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A QUALITATIVE STUDY ON THE FACTORS AFFECTING THE PHENOMENON OF COVID-19 VACCINE HESITANCY IN SWEDEN

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Abstract

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Date: May 31st, 2021
Course: BUS39 Degree Project in Global Marketing
Keywords: Vaccine Hesitancy, Covid-19 Pandemic, Vaccination, Vaccine refusers, Vaccine deniers, Immunization, Social Marketing
Thesis Purpose: The aim of this qualitative study is to understand the factors affecting the Covid-19 vaccine hesitancy phenomenon in Sweden.
Theoretical Perspective: Our study adopts the Socio-Ecological Model in order to understand what factors affect hesitancy towards the Covid-19 vaccines.
Methodology: Our study employs a qualitative research method and uses a deductive approach to analyze the qualitative data. As a part of the qualitative research method, we conducted in-depth interviews and used a non-probability sampling method, when choosing the sample of prospective participants. Our final sample size consists of 20 individuals aged 18 and older, in Sweden, who are hesitant to take Covid-19 vaccines.
Findings/Conclusion: The findings of this paper provide insights on vaccine hesitant individuals or groups in Sweden while distinguishing them into two groups: vaccine deniers and vaccine refusers. The paper, later on, suggests two adopted versions of the SEM model taking into consideration the different behaviors of Covid-19 vaccine deniers and vaccine refusers in Sweden. The first adapted version of the SEM model highlights the effects of the individual socio-ecological factor on vaccine deniers. The second adopted version of the SEM model highlights the individual, interpersonal/community, and public policy factors on vaccine refusers.
Practical Implications: Our research study provides several stakeholders, such as the government, the healthcare organizations, and vaccine producing organizations with valuable insights on how to deal with vaccine hesitancy in Sweden. Our recommendation to the government is to work along with healthcare organizations and vaccine producing organizations towards educating vaccine refusers on the safety and effectiveness of the Covid-19 vaccines. In addition, social marketing strategies should be aimed at communicating and promoting the long-term positive effects of the Covid-19 vaccines to vaccine refusers since, over time, they are more likely to change their attitudes and behavior towards the Covid-19 vaccines.

Acknowledgments

1. Introduction

This section is an introduction to the Covid-19 virus spread worldwide, the Covid-19 vaccination, and the Covid-19 vaccine hesitancy in Sweden. The problematization introduces the challenges regarding consumers' behaviors and attitudes with the coming of the Covid-19 pandemic, and the literature gap regarding the phenomenon of the Covid-19 vaccine hesitancy in Sweden. Finally, we state the purpose of this research paper, the research question, and its contributions to existing literature.

1.1 Background

1.1.1 Covid-19 in Sweden: the Swedish approach to prevent the spread of the virus and criticism

On January 12th, 2020 the World Health Organization (WHO) announced that the cause of a respiratory illness among people in Wuhan, in Hubei, China was caused by a novel coronavirus (nCoV) linked to the Huanan Seafood Wholesale Market in Wuhan City (WHO, 2020a). On January 16th, 2020 a press release issued by the Swedish Public Health Agency highlighted a novel coronavirus and confirmed that the agency monitors the situation accordingly (Folkhälsomyndigheten, 2020a). Initially, the spread of the virus in Sweden was qualified as "very low" due to the reason that it was not yet found to be contagious among humans, however, the Swedish Public Health Agency put some recommendations for individuals visiting Wuhan to seek medical care and undergo medical observations after visiting the city (Folkhälsomyndigheten, 2020a). On January 30th, 2020 WHO classified the novel Coronavirus as a Public Health Emergency of International Concern and demanded all member states, including Sweden, to cooperate in preventing the spread of the virus (WHO, 2020b). Later, the Agency also requested the Swedish government to classify the virus in the Swedish Communicable Diseases Act as a notifiable infectious disease dangerous to public health and society, with contact tracing being required (Folkhälsomyndigheten, 2020b; Dagens Medicin, 2020). On March 13th, 2020 the Swedish Public Health Agency announced that the spread of the virus has entered a new stage and required "other efforts" to prevent it (Folkhälsomyndigheten, 2020c). The focus was to protect the elderly and the most vulnerable people who had a higher risk of being infected with Covid-19 virus (Folkhälsomyndigheten, 2020d). Unlike many other European countries, Sweden has not imposed a lockdown and kept major parts of society open, protecting the freedom of movement of people living in Sweden (Kianzad & Minssen, 2020). With the rise of the virus in Sweden, in winter 2020, the Swedish healthcare system has been put under a strain, with only Covid-19 related care being available in emergency (Kennedy, 2020). As of May 30, 2021, more than 1 million Covid-19 confirmed cases have been recorded in Sweden with more than 14 thousand deaths (WHO, 2021). Compared to neighboring countries in

Scandinavia, Sweden had higher rates of confirmed cases and deaths per capita, however, several European countries had higher rates of infected people and mortality per capita compared to Sweden (The Local, 2021). Due to imposing less strict preventative measures throughout the pandemic, the Swedish government has received considerable criticism (Kiazand et al., 2020). An independent commission, called the Coronakommissionen, released a report in December 2020, announcing that Sweden failed to protect care home residents because of the major spread of the virus throughout Sweden (The Guardian, 2020; Sveriges Radio, 2020). In December 2020, King Care XVI Gustaf of Sweden and the prime minister of Sweden, Stepan Löfven, characterized the Swedish approach to prevent the spread of Covid-19 as failure due to increasing numbers of deaths (BBC, 2020). Stepan Löfven also suggested that Swedish experts failed to predict and prepare for the peak of the virus during the wintertime (BBC, 2020). In response to this, the public started to increasingly criticize the efforts of a Swedish civil servant and physician specializing in infectious disease, Anders Tegnell, and the Swedish health authorities (The Guardian 2020). Neighboring countries such as Finland and Norway, also criticized the Swedish preventative approach, stating that it potentially undermined the preventative measures of the Covid-19 pandemic in their countries (BBC, 2020).

1.1.2 Covid-19 vaccination in Sweden

The benefits of immunization from vaccination are overwhelming and vaccination is considered as a successful and cost-effective intervention to improve public health (SAGE, 2014). The development of an effective vaccine to provide immunization against Covid-19 was challenging, however, one of the main exit strategies to overcome the global pandemic (Alabdulla, Reagu, Al-Khal, Elzain & Jones, 2021). At the end of November, 2020 almost 55 vaccines against Covid-19 were undergoing clinical trials on humans seeking approval for public use (Alabdulla et al., 2021). Covid-19 vaccination in Sweden started on December 27th, 2020, as soon as the European Commission approved Pfizer-BioNTech Vaccine against Covid-19 (Regeringskansliet, 2020 & Folkhälsomyndigheten, 2021a). Accordingly, the Public Health Agency of Sweden was commissioned to create a vaccination plan (Krisinformation, 2020a). It was important to decide the order of priority for those groups with the most need to receive the vaccine first (Krisinformation, 2020a). The first phase of vaccination included healthcare workers working with risk groups, elderly people in care homes, and adults living with someone in the risk group (Reuters, 2020). The second phase of vaccination included other individuals above the age of 70, adults living with functional impairments, and medical care professionals. The third phase of vaccination includes other adults in the risk group (Krisinformation, 2020b). In the fourth phase of the vaccination everyone can receive one, however, in February, 2021, the Public Health Agency of Sweden did not recommend vaccines to children under 18, unless a child belongs to a risk group and can be easily infected by Covid-19 (Krisinformation, 2020b).
Data from February, 2021 indicated that more than 80% of nursing home residents in Sweden are vaccinated with a first shot and nearly 33% with the second shots of the Covid-19 vaccine

(Reuters, 2021). The Public Health Agency of Sweden reported that vaccines are most likely responsible for the decreased number of Covid-19 daily deaths (Reuters, 2021). As of 23 of May, 2021, more than 4.5 million vaccine doses have been administered to the Swedish public (WHO, 2021).

