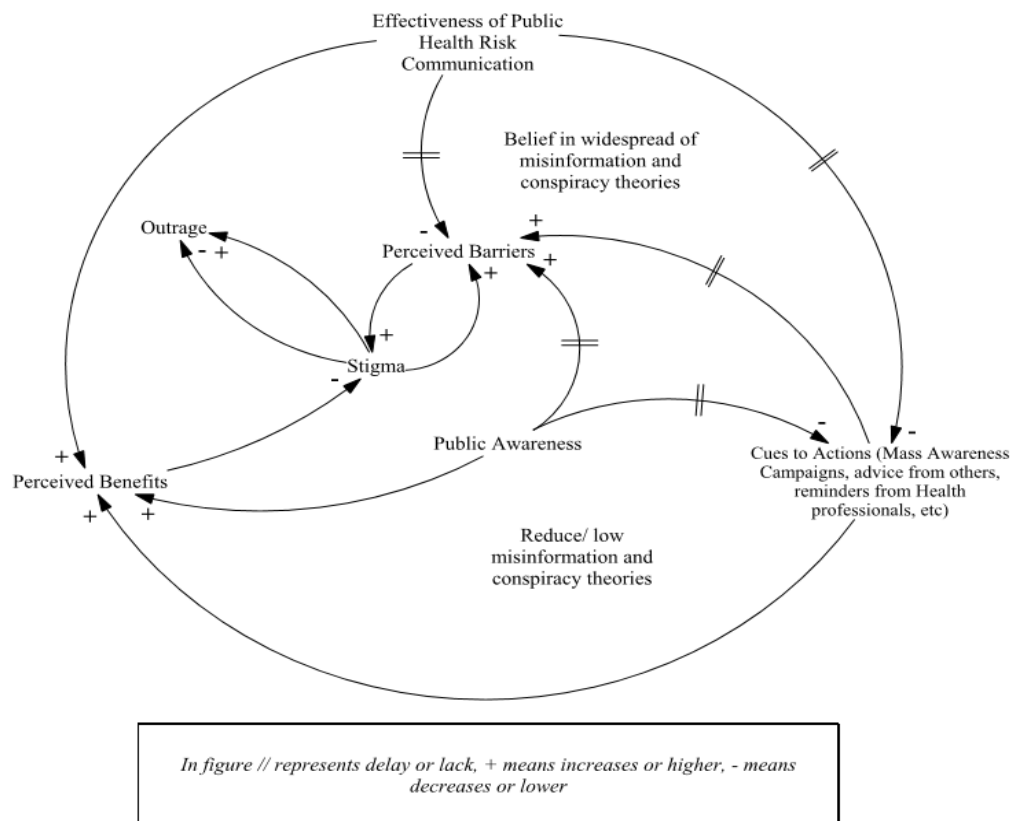
Figure 16: Represents how Stigma and outrage get influenced by constructs of HBM and COVID-19 CLD

Misinformation and overwhelmed information in social media posed a barrier for people to correct actions or follow accurate instructions and create outrage. It was found that stigmatised behaviours occur primarily when there is a lack of awareness and effective health risk communication. These constructs (PHRC, S, PA, PO) are influenced by belief in misinformation and conspiracy theory was widespread. When there is a lack of effective/adequate public health risk communication and awareness, then stigmatised behaviours are generated and shared through social interaction, with remarks like a virus carrier/ spreader or group labelling, discriminated behaviours (hate, threat, violence) which influence not only the stigmatised individual but also people living in such similar condition or similar community or group.

When there is higher stigmatised behaviour prevalence in the society, then there is also outrage in people because it was found that people perceive there is a higher number of infectious people roaming around them and are carrying the virus and spreading it in the society. These perceptions and behaviours promote outrage and stigma in communities with a lack of cues to actions at an individual level, lack of public awareness, and adequate public health risk communication about the disease. In Nepal, medical professionals (doctors, nurses, health care workers) were the most stigmatised group, and people who returned from abroad were also stigmatised as a virus carriers. In addition, the misinformation shared in social media has not only created stigma but also evoked outrage in people. This can be seen from the tweets highlighted below.

Figure 17: Represents how PA, PHRC, PO, PBa, PTs, CA are influenced by Widespread misinformation

"I faced so much discrimination in those days that people would go in the other direction if they saw me from afar, even months after I had fully recovered."

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"We were not only denied rooms and food in the disease-hit districts but also on the way there and back to Kathmandu."

"Several health workers were expelled from their rooms and denied food in hotels".

"Covid-19 patients reluctant to stay in isolation facilities. There are multiple reports of people fleeing various isolation and quarantine centres in Baitadi district, putting communities at risk of local transmission of the virus."

"Nepal's media & social media must not fall prey to anti-Muslim propensity evident in some Indian media (particularly of northern India), as seen in the misreporting on two Janakpur women said to be spreading Covid-19 virus through saliva on rupee notes - proven wrong."

The above tweets found a lack of proper mass media campaign, awareness messages at an individual level (Cues to Actions) due to belief and widespread misinformation, lack of proper knowledge about COVID-19 (barrier), and perceived medical people returned abroad. People from different religions are treated as a threat (COVID-19 carrier/ spreader, i.e., threat) at an individual level. It has created stigmatised labelling and spread misinformation and conspiracy theories, which raised outrage in people following preventive behaviours. For example, this can be seen from these tweets,

"My health was fragile at that time. I was in self-isolation. And on top of that, I was getting lots of hate online. At one time, I was starting to self-stigmatise myself as well and also", and *"Relatives of a Covid-19 patient, who died while undergoing treatment, had attacked doctors and nurses alleging negligence during treatment".*

The above tweets represent how misinformation has created stigmatised behaviours and created outrage among health professionals and returnees. Misinformation created a social stigma that enhances rejection, avoidance, humiliating behaviour to others, breach of confidentiality, loss of trust/ respect. This may prevent people from seeking COVID-19 testing and, if they test

positive, from disclosing their contacts and deter individuals from adopting certain precautionary or protective behaviours such as mask-wearing and seeking proper health care. In addition to these, when there are stigmatised behaviours, it can drive individuals to deny or hide the illness to avoid discrimination, prevent or delay timely health care seeking, and discourage people from engaging in healthy behaviours following NPIs. These behaviours act as a barrier and contribute to more severe problems and add difficulties in controlling the outbreak, which causes outrage in people. Figure 16, 17 explains how the spread of misinformation influence the COVID-19 CLD feedback loop with some behavioural responses as an example.

"Self-medication proving fatal for Covid-19 patients, …. people are buying self-prescribed medicines based on information shared on social media platforms",

"Covid-19 vaccines make the recipient's body magnetic have been circulating across the world, and experts have busted such claims."

"There's much information on social media - it's overwhelming and hard to know what's reliable.

"The flyer is full of misinformation, and we encourage you to dispose of it responsibly. We encourage you to report any scams or misinformation to CERTNZ".

"It will be very difficult to convince the people if they lose their confidence in the vaccines.. we had to struggle to convince people to take the drug for elephantiasis."

And the above tweets shows that how challenging could be to convince people for vaccinations against COVID-19 when there is a lack of widespread misinformation and conspiracy theories. This influences people's willingness to get vaccinated or not and influences their behaviours towards NPIs recommended by authorities.

When there is widespread misinformation and conspiracy theories, effective health risk communication and awareness from individuals and authorities at both individual and population-level play a crucial role, sharing authentic information and taking references from public health websites to reduce the confusion and misinformation that were caused due to overwhelming and misleading information as well as stigmatised communications. People's confusion, outrage, and stigmatised behaviours are minimized when accurate and authentic information is shared through authorities, newspapers, mass media campaigns, advice from healthcare professionals, TV and radio awareness messages, and information from friends/family or social groups. For example,

"A person who has a medical condition prevents them from wearing a mask or face covering safely or comfortably – this includes people with asthma or a disability,

"Due to a surge in testing, there may be a delay in processing tests. Please continue to isolate until you have received a negative result",

"If someone asked me, "Have you been to hell?' I say yes, these are my COVID DAYS. AND still, I am in it when I suffer from every symptom with covid pneumonia…Never believe in those who have not gone through it Because COVID is not a Hoax. It's real, and its impact is too harsh. Very difficult to resists",

"It's important to reiterate that historical cases are not considered to be infectious."

Cues to actions and self-efficacy at an individual level seem to influence and motivate people to follow the preventive behaviours and measures (NPIs). This acted as a benefit and reduced barriers in people with motivating messages, sharing their personal experiences of their and their families illness, how they got treated from COVID-19, reduced misinformation and motivating others not to believe in widespread misinformation and conspiracy theories.

However, those who have proper knowledge and information shared to others and reduced public outrage. This can be seen from the following tweets.

Here the above tweet from a person who has been infected and recovered shared their experience with exposure to the disease (i.e., COVID-19) and suggested not believing in a Hoax created and widespread through misinformation. This acted as a benefit to share and have knowledge about the disease and prior exposure to disease and how to take a preventive measure on it.

The crucial constructs that influence the feedback loop are lower perceived severity, lower perceived threat, lower perceived susceptibility, lower cues to actions and higher perceived barriers at an individual level (from HBM perspectives). These constructs influence in following recommended behaviours or NPIs when people have ignorance, do not acknowledge the threat of COVID-19, do not have adequate knowledge, resources, support, do not adhere to orders of authorities, and lack of preparedness, resources, previous pandemic responses, support programs, among others, these create outrage in people in the community. Here lack of resources, preparedness and support programs for people is a barrier to preventive measures on COVID-19 spread at individual and population levels. Likewise, when people perceive and know government and authorities are not prepared and do not have enough resources, it creates outrage. And when they perceive a lack of accountability of authorities, people start to ignore the recommended behaviours even if they are aware of the disease. For example,

"Infections and deaths are soaring, but people are still acting irresponsibly. This must stop."

"While people do not seem to be taking the potential risks seriously, authorities concerned do not seem to be using the available resources."

"The hospital cannot admit more Covid-19 patients because we don't have the necessary manpower, medical equipment, and medicines to treat them".

When we look at a population level, then lack of enough resources, preparedness, government's activities acts as a barrier for individuals (practical capacity to comply) that restricts the to get proper health care and support during need. Then this influence or makes people ignorant even though they have enough knowledge, awareness about the disease, perceived clarity of those NPIs (capacity to comply) and avoid those NPIs for survival. Thus, practical capacity to comply here act as a barrier for the general public when they do not have enough resources at an individual level and support from authorities at a population level. This can be seen from the following tweets:

"My job involves cleaning the house, cooking, and operating the washing machine. I am going to work although I am aware of the risk of virus transmission",

"they say elderly people are more prone to the coronavirus infection, but if we don't have our maid to help us, life will be hell.,

"…have not gone for Covid-19 test, but everyone is ill. There is no one to help the family, so I do the cooking, dishes, laundry, and everything."

Here the cost of compliance and strain experience due to COVID-19 was associated with less compliance to NPIs (going to work even there is Stay-at-home order and did not do tests as they do not have enough capacity to comply). These are the classic practical examples illustrating how this can influence the epidemic models from the individual level and impact the feedback loop at a population level.

On the other hand, during analysis, it was found that people did not follow NPIs such as a scan of QR codes or do contact tracing not due to only lack of awareness or education but due to ignorance or due to technical difficulties or lack of proper exposure to do so. So this results in ignorance and avoids scanning. So these tweets explain even there is enough awareness messages, people's ignorance and difficulties would influence those NPIs.

"Yep, some people just don't get it and how we keep each other safe by scanning and using the Bluetooth app. I couldn't find one at Coupland's yesterday, so just manually loaded it... Took a whole 60 seconds out of my day. Was really, really hard work."

"Uber driver: Thank you, Madam, "nobody" is scanning. Oh my god, New Zealand, it literally takes 2 seconds to scan. "

"Nope, not going to happen. If you give me a good reason to use such an app and suggest it, I'll use it. But I won't be forced to use a tracing app."

Behavioural responses in media content analysis also indicated that when there is an opportunity to break the rules, people avoid NPIs. These rule-breakers create outrage at a population level. Let's look at an example, how the opportunity to break the rules causes outrage at a population level. When individuals have less opportunity to break the rules, they will comply with the rules and vice versa. As well, rule breakers may influence others to avoid NPIs. Figure 11 shows the influence of rule followers and rule breakers in interacting components.

 Again, let's look few tweets as an example.

"I had some urgent work and had reached New Baneshwar through lanes and back alleys. On the street at the back of the Parliament building, I saw that many people had come out of their homes. Some were playing badminton and football on the street as if there was no virus."

or "it's not only the shops that operate throughout the day but people in groups are seen walking freely ignoring the prohibitory orders",

"I am scared. I am afraid of catching Covid again. I am afraid I might spread the virus to others. My one mistake could take others not only to the hospital but to the death bed. I don't want to be a hero. Today, the drama of Dharahara inauguration has mocked at frontline worker", and

This tweet represents that ignorance at an individual level creates a public outrage at a population level to those who perceive the threat, severity, and susceptibility as higher. Even they were following the recommended preventive actions and behaviours (along with NPIs), or there is impose of countermeasures when they see others precisely opposite to them.

Along with these findings, it was found that people's willingness to engage in preventive/ protective behaviours or follow NPIs waxes or wanes over time, depending on the severity of disease or perception of the threat of disease; when prevalence is low, and people are less willing to follow those behaviours over time. For example, this can be seen from these tweets:

"*At the beginning, after all, that news on the traditional media and social media, people thought the virus was hazardous, but later when they saw people catching the virus and recovering without serious illness, their attitude towards the virus has changed*",

"*People did follow the queue system in the beginning as many were in fear of contracting the virus, but now most people seem to have lost the fear, so they cause a crowd at the shop.*"

"*Last year, when there was a big threat, we adhered to it. Not this year.*"

These responses show how people's behaviour changed over time and the change in their perception of the severity of the disease and its threat.

Media content analysis finds that cultural orientations were prevalent over the countermeasures. People do not want to sacrifice their cultural values when countermeasures became a barrier to celebrating festivals or jatras. Some behavioural traces indicate that people will not follow NPIs or authorities advice because authorities/ government could not manage the pandemic.

"The government was unsuccessful in curbing the pandemic even by cancelling the jatras last year, and it will be pointless to stop the festivals this year too. We will not even follow the lockdown during the festival."

Novelty is the only construct that was not coded with relevant tweets as there is no expression about this in any tweets.
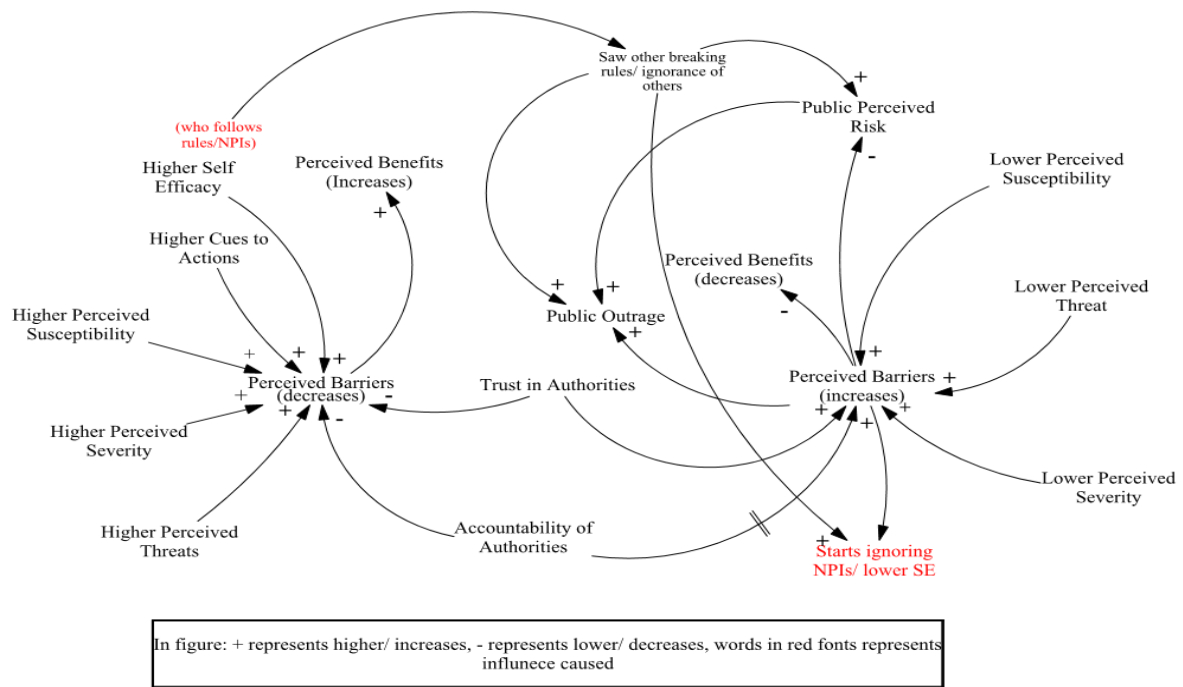
Figure 18: Impact of Perceived Barriers and Benefits on Public Outrage along with Accountability of Authorities and Trust in Authorities

Revised COVID-19-CLD
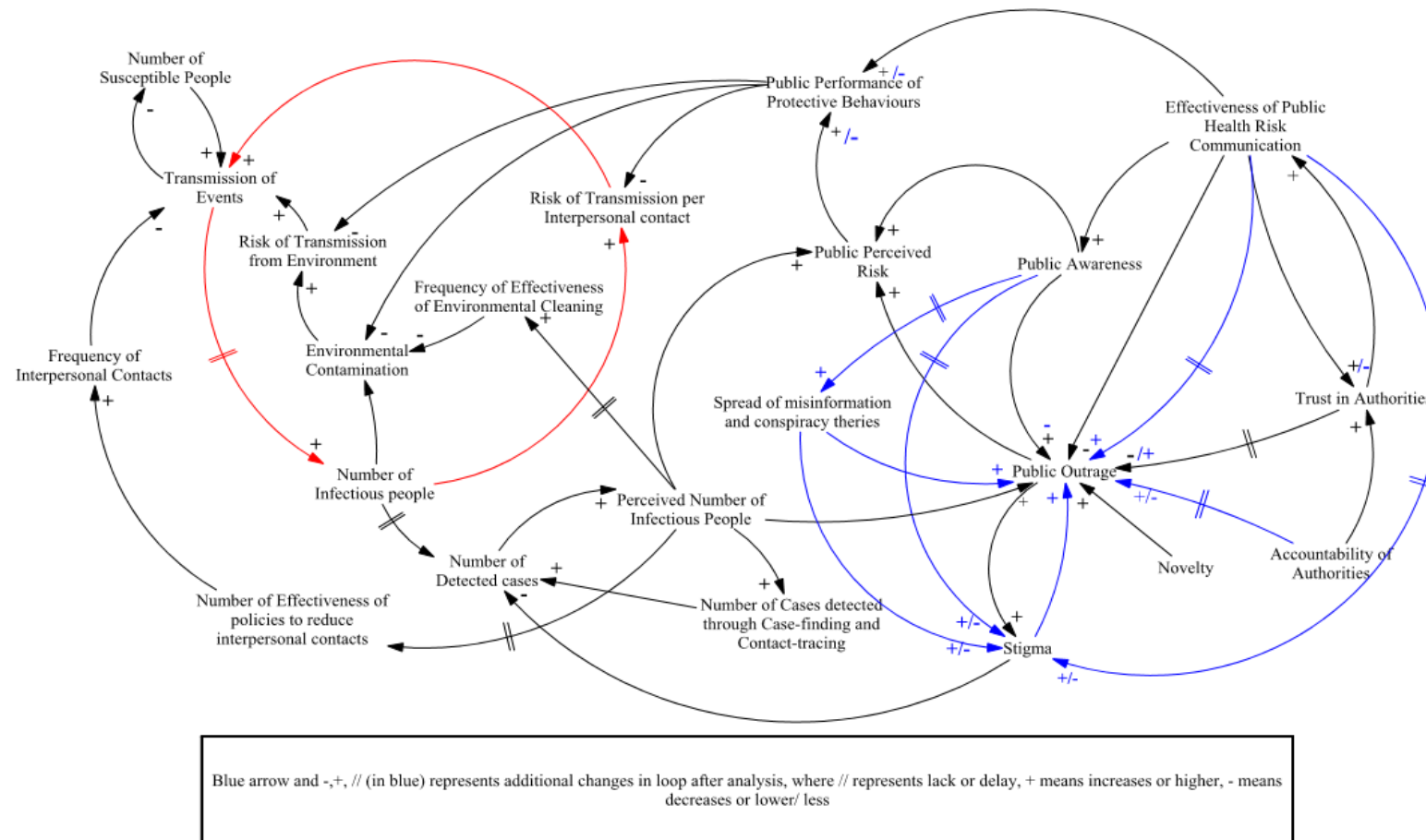
Figure 19: Modified COVID-19 CLD illustrating some of the interacting components in a society responding to the threat of COVID-19 (analysed from individual and population levels

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Figure 19 represents the revised version of COVID-19-CLD (Bradley et al., 2020). This version is created after analysing the influence of HBM constructs on the feedback loop, i.e., COVID-19 CLD. Here this artefact shows how changes in one component cascade to others' changes and back to itself, potentially affecting the entire system's status through feedback loops (how individual-level influence the feedback loop of COVID-19 CLD at a population level) with arrows with +/- representing the polarity, i.e., either positive (if the cause increases, the effect will also increase compared with the situation where the cause did not change) or hostile (if the cause increases, the effect will decrease compared with the situation where the cause did not change). It is most essential to understand how individual constructs influence as a whole (in population). Behavioural factors play a vital role in causing polarity in the feedback loop, either positive or negative. And this gives an idea of how one component cascade to others' changes and back to itself. This also provides essential information for epidemiologists to analyse micro (individual) factors while focusing on a macro (population) level. Additional changes made are represented in blue colour and symbolic representations.