1.1.3. Covid-19 vaccine hesitancy in Sweden

As one of the most remarkable scientific discoveries in the world that has revolutionized the field of medicine and healthcare (Greenwood, 2014), since the early 20th century, vaccine development and vaccination reduced the threat of infectious diseases, morbidity/mortality, and improved average life expectancy (Rappuoli, Santoni & Mantovani, 2019). Hotez (2019) states that vaccination prevents approximately 2 to 3 million deaths worldwide every year. Greenwood (2014) states that, on average, 3.5 to 4.5 million deaths can be prevented globally if vaccination is improved. Though vaccination is considered to be one of the most successful public health measures, a lot of people avoid vaccines stating concerns around vaccination safety, while questioning the need for immunization, which results in increased vaccine refusal and vaccine hesitancy around the world (SAGE, 2014). As defined by Kestenbaum and Feemster (2015) vaccine hesitancy relates to the intentional delay or refusal to vaccination despite vaccine availability. A recent study indicates that 90% of both developed and developing countries indicated some types of vaccine hesitancy (Lane, MacDonald, Marti & Dumolard, 2018). Consequently, in 2019, WHO recognized vaccine hesitancy as one of the first public health treats (WHO, 2019). The Strategic Advisory Group of Experts (SAGE) was set up by WHO to address the worldwide challenges of vaccine hesitancy and refusal (SAGE, 2014). The working group has identified a list of reasons that contribute to vaccine hesitancy as a growing concern globally, which may vary around the world depending on different countries and cultures (SAGE, 2014). While vaccination against Covid-19 already started in Sweden with Pfizer/BioNTech, Moderna, and Oxford-AstraZeneca being offered to the public (Kry, 2021), vaccine hesitancy in Sweden is still present (Rolander, 2020). Though the Public Health Agency of Sweden and other entities provide essential information and recommendations for the public on Covid-19 vaccination periodically, a lot of people are still hesitant about taking the Covid-19 vaccines.

The aim of this paper is to dig more into the Covid-19 vaccine hesitancy in Sweden: understanding the factors affecting the phenomenon and the reasons behind people avoiding or rejecting vaccines. Though the Swedish Public Health Agency informs that Covid-19 vaccines are not mandatory, vaccine hesitancy may still be considered a problem in Sweden, with a lot of people avoiding the vaccine (Folkhälsomyndigheten, 2020e).

1.2 Problematization

As defined by Krogh, Rossi-Lamastra, and Haefliger (2012), phenomena are unanticipated regularities that challenge current knowledge and are significant to scientific discourse. The SAGE (2014) states that vaccine hesitancy is a behavioral phenomenon that is interdependent to various factors, such as the vaccine type, context, expectations, and availability. The definition of vaccine hesitancy is generally defined and in accordance to time, place, and the specific vaccine, it can be changed (SAGE, 2014). While many studies on vaccine hesitancy, as later illustrated in the literature review section, highlight factors, and contextual issues among vaccine hesitant individuals or groups about vaccine uptake, to our best knowledge, there are no qualitative phenomenon-based research studies that aim to understand Covid-19 vaccine hesitancy. Furthermore, in comparison to most other countries, Sweden's approach to the Covid-19 crisis has been moderate (Minssen, 2020). While protecting fundamental freedoms under the Swedish Constitution, such as the freedom of movement, Sweden did not go into total lockdown and did not close primary schools, day care centers, pubs/bars, restaurants, movie theaters, and some other businesses (Minssen, 2020).

Thus, the coming of Covid-19, which was a previously unknown infectious disease for everyone (WHO, 2020c), and the unique approach that Sweden has adopted in fighting the pandemic (Minssen, 2020) has provided us with a unique opportunity to investigate the phenomenon of Covid-19 vaccine hesitancy in Sweden, which to our best knowledge is not yet explored qualitatively.

1.3 Aim and Objectives

Krogh et al. (2012, p. 278) state that the aim of a phenomenon-based research is to "capture, describe and document, as well as conceptualise, a phenomenon so that appropriate theorising and the development of research designs can proceed". With several companies developing and currently offering vaccines against Covid-19 and the willingness of vaccination being influenced by some factors (SAGE, 2014), this research aims to analyze the phenomenon of Covid-19 vaccine hesitancy in Sweden. As already mentioned, since our research is phenomenon-based our main contributions are more practical rather than theoretical. Thus, another objective of our research study is to come up with recommendations to stakeholders on how to better communicate with vaccine hesitant individuals or groups and what possible actions can be made in order to reduce vaccine hesitancy among them. Finally, we aim to understand what and how the socio-ecological factors affect the vaccine hesitancy towards the Covid-19 vaccines; thus, providing stakeholders with more relevant and effective interventions on coping with vaccine hesitancy.

1.4 Research question statement

As previously stated, the main objective of our qualitative research study is to understand socio-ecological factors affecting the phenomenon of Covid-19 vaccine hesitancy in Sweden. Based on the aims of our study we have come up with the following research question:

Research question: What are the socio-ecological factors affecting the Covid-19 vaccine hesitancy in Sweden?

1.5 Research Contributions

As stated above, there is limited research done to understand factors affecting the Covid-19 vaccine hesitancy in general; thus, our research can contribute to the existing literature in many aspects. Since vaccine hesitancy is a public health issue (SAGE, 2014), our research study can help understand factors affecting vaccine hesitancy from a socio-ecological perspective. Therefore, our research will contribute to the existing literature by understanding the relationship between socio-ecological factors and the Covid-19 vaccine hesitancy. Moreover, the unique approach of handling the Covid-19 pandemic by the Swedish government provides us the chance to understand the phenomenon of the Covid-19 vaccine hesitancy in a distinctive context. Since we couldn't find any qualitative research papers on Covid-19 vaccine hesitancy in Sweden, this research study can provide insights for future research on this or similar topics. Last but not least, since our study is a phenomenon-based research, our main contributions to the literature will be towards understanding the phenomenon of the Covid-19 vaccine hesitancy and provide practical implications. For instance, our research can help social marketers, the Swedish government, and healthcare organizations better understand factors that affect vaccine hesitancy towards the Covid-19 vaccination and provide them with suggestions regarding effective communication techniques when dealing with vaccine hesitant individuals or groups. Therefore, our research study can help stakeholders design possible interventions to overcome the Covid-19 vaccine hesitancy or to use this research paper as a basis for further research studies.

2. Literature Review

Vaccine hesitancy leads to decreased vaccination numbers in public, and thus increases the prevalence of vaccine-preventable diseases (VPDs). The coming of Covid-19, which is a previously unknown infectious disease for everyone, has provided a unique opportunity to investigate vaccine hesitancy in Sweden. Though there is already some research about Covid-19 vaccine hesitancy, we couldn't identify a single paper looking to Covid-19 vaccine hesitancy in Sweden during this period.

The literature review section of the paper will dig into some academic research and reports on understanding the phenomenon of vaccine hesitancy and its definition while providing some background on factors to reject vaccination to some degree or fully. This section of the paper provides literature insight on social marketing and vaccine hesitancy and is aimed to understand why people hesitate to adopt vaccination, which is initially aimed to save their lives.

Most literature on Covid-19 vaccine hesitancy is quantitative seeking fast results at the beginning of the pandemic, however, as mentioned before, with Sweden adopting a unique approach on dealing with Covid-19 and vaccination currently being served to the public, we are confident in following a qualitative research method to uncover hidden factors of vaccine hesitancy in Sweden.

With literature review that is mostly based on academic work in public health and medical journals, but which also introduces vaccine hesitancy in social marketing and the importance of marketing in shaping consumer perception and knowledge, the goal of this paper is thus to understand vaccine hesitancy in Sweden and the factors affecting the shaping of vaccine hesitancy in Sweden during the Covid-19 pandemic.