CHAPTER 5 DISCUSSION

5. Discussion

This study investigated the effectiveness of various NPIs used by governments worldwide and how individual behavioural reactions (as measured by HBM) influence COVID-19-CLD at a population level. Rather than surveys, questionnaires, or interviews, this study utilizes social media content to analyse public perceptions and behavioural responses to the government's COVID-19 pandemic response activities in real-time. Real-time analysis can provide a more accurate picture of individual responses from a population in less time than surveys, questionnaires, or interviews can.

Social and behavioural sciences researchers have contributed to governments and policymakers during the crisis. Following the outbreak of COVID-19, several scholars from the social and behavioural sciences have contributed insights from the perspective of behaviour to governments, policymakers, and public health officials. For example, Van Vavel et al. (2020) studied social and behavioural science perspectives on aligning human behaviour with health care professionals and epidemiologists' suggestions. Governments around the world have taken a variety of approaches to restrict the spread of COVID-19.

First, I discovered that risk communication and public awareness influences an individual's capacity and motivation to perform protective behaviours. Risk communication aids in shaping risk perception in various audiences, contexts, and perspectives (Malecki et al., 2020, p.699). Public responses to government risk communication and risk management measures act as benefits or barriers on preventive measures on COVID-19 spread. The continuance of low public risk perceptions and, as a result, low compliance with government risk communication was discovered. This was aligned with the previous research conducted in Singapore(Wong & Jensen, 2020). However, when there is a lack of awareness at an individual level and the spread

of misinformation or misleading information, it is even more challenging to convince people at a population level to engage in those preventive behaviours. Previous studies have highlighted the relevance of risk communication during pandemics at a population level, but they have not been examined at an individual level (Erinoso et al., 2021; Bradley et al., 2020; Abrams & Greenhawt, 2020, and some other research[27]). The people who are self-stigmatised or stigmatised by others during pandemics treated as carriers of diseases and treated as a threat in society shared how they are treated and indicated awareness in people. Lack of risk communication and public awareness from both individual and population-level have created stigmatisation towards any religions, indigenous groups or people with some underlying diseases has created outrage in society. These behavioural responses indicated that people do require effective risk communication at an individual level when there is a spread of misinformation or misleading information, stigmatised messages, communications about the values, beliefs and trust in authorities, either science or government.

The effect of inadequate risk communication and awareness at both individual and population-level can be seen in media content analysis where people ignored NPIs when authorities eased restrictions. Similar actions were also seen in Nigeria due to a lack of adequate risk communications when authorities eased COVID-19 lockdown steps (Chile & Akwagyiram, 2020). Thus, inadequate risk communication and awareness in both individual and population levels act as a barrier to preventive measures in COVID-19. Furthermore, delays in disseminating information from an individual level to population-level or government to public or public to government may create difficulty finding infected people, being infected, suspected or detected, and delaying the introduction of control measures in time. This will hinder showing a true number of cases and scenarios of a pandemic, which results in outrage and creates a

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[27] *Bastani & Bahrami, 2020; Cuan-Baltazar et al., 2020; Devakumar et al., 2020; Ho et al., 2020; Kuika Watat & Moukoko Mbonjo, 2020; Li et al., 2020; Y. Lu & Zhang, 2020; Pennycook et al., 2020; Scherer & Pennycook, 2020*

barrier for authorities to take proper preventive actions in time, which can also cause uncertainty.

On the other hand, when people start to perceive a lower number of infectious people due to lower tests, lower symptoms reporting, lower number of cases detected due to delay in testing or not testing, people start to assume there is a lower risk of disease then they start to ignore NPIs. Such ignorance can lead to further outbreaks and may require more interventions than the previous ones, which act as a potential barrier for authorities on preventive measures on COVID-19 spread. Behavioural responses pointed towards lack of enough testing during media content analysis represent proper information flow is required to increase the likelihood of adherence to NPIs similar to Bradley et al. in a systems approach to preventing and responding to COVID-19 (2020). However, it will benefit preventive measures when there is an adequate level of risk communication and awareness. Means effective and adequate information/ risk communication generates desirable behaviour when people perceive a higher number of infectious people in society and a higher risk of transmission. For example, people start handwashing, self-isolation, symptom reporting, avoiding mass gatherings, cancelling events, and avoiding non-essential activities. These types of actual behavioural responses are noticed in media content analysis similar to those reported by B Lunn et al. (2020) while mentioning the benefits of risk communication on mitigation measures.

Second, it was observed that people's willingness to follow preventative behaviours was influenced by government preparedness. Traces of behavioural responses during media content analysis indicated that individuals were motivated or demotivated to engage in preventive behaviours or follow NPIs recommended by authorities or government. In media content analysis, people tweeted in favour or against the pandemic handling, sufficient or lack of resources, trust and distrust in authorities, accountability and unaccountability of authorities, confidence or lack of confidence in authorities, transparency or lack of transparency of

authorities, confidence in their leader about pandemic handling and also about previous governments too. The media content analysis revealed that when people have confidence in authorities, confidence about government has adequate crisis management strategies or plans, and people trust them, and people showed adherence towards NPIs. These findings align with the discoveries of Al Eid & Arnout (2020), Bargain & Aminjonov (2020), Chan et al. (2020), Goldfinch et al. (2021); people adhere to preventive behaviours due to trust and confidence in authorities.

Similarly, people start to ignore government responses when their government is unreliable, distrust rises in public towards government/ authorities, or when authorities divert to other issues instead then delving into the more immediate problem. Such ignorance behaviour was found in Nepalese people when the government and authorities diverted to other issues rather than solving immediate problems (i.e., the country's catastrophic epidemiological situation (Gul, 2021, p.5). Similar ignorant behaviour was reported study by Gul (2021, p.5), studies performed in the Philippines (Christian Jasper C. Nicomedes, (2020) and Haman (2020) and in Singapore (Wong & Jensen, 2020). The distrust in authorities, lower accountability of authorities and ignorant behaviour act as a barrier to preventive measures on COVID-19 from individual and population levels where people do not adhere to NPIs due to being influenced by others. Similar to these findings Elizabeth Boskey and Carly Snyder (2020) pointed towards that ignorant behaviour is influenced by social consequences.

Interestingly, some behavioural responses indicated that people are demotivated to engage in preventive behaviours such as contact tracing or scanning QR codes, not due to authorities' trust or ignorance but due to technical difficulties and distrust. This is opposite to the findings of Goldfinch et al. (2021), where they mentioned that Covid phone application use is higher when trust in the government and public health scientists is higher. Some actual behaviours and responded behaviours indicate some technical barriers that prevented them from

performing a scan of QR codes or contact tracing. These barriers would cause a delay in the public's adoption of protective behaviours that increase the risk of transmission and transmission events. Also, some behavioural responses created outrage, highlighting questionable remarks on authorities' responses towards pandemic and pointed distrust in authorities which may influence other people to influence following NPIs. Bachtiger et al. (2020, p.3) also demonstrate how technical challenges and other behavioural issues can influence contact tracing and, in turn, epidemic models, where there will be lesser reporting of contacts, resulting in a hidden frequency of interpersonal connections, which can reduce the number of persons who are vulnerable and asymptomatic. These findings are different from the previous research of Goldfinch et al. (2021), where they mentioned that when there is trust in authorities or government, people will use contact tracing apps. The result obtained by Goldfinch et al. (2021) research is from a survey, and the behavioural responses obtained are from media content analysis from individual's tweets in real-time when they encountered during a scan of QR codes or performing contact tracing. These behavioural responses are necessary to include in the epidemic model to provide a more accurate picture of the situation. Still, in-depth research and analysis are required, and proper communication is required, and the spread of misinformation or conspiracy theories is to be handled properly.

On the other hand, people showed responses mentioning non-adherence behaviour or resistance towards NPIs due to lack of confidence in authorities, lack of accountability of authorities (corruption) and distrust. The ignorance and resistive behaviours are often seen in Nepal revealed by media content analysis. These indicators indicated poorer adherence to preventive behaviours, which served as a barrier to preventive measures on COVID-19 and is in accordance with the findings by Vinck et al. (2019, p.7). Additionally, it was also noted that confidence in the healthcare system shapes compliance during COVID-19. These findings are

aligned with the research of Chan et al. (2020, p.5,6) that confidence or lack of confidence in health care systems influenced people to either adhere or avoid those recommended NPIs.

Overburdened health care system, lack of proper resources and preparedness challenged the government to manage pandemic and influenced compliance during COVID-19. This acted as a barrier and outrage triggered in people where media and news reported overburdened health care systems, overcharge of health service, and lack of resources. People who have to pay for their health care services avoided visiting hospitals and even ignored them when the disease was severe. In turn, over-reaction resulted in public outrage. In addition to this, some behavioural responses are from doctors and hospital authorities about lack of preparedness and ignorance of government in health care infrastructures that caused overburdened health system that acted as a barrier for them to provide sufficient services to the general public which influenced individuals on seeking advice from health professionals, symptom reporting, test, trace, and isolate. The behavioural responses of medical authorities indicate that even they are prepared, they could not do any due to the government's lack of preparedness. To take note of this reaction, we may find some evidence from Calnan & Sanford (2004, p.5,6) showing trust in the healthcare system or organisation as a whole differs from trusting health professionals. Thus, confidence in the healthcare system differs from faith in the state /or trust in all institutions inside that country. From this notation, it is crucial to disentangle the level of confidence in health care professionals, trust and confidence in the health care system, and government's response towards the health care system to study separately to better picture what undermines public towards adherence of the compliance measures. Similar notation was also highlighted as an importance Calnan & Sanford (2004) to separate trust in the health care system from trust in medical practitioners and trust in state/ government while introducing mediating effects on compliance.

Third, during the study, I found that the actions of authorities and policies were more important in shaping preventive behaviours. From the media content analysis, behavioural responses indicated economic support, policies such as work-from-home, closure of non-essential activities, promotion of hygienic behaviours influencing adherence to NPIs or recommended behaviours. Such policies were found to reduce the number of interpersonal contacts and environmental contamination, motivating people to focus on preventive behaviours reducing outrage and stigma. Thus, those policies acted as a benefit on taking preventive measures on COVID-19 spread. However, there were behavioural traces where there is a lack of economic support or a lack of policies reducing the interpersonal contacts; there is a higher risk of transmission and a higher number of chances that people will not adhere to the NPIs recommended by the government. I found similar behaviour from tweets across Nepal where people mentioned they would not adhere to NPIs. Similar to this finding, Donovan & Blake (1992) predicted that higher costs would predict less compliance; the higher costs of compliance, the less likely people will rationally decide to obey the measures. During this study, it was found that costs associated with compliance acted as a barrier to COVID-19 preventive measures or spread not only on an individual level but also at a population level. Such non-adherence behaviours created overreaction in public and resulted in outrage and stigma towards those people (as a virus spreader or carrier) on the other hand.

On the other hand, NPI measures for containing the disease spread may not be realistically implementable in developing countries due to social and economic reasons (i.e. poor education, massive unemployment) (Masrur et al., 2020b). This can be challenging to get a better picture of the accurate incidence of COVID-19. This finding is similar to the report of (Cowling et al., 2020), where people in countries like Nepal, who depend on daily labour and wages, have violated the NPIs. Similar results were highlighted by Rashid et al. mentioned that reduced economic activities caused by closures and reduced social interaction could hinder social

distancing behaviour (2015). Also, some responses indicated that cultural orientation influences intentions to engage in behaviours that reduce the spread of the COVID-19. Cultural values, beliefs, and celebrations were sacrificed at the beginning of COVID-19; however, people started violating those restrictions due to negligence in government pandemic responses. This could be due to decreasing anxiety over the course of an outbreak and response of government. This is contradictory to the findings of (Biddlestone et al., 2020) where they reported that collectivism culture encourages for a powerful response and promote and encourage people to follow compliance measures.

Fourth, the belief and spread of misinformation, conspiracy theories stigmatised communication, the share of stigmatised beliefs and messages were noticed during the media content analysis that prevented people from taking preventive measures. The belief and spread of misinformation and conspiracy theories are often due to inadequate risk communication and awareness which acted as a barrier to preventive measures on COVID-19 spread in individual and population levels. Spread of misinformation and conspiracy theories were found during every pandemic and mostly towards vaccinations or preventive measures. During the media content analysis also traces of behavioural responses to misinformation and conspiracy theories were found. Such behaviours can influence people's willingness or unwillingness to get vaccinated or take preventive actions. Studies by Bastani & Bahrami (2020), Malecki et al. (2020), Roozenbeek et al.(2020), Imhoff & Lamberty (2020), Salathé & Khandelwal (2011) also showed similar results where misinformation act as a barrier to taking preventive measures on COVID-19 spread. The barrier not only influences to adhere or avoid the NPIs but also makes it difficult to take corrective actions for government/ authorities.

For example, behavioural responses indicate that stigma and outrage result from the spread of misinformation and conspiracy theories. Stigmatised behaviours towards returnees from abroad and health care workers were frequently reported. Health or medical professional and

returnees were the most who were stigmatised during the COVID-19. Denial of housing, food, physical attack, threat, violence was often tweeted responses found during media content analysis. Furthermore, it is also possible that COVID-19 stigma could prevent people from seeking COVID-19 testing and, if they test positive, from disclosing their contacts. COVID-19 stigma can also deter individuals from adopting certain precautionary or protective behaviours such as mask-wearing and seeking proper health care. COVID-19 can create a social stigma that enhances rejection, humiliating behaviour to others, breach of confidentiality, loss of trust/ respect. Resistant to wear masks due to the perception that it made them appear weak (Kasting et al., 2020). It can drive people to deny or hide the illness to avoid discrimination, prevent or delay timely health care seeking, and discourage people from adopting healthy behaviours (Stangl et al., 2019). Such barriers could contribute to more severe health problems and more significant difficulties in controlling the viral disease outbreak (Van Bortel et al., 2016). Stigmatisation can also lead to rejection, avoidance, and social distancing of those who are feared (Stangl et al., 2019), potentially leading to further harm, such as making it harder for people to secure food or other necessities (BBC News 2020). Such stigmatised behaviours were also reported during HIV (Davtyan et al., 2014; Waterfield et al., 2021), Ebola (Diallo, 2014; Fischer et al., 2019; Davtyan et al., 2014), SARS (Fischer et al., 2019) and Influenza (Barrett & Brown, 2008). Self-stigmatisation and stigmatised behaviours can influence health workers and general people to hide their test results, get tested, seek professional advice. Imran et al. (2020), Gronholm et al.(2021), Azlan et al. (2020), Bagcchi (2020), Fischer et al. (2019), Gronholm et al. (2021), Li et al. (2020), Mostafa et al. (2020) and Serpa & Ferreira (2021) also highlighted the impact of stigma on COVID-19. Similar to these highlighted impacts, it can be evident that there are under-reporting cases due to not testing due to the cost of tests and not reporting due to stigma or among many factors.

On the other hand, effective risk communication made New Zealanders aware of the importance of reducing stigmatised behaviour towards others. Thus, governments tried to reduce such barriers by sharing adequate risk communication and public awareness campaigns Warren, G. W., & Lofstedt, R. (2021). Tweets in media content analysis also presented how public awareness campaigns handled misinformation and helped reduce people's outrage, stigma and averse behaviours towards NPIs. However, an in-depth research is still required in this area.

Fifth, behavioural responses leave some traces that the seriousness of epidemics influences people's ability to participate in self-protective behaviours. When an outbreak lasts for a long time, however, self-protection becomes "self-protection fatigue" (Chen et al., 2013), and people become less likely to participate in such healthy behaviours over time. Additionally, people's behaviour is time and history-based, Chen et al., indicate that policy interventions should be dynamic, flexible, and adaptable (2013, p8). Since people's behaviour is not as sensitive to spikes in recorded incidence early on, policies that aggressively encourage people to take preventive measures in the early stages of an outbreak may be critical in preventing or slowing disease transmission later on. Individuals' tendency to self-protect can shift over time based on how prevalent a disease is, suggesting that prevention efforts will need to be constantly updated during an epidemic to balance or counteract shifts in people's ability to participate in self-protective conduct. Such behaviours can be seen in tweets mentioned that '*they adhere to NPIs last time but not this time', we followed restrictions and cancelled festivals but not this year', or people maintained social distancing. However, this time they were not following queue systems etc.'*. Such ignorant behaviours could be due to knowledge and attitude towards control measures.

Overall, this study found that the individual behavioural response influenced the behavioural responses at a population level which played a pivotal role in shaping the behaviours of people

at a population level towards the NPIs. The substantive moral behaviour acted as a barrier and benefits for the preventive measures on COVID-19. Individuals who believe they are vulnerable/susceptible to a specific health issue are more likely to participate in behaviours that reduce their risk of developing health issues, according to the HBM (Rosenstock, 1974). Additionally, those who perceive that their actions and behaviour could impact others and catch disease or illness are more likely to participate in preventive behaviours for the safety of others and is assumed to follow government or public health authorities' communications. The study support this evidence that the individual behavioural responses showed that when there is a higher susceptibility to the disease, higher perceived threats, and higher perceived severity of the disease, people are more likely to follow the preventive measures, which are also aligned with the findings of Kuiper et al. (2020) amongst others.

Additionally, those who perceive that their actions and behaviour could impact others and catch disease or illness are more likely to participate in preventive behaviours for the safety of others and is assumed to follow government or public health authorities' communications. However, people with lower susceptibility may deny that they are at risk of contracting a particular illness (Rosenstock, 1974). Some people can do not care about the disease and carry out daily activities like before. These kinds of individuals pose a risk of transmission of disease. They are the ones who are likely not engaging in preventive behaviours and not following safety measures recommended by the government. These kinds of ignorance behaviours were noticed during the analysis of media content analysis which influenced other responses. These results were in line with the descriptive or injunctive social norm to persuade or influence compliance factors that are consistent with the findings of Cialdini et al. (2006), Cialdini & Goldstein (2004). This means people are more likely to comply when they see others comply with the rules, and when people see others violate rules, they are more likely to violate the rules themselves.

Several caveats to these results and analysis exist in this research. Owing to the rapid replication (or should we say 'mutation') of virus characteristics, it is challenging to state which NPI measure is effective, and which is not. During this study, various mutants were discovered in Brazil, the United Kingdom, South Africa, and India, and it is still an unforeseen situation. The research is still in the early stages of determining the consequences of those NPIs in preventing the spread of COVID-19. In other words, one form of countermeasure that worked in the past does not work for a mutated virus found in India, the United Kingdom, or some other part of the world. As a result, people's behaviour against preventive behaviours recommended by health authorities can be influenced or impacted. People may compare the effectiveness, accessibility, expense, and time associated with previous and current countermeasures.

Another caveat to this study is that due to limited time, I have not performed any cost-benefit studies of the NPIs. However, NPIs must also be weighted in terms of their economic impact for evaluating their effectiveness. A proper cost-benefit analysis of NPI measures must consider all of the policy's costs as well as its benefits. Allen (2021) presented that both cost and benefit estimates are based on various parameter and structural model assumptions in the lockdown report. Many of the studies analysed (particularly the early ones) were based on false assumptions, which tended to overestimate the benefits while underestimating lockdown costs (p.4, 5). According to the same study, the best lockdowns had a minor impact on reducing cases, transmissions, and deaths. As a result, the advantages of lockdown in terms of the number of deaths are unlikely to be necessary. When the benefits of lockdown are weighed against the costs, the advantage of lockdown becomes much lower. Imposing NPI policies like lockdown can harm the economy because it causes non-essential industries, supply chains, and other service sector operations to close, resulting in disruptions of business and services.

Changes in human behaviour, which can be sensitive to the intervention applied, pose a challenge for the accurate measurement of NPI effectiveness. People were unaware of the virus

before its first appearance in December of last year, so they have no idea how to defend themselves or adopt protective behaviours. Governments worldwide imposed various types of interventions. Several papers focused on the impact of lockdowns or other preventive NPI measures, assuming that there will be a change in transmission rate with immediate response to those interventions rather than gradual changes in behaviour. This empirical estimation was questionable when there is a drop in transmission or deaths or cases due to mandatory or voluntary lockdown (Ibarra-Vega, 2020). Flaxman et al. also highlighted this issue in their paper, stating, "We do not account for changes in behaviour; in reality, even in the absence of government interventions, we would expect a rate of transmission to decrease and therefore would overestimate deaths in the no-intervention model."

More specifically, I cannot claim to have a total representative sample of media content analysis because this study did not report demographic variables such as (age, gender, ethnicity, political orientation, education levels).

CHAPTER 6 CONCLUSION

6. Conclusion

I find the adoption of NPIs, and behaviours associated with adopting preventive measures are influenced by various factors that are inconsistent and unclear. Due to these inconsistent and unclear factors, it has become one of the most challenging tasks for epidemiologists to measure which countermeasures are successful and which are not. This is often challenging because these countermeasures are imposed in combined form, so it is also difficult to measure the effectiveness and influence of those in epidemic models. For example, "*R_0, the reproductive number, which captures the infectiousness of the pathogen, is typically measured from the growth of the epidemic and is harder to estimate once non-pharmaceutical interventions (NPIs) are in place. Similarly, changes to R_0 for evolved SARS-CoV-2 variants are difficult to ascertain given simultaneous changes to behaviour and interventions"* (Baker et al., 2021). Thus, this study can provide a theoretical framework for studying the feedback loop between disease, countermeasures, and individual's behaviours towards those.

This study shows how the expression of an individual's actions, values, and beliefs influence each construct of COVID-19-CLD at a population level. This study shows that people's responses such as anger, support, fear, outrage, avoidance, regret, indifference, ignorance, and shock can be used as a behavioural indicator as a proxy to estimate people's compliance with counter/mitigation measures a public health crisis. Understanding people's values and beliefs from individual perspectives guides us to understand how people react to the countermeasures during a pandemic and how they can influence the epidemic models.

Furthermore, some behavioural traces about cultural orientation were also found, influencing people's behaviours, responses, and actions towards countermeasures. This indicates that while putting restrictions, cultural factors should be analysed.

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Diagnostic uncertainties with lack of proper medication, unproved effectiveness of vaccinations, and frequent changes in reproduction number due to evolution of new variants create difficulties in estimating the infectiousness of pathogens due to imposed restrictions (NPIs). It reveals that behavioural responses or reactions influence the epidemic models directly or indirectly. Therefore, there is a need for behavioural parameters in epidemiological models that can help predict the confounding variables from an individual level. The study of behavioural changes towards interventions provides insights about behavioural parameters of epidemic models to understand what factors influence people to either follow or avoid advice from authorities, get tested or not tested, report symptoms or do not report symptoms, seek or do not seek medical treatment and advice. At the same time, this study finds that when compliance increases, the uncertainty of compliance measures increases, the time frame of countermeasures is more extended, negative emotions start to increase, and people start avoiding NPIs. However, there is no accurate data and proven evidence of the long-term impact of NPIs on behaviour, as these COVID-19 countermeasures are still in imposed phase. Thus, it is necessary to study the long-term impact of those necessary to develop action plans and strategies to minimise the impacts caused by them. Thus, these interacting behavioural components are crucial to understanding by authorities while putting restrictions and measuring the effectiveness of those countermeasures through epidemic models.

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8. Appendices

Appendix A Examples of Model Parameters

Model Parameters	References papers that include
Number of daily death counts, Number of cases, Number of recovered cases, Number of carriers confirmed cases; early cases reported cases, imported cases,	Valencia et al. (2020), Karatayev et al. (2020), Wu et al., (2020), Rahman et al. (2020), Chinazzi et al. (2020), Costantino et al. (2020), Evans et al. (2020), Jefferies et al. (2020), Jian et al. (2017), Wu et al. (2020).
travel history (early cases without travel history, later cases with a travel history and later cases without travel history)	(Chinazzi et al., 2020; Costantino et al., 2020; Evans et al., 2020; Jefferies et al., 2020; Jian et al., 2017; Wu et al., 2020)
number of international travel-related cases, age and gender,	Valencia et al. (2020), Wu et al., (2020) Rahman et al. (2020), Valencia et al. (2020)
highly and least vulnerable, indigenous population	(Haug et al., 2020; Kamga & Eickemeyer, 2021; Roozenbeek et al., 2020; Shinde et al., 2020; Wong & Jensen, 2020)
incubation period,	Guan et al. (2020), C. C. Lai et al. (2020), Q. Li et al. (2020), Masrur et al. (2020) and Shinde et al. (2020)
hospitalizations, medical facilities (testing capacity, resources to trace contacts, ability to isolate all cases, ability to quarantine all contacts, care capacity, availability of personal protective equipment(PPE)), transmission rate, mobility, geographical location,	(Bengtsson et al., 2011; Courtemanche et al., 2020; Evans et al., 2020; Funk et al., 2010; Gasser et al., 2020; Gething & Tatem, 2011; Haug et al., 2020; Hsiang et al., 2020; Kheirallah et al., 2020; Kuiper et al., 2020; Oliver et al., 2020; Salathé et al., 2012; Shinde et al., 2020; Su et al., 2020; Tian et al., 2020; Verelst et al., 2016; J. Zhang et al., 2020)

reporting time, number of workplace outbreaks,(Underlying diseases, strategic policies are all possible model parameters.	146

Table 3: Example of model parameters found during the literature review

Appendix B: Media Content Analysis

HOW TO LOOK THE TABLE

| Examples of content on social media | → | Generalised Behaviour Code | → | COVID-19 CLD Construct | → | HBM Construct | | Impact on model |

Examples are compared with Generalised codes

Impact compared from Both Constructs

Refer to Generalised code book

Codes Terms used in Analysis

Note: Constructs of COVID-19 CLD abbreviated as AA= Accountability of Authorities, TA= Trust in Authorities, PA= Public Awareness, Novelty = N, PHRC= Public Health Risk Communication, S= Stigma, PO = Public Outrage, PPR= Public Perceived Risk, PNIP= Perceived Number of Infectious People in this table
Note: Constructs of Health Belief Model (HBM) abbreviated as PSu = Perceived Susceptibility, PSe = Perceived Severity, PBa = Perceived Barriers, PBf = Perceived Benefits = PBf, CA= Cues to Action, SE = Self-efficacy, PTs = Perceived Threats
+ means Increase or high, (-) means low or decrease

Figure 20: Flow Chart for How Media Content Analysis was done

Examples of content on social media	Generalised Behaviour Code	COVID-19 CLD Construct	HBM Construct	Remarks	Impact on model
Auckland highlights the dangerous policy of not testing asymptomatic people and generally not doing enough testing - a basic public health measure.	I, II, IV, XXI, XXIV XXVII, L LIV, LVII	AA (-) TA (-) PO (+) PPR (+) PNIP (+)	PBa (+) PTs (+) PSe (+)	TA Low Lack of enough testing (PNIP hidden/ lower) Minimum interventions were there. Delay in corrective actions. Delays in information flow.	Influence to get tested or not, to report symptoms. Influence to follow the advice from family, friends, or Government, PHAs Seeking help from a professional. Number of Susceptible people/cases (S), No. of detected cases, No. of infectious people/cases(I) reported lower.
The #JacindaArdern govt's focus has been on the needs of big business.	L, LIV, LVII	AA (-) TA (-) PO (+)	PBa (+)	Dissatisfaction and lack of trust in government	Influence to get tested or not Influence to follow the advice from family, friends, or Government, PHAs Seeking help from a professional. Impact on economic modelling. This impact on strength and determination to stick to NPIs recommended by the government/ authorities.
What is NZ doing to harness the antibodies and plasma of CoVid19 survivors? I have been contacted by UCLA to participate, but nothing	L, LIV, LVII	AA (-) PHRC (-) PO (+)	PSe (+) PTs (+)	TA (-) and AA (-) questionable due to lack of proper response, preparedness	Influence to get tested or not, influence in symptoms reporting.

happening here in NZ, despite being cleared. We could be doing more.					Influence whether to follow the advice from family, friends, or Government, PHAs Seeking help from a professional or not.
New Zealand imports coronavirus from India and Pakistan today.	II, IV, VI, LIII, LXXIV LXXV	S (+) PO (+) PPR (+) PA (-) PHRC (-)	PSe (+) PTs (+)	Needs effective PHRC and PA to reduce stigma.	Stigmas prevent symptom's reporting, testing (Influence to get tested or not), influence on seeking medical advice/ help. No. of detected cases, no. of infected cases, No. of susceptible people/cases will be reported lower than actual.
Last 2 case in NZ is from community spread, scared to leave house.	I, II, IV,VI VII, XII, XXI, XXIX, XXXVI XXXVII	PPR (+) PO (+) PNIP (+)	PSu (+) PSe (+) PTs (+) SE (+)	Fear is high. Need effective PHRC and PA to reduce it.	Susceptible and sick patients seek advice and seek medical help. Symptom's reporting, testing increases. Reduction of interpersonal contacts.
Early morning Wellington supermarket visit. I was the only person l saw in a mask in 30mins. We're that complacent, huh?	I, II,IV,VI VII,XXIII XXVI, XXIX, XXXIV, XXXVI	PPR (+) PHRC (-) PA (-)	PTs (+) PBa (+) SE (+)	Fear, Complain, an opportunity to violate rules, not following rules even other are following rules (Descriptive social norm to influence compliance)	Number of Susceptible people/cases (S), No. of detected cases, No. of infectious people/cases (I) reported lower. Delays in compliance increase delays in information flow and corrective actions thus becomes difficult in tracing infected, suspected cases thus increase risk of transmission and transmission events, increase frequency of interpersonal contacts.

Yep, some people just don't get it and how we keep each other safe by scanning and using the Bluetooth app. I couldn't find one at Coupland's yesterday, so just manually loaded it... Took a whole 60 seconds out of my day. Was really really hard work	I, IV, VII, XLII, LXII	PA (-) PHRC (-)	SE (+) PBf (+) PBa (+)	Lack of PA or lack of knowledge about contact tracing apps. Accessibility/ availability of apps. Difficulty/ Complexity of Apps/ Time consuming, challenging.	Influence on scanning QR codes/ contact tracing due to lack of knowledge. Number of Susceptible people/cases (S), No. of detected cases, No. of infectious people/cases(I) reported lower.
I think that having a further one to two weeks at L4 I would support. It is hard financially, but I am behind the elimination strategy the NZ govt is attempting. However, we find out if we go to L3 later today.	I, II, IV, XXIX, XXXIV, XXXV, L, LI, LVII, LXXII,	TA (+) AA (+) PA (+) PHRC (+)	SE (+) PBa (+) PBf (+)	Even financially difficult (practical capacity to comply is challenging) but people follow and support NPIs.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to get tested or not Influence to follow the advice from family, friends, or Government, PHAs Seeking help from a professional.
Weak positive of Case D's neighbour: does that mean the neighbour had or has it? Pls explain. #nzcovid19	XLIII, XLIV, LVII, LXXI,	PO (+) PPR (+) PA (-)	PSu (+)	Confusion about Weak positive case needs PHRC and PA, which reduce PO and confusion.	Influence to get tested or not, Influence to follow the advice from family, friends, or Government, PHAs. Seeking help from a professional. Impact on No. of detected cases, no. of infected cases, No. of susceptible people/cases.

Jacinda Ardern: "You may not be at work, but that doesn't mean you don't have a job. Your job is to save lives."	L, LVII, LXV, lXX, LXXI, LXXII, LXXII	TA (+) AA (+)	PBf (+)	Support NPIs from an individual level.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to get tested or not. Influence to follow the advice from family, friends, or Government, PHAs. Seeking help from a professional. Impact on No. of detected cases, no. of infected cases, No. of susceptible people/cases.
#NewZealand's awesome PM @jacindaardern on CNN. (And our wonderful Dr @SiouxsieW) Not shown is Dr @AshBloomfield, our D-G of Health, who is also amazing. We're so lucky to have great leaders guiding us through.	L, LVII, LXV, lXX, LXXI, LXXII, LXXII	TA (+) AA (+)	PBf (+)	Preparedness and response during a crisis	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to get tested or not. Influence to follow the advice from family, friends, or Government, PHAs. Seeking help from a professional. Impact on No. of detected cases, no. of infected cases, No. of susceptible people/cases.
Mountain-biker winched off Wellington hill amid lockdowns. Fellow kiwis - we've got this. I'm suppressing my	I, II, IV, VII,XXI,	PO (+) PPR (+) PNIP (+)	PBa (+) PTs (+) SE (+)	Opportunity to break the rules (Barrier and threats)	Impact on No. of detected cases, no. of infected cases, No. of susceptible people/cases.

curtain-twitching, pearl-clutching tendencies (I'm a rule-follower from way back). Not everyone is going to follow the rules 100%. Some will openly flout them. I can't control that. I can do my part, though, and...1/2	XLVII, XXXIV,		PBf (+)	Fear and PO rise due to breakage of rules (PBa) Rule Follower …... (SE). PHRC and PA needed for Rule breakers.	
...a) stay at home, b) have empathy - those "rule breakers" may have valid reasons and/or might not be breaking the rules at all, and c) keep perspective. Even with a few **** out there, we've got a chance to eliminate COVID-19 in NZ. Kia kaha and #StayAtHomeNZ 2/2	I, II, IV, VII,XXI, XLVII, XXXIV	PO (+) PPR (+) PNIP (+)	PBa (+) PTs (+) SE (+) PBf (+)	Social norms to influence compliance (Benefits) A higher level of individual level of impulsivity means rule-breaking (barrier)	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to get tested or not. Influence to follow the advice from family, friends, or Government, PHAs. Influence seeking help from a professional. Impact on No. of detected cases, no. of infected cases, No. of susceptible people/cases.
Stay-at-home isn't easy, but I'm fortunate to be able to enjoy sunrises. A good one this morning over Bay of Plenty	I, II, IV, VII, XLII, XLI, XLVII, XXXIV,	TA (+), AA (+)	PBa (+) PBf (+) SE (+)	Even difficulty following NPIs due to AA (+) people follows NPIs (PBf) that reduces PBa. People are more likely to comply when they see others comply with rules.	Influence to get tested or not. Influence to follow the advice from family, friends, or Government, PHAs. Symptom's reporting, testing increases. Reduction of interpersonal contacts. Susceptible and sick patients seek advice and seek medical help.

Sitting here feeling relieved and pleased that we are in lockdown for another week. So proud of our PM and all NZers. Also madly liking the sage reckons of my pocket friends #lockdownnz #IsolationLife #StayAtHomeNZ	I, II, IV, VII, XLII, XLI, XLVII, XXXIV,	TA (+), AA (+)	PBf (+) SE (+)	Preparedness and response (+) People follow NPIs due to TA and AA. People are more likely to comply when they see others comply with rules.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to get tested or not. Influence to follow the advice from family, friends, or Government, PHAs. Influence seeking help from a professional.
NZ selected the right option. But easing lockdown restrictions too early and people who are breaching the rules may destroy all our hard work.	L, LVII, LXV, lXX, LXXI, LXXII, LXXII	TT (+), AA (+)	PBa (+) PTs (+) PBf (+)	Easing restrictions too early pose Threats (PTs) of breach NPIs and destroy hard work (PBa) Support for compliance measures (Benefits) Ignorance of rules, Rule breakers (people comply less when they fear the authorities)	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to get tested or not. Influence to follow the advice from family, friends, or Government, PHAs. Influence seeking help from a professional
Judging by the amount of people outside in Silverdale walking dogs, cycling, just having a jolly good time, we will never beat corona by this lockdown. People didn't go to work, that's true, but are not staying at home, sadly.	VI, XXI, XXII, XXVI, XXIII, XXVIII, XLVIII, LXIII, LXIX	PHRC (-) PA (-) PPR (+) PNIP (+) PO (+)	PBa (+) PTs (+) PSu (+)	Ignorance of rules, Rule breakers. Threat plus fear rises.	Impact on No. of detected cases, no. of infected cases, No. of susceptible people/cases.

Got my first stop by police to ask me what I was doing out of my home. It felt weird. I was getting petrol and ice. Deemed essential. But I still felt like I was doing the wrong thing. How do people who blatantly disobey the lockdown does not feel any guilt?!?!	III, VIII, XXXIII, LXVII, LXIX, LXI	PPR (+) PNIP (+) PHRC (-) PA (-)	PBa (+) PTs (+) SE (-) PSu (-)	Breach of rule, ignorance, and guilt. Rule breakers (people comply less when they fear the authorities)	Impact on No. of detected cases, no. of infected cases, No. of susceptible people/cases.
@jacindaardern@nzpolice WHY is there not more police surveillance underway? And why are the @NZArmy not being assigned to patrol the streets? This is not a time for libertarianism!	II, IV, VI, XXVIII, L, LIV, LVII, LXV,LXI ,LXIX	AA (-) PO (+) PPR (+) PHRC (-)	PSe (+) PSu (+)	Lack of preparedness or response to NPIs	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to get tested or not. Influence to follow the advice from family, friends, or Government, PHAs. Influence seeking help from a professional.
@jacindaardern I hope you'll be instructing @nzpolice to visit Destiny Churches on Sunday and make them go back home. Brian Tamiki should not be above the law in New Zealand. Especially not during these times.	XXVIII, L, LIV, LVII, LXI ,LXIX, LXVII,	AA (+) TA (+) PHRC (+)	PSe (+) PTs (+)		Impact on No. of detected cases, no. of infected cases, No. of susceptible people/cases.
"New Zealand on Monday reported zero new confirmed cases of COVID-19." They took on Mass Shootings. They took on COVID-19. This is what happens when you're not terrified of smart women.	L, LVII, LXV, lXX, LXXI, LXXII, LXXII	TA (+) AA (+)	PBf (+)	Support NPIs and Leaders. Support for compliance measures.	Influence to get tested or not. Influence to follow the advice from family, friends, or Government, PHAs. Influence seeking help from a professional.

When you lead your Nation from front, this is what happens... While most countries are working on ways to contain the coronavirus, #NewZealand has set itself a much more ambitious goal: eliminating it altogether.	L, LVII, LXV, lXX, LXXI, LXXII, LXXII	TA (+) AA (+)	SE (+) PBf (+)	Support NPIs and Leaders. Support for compliance measures.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to get tested or not. Influence to follow the advice from family, friends, or Government, PHAs. Influence seeking help from a professional
How lucky am I to be in New Zealand with the incredible @jacindaardern guiding us through this pandemic.	XXIV, XXV,L, LVII, LXV, lXX, LXXI, LXXII, LXXII	AA (+) TA (+)	PBf (+)		Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to get tested or not. Influence to follow the advice from family, friends, or Government, PHAs. Influence seeking help from a professional
New Zealand forcing COVID-19 patients into 'quarantine facilities,' health chief announces— So, New Zealand is literally sending COVID-positive people and their families to concentration camps.	L,LIII, LIV, LV, LXVI, LXVII, LXIX, LXXII	PA (-) PHRC (-) TA (-) AA (-) PO (+)	PTs (+) PBa (+)	Lack of PHRC and PA spread misinformation (influenced by Conspiracy theory) which acts as a threat and barrier to Population-level. Likely to disobey/ break rules, Lack of perceived clarity of compliance measures (LXXII negative), more unclear rules in people, etc	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to get tested or not. Influence to follow the advice from family, friends, or Government, PHAs. Influence seeking help from a professional.

Businesses become casualties of coronavirus: The pandemic has devastated small and medium firms, robbing thousands of livelihoods.	XXX, XXXV, LI,LVII,LIX , LVII,	PO (+)	PBa (+) PSe (+)	Lack of preparedness and support from the Government cause public outrage and encourage to break the rules to operate businesses due to lack of capacity during a pandemic to follow the rules.	Cost of compliance and strain experience from following the measures associated with compliance, i.e., higher compliance costs would be associated with less compliance. Influence to get tested or not. Influence to follow the advice from family, friends, or Government, PHAs. Influence seeking help from a professional. Impact on no. of detected cases, susceptible cases, and reported cases.
Villagers in rural parts of Lumbini Province refuse to get tested for Covid-19. Coronavirus suspects reluctant to get tested due to social stigma….	XXXII, XXXIII, XLVII, L, LV, LXVI, LXIV, LXXIV, LXXV	PHRC (-) PO (+) PA (-) S (+) PNIP (-)	PBa (+) PTs (-) PSe (-) Se (-)	Reluctant to get tested due to Stigma and lack of PHRC and PA. PNIP hidden or shown less than actual (lack of symptoms plus case reporting)	Influence to get tested or not. Influence to follow the advice from family, friends, or Government, PHAs. Influence seeking help from a professional. Impact on no. of detected cases, susceptible cases, and reported cases.
As Covid-19 restrictions get stricter in Valley, rule violators face fines: Police say enforcing the restrictions in Valley's inner neighbourhoods and outskirts is still a challenge.	XXXIII, XLVII, L, LXII,LXVI, LXVII	PHRC (-) PA (-)	PBa (+) PTs (-)	Less severity of punishment motivates rule-breaking. Challenges plus barrier to enforce restrictions due to lack of PHRC and PA even there is proper preparation from Authorities.	Ignorance about spread creates difficulty in taking corrective preventive measures thus increases risk of transmission and transmission events thus impact on no. of detected cases, susceptible cases, and reported cases.

Rs23 billion spent on Covid-19 prevention and control measures in two years, survey shows, while new beds were added, health institutions and the medical workforce hardly saw any increase.	XXIV (-), L, LIV, LVII(-)	TA (-) AA (-) PO (+)	PBa (+)	Lack of resources and TA that act as a Barrier and threat for public health (individual health care). Lack of confidence in authorities and resources (XXIV, LVII negative)	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to get tested or not. Influence to follow the advice from family, friends, or Government, PHAs. Influence seeking help from a professional Impact on no. of detected cases, susceptible cases, and reported cases.
Eight Covid-19 patients die due to a delay in oxygen supply. The oxygen supply was insufficient at the Western Regional Hospital in Pokhara on Thursday due to the disruption of the power supply at the oxygen plant.	XXIV (-), L, LIV, LVII(-)	AA (-) PO (+)	PBa (-)	Lack of resources and preparedness during a crisis. Creates panic and outrage in people. Needs effective PHRC and PA. A barrier for individual health care	Impact on no. of detected cases, susceptible cases, and reported cases.
Health workers protest attack on medical personnel at Bheri Hospital. Two nurses jumped out of the window to safety after relatives of a Covid-19 victim had attacked them.	L, LIII, LIV, LV,LXIV, LXXIV, LXXV	S (+) PHRC (-) PA (-) PO (+)	PBa (+)	Stigma caused a threat to Health Officials due to lack of effective PHRC, PA Stigma and threat influence in accountability of health workers that acts as a barrier in health care support.	COVID-19 stigma could prevent people from seeking COVID-19 testing and, if they test positive, from disclosing their contacts. COVID-19 stigma can also deter individuals from adopting certain precautionary or protective behaviours such as mask-wearing and seeking proper health care.

					Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
Relatives of a Covid-19 patient, who died while undergoing treatment, had attacked doctors and nurses alleging negligence during treatment.	L, LIII, LIV, LV,LXIV, LXXIV, LXXV	S (+) PHRC (-) PA (-) PO (+)	PBa (+)	Stigma caused a threat to Health Officials due to the lack of effective PHRC, PA. Stigma and threat influence in accountability of health workers that acts as a barrier in health care support.	COVID-19 stigma could prevent people from seeking COVID-19 testing and, if they test positive, from disclosing their contacts. COVID-19 stigma can also deter individuals from adopting certain precautionary or protective behaviours such as mask-wearing and seeking proper health care. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
Kanchanpur local units hire doctors for primary health centres; the arrival of doctors in village health posts comes as a boon for people during the pandemic.	XXIV, XXXV, L, LVII,	AA (+)	PBf (+)	Preparedness and response of Health Authorities. Benefits for People.	Influence to get tested. Influence to follow the advice from family, friends, or Government, PHAs. Influence seeking help from a professional or seeking proper health care.

Economic impact on the farmer and poor people: With hotels and restaurants shut, farmers can't sell their milk because there are no buyers. Residents also do not want to come out of their houses to buy milk due to the risk of infection.	I, II, IV, VII, XII, XX, XVIIX, LI, XLIX, XIV, XXIX, XXVIII, XXXIV, XXX	PPR (+) PA (+) PO (+)	PBf (+) SE (+) PTs (+) PBa (+) PSu (+) PSe (+)	Public perceived risk is higher, so follow restrictions due to higher level of PA, PSu and PSe of disease is beneficial and have SE in individual, impact on farmers (threat or barrier in following NPIs due to inability or capacity)	Lack of capacity to comply could prevent people from seeking COVID-19 testing. Deter individuals from adopting certain precautionary or protective behaviours due to enough resources/ support. Influence on seeking proper health care. Impact on no. of detected cases, susceptible cases, and reported cases.
Decision to close groceries triggers panic buying. Experts fear virus surge, call decision short-sighted.	XVI, XXIV (-), XXVIII, L, LIV, LVII,	PPR (+) PO (+) TA (-) AA (-)	PTs (+) PBa (+) PSe (+) PBf (+)	PPR and threat of Disease create PO creates panic buying. Lack of AA due to no preparedness acts as a barrier and threat PBf (even groceries are decided to close)	Could deter individuals from adopting certain precautionary or protective behaviours due to enough resources/ support. Influence on seeking proper health care. Impact on no. of detected cases, susceptible cases, and reported cases.
Absence of contact tracing spells trouble for Lumbini. Authorities blame lack of resources and high infection rate for their slow response.	IV, XXVIII, XXIV(-), L, LIV, LVII (-)	AA (-) PO (+) PNIP (+) PPR (+)	PTs (+) PSe (+) PBa (+)	Lack of resources, lack of perceived clarity of compliance measures, lack of prompt response cause PNIP hidden or shown less (Barrier plus threat),	Could deter individuals from adopting certain precautionary or protective behaviours due to enough resources/ support. Influence on seeking proper health care. Impact on no. of detected cases, susceptible cases, and reported cases.

Civil society stages demonstration against House dissolution and government's poor handling of the pandemic.	XXIV(-), L, LIV, LVII (-), LXXII (-), LXXIII(-)	AA (-)	PBa (+)	Lack of response and handling of the crisis	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Could deter individuals from adopting certain precautionary or protective behaviours due to enough resources/ support. Influence on seeking proper health care. Impact on no. of detected cases, susceptible cases, and reported cases.
Anyone obstructing the implementation of the Covid-19 Crisis Management Ordinance or violating the restrictions will face a fine of up to Rs500,000 and one-year jail or both.	XXIV, LVII, LXI, LVII, LXX, LXXII, LXXII,	AA (+) PHRC (+) PA (+) PO (-)	PBf (+) Se (+)	Obligation to obey the law encourage to follow rules	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Could influence individuals from adopting certain precautionary or protective behaviours. Influence on seeking proper health care. Impact on no. of detected cases, susceptible cases, and reported cases.
Nepal woefully short on human resources for Covid-19 treatment. An expert group says it had sent a list of health workers trained in critical care before the first wave, but there was no response from the Health Ministry.	XXIV (-), LVII (-), L, LIV	AA (+) AA (-) PO (+)	PBf (+) PBa (+)	Preparedness of trained health workers (AA+) is Beneficial at individual level support, however lack of response or preparedness from the Health	Could restrict individuals to get proper health care due to lack enough resources/ support.

				Ministry (AA-) acts as a challenges, barrier, and threat.	Could deter individuals from adopting certain precautionary or protective behaviours due to enough resources/ support. Influence on providing proper health care. Influence on seeking proper health care. Impact on no. of detected cases, susceptible cases, and reported cases.
Doctors in Dolpa warn of halting Covid-19 treatment. The health workers have been deprived of allowances and facilities due to them for the treatment of Covid-19 patients since the last fiscal	XVIII, XXIV (-), LVII (-), L, LIV	AA (-) PO (+)	PBa (+)	Government support and response (AA-) pose Health workers to protest (AA-) due to lack or support and resources that creates barrier and challenges plus threat.	Could deter individuals from adopting certain precautionary or protective behaviours due to enough resources/ support. Could restrict individuals to get proper health care due to lack enough resources/ support. Influence on providing proper health care. Influence on seeking proper health care. Impact on no. of detected cases, susceptible cases, and reported cases.
Valley's poor worry about food as authorities prepare to extend lockdown, the state must support the needy in times of crisis.	XVIII, XXIV(-) ,XXX, XXXIV ,XXIV (-),	AA (-) PO (+)	PBa (+)	Inability or capacity of poor to follow Restrictions is Barrier and threat.	Could deter individuals from adopting certain precautionary or protective behaviours due to enough resources/ support.

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	LVII (-), L, LI, LVIII , LIV				Influence on seeking proper health care. Impact on no. of detected cases, susceptible cases, and reported cases.
Private hospital bills give poor Covid-19 patients the shivers. Hospitals are overcharging patients up to three times the rates fixed by the government. Yet no action has been taken.	XVIII, XXIV(-) ,XXX, XXXIV ,XXIV (-), LVII (-), L, LI, LVIII , LIV	AA (-) TA (-) PO (+)	PBa (+)	Lack of Government response, preparedness which creates barrier for people to visit hospital that creates threats at population level.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Could deter individuals from adopting certain precautionary or protective behaviours due to enough resources/ support. Influence on seeking proper health care. Impact on no. of detected cases, susceptible cases, and reported cases.
Covid-19 patients reluctant to stay in isolation facilities. There are multiple reports of people fleeing various isolation and quarantine centres in Baitadi district, putting communities at risk of a local transmission of the virus.	III, V, VIII, XI(-), XVII, XXXII, XXXIII, XLVIII, LIX, LXIX, LXVI	PHRC (-) PA (-) PNIP (+) PPR (+) PO (+)	Se (-) PSe (+) PBa (+) PTs (+/-)	Due to lack of PHRC and PA people flee isolation centres (Barrier plus threats) which also creates PO. Opportunity to violate rules. Will reduce the number of PNIP and symptoms reporting.	Could deter individuals from adopting certain precautionary or protective behaviours due to enough resources/ support. Influence on seeking proper health care. Impact on no. of detected cases, susceptible cases, and reported cases.
Bed shortage at public hospitals pushing Covid-19 patients to expensive private hospitals.	XVIII, XXIV (-),	AA (-) PO (+)	PBa (+)	Lack or resources of Public Hospital (AA-), lack of	Could deter individuals from adopting certain precautionary or protective behaviours due to enough resources/ support.

	LVII (-), L, LIV			capacity of people (Barrier plus threat).	Influence on providing proper health care. Influence on seeking proper health care. Impact on no. of detected cases, susceptible cases, and reported cases.
Self-medication proving fatal for Covid-19 patients, …. people are buying self-prescribed medicines based on information shared on social media platforms.	XXXII, L, LIII, LV	PHRC (-) PA (-) PO (+)	PBa (+) CA (-)	Novelty of disease creates confusion, needs effective PHRC and PA. Lack of enough knowledge, misinformation (Barrier and threat).	Could deter individuals from adopting certain precautionary or protective behaviours due to lack of knowledge/ proper information. Influence on seeking proper health care which influence on no. of detected cases, susceptible cases, and reported cases.
People with non-Covid-19 conditions avoiding hospital visits fearing infection, Reluctance to visit the hospitals fearing Covid-19 infection could be deadly especially for people with pre-existing conditions.	I, II, IV, VII, XII, XIV, XXIII, XXXII, XXVIII, LIII, LV	PHRC (-) PA (-) PPR (+) PNIP (+) PO (+)	PBa (+) PTs (+) PSe (+) PSu (+)	Novelty of disease creates confusion, needs effective PHRC and PA. Reluctant to visit hospital (fear = PBa plus PTs) creates problem for people with pre-existing conditions (PSe +)	Could deter individuals from adopting certain precautionary or protective behaviours due to lack of knowledge/ proper information. Influence on seeking proper health care which influence on no. of detected cases, susceptible cases, and reported cases.
With pandemic showing signs of sliding into a devastating crisis, authorities mull a new law to streamline response, as they ignore the basics like tracing, testing, and isolating.	IV, XXVIII, XXIV(-), L, LIV, LVII (-)	AA (-) PO (+)	PBa (+) PTs (+)	Lack of preparedness from Authorities acts as a barrier and threat to individual level.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not.

				Cases, symptoms reporting (PNIP) will be reported lower due to lack of tracing, isolating, and testing.	Could restrict individuals to get proper health care due to lack enough resources/ support. Influence on seeking proper health care. Such barriers could contribute to more severe health problems and greater difficulties in controlling the outbreak. Impact on no. of detected cases, susceptible cases, and reported cases.
People flout health protocols despite number of infections rising every day. With prohibitory orders in place in Kathmandu Valley the general public have been told to leave their homes only for essential purposes.	VIII, XXVIII, XXXIII, XXXVII(-), XLVIII, LXII, LIX LXIX, LXVII, LXVI	AA (+) PO (+) PHRC (-) PA (-)	PBa (+) PTs (+/-) PSu (-) PSe (-)	Ignorance of people breaching rules when individual perceive PSu low and PPR low it creates Barrier and threat to other individuals, that creates fear and outrage at population level even authorities have prepared.	Could deter individuals from adopting certain precautionary or protective behaviours due to lack of knowledge/ proper information. Influence others to violate rules. Influence on seeking proper health care which influence on no. of detected cases, susceptible cases, and reported cases.
Only Covid-19 hospital in Arghakhanchi does not have intensive care unit. The hospital running on basic medical infrastructure is not equipped to deal with Covid-19 cases, health workers say.	IV, XXVIII, XXIV(-), L, LIV, LVII (-)	AA (-) PO (+)	PBa (+)	Lack or resources and preparedness from Authorities. Difficulty for health workers (Barrier and threat at population level)	Could restrict individuals to get proper health care due to lack enough resources/ support. Influence on seeking proper health care. Influence on providing proper health care.

				difficult to get health care support (at individual level)	Such barriers could contribute to more severe health problems and greater difficulties in controlling the outbreak. Impact on no. of detected cases, susceptible cases, and reported cases.
Mugu ill-equipped to deal with increasing Covid-19 cases. Health workers say the authorities' negligence in not running tests on returnees has resulted in the transmission of virus at the community level.	IV, XXVIII, XXIII, XXIV(-), L, LIV, LVII (-)	AA (-) TA (-) PO (+) PPR (+) PNIP (+)	PBa (+) PTs (+) PSu (+) PS (+)	Authorities Negligence (i.e., lack of testing) creates outrage due to lack of proper preparedness and available resource. Resulted transmission of virus at community level (Threat, barrier, and challenges) reporting of cases, symptoms (PNIP lower than actual will question on TA)	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Could restrict individuals to get proper health care due to lack enough resources/ support. Influence on seeking proper health care. Such barriers could contribute to more severe health problems and greater difficulties in controlling the outbreak. Impact on no. of detected cases, susceptible cases, and reported cases.
Even during the lockdown, people breached the rules, they walked holding hands, stayed in groups. I do not think passengers will follow the rule set by the government…	VIII, XIV, XXVIII, XXXIII, XXXVII(-), XLVIII,	PO (+) TA (-) AA (+)	PSu (-) PSe (-) PBa (+) PTs (-)	Even Government/ authorities are prepared ignorance of people due to lower PSu and PSe (self). Lower PPR in population level, Ignorance,	Could deter individuals from adopting certain precautionary or protective behaviours due to enough resources/ support. Influence on seeking proper health care.

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	LXII, LIX LXIX, LXVII, LXVI, L, LIV, LVII (-)			and breach of rules (PBa+, PTs+), Fear. Less severity of punishment motivates for rule breaking.	Impact on no. of detected cases, susceptible cases, and reported cases.
If someone asked me, "Have you been to hell?' I say yes, these are my COVID DAYS. AND still, I am in it when I suffer from every symptom with covid pneumonia…Never believe in those who have not gone through it Because COVID is not a Hoax. It's real, and its impact is too harsh. Very difficult to resists.	I, II, IV, VII, XXXVII, XXV, XXIX, XXXVI, XXXVIII, XLII, XLV, XLIX,	PO (-) PA (+) PHRC (+)	PSu (+) PSe (+) Se (+) CA (+) PBf (+)	PHRC, PA can reduce misinformation in people and aware others at population level from self-experience.	Direct experience to outbreak increases self-efficacy, which leads to engagement in precautionary action. Influence to get tested. Influence to follow the advice from family, friends, or Government, PHAs. Influence seeking help from a professional or seeking proper health care.
I was shocked to see so many people together despite the high risk of Covid-19 infection and prohibitory orders in place.	I, II, III, IV, V, VI, VIII, XVII, XXI, XXXIIX, XLVIII,	PO (+) PPR (+) PA (-) PHRC (-)	PSu (-) PSe (-) PTs (+/-)	Even NPIs are imposed PPR in people low, ignorance and disobey rules creates threats and barriers. Lack of PHRC, PA. Creates fear in individual who are susceptible and severity to disease and follow rules.	Influence to get tested. Influence to follow the advice from family, friends, or Government, PHAs. Influence seeking help from a professional or seeking proper health care.

I am scared. I am afraid of catching Covid again. I am afraid I might spread the virus to others. My one mistake could take others not only to hospital but to death bed. I don't want to be a hero. Today, the drama of Dharahara inauguration has mocked at frontline worker.	I, II, IV, VI, VII, XII, XVI, XX, XXIII, XXV, XXVIII, XXIX,	AA (-) PO (+) PPR (+) PA (-) PHRC (-)	PSe (+/-) PSu (+/-) Se (+) PTs (+/-) PBf (+)	Even PHRC and PA is at individual level (Benefits) lack of PHRC and PA, low PPR at large population level it creates barrier and threats.	Direct experience to outbreak increases self-efficacy, which leads to engagement in precautionary action. Influence to get tested. Influence to follow the advice from family, friends, or Government, PHAs. Influence seeking help from a professional or seeking proper health care.
I went to my friend's wedding on Wednesday which was organised at his home but when I saw the crowd at the wedding, I got scared and returned.	I, II, IV, VI, VII, XII, XVI, XX, XXIII, XXV, XXVIII, XXIX, XXXVIII, XLII, XLV	PA (+) PHRC (+)	PSu (+) PSe (+) PTs (+) Se (+)	PHRC and PA, PSu, PSe of disease in individual level motivate people to follow rules, acts as benefits.	Direct experience to outbreak increases self-efficacy, which leads to engagement in precautionary action. Influence to get tested. Influence to follow the advice from family, friends, or Government, PHAs. Influence seeking help from a professional or seeking proper health care.
The new variant of the virus is more dangerous than before as we have seen a patient who has been in ICU for 21 days now and he is on oxygen support from the start and has not recovered yet.	XXVIII, XXV, XLIII, XLIL, LVII XXV	PHRC (+) PA (+) PO (-)	PBf (+) CA (+)	When there is Novelty of disease there needs proper PHRC and PA through some evident cases that acts as Benefits for individual level.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence seeking help from a professional or seeking proper health care.

					Influence to follow the advice from family, friends, or Government, PHAs.
Though entry inside the ground was restricted, people had gathered in large numbers outside the ground, and we could not do anything.	I, II, III, IV, V, VI, VIII, XVII, XXI, XXXIIX, XLVIII, L,LIV, LV, LXII, LXVI, LXVII, LXIX	PPR (-) PO (+) AA (+/-)	PTs (-) PSe (-) PSu (-)	Even there is enough restrictions (AA+) ignorance of people due to low PSu and PPR it creates outrage in population level which acts as Threats and Barrier. Opportunity to break rule is higher (Barrier), People see other violates rules, the more likely to violate the rules	Influence others to break rules. Impact on no. of detected cases, susceptible cases, and reported cases.
The hotel isolation centre is empty, and people are roaming around the village without any restriction as they don't want to go into isolation	XXVIII, XXXIII, XXXII, XLVIII, LXVI, LX, LXXIII(-)	PPR (-) PO (+)	PTs (+) PBa (+) PSu (-)	Even there is enough resources (AA+), ignorance of people due to low PSu and PPR it creates outrage in population level which acts as Threats and Barrier.	Influence others to break rules. Impact on no. of detected cases, susceptible cases, and reported cases.
there are no Covid testing kits to conduct testing in Jagarnathpur	XXIV(-), L, LIV, LVII (-) , XXXIV	PO (+) AA (-)	PBa (+) PBf (-)	Lack or enough resources creates outrage (fear) at population level which impact testing at individual level (Barrier)	Could restrict individuals to get proper health care due to lack enough resources/ support. Influence on seeking proper health care.

					Such barriers could contribute to more severe health problems and greater difficulties in controlling the outbreak. Impact on no. of detected cases, susceptible cases, and reported cases.
About 81 per cent of COVID-19 patients admitted to hospitals across Nepal are asymptomatic.	XXVIII, XXV, XLIII, XLIL, LVII XXV	N (+) PHRC (+) PA (+)	PBf (+)	Proper PA and PHRC about Novelty of disease is beneficial at individual level.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence seeking help from a professional or seeking proper health care. Influence to follow the advice from family, friends, or Government, PHAs.
In the beginning, people followed restrictions in fear of getting the virus but over time they have lost that fear.	XXI (+/-), LVI, LIX, XLVIII, XXXIII, XVII, VIII, XXVIII, LXIX, LXVI	PA (+/-) PHRC (-/+) PPR (+/-) PNIP (+) PO (+)	PBf (+/-) Se (+/-) PSu (+/-) PSe (+/-) PTs (+/-)	In beginning fear (+) people followed rules (benefits) when PPR (+) Later with Time of NPIs imposed (+), fear (-), PSe (-), PSu (-) leads Breakage of rules (SE-)	Influence others to break rules. Impact on no. of detected cases, susceptible cases, and reported cases.
Safety is more than a synonym or a metaphor. It is a prayer. I hope you will not have to go through what I just did.	XXV, XXI, XXIX,	PO (-)	CA (+) Se (+)	Self- experience of disease (CA) creates motivation (SE)	Direct experience to outbreak increases self-efficacy, which leads to engagement in precautionary action.

	XXXIX, XLII, XLV		PBf (+) PSe (+)	to others to follow rules (benefits), reduce PO.	Influence to get tested. Influence to follow the advice from family, friends, or Government, PHAs. Influence seeking help from a professional or seeking proper health care.
Everyone is talking about the problems of big cities and big hospitals, a lot of people in the villages have been suffering from the infections and some are also dying.	L, LIV, LVIII, LVII (-), XXVIII, XXIV (-), XXXV, XXX, LI, XXXIV	AA (-) PO (+)	PBa (+) PTs (+)	Lack of resources creates outrage. Acts as a barrier and threat.	Could restrict individuals to get proper health care due to lack enough resources/ support. Influence on seeking proper health care. Such barriers could contribute to more severe health problems and greater difficulties in controlling the outbreak. Impact on no. of detected cases, susceptible cases, and reported cases.
Health workers fear the spread of Covid-19 if safety guidelines are not followed while allowing entry to trucks.	XXVIII, XXV, XXI, XVII, XXIV (-), XXXIV, XXXIII	PO (+)	PTs (+) PBa (+) PSe (+)	Fear, PSu, PSe at individual level creates PO and influence in PPR. Not following Safety guidelines creates barriers and threats.	Could restrict individuals to get proper health care due to lack enough resources/ support. Influence on providing proper health care. Influence on seeking proper health care. Such barriers could contribute to more severe health problems and greater difficulties in controlling the outbreak. Impact on no. of

					detected cases, susceptible cases, and reported cases.
While people do not seem to be taking the potential risks seriously, authorities concerned do not seem to be using the available resources.	XXXIII, XLVIII, LIV, L, LVII(-) XXIV(-)	AA (-) PO (+) PHRC (-) PA (-) PPR (+) PNIP (+)	PSu (-) PSe (-) PBa (+) PTs (+)	Lower level of PSu and PSe at individual level creates PO and low PPR, AA (-) at population level which acts as threat and barrier to both levels. Lack of knowledge about the disease.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence seeking help from a professional or seeking proper health care. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
The hospital needs at least eight full oxygen cylinders every day. But we have only two full cylinders left.	LIV, L, LVII (-), XXIV (-)	AA (-) PO (+)	PBa (+)	Lack of resources creates barriers and threats at individual and population level (fear and outrage).	Could restrict individuals to get proper health care due to lack enough resources/ support. Influence on seeking proper health care. Such barriers could contribute to more severe health problems and greater difficulties in controlling the outbreak. Impact on no. of detected cases, susceptible cases, and reported cases.