2.1 Introduction to the concept of vaccine hesitancy

Vaccine hesitancy definitions used by different researchers are usually too general and target heterogeneous people or situations and various explanatory factors such as historic, political, socio-cultural, and individual and group influences (Dubé, Laberge, Guay, Bramadat, Roy & Bettinger, 2013). A research by Peretti-Watel, Larson, Ward, Schulz and Verger (2015) takes into consideration some vital structural features of contemporary societies, which define vaccine hesitancy as part of consumer decision-making process that is interdependent on the people's level of commitment to healthism or risk culture, and on the trust and confidence level towards health authorities and medicine. Vaccine hesitancy is mostly talked about in scientific journals in the field of public health and medicine, specialised in vaccination or in paediatric issues, thus the phenomenon of vaccine hesitancy still remains an ambivalent notion and the theoretical

background appears to be uncertain (Peretti-Watel et al., 2015). Peretti-Watel et al. (2015) do not define vaccine hesitancy as a behavior, as it is associated in scientific research with different outcomes and non-specific behaviors. They suggest that vaccine hesitancy is not the only possible explanation of different outcomes, such as acceptance or refusal of strong opposition, delay to procrastination, oversight, and ignorance. Moreover, they suggest that vaccine hesitancy is actually associated with many other types of behaviors including information search, positive and negative evaluation, or disposition to act. As vaccine hesitancy is complex in its nature, it creates problems dealing with it (SAGE, 2014). From the public health perspective, behavioral outcomes of vaccine hesitancy still remain important to prevent the spread of any virus (SAGE, 2014).

2.2 Vaccine hesitancy definition

The SAGE (2014) defines vaccine hesitancy as the "delay in acceptance or refusal of vaccination despite availability of vaccination services." They further suggest that "vaccine hesitancy is complex and context-specific varying across time, place and vaccines".
SAGE (2014) states that vaccine hesitancy is present when vaccine acceptance in a specific setting is lower compared to what it was expected to be when vaccine services are available. Thus, they define vaccine hesitancy as some kind of a behavioral phenomenon that is specific to the vaccine and the context. They furthermore suggest that vaccine hesitancy is measured against an expectation of reaching a coverage goal of vaccination when immunization services are available. As suggested, vaccine hesitancy occurs within the continuum of full vaccine acceptance (including high vaccination demand) and full vaccine refusal of all or some vaccines, meaning that many people fail somewhere in the continuum.

There are two main concepts that are referred to in another document by WHO (2017) in the vaccine hesitancy continuum (see Figure 1) - vaccine deniers and vaccine refusers. Vaccine refusers are people who "refuse to accept recommended vaccines" and "refuse to accept all vaccinations without a doubt" (WHO, 2017). However, they may be convinced by other opinions and scientific evidence or by good argumentation (WHO, 2017). Vaccine deniers, on the other hand, are explained to be a subgroup at the extreme end of the hesitancy continuum", having a drastically negative attitude towards vaccination and are not open to change their opinions no matter any scientific evidence or consensus, and strong argumentation (see Figure 2) (WHO, 2017). They may even sometimes "counter-react to evidence-based arguments" (WHO, 2017, p.8). This suggests that public health interventions may help to move people throughout the continuum of vaccine hesitancy (WHO, 2017).
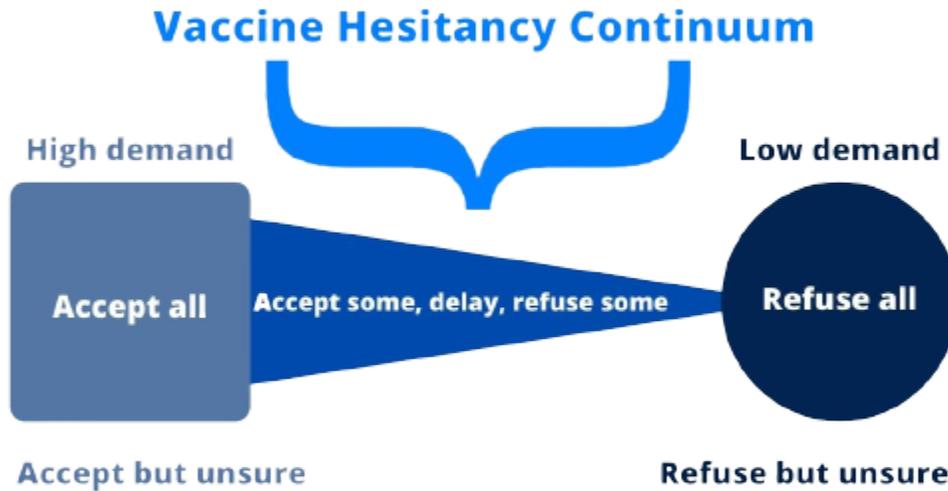
Figure 1: The Continuum of Vaccine Hesitancy between Full Acceptance and Outright Refusal of all Vaccines. Source: SAGE (2014)
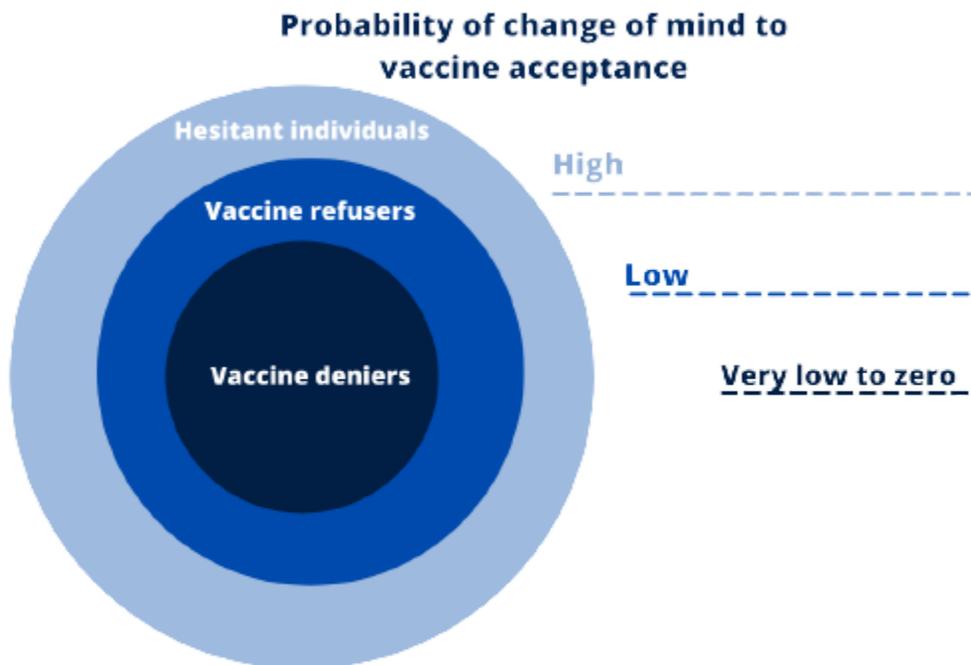
Figure 2: Vaccine hesitancy categorized by the likelihood of a change of mind regarding vaccine acceptance. Source: WHO (2017)

Since vaccine hesitancy is a key factor for vaccination coverage, vaccine hesitancy remains an important phenomenon to understand conceptually. As Covid-19 is new, few researchers have specifically looked at Covid-19 vaccine hesitancy, however, based on our search of scientific

work on vaccine hesitancy, some quantitative research papers provide statistical insights on Covid-19 vaccine hesitancy rates in different countries.

2.3 Who are the people refusing Covid-19 vaccines?

A recent quantitative research conducted in China (Wang, Han, Zhao, Liu, Liu, Chen, Xie, Liu, Zheng, Zhang, Wang, Huang, Du, Liu, Lu & Cui, 2021) that distinguishes between two types of vaccine hesitant individuals - vaccine deniers and vaccine refusers - was aimed to understand the vaccination situation and facilitate it in an efficient way among the priority population, who had access to the Covid-19 vaccine in the early stages of vaccination in the country. The survey covered a big sample size of 2350 participants in the priority group and 33.5% of all participants were vaccine hesitant, including acceptors with doubts (49%), refusers (39%), and deniers (12%) (Wang et al., 2021). As the survey indicated the most prevalent reason for participants in the priority population being vaccine hesitant was the safety of Covid-19 vaccine (75%), the low efficiency of the Covid-19 vaccine (22%), and the reasons were the same among participants who were previously vaccinated and not (Wang et al., 2021). While the research provides more demographic statistical analysis on the Covid-19 vaccine hesitancy based on sex, age, geography, education, and occupation, the main findings of this paper indicate that even if there were adequate vaccines available for the entire population in China, high vaccination coverage in the country would have been hard to achieve if the public willingness or confidence in Covid-19 vaccinations remain low (Wang et al., 2021).