The hospital cannot admit more Covid-19 patients because we don't have the necessary manpower, medical equipment, and medicines to treat them.	LIV, L, LVII (-), XXIV (-)	AA (-) PO (+)	PBa (+)	Lack of resources creates barriers and threats at individual and population level (fear and outrage).	Could restrict individuals to get proper health care due to lack enough resources/ support. Influence on seeking proper health care. Such barriers could contribute to more severe health problems and greater difficulties in controlling the outbreak. Impact on no. of detected cases, susceptible cases, and reported cases.
My job involves cleaning the house, cooking, and operating the washing machine. I am going to work although I am aware of the risk of virus transmission.	XXVIII,XXV, XXIV (-), XXXIV	PHRC (+)	PBa (+) PBf (+)	Individual level pf PHRC encourage to follow preventive measures (SE) which act as Benefits in both individual and population level. Lack or practical capacity to comply rules(Barrier).	Could deter individuals from adopting certain precautionary or protective behaviours due to enough resources/ support. Influence on seeking proper health care. Impact on no. of detected cases, susceptible cases, and reported cases.
If the restrictions on movement continue for long, people like us could die from hunger than from the coronavirus.	XXVIII,XXV, XXIV (-), XXXIV	PO (+)	PBa (+)	Inability and not enough capacity of people to follow NPIs pose threats and barriers when there is lack of resources creates outrage and fear.	Could restrict individuals to get proper health care due to lack enough resources/ support. Could deter individuals from adopting certain precautionary or protective behaviours due to enough resources/ support.

					Influence on seeking proper health care. Such barriers could contribute to more severe health problems and greater difficulties in controlling the outbreak. Impact on no. of detected cases, susceptible cases, and reported cases.
It is my responsibility to ensure that I am not a source of any spread. It has already been 11 days since I locked myself inside my bedroom to limit physical contact with others, while watching for symptoms.	I, II, IV, VII, XXV, XXIX, XXXVI, XXXVIII, XLIX, XXVIII, , XXIV, XXXVII, XXXVI, XXXV, XLII, XLV,	PO (-) PA (-) PHRC (+)	PBf (+) PSu (+) PSe (+) CA (+) Se (+)	Individual level of PSu, PSe, CA encourage to follow restrictions (SE) which is beneficial to population level to share info about PHRC.	Direct experience to outbreak increases self-efficacy, which leads to engagement in precautionary action. Influence to get tested. Influence to follow the advice from family, friends, or Government, PHAs. Influence seeking help from a professional or seeking proper health care.
…. were not following social distancing while many even did not have masks on their faces. It seemed they did not have any fear of the virus.	LIX, XLVIII, LXVII, LXIX, XLVIII, XXVIII,	PO (+)	PSe (-) PSu (-) PTs (+) PBa (+)	Ignorance of individual behaviour PSe, PSu created PO at population level and acts a barrier and threat.	Influence others to break rules. Influence seeking help from a professional or seeking proper health care. Impact on no. of detected cases, susceptible cases, and reported cases.

	XXXIII, XXI (+/-), VIII, V, III				
For the first two days, the lockdown was not strict, so I went to work. But after the restrictions became tighter, I stopped going.	IV, VI, X, XII, XIV, XXV XXVIII, XXI, XLIX	AA (+)	SE (+) PBf (+)		Direct experience to outbreak increases self-efficacy, which leads to engagement in precautionary action. Influence to get tested. Influence to follow the advice from family, friends, or Government, PHAs. Influence seeking help from a professional or seeking proper health care.
Also, going to work would put me at risk of contracting the virus and I could also transmit the virus to my family.	IV, VI, X, XII, XIV, XXV XXVIII, XXI, XLIX	PO (-) PA (+)	PSu (+) PTs (+) PSe (+) CA (+) PBf (+)	Severity of disease encourages to follow rules, Knowledge of disease. Perceived clarity of necessity of compliance measures.	Direct experience to outbreak increases self-efficacy, which leads to engagement in precautionary action. Influence to follow the advice from family, friends, or Government, PHAs. Influence seeking help from a professional or seeking proper health care.
They have not gone for Covid-19 test, but everyone is ill. There is no one to help the family	XXVIII,XX V (-), XXIV (-), XXXII, XXXIV	PO (+)	PTs (+) CA (-)	Lack of capacity/ enough resources to follow NPIs and result into indifference	Could restrict individuals to get proper health care due to lack enough resources/ support.

so I do the cooking, dishes, laundry, and everything.	XVIII, XXX, XLVIII		Se (-) PBa (+)	behaviour in people that pose threats and barrier.	Could deter individuals from adopting certain precautionary or protective behaviours due to enough resources/ support. Influence on seeking proper health care. Such barriers could contribute to more severe health problems and greater difficulties in controlling the outbreak. Impact on no. of detected cases, susceptible cases, and reported cases.
In the beginning after all that news on the traditional media and social media people thought the virus was very dangerous, but later when they saw people catching the virus and recovering without serious illness, their attitude towards the virus has changed.	XXVII, XXII, XXV, XXXIII, LIX, LVI, XLVIII LIII, LV, LX, LXVI, LXVII, LXIX	PA (+/-) PPR (+/-) PHRC (+/-) PNIP (+) PO (+)	PBa (-/+) PSu (+/-) PSe (+/-) PTs (+/-) Se (+/-) CA (+)	In Beginning N (+), fear of disease PSe+ PHRC +, PA + = people followed NPIs. Later PSe -, Fear -, = ignored NPIs posed threat and barrier. Less severity of punishment motivates for rule breaking.	Influence others to break rules. Influence seeking help from a professional or seeking proper health care. Impact on no. of detected cases, susceptible cases, and reported cases.
We have 84 people living in an isolation centre and we have been providing free meals and medicines with round the clock doctor's help.	LVII, XLVII, XLV, XLIII, , XLI	AA (+) PO (-)	PBf (+)	Enough resources and preparedness.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not.

					Influence seeking help from a professional or seeking proper health care. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
it's not only the shops that operate throughout the day, but people in groups are seen walking freely ignoring the prohibitory orders.	LIX, XLVIII, LXVII, LXIX, XLVIII, XXVIII, XXXIII, XXI (+/-), VIII, V, III	PO (+) PPR (+) PNIP (+) PHRC (-) PA (-)	PSe (-) PSu (-) PTs (+) Se (-)	Ignorance of people i.e., Low PSe, PSu (barrier and threats) creates PO.	Influence others to break rules. Influence seeking help from a professional or seeking proper health care. Impact on no. of detected cases, susceptible cases, and reported cases.
I had some urgent work and had reached New Baneshwar through lanes and back alleys. On the street at the back of the Parliament building, I saw that many people had come out of their homes, and some were playing badminton and football on the street as if there was no virus,	XXVII, XXII, XXV, XXXIII, LIX, LVI, XLVIII LIII, LV, LX, LXVI,	PO (+) PPR (+) PNIP (+)	PSe (-) PSu (-) PTs (-) Se (-)	Ignorance of people i.e., Low PSe, PSu (barrier and threats) creates PO. Less severity of punishment motivates for rule breaking.	Influence others to break rules. Influence seeking help from a professional or seeking proper health care. Impact on no. of detected cases, susceptible cases, and reported cases.

	LXVII, LXIX				
Infections and deaths are soaring, but people are still acting in an irresponsible manner. This must stop.	XXVII, XXII, XXV, XXXIII, LIX, LVI, XLVIII LIII, LV, LX, LXVI, LXVII, LXIX	PO (+)	PSu (-/+) PSe (-/+) PTs (-/+)	Ignorance of people creates barrier and threats and creates outrage in people at population level. Lack of knowledge about diseases and consequences of it.	Influence others to break rules. Influence seeking help from a professional or seeking proper health care. Impact on no. of detected cases, susceptible cases, and reported cases.
They say elderly people are more prone to the coronavirus infection, but if we don't have our maid to help us, life will be hell.	XXVIII,XXV (-), XXIV (-), XXXII, XXXIV XVIII, XXX, XLVIII	PO (+) S (+)	PSe (+) PTs (+) PBa (+)	Lack of capacity/ enough resources to follow NPIs pose threats and barrier. Stigma towards elder people can rise.	Could restrict individuals to get proper health care due to lack enough resources/ support. Could deter individuals from adopting certain precautionary or protective behaviours due to enough resources/ support. Influence on seeking proper health care. Such barriers could contribute to more severe health problems and greater difficulties in controlling the outbreak. Impact on no. of detected cases, susceptible cases, and reported cases.

Many elderly people are completely dependent on domestics for all household chores, so the pandemic and the restrictions on movement have created huge problems for such people.	XXVIII,XXV (-), XXIV (-), XXXII, XXXIV XVIII, XXX, XLVIII	PO (+) S (+)	PSe (+) PTs (+) PBa (+)	Lack of capacity/ enough resources to follow NPIs pose threats and barrier.	Could restrict individuals to get proper health care due to lack enough resources/ support. Could deter individuals from adopting certain precautionary or protective behaviours due to enough resources/ support. Influence on seeking proper health care. Such barriers could contribute to more severe health problems and greater difficulties in controlling the outbreak. Impact on no. of detected cases, susceptible cases, and reported cases.
I faced so much discrimination in those days that people would go to the other direction if they saw me from afar, even months after I had fully recovered. ,	LXXIV, LXIV, LXXV	S (+) PO (+)	PTs (+)	Perceived as a threat of COVID-19 spreader (stigmatised) which create Outrage in community	COVID-19 stigma could prevent people from seeking COVID-19 testing and, if they test positive, from disclosing their contacts. COVID-19 stigma can also deter individuals from adopting certain precautionary or protective behaviours such as mask-wearing and seeking proper health care. Influence to follow the advice from family, friends, or Government, PHAs.

					Impact on no. of detected cases, susceptible cases, and reported cases.
We were not only denied rooms and food in the disease-hit districts but also on the way there and back to Kathmandu.	LXXIV, LXIV, LXXV	S (+) PO (+)	PTs (+) PBa (+)	Perceived as a threat of COVID-19 spreader (stigmatised) which create Outrage in community	COVID-19 stigma could prevent people from seeking COVID-19 testing and, if they test positive, from disclosing their contacts. COVID-19 stigma can also deter individuals from adopting certain precautionary or protective behaviours such as mask-wearing and seeking proper health care. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
When they found out that we were returning from districts with many cases of Covid-19, like Udayapur, Parsa and Jhapa, they even refused to talk to us. If we were treated like this, you can only imagine how much discrimination the locals might be encountering.	LXXIV, LXIV, LXXV, XXXII	S (+) PO (+) PHRC (-) PA (-)	PTs (+) PBa (+)	Perceived as a threat and stigmatised, created outrage due to lack of PHRC and PA snf discriminations on locals prevent them for taking preventive measures on COVID-19 spread (due to fear	COVID-19 stigma could prevent people from seeking COVID-19 testing and, if they test positive, from disclosing their contacts. COVID-19 stigma can also deter individuals from adopting certain precautionary or

				of discrimination) becomes a barrier.	protective behaviours such as mask-wearing and seeking proper health care. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
Several health workers were expelled from their room and denied food in hotels.	LXXIV, LXIV, LXXV	S (+) PO (+)	PBa (+) PTs (+)		COVID-19 stigma could prevent people from seeking COVID-19 testing and, if they test positive, from disclosing their contacts. COVID-19 stigma can also deter individuals from adopting certain precautionary or protective behaviours such as mask-wearing and seeking proper health care. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.

My health was fragile at that time. I was in self isolation. And on top of that, I was getting lots of hate online. At one time, I was starting to self-stigmatise myself as well and also …	IV, XIV, XX, XXIII, XXV, XXVIII, LXXIV, LXIV, LXXV, LIII, LV	S (+) PO (+)	PSe (+) CA (+) Se (+) PBf (+)		COVID-19 stigma could prevent people from seeking COVID-19 testing and, if they test positive, from disclosing their contacts. COVID-19 stigma can also deter individuals from adopting certain precautionary or protective behaviours such as mask-wearing and seeking proper health care. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
Most media never bothered to mention that I was responsible and had stayed in self-quarantine even before I tested positive. Instead, they made things up, saying I was roaming around, without quarantining myself…	IV, XIV, XX, XXIII, XXV, XXVIII, LXXIV, LXIV, LXXV, LIII, LV	PA (-) PHRC (-) PO (+) S (+)	CA (+/-) SE (+) PTs (+) PBf (+) PBa (+)	Media Mongering acts as threat and barrier for PA and PHRC	Influence to follow the advice from family, friends. Impact on no. of detected cases, susceptible cases, and reported cases.

I think people were angry towards me simply because the media failed to report accurately what I was doing before I tested positive."	IV, XIV, XX, XXIII, XXV, XXVIII, LXXIV, LXIV, LXXV, LIII, LV	PA (-) PHRC (-) PO (+) S (+)	CA (+/-) SE (+) PTs (+) PBf (+) PBa (+)	Even following preventive behaviours Media failed to provide accurate information and created self-stigmatised behaviour.	COVID-19 stigma could prevent people from seeking COVID-19 testing and, if they test positive, from disclosing their contacts. COVID-19 stigma can also deter individuals from adopting certain precautionary or protective behaviours such as mask-wearing and seeking proper health care. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
I have seen many of my friends get infected with the coronavirus. But the house owners are more dangerous than the virus because if they kick us out of their homes, where will we go?	IV, XIV, XX, XXIII, XXV, XXVIII, LXXIV, LXIV, LXXV, LIII, LV	S (+) PO (+)	CA (+) PSe (+) PTs (+) PBa (+)	Lack of PHRC in house owners created Stigmatised behaviours towards infected people.	COVID-19 stigma could prevent people from seeking COVID-19 testing and, if they test positive, from disclosing their contacts. COVID-19 stigma can also deter individuals from adopting certain precautionary or protective behaviours such as mask-wearing and seeking proper health care.

					Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
Nepal's media & social media must not fall prey to anti-Muslim propensity evident in some Indian media (particularly of northern India), as seen in the misreporting on two Janakpur women said to be spreading Covid-19 virus through saliva on rupee notes - proven wrong.	IV, XIV, XX, XXIII, XXV, XXVIII, LXXIV, LXIV, LXXV, LIII, LV	S (+) PO (+) PHRC (-) PA (-)	PTs (+) PBa (+) CA (-)	Misinformation by media report raised stigma towards race / culture religion and increased panic in people. Threat and Barrier for those people for getting support and care.	COVID-19 stigma could prevent people from seeking COVID-19 testing and, if they test positive, from disclosing their contacts. COVID-19 stigma can also deter individuals from adopting certain precautionary or protective behaviours such as mask-wearing and seeking proper health care. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
People did follow the queue system in the beginning as many were in fear of contracting the virus, but now most people seem to have lost the fear, so they cause a crowd at the shop.	XXVII, XXII, XXV, XXXIII, LIX, LVI, XLVIII LIII, LV, LX,	PO (+) PPR (+/-)	PBa (+/-) PTs (+/-) Se (+/-) PSu (+/-)	In Beginning N (+), fear of disease PSe+ PHRC +, PA + = people followed NPIs. Later PSe -, Fear -, = ignored NPIs posed threat and barrier.	Influence others to break rules. Influence seeking help from a professional or seeking proper health care.

	LXVI, LXVII, LXIX		PSe (+/-) PBf (+/-)		Impact on no. of detected cases, susceptible cases, and reported cases.
We don't have enough testing kits left; Government does not provide enough kits	LIV, L, LVII (-), XXIV (-)	AA (-) PO (+)	PBa (+)	Lack of resources creates barrier and threats in testing, PNIP and cases reported lower than actual, creates outrage.	Could restrict individuals to get proper health care due to lack enough resources/ support. Influence on providing proper health care. Influence on seeking proper health care. Such barriers could contribute to more severe health problems and greater difficulties in controlling the outbreak. Impact on no. of detected cases, susceptible cases, and reported cases.
Many people on social media expressed their frustrations at the lack of social distancing during the inauguration led by Prime Minister.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-),	AA (-) PO (+)	PBa (+) PTs (+)	Lack of proper compliance measures followed by authorities.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to break rules or influence to avoid the compliance measures. Influence seeking help from a professional or seeking proper health care. Influence to follow the advice from family, friends, or Government, PHAs.

					Impact on no. of detected cases, susceptible cases, and reported cases.
If Covid-19 cases continue to increase at current rate, Nepal's health infrastructure could easily be overwhelmed.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-),	AA (-) TA (-) PO (+)	PBa (+) PTs (+)	Lack or resources/ preparedness (act as threat and barriers), creates outrage and panic in people	Could restrict individuals to get proper health care due to lack enough resources/ support. Influence on providing proper health care. Influence on seeking proper health care. Such barriers could contribute to more severe health problems and greater difficulties in controlling the outbreak. Impact on no. of detected
Social distancing, the primary weapon to prevent the pandemic from spreading, is a privilege.	XXV, XXI, XXIX, XXXIX, XLII, XLV	PA (+) PHRC (+)	PBf (+) SE (+)	Sharing own experience about NPI (SE) is beneficial for spreading PA and PHRC.	Direct experience to outbreak increases self-efficacy, which leads to engagement in precautionary action. Influence to follow the advice from family, friends, or Government, PHAs. Influence seeking help from a professional or seeking proper health care.
Even though the number of Covid-19 cases in Nepal remains inexplicably stuck at one, doctors and public health experts warn of a potential disaster if measures aren't taken.	XXVII, XXII, XXV, XXXIII, LIX, LVI, XLVIII LIII,	PHRC (+) PA (+) PO (-)	PSu (+) PSe (+) PTs (+)	Effective PHRC and PA can reduce outrage and fear. Potential disaster (Threats of	Could restrict individuals to get proper health care due to lack enough resources/ support. Influence on providing proper health care.

	LV, LX, LXVI, LXVII, LXIX		PBf (+) CA (+) PBa (+)	COVID-19) if not taken measures (barrier)	Influence on seeking proper health care. Such barriers could contribute to more severe health problems and greater difficulties in controlling the outbreak. Impact on no. of detected
..government officials and politicians themselves have been organizing public gatherings and rallies. So ordinary people also have stopped taking the precautions.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-),	TA (-) AA (-) PO (+)	PBa (+) Se (-)	Lack of preparedness, negligence of AA pose threats and barrier (ordinary people stopped taking precautions)	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to break rules or influence to avoid the compliance measures. Influence seeking help from a professional or seeking proper health care. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
Both the government and the political parties have been engaged in the game of political one-upmanship at the expense of the public.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-),	TA (-) AA (-)	PBa (+)	Lack of preparedness, negligence of AA pose threats and barrier.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to break rules or influence to avoid the compliance measures.

					Influence seeking help from a professional or seeking proper health care. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
Contact tracing has been effective in preventing the virus' spread in many East Asian countries, but Nepal lacks the means to trace and adequate means to test.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-),	AA (-) PO(+) PPR (+) PNIP(+)	PBa (+)	Lack of preparedness, negligence of AA pose threats and barrier. PNIP, cases reported lower than actual.	Could restrict individuals to get proper health care due to lack enough resources/ support. Influence on providing proper health care. Influence on seeking proper health care. Such barriers could contribute to more severe health problems and greater difficulties in controlling the outbreak. Impact on no. of detected cases, susceptible cases, and reported cases
Health professionals in Nepal, especially doctors and nurses, who are on the frontline of the fight against COVID-19, are ill-equipped to treat #coronavirus patients, as they don't have adequate number of personal protective equipment.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-),	AA (-) PO (+)	PBa (+)	Lack or resources/ preparedness (act as threat and barriers).	Could restrict individuals to get proper health care due to lack enough resources/ support. Influence on providing proper health care. Influence on seeking proper health care.

					Such barriers could contribute to more severe health problems and greater difficulties in controlling the outbreak. Impact on no. of detected cases, susceptible cases, and reported cases
Nepal's health sector, which has limited stock of equipment to test coronavirus disease, is now facing another problem: shortage of kits to safely transport samples collected from suspected COVID-19 patients.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-),	AA (-) PO (+)	PBa (+)	Lack or enough resources/ preparedness (act as threat and barriers).	Could restrict individuals to get proper health care due to lack enough resources/ support. Influence on providing proper health care. Influence on seeking proper health care. Such barriers could contribute to more severe health problems and greater difficulties in controlling the outbreak. Impact on no. of detected cases, susceptible cases, and reported cases.
The central Government does not work but only gives instructions.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-)	AA (-) TA (-)	PBa (+)	Increase barrier for Health officials to work.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to break rules or influence to avoid the compliance measures. Influence seeking help from a professional or seeking proper health care.

					Influence to follow the advice from family, friends, or Government, PHAs.
					Impact on no. of detected cases, susceptible cases, and reported cases.
…as the crisis deepens, the state apparatuses, leaders and politicians seem to be doing little, if not nothing, to address the situation.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-)	AA (-) TA (-) PO (+)	PBa (+)	Lack or enough resources/ preparedness (act as threat and barriers).	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to break rules or influence to avoid the compliance measures. Influence seeking help from a professional or seeking proper health care. Could restrict individuals to get proper health care due to lack enough resources/ support. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
"If only the Oli government had allowed the local governments to work, the situation would not have come to this depressing point.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-)	AA (-) TA (-) PO (+)	PBa (+) PTs (+)	Lack or enough resources/ preparedness (act as threat and barriers).	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not.

					Influence to break rules or influence to avoid the compliance measures. Influence seeking help from a professional or seeking proper health care. Could restrict individuals to get proper health care due to lack enough resources/ support. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
Doctors say attributing Covid-19 deaths to pre-existing and underlying medical conditions is tantamount to refusing to recognise the real threat of the virus.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-)	PHRC (+) PA (+) PO (-)	PBf (+) CA (+) PSe (-) PSu (-) PBa (+) PTs (+)	PHRC and PA from Health official is beneficial however people's ignorance PSu-, PSe-, pose barrier and threats.	Could restrict individuals to get proper health care due to lack enough resources/ support. Influence on providing proper health care. Influence on seeking proper health care. Such barriers could contribute to more severe health problems and greater difficulties in controlling the outbreak. Impact on no. of detected cases, susceptible cases, and reported cases.

Doctors say if precautions are not taken, Nepal could see a massive surge in Covid-19 cases, burdening the country's already fragile and exhausted health care system.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-)	PHRC (+) PA (+) AA (-) PO (+/-)	PBa (+) PTs (+) CA (+)	Warn for preparedness for outbreak (PHRC and PA) due to lack of resources (threat and barrier)	Could restrict individuals to get proper health care due to lack enough resources/ support. Influence on providing proper health care. Influence on seeking proper health care. Such barriers could contribute to more severe health problems and greater difficulties in controlling the outbreak. Impact on no. of detected cases, susceptible cases, and reported cases.
On in four migrants returning from Delhi tests positive for Covid-19. What does it mean for Bihar? Also, what does it mean for Nepal, across the open border? Vital and urgent in both instances.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-),	PHRC (-) PA (-) PO (+)	PSu (+) PSe (+) PTs (+)	PHRC and PA necessary at individual level.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence seeking help from a professional or seeking proper health care. Could restrict individuals to get proper health care due to lack enough resources/ support. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.

What is significant, obviously, is not the number of Covid-19 dead but deaths per million population, so this list is instructive for now. In terms of cases on the timeline, India is going off the map, no flattening of the curve, and Nepal also seems vulnerable.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-),	PHRC (-) PA (-) PO (+)	PTs (+) PSe (+)	PHRC and PA necessary at individual level.	Influence seeking help from a professional or seeking proper health care. Could restrict individuals to get proper health care due to lack enough resources/ support. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
Covid-19 epidemic is yet to start in Nepal, experts say public health experts deem quarantine tests alone not enough to control the contagion and stress community tracing.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-),	PO (+) PPR (+) AA (-) PNIP (+)	PBa (+) PSe (+) PTs (+) CA (+)	Warn for preparedness for outbreak (PHRC and PA) due to lack of resources (threat and barrier) PNIP, cases reported lower than actual.	Influence seeking help from a professional or seeking proper health care. Could restrict individuals to get proper health care due to lack enough resources/ support. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
Experts say Covid-19 epidemic has not yet started in Nepal and performing tests only on people placed in quarantine does not help prevent the looming public health threat.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-),	PO (+) PPR (+) AA (-)	PBa (+) PSe (+) PTs (+)	Warn for preparedness for outbreak (PHRC and PA) due to lack of resources (threat and barrier).	Influence seeking help from a professional or seeking proper health care. Could restrict individuals to get proper health care due to lack enough resources/ support.

		PNIP (+)	CA (+)	PNIP, cases reported lower than actual.	Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
U gave credence to a 'report' that Indian Muslims planned to infiltrate after taking paracetamol to cover Covid-19 infection. No investigation as to origin of this cohort, u do not care to know how long Nepal airways have been closed. U quote DG Bihar, then pooh pooh his denial of ****	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-), LXIV, LXXIV, LXXV	S (+) PO (+) PHRC (-) PA (-) PNIP (+) PPR (+)	PBa (+) PTs (+)	Misinformation/ lack of credential information created stigma and discrimination towards Muslims.	Could raise stigma which further could prevent people from seeking COVID-19 testing and, if they test positive, from disclosing their contacts. COVID-19 stigma can also deter individuals from adopting certain precautionary or protective behaviours such as mask-wearing and seeking proper health care. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
We have not been able to sleep properly for the last three days due to the problems in oxygen management.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-)	AA (-)	PBa (+)	Lack or enough resources/ preparedness (act as threat and barriers).	Influence seeking help from a professional or seeking proper health care. Could restrict individuals to get proper health care due to lack enough resources/ support.

					Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
The Govt of Nepal has published 'Hazard Allowance Management Order for Human Resources Involved in the Treatment of COVID-19 Infection' in Nepal Gazette for its implementation.	XXXIII, XLVIII, LIV, L, LVII, XXIV	AA (+)	PBf (+) PBa (-)	Support for Health Workers encourage them to work for the support of COVID-19 Treatment	Influence seeking help from a professional or seeking proper health care. Influence to provide proper health care support. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
With the government throwing up its hands asking its citizens to protect themselves, local communities and neighbourhoods are setting up their own isolation wards and oxygen banks.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-)	AA (-) TA (-)	PBa (+)	Lack or enough resources/ preparedness (act as threat and barriers). Locals united for each other's SE+	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence seeking help from a professional or seeking proper health care. Could restrict individuals to get proper health care due to lack enough resources/ support. Influence to follow the advice from family, friends, or Government, PHAs.

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					Impact on no. of detected cases, susceptible cases, and reported cases.
Nepal Police's decision to deduct salaries for the Covid-19 fund has been roundly criticised by many who say that it is unjust for police personnel working long hours at meagre salaries to have their salaries deducted.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-), XXXIV	AA (-) PO (+)	PBa (+)	Lack or enough resources/ preparedness (act as threat and barriers will demotivate for security persons to work.	Could restrict individuals to get proper health care due to lack enough resources/ support. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
Despite having human resources and beds, we are not in a position to provide care to infected patients due to lack of oxygen.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-), XXXIV	AA (-) PO (+)	PBa (+)	Lack or enough resources/ preparedness (act as threat and barriers for treatment.	Influence seeking help from a professional or seeking proper health care. Could restrict individuals to get proper health care due to lack enough resources/ support. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
If the government is serious about saving lives, it should have brought oxygen plants and asked the hospitals to install them.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-), XXXIV	AA (-) PO (+)	PBa (+)	Lack or enough resources/ preparedness act as threat and barriers for treatment.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not.

					Influence to break rules or influence to avoid the compliance measures. Influence seeking help from a professional or seeking proper health care. Could restrict individuals to get proper health care due to lack enough resources/ support. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
In some places like remote villages of Kalikot district in Nepal there are no resources readily available. ,	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-), XXXIV	AA (-) PO (+)	PBa (+)	Lack or enough resources/ preparedness act as threat and barriers for treatment.	Influence seeking help from a professional or seeking proper health care. Could restrict individuals to get proper health care due to lack enough resources/ support. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.

Only in Nepal, a mass demonstration with sophisticated, clued-in slogans - "Expand PCR testing, End RDT testing, Transparency in Covid-19 spending.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-), XXXIV	AA (-) TA (-) PO (+)	PBa (+)	Lack or enough resources/ preparedness act as threat and barriers for treatment.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to break rules or influence to avoid the compliance measures. Influence seeking help from a professional or seeking proper health care. Could restrict individuals to get proper health care due to lack enough resources/ support. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
Hospitals cannot admit more Covid-19 patients because they don't have the necessary manpower, medical equipment, and medicines to treat them.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-), XXXIV	AA (-) TA (-) PO (+)	PBa (+)	Lack or enough resources/ preparedness act as threat and barriers for treatment.	Influence seeking help from a professional or seeking proper health care. Could restrict individuals to get proper health care due to lack enough resources/ support. Influence to follow the advice from family, friends, or Government, PHAs.

					Impact on no. of detected cases, susceptible cases, and reported cases.
This is a result of ignoring investment in health infrastructure not only by the incumbent government but also by previous ones and all are responsible for this.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-), XXXIV	AA (-) TA (-) PO (+)	PBa (+)	Lack or enough resources/ preparedness act as threat and barriers for public health responses.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to break rules or influence to avoid the compliance measures. Influence seeking help from a professional or seeking proper health care. Could restrict individuals to get proper health care due to lack enough resources/ support. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
The country is ill-prepared to handle the pandemic of this scale.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-), XXXIV	AA (-) TA (-) PO (+)	PBa (+)	Lack or enough resources/ preparedness act as threat and barriers for treatment.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to break rules or influence to avoid the compliance measures.

					Influence seeking help from a professional or seeking proper health care. Could restrict individuals to get proper health care due to lack enough resources/ support. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
Security personnel working in high-risk zone of Covid -19 lack proper safety gear Nepal Police personnel are being mobilised for contact tracing and transporting suspected patients to health facilities.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-), XXXIV	AA (-) PO (+)	PSe (+) PBa (+)	Lack or enough resources/ preparedness (act as barriers)	Could restrict individuals to get proper health care due to lack enough resources/ support. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
It will be very difficult to convince the people if they lose their confidence in the vaccines.. we had to struggle to convince people to take the drug for elephantiasis.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-), LIII	PHRC -) PA (-)	PBa (+) Se (-)	Difficult to convince (Barrier and convince i.e Se) for vaccinations due to lack of PHRC and PA	Influence to break rules or influence to avoid the compliance measures. Influence to get willingness to vaccinated. Influence seeking help from a professional or seeking proper health care.

					Could restrict individuals to get proper health care due to lack enough resources/ support. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
Business community criticised govt for not introducing concrete relief packages for businesses affected by COVID-19.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-), XXXIV	AA (-)	PBa (+)	Lack or enough resources/ preparedness (act as threat and barriers) Lack of capacity to follow NPIs.	Could restrict individuals to get proper health care due to lack enough resources/ support. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
"…the municipality refused to provide relief…"	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-), XXXIV	AA (-)	PBa (+)	Lack of capacity to follow NPIs.	Could restrict individuals to get proper health care due to lack enough resources/ support. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.

Already underfunded and overstretched, hospitals in Far-West Province struggle to cope with new #Covid wave.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-), XXXIV	AA (-) PO (+)	PBa (+) PTs (+)	Lack or enough resources/ preparedness (act as threat and barriers) Lack of capacity to follow NPIs.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to break rules or influence to avoid the compliance measures. Influence seeking help from a professional or seeking proper health care. Could restrict individuals to get proper health care due to lack enough resources/ support. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
Are the management competent to handle this pandemic crisis. We don't see any kind of arrangement. "Better late than never" quote will not work in this. Act fast with proper intelligence.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-), XXXIV	TA (-) AA (-) PO (+) PHRC (-)	PBa (+) PTs (+)	Lack or enough resources/capacity/preparedne ss (act as threat and barriers)	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to break rules or influence to avoid the compliance measures. Influence seeking help from a professional or seeking proper health care.

					Could restrict individuals to get proper health care due to lack enough resources/ support. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
Government falls even as Covid-19 peaks & PM Oli gives SOS call in #Guardian newspaper. How will Caretaker Govt get us vaccines, motivate health workers, ensure lockdown compliance, monitor open southern border?	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-), XXXIV	TA (-) AA (-) PA (-) PHRC (-) PO (+)	PBa (+)	Lack or enough resources/capacity/preparedness (act as threat and barriers)	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Delay in corrective actions, delays in information flows. Influence to break rules or influence to avoid the compliance measures. Influence seeking help from a professional or seeking proper health care. Could restrict individuals to get proper health care due to lack enough resources/ support. Increases the risk of environmental contamination, increase risk of transmission from environment, increases frequency of

					interpersonal contacts with infected or suspected people. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
Covid-19 infecting more children, but government reluctant to close schools.	XXVIII ,XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-), XXXIV	AA (-) PO (+) PNIP (+) PPR (+)	PBa (+) PTs (+) PSe (+) PSu (+)	Lack or enough resources/capacity/preparedne ss (act as threat and barriers)	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to break rules or influence to avoid the compliance measures. Influence seeking help from a professional or seeking proper health care. Could restrict individuals to get proper health care due to lack enough resources/ support. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.

Kathmandu experts reject Oxford University Covid-19 modelling for Nepal as alarmist and flawed.	XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-), XXXIV	TA (-) AA (-) PHRC (-) PA (-)	PBa (+) PTs (+)	Questions for Authorities' knowledge and preparedness. Misinformation to public from experts.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to break rules or influence to avoid the compliance measures. Influence seeking help from a professional or seeking proper health care. Could restrict individuals to get proper health care due to lack enough resources/ support. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
On the horns of a dilemma: Nepal wants to say it is open to the world, but Covid-19 cases are rising.	XXVIII ,XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-), XXXIV	PO (+) AA (-) PPR (+)	PBa (+) PTs (+/-) PSe (+/-)	Lack of enough preparedness from Government raises PO with PPR+ Confusion and fear from government responses.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to break rules or influence to avoid the compliance measures. Influence seeking help from a professional or seeking proper health care.

					Could restrict individuals to get proper health care due to lack enough resources/ support. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.
India ranks No. 4 on new cases of Covid-19 and *138th* in term of tests. Nepal may not be doing much better, but the open border looms as the point for dangerous entry of the virus. And the plains population is first on the line of vulnerability. Time to hit the crisis button.	XXVIII ,XXXIII, XLVIII, LIV, L, LVII (-), XXIV (-), XXXIV	PO (+) AA (-) PPR (+) PNIP (+)	PBa (+) PTs (+) PSe (+) Se (+)	Lack of enough preparedness from Government raises PO with PPR+ Confusion, threat, and fear from government responses.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to break rules or influence to avoid the compliance measures. Influence seeking help from a professional or seeking proper health care. Could restrict individuals to get proper health care due to lack enough resources/ support. Influence to follow the advice from family, friends, or Government, PHAs. Impact on no. of detected cases, susceptible cases, and reported cases.

A symbol will appear on the tracer app dashboard if users have at least one scan or manual entry every day for 14 days in a row. This is to provide extra motivation to keep your movements up to date. Yesterday, 15,000 app users earned their 14-day spiral.	I, II, IV,VI VII, XII, XXI, XXIX, XXXVI XXXVII, XLIII, XLIV, XLV, LXV, LXXI	PHRC (+) PA (+) PO (-)	Se (+) PBf (+) CA (+)	PHRC and PA reduces public outrage and motivate people to follow NPIs (SE+) is beneficial.	Influence to follow the advice from family, friends, or Government, PHAs. Influence to get tested or not Seeking help from a professional Impact on no. of detected cases, susceptible cases, and reported cases.
We don't have this information. Research into how protective the vaccine is against the new forms (variants) of the virus are continuing. However, studies suggest that the Pfizer/BioNTech vaccine will still provide substantial protection against new variants.	L, LIII (-), LIV (-), LV (+/-), LVII XLIII, XLIV, XLV	AA (+) PHRC (+) PA (+) PO (-)	PBf (+) CA (+)	Response from Authorities with accurate information through PHRC and PA reduces public outrage.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence on willingness to get vaccinated or not. Influence to follow the rules with proper communication. Reduce confusion.
Kia ora, you can find all vaccination locations in the Auckland and Northland area on their website here: https://t.co/XfaboH0Shs Please note that as the rollout scales up, more will be opening to make it as easy as possible for everyone to get their vaccines.	L, LIII (-), LIV (-), LV (+/-), LVII XLIII, XLIV, XLV	AA (+) PHRC (+) PA (+) PO (-)	PBf (+) CA (+)	Response from Authorities with accurate information through PHRC and PA reduces public outrage.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence on willingness to get vaccinated or not. Reduce confusion.
Please do not report others who you think are disregarding the mask requirement. They may	L, LIII (-), LIV (-), LV (+/-), LVII XLIII,	PHRC (+) PA (+)	PBf (+) CA (+)	Response from Authorities with accurate information through PHRC and PA	Reduce confusion as well as some sort of stigmatised behaviour.

have a valid reason for not wearing a mask. Wearing is caring.	XLIV, XLV, LXXIV (-), LXXV (-)	PO (-) S (-)		reduces public outrage and fear/ stigma.	Influence to follow the rules with proper communication. Influence on following the recommended behaviours from health authorities and spread knowledge about such measures.
We all need to continue to play our part to keep safe, this means you must stay home if you're sick, use the NZ COVID tracer app to scan everywhere you go and turn your Bluetooth on.	L, LIII (-), LIV (-), LV (+/-), LVII XLIII, XLIV, XLV, LXXIV (-), LXXV (-)	PHRC (+) PA (+) PO (-)	PBf (+) CA (+) SE (+)	Response from Authorities with accurate information through PHRC and PA encourage people follow NPIs. SE+ (individual plus population level)	Influence on following the recommended behaviours from health authorities and spread knowledge/ proper communication about such measures.
Public health officials are in daily communication with all contacts to monitor their health and confirm any upcoming testing dates.	L, LIII (-), LIV (-), LV (+/-), LVII XLIII, XLIV, XLV	PHRC (+) PA (+) PO (-)	PBf (+) CA (+) SE (+)	Response from Authorities with accurate information through PHRC and PA encourage people follow NPIs. SE+ (individual plus population level)	Influence on following the recommended behaviours from health authorities and spread knowledge/ proper communication about such measures.. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
If you are concerned they are breaching Alert Level requirements, you can report non-compliance.	L, LIII (-), LIV (-), LV (+/-), LVII	PO (+/-) PPR (+)	PSu (-) PBa (+/-)	Ignorance of people (PSu+) create outrage, threat to others	Influence on following the recommended behaviours from health authorities and spread

	XLIII, XLIV, XLV		PTs (+/-)	can be reduced (i.e., PBa-, PTs-) by PHRC and PA.	knowledge/ proper communication about such measures. Reduce confusion/ outrage. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
**** has it wrong, she is a horrible communicator. She has the majority of the country thinking that we're on lock down to get rid of this virus, and if it's not gone by then, it will be the people's fault.	L, LVII, LXV, lXX, LXXI, LXXII, LXXII	PO (+) PHRC (-) TA (+) AA (+/-)	PBa (+/-) PTs (+/-) SE	AA+ and PHRC reduces PO and misinformation which was a Barrier and threat and encourage people to follow NPIs.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence on following the recommended behaviours from health authorities and spread knowledge/ proper communication about such measures. Influence seeking help from a professional or seeking proper health care.
It's incredibly important that people keep a record of where they've been. Scanning in can help support contact tracers in tracing potential close and casual contacts of people who have tested positive for COVID-19.	I, II, IV,VI VII, XII, XXI, XXIX, XXXVI XXXVII, XLIII, XLIV, XLV, LXV, LXXI	PHRC (+) PA (+)	PBf (+) CA (+) SE (+)	Response from Authorities with accurate information through PHRC and PA encourage people follow NPIs. SE+ (individual plus population level)	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence on following the recommended behaviours from health authorities and spread knowledge/ proper communication about such measures.

					Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
Thanks for letting us know! Misinformation works against us at a time when we need to work together to beat the virus. We encourage you to also report any scams or misinformation.	L, LIII (-), LIV (-), LV (+/-), LVII XLIII, XLIV, XLV	PO (+/-) PHRC (+) PA (+)	PBa (+/-) CA (+) Se (+)	AA+ and PHRC reduces PO and misinformation which was a Barrier, fear and threat and encourage people to follow NPIs.	Influence on following the recommended behaviours from health authorities and spread knowledge/ proper communication about such measures. Reduce confusion/ outrage. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
Running ads on the radio, and TV from tonight about the change in Alert Levels and new mask requirements.	L, LIII (-), LIV (-), LV (+/-), LVII XLIII, XLIV, XLV	PHRC (+) PA (+)	PBf (+) CA (+) Se (+)	Response from Authorities with accurate information through PHRC and PA encourage people follow NPIs. SE+ (individual plus population level)	Influence on following the recommended behaviours from health authorities and spread knowledge/ proper communication about such measures. Reduce confusion/ outrage. Influence to follow rules/compliance measures Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
Police have established road checkpoints, which will be in place until midnight tomorrow.	I, II, IV,VI	AA (+)	PBf (+)	Response from Authorities with accurate information	Influence on following the recommended behaviours from health authorities and spread

	VII, XII, XXI, XXIX, XXXVI XXXVII, XLIII, XLIV, XLV, LXV, LXXI	PHRC (+) PA (+)	PBa (-) CA (+) Se (+)	through PHRC and PA encourage people follow NPIs. SE+ (individual plus population level)	knowledge/ proper communication about such measures. Reduce confusion/ outrage. Influence to follow rules/compliance measures. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
***We do still have advance purchase agreements in place for 3 other vaccines (Janssen, AstraZeneca and Novavax), but none of these are approved for use in New Zealand yet. If approved, they may be used for people who are unable to take the Pfizer/BioNTech vaccine.	L, LIII (-), LIV (-), LV (+/-), LVII XLIII, XLIV, XLV	PHRC (+) PA (+) PO (-)	PBf (+) PBa (-) CA (+) Se (+)	Response from Authorities with accurate information through PHRC and PA encourage people follow NPIs. SE+ (individual plus population level)	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence on willingness to get vaccinated or not. Influence to follow the rules with proper communication. Reduce confusion.
Pre-departure testing is an extra layer of protection, and the fact we are picking up positive cases at the border means that our lines of defence are working. Tests can be taken too early in the infection to be detected and the virus can be caught in transit.	L, LIII (-), LIV (-), LV (+/-), LVII XLIII, XLIV, XLV	PHRC (+) PA (+) PO (-)	PBf (+) CA (+) Se(+) PBa (-)	Response from Authorities with accurate information through PHRC and PA encourage people follow NPIs. SE+ (individual plus population level). Reduce misinformation / misconceptions	Influence on following the recommended behaviours from health authorities and spread knowledge/ proper communication about such measures. Reduce confusion/ outrage. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
***Any service selling any essential items should be allowed to sell those items. Put a restriction on	L, LIII , LIV, LV,	PO (+)	PBa (+)	PHRC and PA is required to reduce PO in people.	Influence on following the recommended behaviours from health authorities and spread

non-essentials, that's fine. But having essential items locked away in inaccessible stores is idiotic and increases the risk to the country.	LVII , XLIII, XLIV, XLV	AA (-)	PTs (-) PSe (-) PSu (-)	AA (-) questionable due to lack of proper response and proper communication/information, chance of violation of rules/NPIs.	knowledge/ proper communication about such measures. Reduce confusion/ outrage. Influence to follow or break rules/compliance measures. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
Border and MIQ staff have now supported more than 120,000 people to safely cross the border to life in New Zealand, all while protecting our communities. Arohanui to those working hard to keep us all safe ♡	XXIX, XXXVI XXXVII, XLIII, XLIV, XLV, LXV, LXXI	PHRC (+) PA (+) AA (+)	PBf (+) CA (+) Se (+)	Response from Authorities with accurate information through PHRC and PA encourage people follow NPIs. SE+ (individual plus population level), increase Motivation plus support.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence on following the recommended behaviours from health authorities and spread knowledge/ proper communication about such measures. Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
Both the Ministry and DHB are thanking a member of the public with strong technical skills for the prompt alert after they detected a security	XXIX, XXXVI	PHRC (+) PA (+)	PBf (+) CA (+)	Response from Authorities with accurate information through PHRC and PA	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not.

vulnerability in the code and then were able to view contact details of those who had already booked.	XXXVII, XLIII, XLIV, XLV, LXV, LXXI	AA (+)	Se (+)	encourage people follow NPIs. SE+ (individual plus population level), increase Motivation plus support. Reduce PO by effective PHRC.	Influence on following the recommended behaviours from health authorities and spread knowledge/ proper communication about such measures. Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
We have planned for the likelihood of further community outbreaks and have activated our national resurgence plan. We have stamped out the virus before and we can do it again. COVID-19 UPDATE There is one new case of COVID-19 in the South Auckland community.	XXIX, XXXVI XXXVII, XLIII, XLIV, XLV, LXV, LXXI	PHRC (+) PA (+) AA (+) TA (+) PO (-)	PBf (+) CA (+) Se (+)	Preparedness from authorities and response from Authorities with accurate information through PHRC and PA encourage people follow NPIs. SE+ (individual plus population level), increase Motivation plus support. Reduce PO by effective PHRC.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence on following the recommended behaviours from health authorities and spread knowledge/ proper communication about such measures. Reduce confusion. Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases..