The SAGE (2014) suggests the 3C model, which explains that vaccine hesitancy includes constellation factors, such as complacency, convenience, and confidence, that have an influence on the decision making process of individuals or groups, to accept some or all vaccines offered to the public.
To better understand the factors affecting vaccine hesitant individuals or groups and the strategies to better address them, we found it important to look at this model in detail.

2.4 Vaccine hesitancy: Confidence, Complacency, Convenience (3C) Model

As mentioned before, vaccine hesitancy is a threat to the implementation of any immunization program worldwide. Thus, SAGE (2014) was among the first to understand the factors of compliance with vaccination. The 3C model helps to further conceptualize the definition of vaccine hesitancy and vaccine hesitancy determinants (see Figure 3).
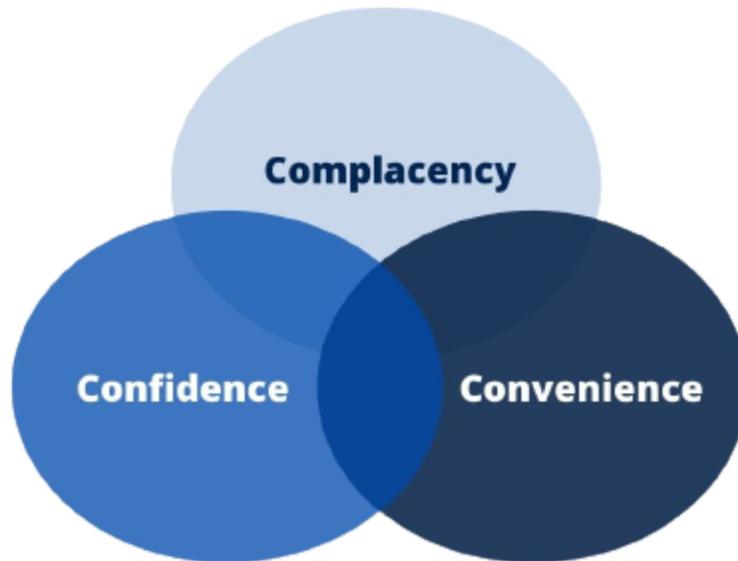
Figure 3: The 3 C model. Source: SAGE, (2014)

The 3C model is effective in distinguishing vaccine refusers from vaccine hesitant individuals or groups based on 3 attributes:

- *Confidence* refers to the trust level towards the safety and effectiveness of a vaccine, the systems delivering them, including the competence and reliability of health services and professionals, and the motivations of policy-makers on vaccination.
- *Complacency* exists when "the perceived risk of vaccine-preventable diseases are low and vaccination is not deemed a necessary action". Many factors influence the complacency level among vaccine hesitant individuals or groups about a particular vaccine or vaccination in general.
- *Convenience* refers to the degree to which "physical availability, affordability or willingness-to-pay, geographical accessibility, ability to understand (language and health literacy) and appeal to immunization services" affects people or groups of people (SAGE, 2014).

Thus, the 3C model suggests the three barriers that influence public vaccine intake, which may be used to increase vaccine intake rates in a particular community.

Further studies suggest that the behaviors of vaccine hesitant individuals or groups are complex, and vaccine hesitancy determinants are highly variable (Larson, Jarrett, Eckersberger, Smith, Paterson, 2014). Moreover, there is evidence suggesting that not all potential factors affecting vaccine hesitant individuals or groups have been identified or investigated in detail (Brown, Fraser, Ramsay, Shanley, Cowley, Wijgerden, Toff, Falconer, Hudson, Green, Kroll, Vincent & Sevdalis, 2011; Mills, Montori, Ross, Shea, WIlson & Guyatt, 2005). SAGE (2013) further

elaborates that vaccine decision making can be influenced by different factors directly and indirectly, which include contextual influences, individual and group influences, and vaccine/vaccination-specific issues (SAGE, 2013). As illustrated by them, contextual influences include historic, socio-cultural, environmental, health system/institutional, economic or political factors. Individual and group influences include personal perception of a vaccine or influences of the social/peer environment. Vaccine/vaccination- specific issues are directly interrelated to a specific vaccine or vaccination program. SAGE (2013) interconnected those influences to the 3C model depending on the context. Thus, as SAGE (2013) reports, understanding how such barriers to vaccination may affect the 3C model, is vital in designing effective strategies and activities that may influence vaccine hesitancy positively.

So far the literature review section provided information on vaccine hesitancy and referred to existing literature on factors affecting vaccine hesitancy among individuals or groups. However, as our topic regards a consumer behavior issue, it is important to also understand the role of social marketing in overcoming vaccine hesitancy.

2.5 What is social marketing and how does it help with immunization programs?

Social marketing is concerned with "selling" of socially accepted behaviors and attitudes and enhancing the health of particular individuals or a larger population (Lefebvre, 2013; Lee & Kotler, 2011; Suarez-Almazor, 2011; Graham, 1997). As opposed to commercial marketers who persuade people to buy advertised goods and services, social marketers are more focused on urging people to value and follow certain recommended actions (Nowak, Gellin, MacDonald & Butler, 2015). Though there is a difference in the desired outcomes for social marketers and commercial marketers, their aim is to change or encourage a certain behavior; therefore, similarities exist between the methods and practices adopted by both parties (Nowak et al., 2015).

Social marketing applies the principles of commercial marketing in order to promote behaviors that will enhance the well-being of the individual, as well as the whole society (Nowak et al., 2015). Thus, social marketing can provide useful insights to understand the issue of vaccine hesitancy (Nowak et al., 2015). In order to overcome vaccine hesitancy in a particular country, there should be a thorough understanding of the immensity of the hesitancy, observation of the patterns over time, identification of the main reasons behind the hesitancy and assessment of the influence of possible interventions (Larson et al.,, 2014; Dubé, Vivion & MacDonald, 2015; Dubé, Gagnon, Nickels, Jeram, Schuster, 2014; Caitlin, Wilson, O'Leary, Eckersberger & Larson, 2015; MacDonald, 2015). Since social marketing is concerned with creating, delivering, and sharing valuable offerings for particular individuals, it can provide a useful framework for dealing with vaccine hesitancy (Lefebvre, 2013; Suarez-Almazor, 2011; Graham, 1997).

By introducing immunization to brand positioning, social marketing creates programs that view the importance of immunization in a new way (Nowak et al., 2015). Therefore, the immunization programs should focus on promoting vaccines and its advantages from vaccine hesitant individuals' perspective instead of the program planner's perspective (Nowak et al., 2015).

In addition, social marketing segments the population not only based on background characteristics, but also based on demographic and psychographic characteristics, individuals' previous experiences with immunization, the individual's intentions behind their behavior, medical conditions of the individuals, and cultural and environmental factors (Nowak et al., 2015). This form of in-depth segmentation of the population allows a more descriptive picture of the population (Nowak et al., 2015). Furthermore, social marketing considers the importance of identifying the influencers and gatekeepers who provide information regarding the vaccination and how that information is being communicated with the population (Nowak et al., 2015). Thus, social marketing aims to thoroughly understand differences in persuasion techniques for different individuals since social marketing takes into account the fact that factors affecting vaccine hesitancy differ among the individuals (Larson, Cooper, Eskola, Katz & Ratzan, 2011). The application of immunization to social marketing also makes it easier to understand the difference between hesitancy towards new and old vaccines (Nowak et al., 2015).

Due to social marketing, immunization programs not only can identify factors influencing vaccine acceptance but also study immunization convenience (Butler & MacDonald, 2015; Lefebvre, 2013). Social marketing allows the identification of alternative strategies and channels for reaching the target population (Nowak et al., 2015). In general, marketers pay close attention to how their offerings are distributed, as well as if the distribution outlets and locations where the offerings are available suit the needs of the target population (Nowak et al., 2015). In social marketing, not only the negative factors but also positive factors that affect a desired action are taken into account (Smith et al., 2013; Larson et al., 2011). This is also essential when social marketers are dealing with vaccine hesitancy since most of the people in the targeted population practice the desired action, that is accepting vaccines (Nowak et al., 2015). Social marketers need to identify possible strategies for promoting the acceptance of vaccines among individuals who do not practice the desired action (Nowak et al., 2015). Social marketers also need to choose between communicating the long-term or short-term advantages of vaccinations (Nowak et al., 2015). Thus, the main concern for social marketers is the identification of factors that will encourage vaccine hesitant individuals to accept the vaccines (Suarez-Almazor, 2011; Stead, Gordon, Angus & McDermott, 2007).