It's clear you don't care about the wellbeing of this country. #notakiwi.	XLVIII, XXIII	PO (+)	PSu (-) PSe (-) PBa (+) PTs (+)	Ignorance of individual pose threats and barriers for NPI (disobey of rule is likely more) and create fear and outrage.	Influence to follow or break rules/compliance measures. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
****** No one is spreading fear (apart from maybe the government). It's very clear the warehouse was shut down because of social justice pressure. Not because of an intelligent thought-out plan.	XXIII, XLVIII, LIV, LV, L LVII (-)	TA (-) AA (-)	PBa (+)	Misinformation, dissatisfaction, and lack of trust in government pose threats and barrier in imposing NPIs and disobey of rule is likely to be higher.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to follow o break rules/compliance measures. Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases..
@jacindaardern Pretty sick of your horrible decisions, this isn't about keeping us safe. This is about social control and manipulation. Your gov is horrible and you're an embarrassment.	XXIII, XLVIII, LIV, LV, L LVII (-)	TA (-) AA (-) PO (+)	PBa (+)	Misinformation, dissatisfaction, and lack of trust in government pose threats and barrier in imposing NPIs and disobey of rule is likely to be higher.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to follow o break rules/compliance measures.

					Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases..
The vaccine has been approved by Medsafe, who evaluates applications for all new medicines, including vaccines. They must comply with international standards and local requirements for quality, safety, and efficacy before they can be approved and used in New Zealand.	L, LIII (-), LIV (-), LV (+/-), LVII XLIII, XLIV, XLV	PHRC (+) PA (+) PO (-)	PBf (+) PBa (-) CA (+) Se (+)	Response from Authorities with accurate information through PHRC and PA encourage people follow NPIs. SE+ (individual plus population level)	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence on willingness to get vaccinated or not. Influence to follow the rules with proper communication. Reduce confusion.
A person who has a medical condition that prevents them from wearing a mask or face covering safely or comfortably – this includes people with asthma or a disability.	L, LIII (-), LIV (-), LV (+/-), LVII XLIII, XLIV, XLV, LXXIV (-), LXXV (-)	PHRC (+) PA (+) AA (+) PPR (+) PNIP (+) PO (+/-) S (-)	PSe (+) PBf (+) CA (+) Se (+) PTs (+/-)	Response from Authorities with accurate information through PHRC and PA encourage people follow NPIs. SE+ (individual plus population level). Reduces confusion and stigma.	Reduce confusion as well as some sort of stigmatised behaviour. Influence to follow the rules with proper communication. Influence seeking help from a professional or seeking proper health care Influence on following the recommended behaviours from health authorities and spread knowledge about such measures.

It's important to reiterate that historical cases are not considered to be infectious.	LXXIV (+/-), LXXV (+/-), LXV, XXV,	PHRC (+) PA (+) PO (+/-) S (-)	PTS (+/-) PBf (+) CA (+) PBa (-)	Response from Authorities with accurate information through PHRC and PA encourage people follow NPIs. SE+ (individual plus population level). Reduces confusion, threats, and barrier.	Influence on following the recommended behaviours from health authorities and spread knowledge/ proper communication about such measures. Reduce confusion. Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
While it's encouraging to see another day without any community cases, we must all remain vigilant and continue to do our bit.	XXIV, XXXVI, XXXV, XXIX, XXVIII, XLII, XLV, XLVII, L, LII, LVII	PHRC (+) PA (+) PNIP (-) PO (-)	PBf (+) CA (+) PS (+)	Response from Authorities with accurate information through PHRC and PA encourage people follow NPIs. SE+ (individual plus population level)	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence to follow or break rules/compliance measures. Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases..
The flyer is full of misinformation, and we encourage you dispose of it responsibly. We	LIV (-), LV (-), LIII (-)	PO (+/-) PHRC (+)	PBa (+/-) CA (+)	AA+ and PHRC reduces PO and misinformation which was a Barrier, fear and threat and	Influence on following the recommended behaviours from health authorities and spread

encourage you to report any scams or misinformation to CERTNZ.	LVII, L, XLIII	PA (+)	Se (+)	encourage people to follow NPIs.	knowledge/ proper communication about such measures. Reduce confusion/ outrage. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
Due to a surge in testing, there may be a delay in processing tests. Please continue to isolate until you have received a negative result.	XXIV, XXXVI, XXXV, XXIX, XXVIII, XLII, XLV, XLVII, L, LII, LVII, LXXIV (-), LXXV (-)	PPR (+) PNIP (+) PO (+/-) PHRC (+) PA (+)	PBf (+) CA (+)	PO caused due to confusion can be reduced with effective PHRC and PA.	Influence to follow the rules with proper communication. Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.. Influence on following the recommended behaviours from health authorities and spread knowledge about such measures.
There is a range of other support listed on the Ministry of Health website. Now more than ever, people in Auckland need to look out for each other. We appreciate what you are doing is for the benefit for all of us.	XXIV, XXV, LVII, L, XLV, XLIV, XLIII	PHRC (+) PA (+) AA (+)	PBf (+) CA (+) Se (+)	Response from Authorities with accurate information through PHRC and PA encourage people follow NPIs. SE+ (individual plus population level)	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence seeking help from a professional or seeking proper health care.

					Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.. Influence on following the recommended behaviours from health authorities and spread knowledge about such measures.
At 11am today, media are invited to hear from @minhealthnz about research undertaken to learn more about public attitudes and sentiment towards COVID-19 vaccines. Panellists will share key findings from the research, ahead of the first immunisations this weekend.	L, LIII (-), LIV (-), LV (+/-), LVII XLIII, XLIV, XLV, XLIII, XLIV	PHRC (+) PA (+) AA (+)	PBf (+) PBa (-) CA (+) Se (+)	Response from Authorities with accurate information through PHRC and PA encourage people follow NPIs. SE+ (individual plus population level), reduces misinformation that acts as barrier and threats.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Reduce misinformation, confusion. Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.. Influence on following the recommended behaviours from health authorities and spread knowledge about such measures.
All arguments aside about vaccines, your girlfriend sounds like a ****!	XLVIII, XXXII, XXXIII,	PHRC (-) PA (-) PO (+)	PTs (+) PBa (+)	Misinformation caused due to conspiracy theories acts as threat and barrier. Need effective PHRC and PA.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not.

	XXV, XXIII (+/-)				Influence on willingness to get vaccinated or not. Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases..
You spread hate, misinformation, and lies. If you're going to call someone a bigot, PROVE IT. But you don't, because you can't. The only person who isn't accepting of other people's ideas and values is you. Disgusting human being you are.	XXXII, XXI (+/-), XXV, XXXIII, XLVIII, LIII(+/-), LV(-/+)	PHRC (-) PA (-) TA (-) PA (-) PO (+)	PTs (+) PBa (+)	Misinformation caused due to conspiracy theories acts as threat and barrier, increase stigma. Need effective PHRC and PA.	Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.. Influence on following the recommended behaviours from health authorities and spread knowledge about such measures.
There is no risk of infection from COVID-19 in wastewater.	LIII (+/-), LV (+/-), XLIII	PO (-) PHRC (+) PA (+)	PBf (+) PT (-) PSe (+) CA (+)	Response from Authorities with accurate information through PHRC and PA reduces fear in public.	Influence on following the recommended behaviours from health authorities and spread knowledge about such measures. Influence seeking help from a professional or seeking proper health care.

					Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
***It's a shame that both sides are so very dumb sometimes. Being vaccinated doesn't mean you instantly destroy the virus the moment you come in contact with it. You are still able to spread it to some degree. Let's have some common sense when it comes to health. No politics.	XXXII, XXI (+/-), XXV, XXXIII, XLVIII, LIII(+/-), LV(-/+)	AA (-) TA (-) PA (-) PHRC (-) PO (+)	CA (-) PBa (+)	Misinformation caused due to conspiracy, lack of PA, PHRC acts as threat and barrier, increase stigma. Need effective PHRC and PA.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence on willingness to get vaccinated or not. Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases..
There's a lot of information on social media - it's overwhelming and hard to know what's reliable.	XXXII, XXI (+/-), XXV, XXXIII, XLVIII, LIII(+/-), LV(-/+)	PA (-) PHRC (-) PO (-)	CA (-) PBa (+)	Overwhelming, media mongering, and lack of reliable information acts as threat and barrier, creates outrage in people. Need effective PHRC and PA.	Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases..
A plan that relies on 4.8 million people to be obedient is a failed plan to begin with. People will	II, IV, XIV, XXVIII, XXXII, XXV, XXI	AA (-) TA (-)	CA (-) PTs (+)	Misinformation, dissatisfaction, and lack of trust in government pose threats and barrier in imposing	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not.

go out regardless. That is why it's better to spread them out.	(+/-), XXXIII, XLVIII, LIV, LV, L, LVII, LIII	PHRC (-) PA (-) PO (+)	PBa (+)	NPIs and disobey of rule is likely to be higher. Need effective PHRC and PA.	Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases..
Very little has been said about testing, even though testing has been key in all the countries on top of this pandemic. Decisions have been made late and are now making New Zealanders more financially reliant on the government than ever before.	LIV, LV, L, LVII, XLIII (-), LIV, LIII, XXXII, XXIV (-), XXVIII	AA (-) TA (-) PO (+)	PBa (+)	Misinformation, dissatisfaction, and lack of trust in government pose threats and barrier in imposing NPIs and disobey of rule is likely to be higher. Need effective PHRC and PA.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases..
We acknowledge and appreciate the hard work and commitment of nurses in all settings, including our hospitals, primary care, in community settings and in aged residential care.	XXIX, XXXVI XXXVII, XLIII, XLIV, XLV, LXV, LXXI	A (+)	PBf (+) CA (+) SE (+)	Response from Authorities with accurate information through PHRC and PA encourage people follow NPIs. SE+ (individual plus population level), increase Motivation plus support.	Influenced how they viewed the measures and authorities which eventually, affect whether to comply or not. Influence on following the recommended behaviours from health authorities and spread knowledge/ proper communication about such measures. Influence seeking help from a professional or seeking proper health care.

					Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
It is important we continue to stay vigilant, by keeping a record of where we have been by scanning QR codes and turning on Bluetooth using the NZ COVID Tracer app or keep manual diaries.	VII, XII, XXI, XXIX, XXXVI XXXVII, XLIII, XLIV, XLV, LXV, LXXI,	PHRC (+) PA (+) PO (-)	PBf (+) CA (+) Se (+)	Response from Authorities with accurate information through PHRC and PA encourage people follow NPIs. SE+ (individual plus population level), increase Motivation plus support.	Influence on following the recommended behaviours from health authorities and spread knowledge/ proper communication about such measures. Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
Yup, more typical garbage reporting from ZB. Is he not allowed a Christmas holiday? are you so dumb to think that the covid relief relies entirely on him? Morons	XXIV (-), XVIII, XXXII, XXXIV, LVII (-), LIV, LV, L, XLVIII, LI	AA (-) PO (+)	PBa (+)	Misinformation, dissatisfaction, and lack of trust in government pose threats and barrier in imposing NPIs and disobey of rule is likely to be higher.	Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
This person has done the right things – they've been regularly tested at their workplace, & we know they've been using the NZ COVID Tracer app, with Bluetooth turned on.	XLIII, XXV, XXIV, XXVIII, XXXVI,	PO (-) S (-) PHRC (+)	PBf (+) PTs (-) PSe (+)	Response from Authorities with accurate information through PHRC and PA reduces fear, outrage in public.	Influence seeking help from a professional or seeking proper health care.

	XXVI, XIV, XLVII, XLV, XLII, LV(-), LXIII, LXXIV (+/-), LXXV (+/-) , LXI	PA (+)	CA (+)		Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
While the investigation is underway, as a precaution, a local childcare centre is being closed for the rest of the week.	VII, XII, XXI, XXIX, XXXVI XXXVII, XLIII, XLIV, XLV, LXV, LXXI	PO (+) PHRC (+) AA (+) PA (+)	PBf (+) PSe (+) CA (+)	Response from Authorities with accurate information through PHRC and PA reduces fear, outrage in public.	Influenced how they viewed the measures and authorities handle responses determines which eventually, affect whether to comply or not. Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
Anyone who thinks it's possible to cut off this virus isn't paying attention. Eradicating this virus in nz only sets us up for a larger second wave. It needs to be trickled into the country to allow our medical system to beef up and handle it. We'll all get this virus eventually.	LXXIII, LXXII, LXXI , LXX, LXVIII, LXIII, LXI, LVII, L, XLV, XLIII,	PO (+) PHRC (-) AA (-) TA (-) PA (-)	PBf (+) PTs (+) PSe (+) CA (-)	Response from Authorities with accurate information through PHRC and PA reduces fear, outrage in public. Ignorance of People (PSu-) creates PO+	Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.

	XLII, XXV, XXXIII, XXXII, XVIII, XLIX,				
@jacindaardern Don't be a fool to the media. Many New Zealanders are unhappy with the way she is running the country. There is far more to NZ than covid and we're failing in many ways.		TA (-) AA (-) PO (-)	PBa (+)	Misinformation, dissatisfaction, and lack of trust in government pose threats and barrier in imposing NPIs and disobey of rule is likely to be higher.	Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases. Influence to follow or break rules/compliance measures.
Let's not forget that while locking down the country may be the lesser of two evils, it's still an evil. Our economy will suffer, society will suffer, and you will suffer. 0.004% of New Zealanders have the virus, but 100% of us will feel the effect. #nzlockdown	LXXIII, LXXII, LXXI , LXX, LXVIII, LXIII, LXI, LVII, L, XLV, XLIII, XLII, XXV, XXXIII, XXXII,	PO (+) PA (-) PHRC (-)	PBa (-)	Response from Authorities with accurate information through PHRC and PA reduces fear, outrage in public.	Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.

	XVIII, XLIX,				
Cindy and the media tell one story, the facts tell another.	LXXIII, LXXII, LXXI , LXX, LXVIII, LXIII, LXI, LVII, L, XLV, XLIII, XLII, XXV, XXXIII, XXXII, XVIII, XLIX,	PO (+) TA (-) AA (-) PHRC (-) PA (-)	PBa (+) CA (-)	Misinformation, dissatisfaction, lack of trust in government, and media mongering pose threats and barrier (Creates outrage in people) in imposing NPIs and disobey of rule is likely to be higher.	Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases. Influence to follow or break rules/compliance measures.
Same result in NZ, Very VERY few people wear masks here, less than 1% in public. Social distancing is the key, not masks.	LXXIII, LXXII, LXXI , LXX, LXVIII, LXIII, LXI, LVII, L, XLV, XLIII, XLII, XXV, XXXIII,	PO (+) PHRC (-) PA (-)	PSe (-) CA (-) PBa (+) PTs (-) Se (-)	Misinformation, fear pose threats and barrier (Creates outrage in people) in imposing NPIs and disobey of rule is likely to be higher even there is some rule follower.	Influence to follow or break rules/compliance measures. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.

	XXXII, XVIII, XLIX,				
Nope, not going to happen. If you give me good reason to use such an app, and suggest it, I'll use it. But I won't be forced to use a tracing app.	LXXIII (-), L, XXXIII, XXXII, XVIII, XLIX, LIV, LV, LVII (-)	PA (-) PHRC (-) PO (+)	CA (-) PBa (+) Se (-)	Misinformation, dissatisfaction, lack of trust in government, media mongering, lack of PA, PHRC, ignorance (PSu-) pose threats and barrier in imposing NPIs and disobey of rule is likely to be higher even there is some rule follower.	Influence seeking help from a professional or seeking proper health care. Influence to follow or break rules/compliance measures. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
*** Words mean nothing, actions mean everything. Where is the action? If listening is all we should do, then it's no wonder nz voted back in this liar of a pm.	LXXIII (-), L, XXXIII, XXXII, XVIII, XLIX, LIV, LV, LVII (-)	PO (+) TA (-) AA (-)	PBa (+)	Misinformation, dissatisfaction, lack of trust in government, media mongering, lack of PA, PHRC pose threats and barrier in imposing NPIs and disobey of rule is likely to be higher.	Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases. Influence to follow or break rules/compliance measures.
Fear has turned people irrational, afraid to go outside their homes. They are treating this as an airborne threat when it clearly is not. The vast	XXVIII, XXXI, XXVI, XXXVI,	PO (+) PPR (+) PHRC (-)	PBa (+) PTs (+) CA (-)	Misinformation, media mongering, conspiracy theories, confusion, lack of	Influence seeking help from a professional or seeking proper health care.

majority of cases in our country were imported with a staggeringly low local transmission rate.		PA (-) PNIP (+) PPR (+)		PA, PHRC pose threats and barrier	Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
@dbongino and the cops sat there and did nothing, wtf.	L, LIII, LIV, LV, LVII (-), LXVII, LXVI, LXXIII (-), LXXII (-)	PO (+) AA (-)	PBa (+) PTs (+)	TA (-) and AA (-) questionable due to lack of proper response and proper response and preparedness pose threats and barrier in imposing NPIs and disobey of rule is likely to be higher.	Influenced how they viewed the measures and authorities handle responses determines which eventually, affect whether to comply or not. Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
Congratulations to Emirates Team New Zealand! We're sure they will continue to wash their hands and keep scanning QR codes.	XLIII, XLV, XLVII, XLI, XXXIX	PA (+)	PBf (+) Se (+)	Sharing positive information and motivations encourage others to follow NPIs (beneficial).	Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
When the quarantine and border facilities succeed or fail, that is the doing of the gov, either way. If Covid goes crazy in the community, or is suppressed, that is the public's doing, either way. Please engage your brain a little.	L, LIV, LIII, LIV, LVII, XXXII, XXXIII, XXV, XXIV, XLII,	PA (+)	PBf (+) CA (+) PBa (-)	Misinformation, dissatisfaction, lack of trust in government, lack of PA, PHRC, ignorance (PSu-) pose threats and barrier in imposing	Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. detected cases, susceptible cases, and reported cases.

	XLVIII, LXXIII (+/-)			NPIs and disobey of rule is likely to be higher.	
She says there is a lot of misunderstanding in the community about what they do. While on the frontline of a 'Viral World War', they have the right equipment & processes to protect the public.	L, LIV, LIII, LIV, LVII, XXXII, XXXIII, XXV, XXIV, XLII, XLVIII, LXXIII (+/-)	PO (+/-) AA (+)	PBa (+/-) PBf (+)	Overwhelming information, misinformation, media mongering, misunderstanding pose threats and barrier (Creates outrage in people). AA+ PHRC, PA reduces PO. Preparedness and sufficient resources (Benefits).	Influence seeking help from a professional or seeking proper health care. Influence to follow or break rules/compliance measures. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
We're lucky to work with some very talented people! ♡	XXIX, XXXVI XXXVII, XLIII, XLIV, XLV, LXV, LXXI	AA (+)	PBf (+)	Efficient and proper resources motivate people to follow/support NPIs (Benefit)	Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
@irrhetorical You're not wrong, the plan put in place definitely feels like a partial lock down, and the New Zealand people have already been blamed for its failure by our PM.	L, LIV, LIII, LIV, LVII, XXXII, XXXIII, XXV, XXIV, XLII,	PO (+) AA (-)	PBa (+)	Misinformation, media mongering, misunderstanding pose threats and barrier (Creates outrage in people). AA+ PHRC, PA reduces PO. Preparedness and sufficient resources (Benefits).	Influenced how they viewed the measures and authorities handle responses determines which eventually, affect whether to comply or not. Influence seeking help from a professional or seeking proper health care.

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	XLVIII, LXXIII (+/-)				Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
Great to hear! Thank you for getting a test.	XLVII, XLV, XLII, XL, XXXIX, XXVI	PA (+)	CA (+) SE (+) PBf (+)	Sharing positive information and motivations encourage others to follow NPIs (beneficial).	Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
Smokers are in the high-risk category for covid-19. Why aren't cigarettes being pulled from shelves? Are these items considered essential?	XXXII, XXXIII, XXI(-), XLVIII, LIII, LV	PPR (+) PO (+) PHRC (-) PA (-)	PTs (+) PSe (+) PSu (+) CA (-) PBa (+)	Misinformation, misunderstanding pose threats and barrier (Creates outrage in people). PHRC, PA reduces PO. People sharing positive information becomes beneficial.	Influence seeking help from a professional or seeking proper health care. Influence to follow or break rules/compliance measures. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
You don't need to "catch" it to spread it, contact is enough.	XXXII, XXXIII, XXI (+/-), XXV, XLVIII	PO (-) PA (+)	CA (+) PBf (+)	Misinformation, misunderstanding pose threats and barrier (Creates outrage in people). PHRC, PA reduces PO. People sharing positive information becomes beneficial.	Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.

People wouldn't try to minimize it if she wasn't trying to glorify it.	XXIX, XXXVI XXXVII, XLIII, XLIV, XLV, LXV, LXXI	AA (+) PO (-)	PBf (+)	Response from Authorities with accurate information through PHRC and PA reduces fear, outrage in public.	Influence seeking help from a professional or seeking proper health care. Influence to follow or break rules/compliance measures. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
I've done the mathematical simulations, more open stores = more separation = less risk for the public. The number of open stores does not change the demand. Clearly basic math is beyond you.	XXIX, XXXVI XXXVII, XLIII, XLIV, XLV, LXV, LXXI, LIV (-), LV (-), LIII (-)	PO (-) PHRC (+) PA (+)	CA (-) PBa (+)		Influence seeking help from a professional or seeking proper health care. Influence to follow or break rules/compliance measures. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
You have a weak mind, and a weak soul. Masks are good, but anyone with half a brain knows most surface contact and touch is the major cause of infection here. To blame others for not wearing masks only shows you are incapable of thinking for yourself. Weak little man.	XXXII, XXXIII, XXI(-), XLVIII, LIII, LV	PHRC (-) PA (-)	PSu (-) PBa (+) CA (-) PBf (+)	Ignorance of people (PSu-), misinformation creates threats and barriers. Proper and accurate information (PHRC, PA) reduces fear and threats, outrage.	Influence seeking help from a professional or seeking proper health care. Influence to follow or break rules/compliance measures. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.

Some promises are worth breaking. Our government does it all the time :)	LXXIII (-), L, XXXIII, XXXII, XVIII, XLIX, LIV, LV, LVII (-)	AA (-) TA (-)	PBa (+)	TA (-) and AA (-) questionable due to lack of proper response, preparedness pose, ignorance of people (PSu-) threats and barrier in imposing NPIs and disobey of rule is likely to be higher.	Influence to follow or break rules/compliance measures. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
Fear mongering has no place in this situation. But that shouldn't stop people from asking the hard questions about the destruction this will cause our economy. It's a discussion that needs to be had now. Your livelihood is just as important as your health.	L, LIV, LIII, LIV, LVII, XXXII, XXXIII, XXV, XXIV, XLII, XLVIII, LXXIII (+/-)	PA (+) PHRC (+) PO (-)	PBa (-) PBf (+) CA (+)	Misinformation, media mongering, misunderstanding pose threats and barrier (Creates outrage in people PO+). AA+ PHRC, PA reduces PO (Benefits).	Influence seeking help from a professional or seeking proper health care. Influence to follow or break rules/compliance measures. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
Locals prepare to defy as another Jatra season in Kathmandu comes with warning of Covid-19 surge.	XLVIII, XXXII, XXXIII, III, V, VIII,	PO (+)	PTs(-) PSe (-) PBa (+)	Ignorance of people creates Public Outrage.	Influence to follow or break rules/compliance measures. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
Biska Jatra (Bisket Jatra) was cancelled as the jatra could not take place following the threat of	XXI (-), XXXII, XXXIII, XXXVII (-),	PPR (+) PA (+)	SE (+) PSu (+)	PSe+, PSu+ motivates people to follow NPIs cancelling	Influence seeking help from a professional or seeking proper health care.

the Covid-19 pandemic and subsequent lockdown.	XLVIII, LVI, LIX, LX, LXVII, LXIII (-)	PHRC (+)	PSe (+) PTs (+) CA (+) PBf (+)	activities (SE) due to PA+, PHRC +, and PPR +.	Influence to follow or break rules/compliance measures. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
Directions like such imply that the government authorities are 'targeting' the local festivals and the Newa community. That is what has made the community enraged. Just like other political gatherings, the authorities can and should coordinate with the locals to organise the festivals better and minimise the epidemic fears.	XXI (-), XXXII, XXXIII, XXXVII (-), XLVIII, LVI, LIX, LX, LXVII, LXIII (-). LXIX, LVII (-), LIV, L	AA (-) TA (-) PHRC (-) PA (-) PO (+)	PBa (+) CA (-)	TA (-) and AA (-) questionable due to lack of proper response, preparedness pose, ignorance of people (PSu-) threats and barrier in imposing NPIs and disobey of rule is likely to be higher.	Influenced how they viewed the measures and authorities handle responses determines which eventually, affect whether to comply or not. Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
Diseases and infections are above everyone. But there are different people in society who believe differently. Experts recommend not to drink and smoke for health reasons, but people are doing so. So, if the mass gathers and starts the celebration, no one will be able to stop them.		PO (+)	PSu (-) PBa (-) PTs (-) PSe (-)	Ignorance of People (PSu-) pose threats and barrier in imposing NPIs and disobey of rule is likely to be higher, creates Outrage in society	Influence seeking help from a professional or seeking proper health care. Influence to follow or break rules/compliance measures. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.

When the political party gatherings are to be held, they do not acknowledge the health threats. But, when it comes to the Newa festivals, they start opposing," "We will not adhere to such orders. The festivals are of our community, and we will make sure that they are held as intended.	XXI (-), XXXII, XXXIII, XXXVII (-), XLVIII, LVI, LIX, LX, LXVII, LXIII (-). LXIX, LVII (-), LIV, L	AA (-) TA (-) PO (+)	PBa (+) PSu (-) Se (-)	TA (-) and AA (-) questionable due to lack of proper response, preparedness pose, ignorance of people (PSu-) threats and barrier in imposing NPIs and disobey of rule is likely to be higher.	Influenced how they viewed the measures and authorities handle responses determines which eventually, affect whether to comply or not. Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
The government was unsuccessful to curb the pandemic even by cancelling the jatras last year, and it will be pointless to stop the festivals this year too. We will not even follow the lockdown during the festival.	XXI (-), XXXII, XXXIII, XXXVII (-), XLVIII, LVI, LIX, LX, LXVII, LXIII (-). LXIX, LVII (-), LIV, L	AA (-) TA (-)	PBa (+) PSu (-) Se (-)	TA (-) and AA (-) questionable due to lack of proper response, preparedness pose, ignorance of people (PSu-) threats and barrier in imposing NPIs and disobey of rule is likely to be higher.	Influenced how they viewed the measures and authorities handle responses determines which eventually, affect whether to comply or not. Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
The local guthi and residents have somewhat agreed to keep the festival to the locals here, with minimum participation from outside, and follow health precautions. But there is no guarantee. Festivals are a crowded affair; they witness	XXI (-), XXXII, XXXIII, XXXVII (-), XLVIII,	PO (+) AA (-)	PBa (+) Se (-) PSu (-)	Ignorance of People (PSu-) pose threats and barrier in imposing NPIs and disobey of	Influenced how they viewed the measures and authorities handle responses determines which eventually, affect whether to comply or not.

people from all over the places. We cannot stop or track them.	LVI, LIX, LX, LXVII, LXIII (-). LXIX, LVII (-), LIV, L, LVI			rule is likely to be higher, creates Outrage in society	Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
Last year, when there was a big threat, we adhered to it. Not this year.	XXI (-), XXXII, XXXIII, XXXVII (-), XLVIII, LVI, LIX, LX, LXVII, LXIII (-). LXIX, LVII (-), LIV, L, LVI	PO (+)	PBa (+) PTs (-) PSu (-) Se (-)	TA (-) and AA (-) questionable due to lack of proper response, preparedness pose, ignorance of people (PSu-) threats and barrier in imposing NPIs and disobey of rule is likely to be higher.	Influence to follow or break rules/compliance measures. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
With the looming threat of the Covid-19 pandemic, some are sceptic the festivity will cancel this year too.	XXVIII, XXV, XXIII, XXXVI, XXIX, XIV, I, II, IV, VI, VII, XLIX,	PPR (+)	PSe (+) PSu (+) PBf (+)	PSe+, PSu+ motivates people to follow NPIs cancelling activities (SE) due to PA+, PHRC +, and PPR +.	Influence seeking help from a professional or seeking proper health care. Influence to follow or break rules/compliance measures.

					Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
We will adhere to the health precautions as well, however, have not received any official statement from the authorities yet to cancel the festivities nonetheless.	XXVIII, XXV, XXIII, XXXVI, XXIX, XIV, I, II, IV, VI, VII, LVII (-), LIV, L, XLIX,	AA (-)	Se (+) PBa (+)	PSe+, PSu+ motivates people to follow NPIs cancelling activities (SE) due to PA+, PHRC +, and PPR +.	Influence seeking help from a professional or seeking proper health care. Influence to follow or break rules/compliance measures. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
We need 50 people to just carry the khats, so lockdown will affect that. If we are to organise the festival, we will encourage masks and sanitisers.	XXI (-), XXXII, XXXIII, XXXVII (-), XLVIII, LVI, LIX, LX, LXVII, LXIII (-). LXIX, LVII (-), LIV, L, LII, XLII, XXXIX	PA (+) PHRC (+)	SE (+)	PSe+, PSu+ motivates people to follow NPIs cancelling activities (SE) due to PA+, PHRC +, and PPR +.	Influence seeking help from a professional or seeking proper health care. Influence to follow or break rules/compliance measures. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.

Rumours that Covid-19 vaccines make the recipient's body magnetic have been circulating across the world and experts have busted such claims.	LIII, LV, XXXII	PO (+) PHRC (-) PA (-)	PBa (+) CA (-)	Misinformation over social media created barrier and threat of spread of misinformation and conspiracy theories, creates PO.	Influence on intentions to get vaccinated. Influence seeking help from a professional or seeking proper health care.
Only about five thousand antigens tests are performed daily, which according to the experts are not sufficient.	LIV, LV, L, LVII, XLIII (-), LIV, LIII, XXXII, XXIV (-), XXVIII	AA (-) PO (+)	PBa (+)	TA (-) and AA (-) questionable due to lack of proper response, preparedness pose, ignorance of people (PSu-) threats and barrier in imposing NPIs and disobey of rule is likely to be higher.	Influenced how they viewed the measures and authorities handle responses determines which eventually, affect whether to comply or not. Influence seeking help from a professional or seeking proper health care. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.
Uber driver: Thank you, Madam, "nobody" is scanning. Oh my god, New Zealand, it literally takes 2 seconds to scan.	XXVIII (+/-), XXXIII, XXI (+/-), XLVIII, XLII	PO (+/-) PA (-) PHRC (-)	PBa (+) PSu (-) CA (-)	Ignorance of People (PSu-) pose threats and barrier in imposing NPIs and disobey of the rule is likely to be higher, creates Outrage in society	Influence on scan or use contact tracing apps. Influence to get tested. Impact on no. of detected cases, susceptible cases, and reported cases.

Table 4: Media Content Analysis

Appendix C: Generalised codes used for content analysis

i. They are afraid of catching the disease, then unintentionally transmitting it to others (Christian Jasper C. Nicomedes, 2020).

ii. The disease has a high mortality (Shahnazi et al., 2020)

iii. The disease is not very dangerous (Shahnazi et al., 2020)

iv. The risk of acquiring COVID-19 is high (Christian Jasper C. Nicomedes, 2020).

v. The risk of acquiring COVID-19 is low (Christian Jasper C. Nicomedes, 2020).

vi. Perceive infection to be serious if acquired (Christian Jasper C. Nicomedes, 2020).

vii. More likely to get a disease (Christian Jasper C. Nicomedes, 2020).

viii. Don't care about COVID and do my daily activities.

ix. Cancelled or delayed travelling overseas (Seale et al., 2020).

x. Cancelled or postponed social events (Seale et al., 2020).

xi. Compliance with quarantine (Bish & Michie, 2010).

xii. Away from crowded places (Seale et al., 2020).

xiii. Avoidance of public transportation (Mondino et al., 2020; Costa, 2020). Public transportation users perceive a greater contamination susceptibility that influences them to avoid public transportation (Costa, 2020).

xiv. Those who perceived their symptom severity as "high" were more likely to adopt social distancing. Conversely, those who perceived transmission as "easy" were prone to adopt general social and contact avoidance.

xv. Family members being infected, involvement in the care of COVID-19 patients (Mostafa et al., 2020)

xvi. Increased individuals' impulsive buying tendencies (Deng et al., 2020), panic buying, stockpiling that violated social distancing rules.

xvii. Catching or not catching the disease is out of my control (Shahnazi et al., 2020).

xviii.   Don't have the necessary capacity (Seale et al., 2020)

xix.   Nonavailability of effective vaccines, a high chance of having a large-scale local outbreak, and mental distress resulted in frequent hand washing and wearing a face mask (J. T. F. Lau et al., 2010).

xx.   Avoidance of crowds, public transport, work (Bish & Michie, 2010).

xxi.   Concerned about the possibility of widespread (Faasse & Newby, 2020).

xxii.   The disease can be easily prevented by regularly following preventive behaviours (washing hands regularly with soap and water, wearing personal protective equipment, masks, and disposable gloves) (Shahnazi et al., 2020)

xxiii.   Perceived severity from previous pandemics be beneficial (Petrie et al., 2016). (self-efficacy too).

xxiv.   Confidence and resources to comply with strategies (J. T. F. Lau et al., 2010) (Self-efficacy)

xxv.   Knowledge about the disease and appropriate preventive behaviours (Faasse & Newby, 2020).

xxvi.   Perceptions about the benefits of the behaviours and the impact of an individual's behaviour on another's health influence to engage in preventive behaviours (Bish & Michie, 2010; Hershey et al., 1994). (Benefits plus self-efficacy)

xxvii.   In countries where mask-wearing is common, there is less opposition (for example, in Japan, China, South Korea, Nepal) (Kasting et al., 2020)

xxviii.   The transmission power of disease is high (Shahnazi et al., 2020). (Self-efficacy plus benefits)

xxix.   Higher worry about disease greater health-preventive behaviours (Bults et al., 2011)

xxx.   Perceived costs, working status (Bish & Michie, 2010)

xxxi. Individualistic culture and individualistic liberty are valued over communal wellbeing (for example, in the USA, mask-wearing is resisted) (Kasting et al., 2020)

xxxii. Lack of knowledge about the disease and appropriate preventive behaviour (Faasse & Newby, 2020).

xxxiii. Ignorance about the possibility of widespread (Faasse & Newby, 2020).

xxxiv. Ability or capability is inadequate to cope with the virus (Yıldırım & Güler, 2020).

xxxv. People's ability/ capacity associated with compliance measures (Seale et al., 2020), Perceived costs.

xxxvi. Higher risk perceptions may only predict protective behaviour when people believe that practical protective actions are available (response efficacy) and when they are confident that they can engage in such protective actions (self-efficacy) (Seale et al., 2020).

xxxvii. Direct experience to outbreak increases self-efficacy, which leads to engagement in precautionary actions (de Zwart et al., 2009).

xxxviii. Preferences for achieving and maintaining a self-image as a socially responsible person influence preventive behaviour (Seale et al., 2020) (Brekke et al., 2003).

xxxix. Social norms, perceived efficacy (compliance with preventive measures).

xl. Perceived efficacy about vaccination (Bish & Michie, 2010).

xli. Role modelling by influential actors in social media networks can be beneficial in conveying information's as motivated to follow preventive behaviours (Seale et al., 2020).

xlii. How one's action contributes to promoting COVID-19 mitigation behaviours (putting psychological science into actions) (Brewer et al., 2017)

xliii. Media campaigns and awareness of recommended behaviours can motivate people to comply with compliance measures (such as self-isolation, working from home) (Seale et al., 2020).

xliv.   Mass media campaigns frame messages around social collective actions/power or the inclusion of the general public (Seale et al., 2020).

xlv.   Promotion of pro-social behaviours (Seale et al., 2020) (Brewer et al., 2017).

xlvi.   Social pressure for mask-wearing or following any measures (Bish & Michie, 2010).

xlvii.   Use of empathy messaging concept (empathy for most vulnerable to the virus promotes the motivation to adhere to follow preventive measures such as social distancing and mask-wearing) (Pfattheicher et al., 2020).

xlviii.   Feelings of Indifference (stops giving cease care and stops taking action on something happening around them) (Christian Jasper C. Nicomedes, 2020).

xlix.   Higher worry about disease greater health-preventive behaviours (Bults et al., 2011)

l.   Public trust in relevant authorities and information is high/low (Vinck et al., 2019)

li.   People's ability/ capacity associated with compliance measures (Seale et al., 2020), Perceived costs. (practically unable to comply with the rules and less likely to report complaint behaviour).

lii.   Preferences for achieving and maintaining a self-image as a socially responsible person influence preventive behaviour (Seale et al., 2020) (Brekke et al., 2003).

liii.   Belief in misinformation was widespread (Vinck et al., 2019)

liv.   Low institutional trust (Vinck et al., 2019)

lv.   Mistrust and misinformation for outbreak control (Vinck et al., 2019).

lvi.   People's willingness to engage in safe behaviour waxes or wanes over time, depending on the severity of an epidemic: when prevalence is high, people are more likely to adopt self-protective measures as time goes by; when prevalence is low, a 'self-protection fatigue' effect sets in whereby individuals are less willing to engage in safe behaviour over time(Chen et al., 2013).

lvii. To what extent people thought the overall approach taken by the authorities was consistent and adequate (Kuiper et al., 2020).

lviii. Cost of compliance and strain experience from following the measures associated with compliance, i.e., higher compliance costs, would be associated with less compliance(Kuiper et al., 2020).

lix. People who experienced more strain and negative emotions would display low compliance (Kuiper et al., 2020).

lx. People might cope with the negative emotions and strain by violating the rules (Kuiper et al., 2020).

lxi. People comply with rules when there is greater certainty and severity of punishment (Kuiper et al., 2020).

lxii. Perceptual deterrence was not associated with compliance, and people comply less when they fear the authorities (Benjamin Van Rooij 2020)

lxiii. People see others comply with rules or requests and are more likely to comply (Cialdini et al., 2006; Cialdini & Goldstein, 2004)

lxiv. Discriminated & devalued by others "Why try" phenomenon (e.g., Less desire for social distance.

lxv. Capacity to comply with sufficient knowledge of what is expected of them(Kuiper et al., 2020).

lxvi. More unclear rules to people, more complex in compliance (Feldman and Teichman, 2009)

lxvii. Opportunity to break the rules (less opportunity to break would report less rule-breaking or comply rules and vice versa) (Cohen, L.E. and Felson (1979) and Kuiper et al. (2020)

lxviii. Descriptive social norms influence compliance, i.e., people are more likely to comply when they see other comply rules (Kuiper et al., 2020)

lxix. People who see others violate rules are more likely to violate the rules (Cialdini et al., 2006; Cialdini & Goldstein, 2004)

lxx. Obligation to obey the law and procedural justice example, people who feel more obligated to obey the law are more likely to comply (Tyler, 1997).

lxxi. People learned about the pandemic and its measures through news and social media, communication sources that could be aligned with a particular political orientation(Kuiper et al., 2020).

lxxii. People voluntarily obey the rules if these are made in a procedurally just way by an adequately established authority (Fine et al., 2020, Fine et al. 2016, Nagin and Telep, 2017, Tyler 1996, 2006, 2017 included references in a paper (Kuiper et al., 2020)

lxxiii. Perceived clarity of current measures, such as how people learned about the pandemic, may have influenced how they viewed the measures and authorities (Fine, Rowan and Simmons, 2019 obtained from (Kuiper et al., 2020) paper), which eventually affected whether they complied.

lxxiv. It can drive people to deny or hide the illness to avoid discrimination, prevent or delay timely health care seeking, and discourage people from adopting healthy behaviours (Stangl et al., 2019). Such barriers could contribute to more severe health problems and more significant difficulties in controlling the viral disease outbreak (Van Bortel et al., 2016).

lxxv. Stigmatisation can also lead to rejection, avoidance, and social distancing of those who are feared (Stangl et al., 2019), potentially leading to further harm, such as making it harder for people to secure food or other necessities (BBC News 2020).