To conclude, social marketing that applies to immunization and vaccination focuses on end-user outcomes and is thus end-user driven (Nowak et al., 2015). With the help of social marketing and the systematic ways and tools that it provides, it becomes possible to effectively engage

communities and facilitate empowerment and ownership with the aim to have an effective community solution to target the community itself to "own" the outcomes after understanding the benefits of immunization programs (Nowak et al., 2015).

2.6 Dealing with vaccine hesitancy with the help of social marketing

The following analysis, along with the study presented by the SAGE working group, concludes that the issue of vaccine hesitancy can be tackled by the adoption of marketing and communications strategies, and social marketing framework and principles (Nowak et al., 2015). A variety of studies have adopted strategies of both marketing and social marketing for promoting vaccine acceptance in various environments and contexts (Nowak et al., 2015). Such programs have promoted vaccine acceptance by raising public awareness about immunization recommendations, responding to the concerns of vaccine hesitant individuals, and communicating recommendations about vaccinations in a way that increased individuals' knowledge and encouraged the desired action (Nowak et al., 2015). When promoting or changing a certain behavior, both marketing and social marketing frameworks emphasize the important role of "value" (Nowak et al., 2015). That is, people will be encouraged to act accordingly when a certain behavior, such as buying an offering or practicing a desired behavior, allows them to gain something valuable (Nowak et al., 2015). Commercial marketers are aware that people are more concerned about the advantages of a particular action, as well as how these advantages are communicated with them (Nowak et al., 2015). Therefore, programs promoting immunization should understand the importance of highlighting its value and communicating messages that will encourage vaccine acceptance (Nowak et al., 2015). Commercial and social marketing provides relevant strategies when it comes to communicating the value that will enhance vaccine acceptance or recommendations (Nowak et al., 2015).

Moreover, strategies adopted by commercial and social marketing pay close attention to other key considerations (Nowak et al., 2015). First of all, promotion of a desired behavior is only one of the categories that need to be taken into account when dealing with vaccine hesitancy and encouraging vaccine acceptance; three other essential categories that also need to be considered are product, price, and place (Nowak et al., 2015). Thus, immunization programs need to identify which aspects of such categories affect vaccine acceptance or vaccine hesitancy (Nowak et al., 2015). For instance, inconvenient access, unavailability of vaccination services, and inadequately trained vaccination providers can be contributors to vaccine hesitancy (Nowak et al., 2015). Thus, immunization programs should not focus merely on promotion and communication in order to reach success (Nowak et al., 2015). Besides, immunization programs should not focus on universal communications and messages for everyone since differences exist in value, interest, and needs among various segments of the population (Nowak et al., 2015). Therefore, for successful communications and promotions, there should be a variety of messages and materials, including the ones for vaccine hesitant individuals (Nowak et al., 2015).

As mentioned by Nowak et al. (2015) when developing successful marketing and communication strategies, as well as applying marketing and social marketing strategies, immunization programs should take into consideration four key aspects.

1. A great amount of time and resources are needed for developing successful marketing strategies, especially for vaccine hesitant and reluctant individuals. Efforts should be directed towards understanding individuals' perceptions for vaccines and vaccine recommendations, identifying factors encouraging vaccine acceptance, and training the healthcare workers;

2. While applying marketing and social marketing strategies, immunization programs should be careful with using the word "marketing" since people might be attributing it with "selling" or persuasion of purchasing offerings that people do not need or doing things people wouldn't do in the absence of the marketing efforts. In this regard, immunization programs and vaccine producers have sometimes been criticized for "marketing" and promoting the vaccines (Gottlieb, 2013; Bunton & Gilding, 2013);

3. It is important to consider that sometimes marketing and social marketing strategies might not be effective in persuading or changing the attitudes of individuals who are completely against vaccines and vaccinations. Meanwhile, such strategies might be more effective for persuading individuals who might be willing to take vaccines;

4. It can be practically difficult to create a marketing strategy when the reason for the vaccine hesitancy is the "product" category, such as a specific vaccine or the immunization schedule. Despite the ongoing improvements for ensuring vaccines' and immunization schedules' safety and efficiency, the timeframes for vaccinations are difficult to change depending on consumer interests. Even though prioritization of science and public health might not correspond to peoples' own interests, science and public health will be the core for immunization programs.

To conclude, this section of the literature review illustrated that along with their advantages, commercial and social marketing strategies can also pose some shortcomings. Therefore, depending on the situation, there might be a need for alternative strategies, such as educating and training healthcare workers, conducting educational programs in schools, and adopting policies promoting vaccinations (Nowak et al., 2015).

This section of the paper concludes that vaccine hesitancy is a phenomenon that may differ according to many factors and existing literature concludes that vaccine hesitancy can be summarized by the 3C model. Throughout the paper, it is vital to remember the distinction between vaccine hesitant refuser and vaccine hesitant deniers, as this is a focal point in understanding vaccine hesitancy in new conditions created by the Covid-19 pandemic. Last but not least, this section illustrated how social marketing can be used in overcoming vaccine hesitancy.

3. Theoretical Framework

3.1 Background of the initial SEM Model

In the following section, we will introduce the Social Ecological Model (SEM) theory that will help us uncover socio-ecological factors affecting hesitancy towards the Covid-19 vaccines. Initially, the chapter presents the historical background of the SEM theory and afterward explains how the theory can be applied to understand factors affecting people's hesitancy to take the Covid-19 vaccine in Sweden. Finally, we present our study expectations based on existing literature.

3.1.1 Ecology

In literature, the word ecology refers to the science of the relation of the organism to the environment; or, the study of variation in the earth's biosphere, to understand why plants and animals are found in certain areas and what controls their numbers (Stiling, 1996 cited in McLaren & Hawe, 2005). For more than a century, ecology has been applied in diverse scientific fields of study (Green, Richard & Potvin, 1996 cited in McLaren et al., 2005). According to Beatty (1988), ecology is a diverse field, which has been used in several contexts related to scientific, philosophical, and sociopolitical developments. Initially, ecological thinking was introduced after the First World War when sociologists of the Chicago School started applying an ecological approach to urban studies (McLaren et al., 2005). Despite the decreased interest in ecological thinking, recently the use of the ecological approach has regained its popularity in scientific studies, especially in the public health field (McLaren et al., 2005).

3.1.2 Ecological perspective

The term ecological perspective is a conceptual framework aimed at understanding individual and environmental factors affecting human behavior, such as intrapersonal factors, interpersonal processes, organizations, community, and public policy (McLaren et al., 2005). Each of these factors represents various levels influencing human behaviors (McLaren et al., 2005). The underlying theme of the ecological perspective is the presumption of interconnectedness and reciprocal causation among the levels (McLaren et al., 2005). Consequently, intervention into each level is required to change or improve human behaviors, and the effectiveness of each intervention should be assessed at various levels (McLaren et al., 2005).

In the public health field, ecological perspective has been defined as "the interaction between, and interdependence of, factors within and across all levels of a health problem, which highlights people's interactions with their physical and sociocultural environments" (Rimer & Glanz, 2005, p. 10). From an ecological perspective, the environmental factors affecting public health include

social connections, the organization and structure of work, home, and community environments, availability of health information, and the economic and political climate (McLaren et al., 2005). From an ecological perspective, in the public health field, there are few core principles concerning the interaction between environmental factors and human behaviors and well-being (Stokols, 1996). First, environmental conditions consist of several dimensions, such as cultural, social, and physical that can have an impact on health outcomes, including health status, developmental maturation, emotional well-being, and social cohesion (WHO, 1984 cited in Stokols, 1996). Secondly, instead of focusing only on environmental, biological, or behavioral determinants of well-being, the ecological approach highlights the interaction of personal and situational factors (Stokols, 1996). Last but not least, environmental conditions are closely interconnected and can have either independent or joint impact on a person's well-being (Stokols, 1996).

3.1.3 Social Ecological Model (Initial Version)

Social Ecological Model (SEM) has been developed and revised from the studies of several prominent researchers such as Urie Bronfenbrenner's The Ecology of Human Development (1979); Daniel Stokols' Translating social ecological theory into guidelines for community health promotion (1996); and McLeroy, Bibeau, Steckler, and Glanz's An ecological perspective on health promotion programs (1988). The SEM model was first introduced by Bronfenbrenner in 1979 (Bronfenbrenner, 1979). Even though Bronfenbrenner's initial version of the theory was changed, revised, and extended, his proposed theory has always been ecological, stressing person-context interrelatedness (Tudge, Gray & Hogan, 1997 cited in Tudge, Mokrova, Hatfield & Karnik, 2009). Initially, Bronfenbrenner introduced the model in order to study the ecology of human development, which is " the process through which the growing person acquires a more extended differentiated, and valid conception of the ecological environment, and becomes motivated and able to engage in activities that reveal the properties of, sustain, or restructure that environment at levels of similar or greater complexity in form and context" (Adu & Oudshoorn, 2020; Bronfenbrenner, 1979, p. 27). According to his theory, for understanding human growth in more detail, the whole environment should be considered since the environment where a person grows up has a huge impact on every aspect of a person's life including his/her way of thinking, feelings, and preferences (Santa Clara University, 2021).

According to Bronfenbrenner's Ecological Model, the environment consists of four interconnected systems (Microsystem, Mesosystem, Exosystem, and Macrosystem) that place individuals at the center (Tudge et al., 2009; Kilanowski, 2017). The Ecological Model is illustrated below.
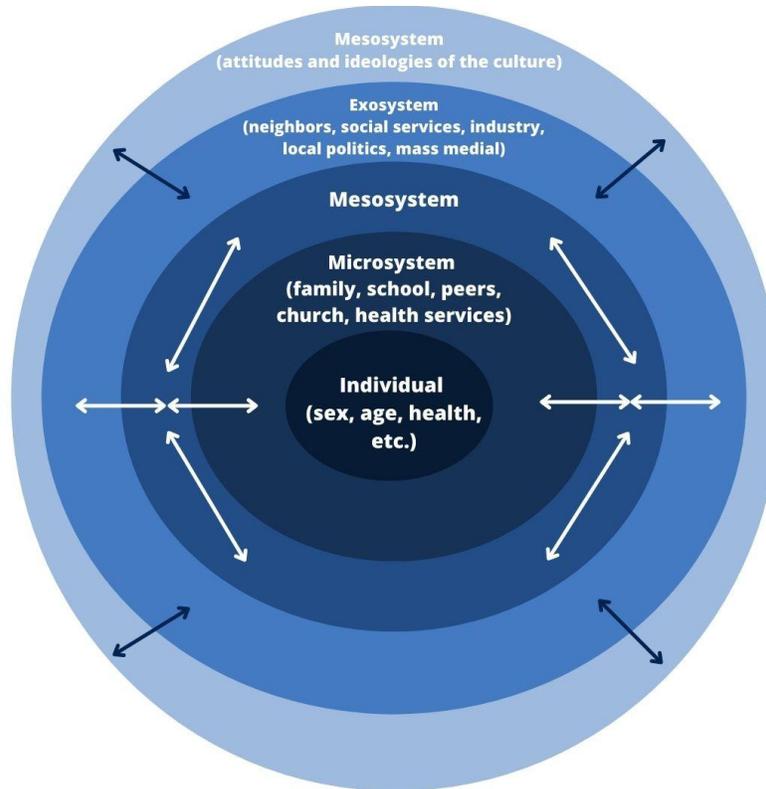
Figure 4: Bronfenbrenner's Ecological systems theory. Source: (McLaren & Hawe) 2005

Microsystem

A microsystem is defined as "the pattern of activities, roles, and interpersonal relations experienced by the developing person in a given setting with particular physical and material characteristics" (Bronfenbrenner, 1979, p. 22). Microsystem is the closest system to the individual which has the strongest influences on the individual and that includes the closest interactions and relationships with immediate surroundings in which the individual spends a great deal of time, such as home, school, or peer group (Kilanowski, 2017; Tudge et al., 2009).

Mesosystem

"A mesosystem is a system of microsystems, which is formed or extended whenever the developing person moves into a new setting" (Bronfenbrenner, 1979, p. 25). In addition, mesosystem looks beyond immediate interactions and consists of interrelations among two or more settings in which the developing person actively participates or has a direct contact with such as work, school, church, and neighborhood (Kilanowski, 2017; Bronfenbrenner, 1979).

Exosystem

An exosystem refers to "one or more settings that do not involve the developing person as an active participant, but in which events occur that affect, or are affected by, what happens in the setting containing the developing person" (Bronfenbrenner, 1979, p. 25). That is, the exosystem indirectly impacts the individual by having both negative and positive effects on the person (Kilanowski, 2017). In the case of a child, examples of an exosystem can involve the parents' friends, the activities of the local school board, to name a few (Bronfenbrenner, 1979).

Macrosystem

"The macrosystem refers to consistencies, in the form and content of lower-order systems (micro-, meso-, and exo-) that exist, or could exist, at the level of the subculture or the culture as a whole, along with any belief systems or ideology underlying such consistencies" (Bronfenbrenner, 1979, p. 26). The macrosystem is the largest system which is the environment an individual indirectly interacts with, but which also has a significant impact on the individual's life (Adu et al., 2020). Generally, the macrosystem involves the societal, religious, and cultural values and influences that play an essential role in the individual's development (Kilanowski, 2017).

3.1.4 Process-Person-Context-Time Model

In the 1990s, Bronfenbrenner introduced the Process-Person-Context-Time (PPCT) model, which became an integral part of his original theory (Tudge et al., 2009). The full and revised theory proposed by Bronfenbrenner also includes the PPCT model, which deals with interactions between four key aspects: processes, person, context, and time (Tudge et al., 2009).

Process

Processes play an essential role in an individual's development (Tudge et al., 2009). Proximal processes, which refer to the interaction of an individual and the environment on a regular basis, are especially fundamental since it is through such interactions that individuals "come to make sense of their world, understand their place in it" (Tudge et al., 2009, p. 200).

Person

According to Bronfenbrenner, personal characteristics consist of three types: demand, resource, and force characteristics (Tudge et al., 2009). Demand characteristics include age, gender, skin color, and physical appearance, which have a huge impact on the initial interaction among people (Tudge et al., 2009). Resource characteristics include both mental/emotional resources such as experiences, skills, intelligence, and also include social/material resources such as access to good

food, housing, caring parents, and educational opportunities (Tudge et al., 2009). Finally, force characteristics refer to temperament, motivation, and persistence (Tudge et al., 2009).

Context

A context, also known as an environment, involves the interconnected systems of the initially proposed theory: the individual, the microsystem, the mesosystem, the exosystem, and the macrosystem (Tudge et al., 2009).

Time

The last component of the model, time or timing, plays an essential role in an individual's development since all the elements of the PPCT model are subject to relative constancy and change (Tudge et al., 2009). This can be the case when considering the individuals themselves, the activities that they engage in, and the microsystems where the individual is living (Tudge et al., 2009).

3.2 Social Ecological Model (Adapted Version)

Based on the Ecological framework introduced by Urie Brofenbrenner (1979), and other prominent researchers, McLeroy, Bibeau, Steckler, and Glanz (1988) introduced five factors influencing human behavior: intrapersonal characteristics, interpersonal processes, institutional factors, community features, and public policy. Along with the five influencing factors on human behavior, the researchers also came up with five possible intervention strategies at each level of influence (McLeroy et al., 1988). Similar to the original theory proposed by Brofenbrenner (1979), the adapted version of the model also suggests that "interactions between individuals and their environment are reciprocal", meaning that an individual is influenced by the environment he/she lives in, as well as, the environment is influenced by the individual (Salihu, Wilson, King, Marty & Whiteman, 2015, p. 87). Currently, there are various health organizations that use multiple versions of the SEM model to understand factors affecting individuals' behavior in different social contexts. In general, The Centers for Disease Control and Prevention (CDC) uses a four-level model consisting of the following factors: individual, relationship, community, and societal (CDC, n.d.). Meanwhile, the United Nations Children's Fund (UNICEF) usually uses the five-level model similar to the model proposed by McLeroy et al. (1988), which includes the following factors: individual, interpersonal, community, organizational, and policy (UNICEF, 2016). The five-level SEM model suggested by UNICEF is depicted below.
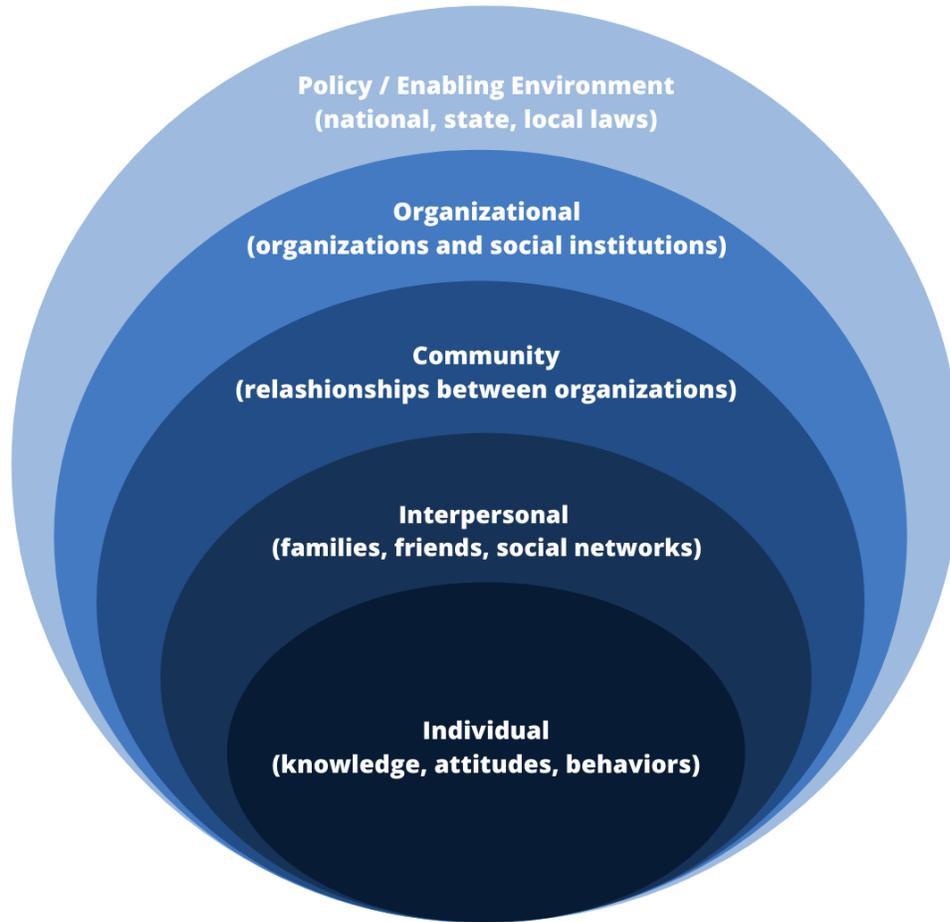
Figure 5: The SEM model. Source: UNICEF (2016)

Intrapersonal/Individual

The individual/intrapersonal level includes an individual's personal characteristics and identities that have an impact on the individual's behavior (Poux, 2017). At this level, the factors include an individual's age, gender, education level, economic status, financial resources, values, goals, expectations, genetics, race, knowledge, attitudes, beliefs, to name a few (Poux, 2017; ACHA, 2018; RHI, n.d.).

Intervention: At the intrapersonal level, intervention strategies include educational programs, mass media, support groups, organizational incentives, or peer consulting (McLorey et al, 1988). Though the interventions at this level involve social influences, the main aim is to change an individual's knowledge, attitudes, skills, intentions in accordance with desirable behavioral norms (McLorey et al, 1988).

Interpersonal

The interpersonal level includes the influence on an individual's behavior from the individual's formal or informal relationship and interactions with other people, such as family, friends, neighbors, supervisors, traditions, rituals, to name a few (Salihu et al., 2015; ACHA, 2018; Poux, 2017; McLorey et al, 1988)

Intervention: At the interpersonal level, an intervention should be in the form of changing social norms and social relationships that motivate or support an undesirable individual behavior (McLorey et al, 1988).

Community

At this level, community factors affecting an individual's behavior consist of three distinct components: mediating structures, relationships among organizations, and power (McLorey et al, 1988). Firstly, mediating structures such as family, informal social networks, churches, voluntary associations, and neighborhoods shape social identity and affect an individual's beliefs, attitudes, and behaviors (McLorey et al, 1988). Secondly, the second component comprising community is the relationships among organizations and agencies in a certain political or geographical region (McLorey et al, 1988). Finally, power structures in cities, counties, and states play an important role in individuals' life and also shape those individuals' behaviors (McLorey et al, 1988).

Intervention: At the community level, intervention strategies include changing relationships among organizations by increasing coordination among agencies and building coalitions to influence community awareness (McLorey et al, 1988).

Institutional/Organizational

At an institutional level, organizations' (schools, universities, work settings) rules, regulations, policies, and informal structures affect the shaping of individuals' behaviors (RHI, n.d.; McLorey et al, 1988).

Intervention: At the institutional level, intervention strategies involve creating healthier organizational environments that will encourage desirable behavioral norms (McLorey et al, 1988).

Public Policy

The largest level of the SEM model includes policies, laws, procedures, and regulations adopted at the local, state, national, and global levels that have the greatest impact on shaping behaviors of a large number of individuals (Poux, 2017).

Intervention: At the public policy level, interventions involve the creation or alteration of local, state, national, and global policies and laws that will restrict or encourage certain behavioral norms (McLorey et al, 1988; HU, Zhou, Crowley-McHattan & Liu, 2021). The key three processes that also play an important role in changing individuals' behaviors are policy development, policy advocacy, and policy analysis (McLorey et al, 1988). Policy development can include raising awareness among individuals about certain issues and educating them on the policy development process (McLorey et al, 1988). Moreover, policy advocacy might include encouraging individuals to participate in the political process like creating coalitions to promote the policies or monitoring the implementation of the policies (McLorey et al, 1988). Finally, policy analysis includes providing policy options to the public, policymakers and encouraging the participation of the public in the policy creation process (McLorey et al, 1988).

3.3 Applications of the SEM model in various fields

The social ecological approach can be found in various fields of research studies. Since initially the model was created to understand individual and environmental factors affecting human development (Brofenbrenner, 1979) and later to propose intervention strategies at each level for health promotion (McLorey et al, 1988), the majority of studies applying the SEM model are related to public health fields, such as violence prevention or the participation of school-aged children in physical activities (CDC, n.d.; HU et al., 2021).

3.4 Application of the SEM model to our research topic

For our research paper, we are going to use the SEM model that was adapted by McLeroy, Bibeau, Steckler, and Glanz (1988). In current literature, the SEM model is extensively used to study the reasons why individuals engage in certain behavior. Therefore, in our research study, application of the SEM model can help us identify and explain how individual and environmental factors of each level of the model affect the decision not to take Covid-19 vaccines among the Swedish population, as well as, help us come up with possible communicational interventions at each level that might change individuals' negative attitudes and behavior towards the Covid-19 vaccines, thus, reduce the Covid-19 vaccine hesitancy among Swedes.

3.5 Research Study Expectations

Since our study adopts a qualitative research method, we do not have a hypothesis to test statistically. However, instead of hypotheses, we state our expectations based on the previous literature available in the field. First of all, the impact of knowledge, attitudes (towards vaccines, vaccine producing companies, the government, healthcare providers), personal experiences on

vaccine hesitant individuals have been mentioned by several authors (Williams, 2014; SAGE, 2013; Dube et al., 2018). Since these factors are included in the first level of the SEM model, we expect that individual factors will have the strongest influence on people's hesitancy to take the Covid-19 vaccines. Previous research on vaccine hesitancy (SAGE, 2013; Dube et al., 2018) has also mentioned that people's vaccine hesitancy can be impacted by communication with their family, friends, peers, and other social groups who comprise the second and the third level of the SEM model. Since the knowledge and opinions are frequently shared among close family members and friends, interactions with them will most likely affect the shaping of individuals' behavior, that is, their hesitancy to take the vaccine. Thus, we also expect that the influence of interpersonal relationships and community will be the second and the third-largest contributors to vaccine hesitancy (respectively). According to Sage (2013), public policies, such as laws adopted by the government that force vaccination, also have an impact on vaccine hesitancy. However, since in Sweden getting the Covid-19 vaccines are not mandatory (Folkhälsomyndigheten, 2020) the public policy factor cannot have an impact on people's vaccine hesitancy. Therefore, we expect that the fifth level of the model, public policy, will not have an impact in shaping individuals' hesitancy to take the Covid-19 vaccine. In addition, another determinant of vaccine hesitancy mentioned by SAGE (2013) is related to vaccine and vaccination-specific issues. Another article by Williams (2014) mentions that the main concern of vaccine hesitant parents is related to the safety of the vaccines. Therefore, we expect that perceived risks associated specifically with the Covid-19 vaccine will be another essential factor affecting people's vaccine hesitancy.

4. Methodology

In the following section, we introduce the methodology of our thesis paper. Initially, we introduce our research approach and method, as well as the sampling method and size of the research participants. In addition, we describe how the data was gathered and what method was used for the data analysis. Finally, we assess the quality of our research in terms of its reliability, validity, and reproducibility.

4.1 Research method

For our research study, we adopted a qualitative research method, which "involves collecting, analyzing, and interpreting data by observing what people do or say" (Burns & Bush, 2014, p. 118). In contrast to quantitative research methods, qualitative research is "a form of social inquiry that tends to adopt a flexible and data-driven research design, to use relatively unstructured data, to emphasize the essential role of subjectivity in the research process, to study a small number of naturally occurring cases in detail, and to use verbal rather than statistical forms of analysis" (Hammersley, 2013, p. 12). Since our thesis project aims to understand a recent phenomenon, the Covid-19 vaccine hesitancy, the adoption of a qualitative research strategy helped us acquire more thorough information from the participants. In addition, as there are not many academic studies on understanding the factors affecting hesitancy towards taking Covid-19 vaccines among Swedes, our qualitative research study aims to gather primary data. Moreover, the main advantage of collecting primary data was that it enabled us to collect more relevant data with respect to our research study, meanwhile, the data from secondary sources did not correspond much to the research we aimed to study.

4.2 Research approach

Generally, when conducting quantitative research, hypotheses are created from theories; thus, a deductive approach is used (Newman, 2000). Meanwhile, qualitative studies use an inductive approach since the main aim is to create new theories or explain a certain phenomenon instead of testing a theory (Newman, 2000). Qualitative studies usually go through the following steps: data collection, data analysis, conclusions, and development of hypotheses and/or theories (Newman, 2000). Since our study uses qualitative research methods and we do not test hypotheses, it would be assumed that our study should apply an inductive approach. However, qualitative data can be analyzed by using both inductive and deductive approaches (Azungah, 2018). But, in our research study, we introduced our expectations instead of hypotheses; therefore, our research will use a deductive approach by basing the analysis on existing theory. Instead of testing hypotheses, we will try to see if our expectations regarding which factors affect Swedes' hesitancy to take Covid-19 vaccines correspond to reality.

4.3 Research technique

The most common qualitative research techniques include focus groups, interviews, ethnographic research, protocol analysis, various projective techniques, and physiological measurement (Burns et al., 2014). In general, interviews are directed conversations that differ from day-to-day conversations in a sense that the questions follow a certain purpose, that is, the exploration of a specific topic (Lofland and Lofland, 1984 cited in Easterby-Smith et al., 2015). Qualitative interviews are considered to be the best method of acquiring information (Easterby-Smith et al., 2015). Therefore, in the scope of our research project, we decided to conduct in-depth interviews, also known as an IDI, which consists of probing questions posed to an individual to gain an understanding of what the individual thinks about a certain topic or why he/she behaves in a certain way (Burns et al., 2014). Since our research topic aims to understand rather a new phenomenon, that is, Covid-19 vaccines hesitancy among Swedish people, asking questions during interviews helped us to gain a more in-depth understanding of the interviewees' opinion of the Covid-19 pandemic, and the possible factors affecting their hesitancy to take Covid-19 vaccines. Moreover, for our research study, we adopted semi-structured interviews which consisted of a fixed set of questions that were addressed in a flexible manner (Easterby-Smith et al., 2015). Another advantage of conducting semi-structured in-depth interviews was that besides the fixed questions, it also enabled us to ask additional questions depending on the interviewees' answers; thus, it helped us obtain thorough and rich responses. Generally, in-depth interviews are conducted either in the participant's house or at a central interviewing location (e.g., a mall-intercept facility), where several participants can be interviewed in depth in a short period (Burns et al., 2014). However, considering the fact that our interviewees were living in different parts of Sweden, it would be time-consuming to travel long-distance to conduct the interviews. In addition, because of the ongoing Covid-19 pandemic, most of the participants were reluctant to participate in face-to-face interviews with strangers. Therefore, we opted for Synchronous mediated interviews (Easterby-Smith et al., 2015): we conducted the interviews via Zoom. This type of remote interviewing is similar to face-to-face interviews; it has enabled us and the interviewees to communicate directly at the same time and also to elaborate on the questions.

4.4 Questionnaire

To understand how and which socio-ecological factors of the SEM model affect the Covid-19 vaccine hesitancy, we have designed our questionnaire mainly based on two articles (See Appendix A). The first academic article has developed survey questions to understand vaccine hesitancy based on the initial reviews of already existing vaccine hesitancy surveys (Larson, Jarrett, Schulz, Chaudhuri, Zhou, Dubé, Schuster, MacDonald & Wilson, 2015). The second source we have used for our questionnaire design was a report by SAGE (2014), which has developed standard survey questions for revealing the main determinants of vaccine hesitancy.

When designing our questionnaire, we have added additional questions and have adjusted the questions used from the two above-mentioned articles in order to understand what factors of the SEM model, as well as what other external factors affect the Covid-19 vaccine hesitancy.

Individual level

According to the SEM model, an individual's knowledge, attitudes, beliefs, and personal characteristics, such as age, gender, educational level, economic status can have an impact on the individual's behavior (Poux, 2017; ACHA, 2018; RHI, n.d.). Therefore, we have asked a few relevant questions in order to understand whether and what factors on this level affect the Covid-19 vaccine hesitant individuals or groups. Initially, we asked the interview participants' opinions about the Covid-19 pandemic and whether they have used any preventative methods not to get infected with the Covid-19 in order to reveal whether they believed in conspiracy theories about the Covid-19 virus, which would directly affect their vaccine hesitancy. We also asked the participants if they have been infected by the virus, whether they had mild or severe symptoms, and whether there was an event in the past that has discouraged them to take vaccines. Answers to these questions helped us understand whether their personal experiences have an effect on their behavior. For instance, if an individual had mild symptoms of the virus, they would be more likely to regard the virus as less harmful and consider the Covid-19 vaccines as unnecessary, which would explain their hesitancy. Also, the participants were asked if they thought that vaccines should be compulsory. This question helped us understand whether their negative attitudes towards vaccinations, in general, have a potential impact on their hesitancy to take the Covid-19 vaccines. In addition, to understand if the participants' knowledge about vaccinations could have an effect on the Covid-19 vaccine hesitancy, they were asked if they possess negative information about vaccinations in general. Moreover, we tried to understand whether the participants were familiar with the Covid-19 vaccines producing companies and whether they think that the companies are interested in their health. The potential negative attitudes towards such companies could be another determinant for people's vaccine hesitancy. Also, we asked the participants whether they trust the government and whether they think that the government makes the best decisions about vaccinations. This way, we tried to understand if people's beliefs or negative attitudes towards the government, in general, might affect their hesitancy to take vaccines that are recommended by the government. Last but not least, we ended our questionnaire with some demographic questions (age, education, income, religion) in order to analyze whether the characteristics of the participants also affect their vaccine hesitancy.

Interpersonal level

On the interpersonal level, an individual's close interactions with other people, such as family members, friends, supervisors influence their behavior (Salihu et al., 2015; ACHA, 2018; Poux, 2017; McLorey et al, 1988). When asking to mention the most common, the most, and the least trustworthy information sources the participants turn to regarding the Covid-19 vaccines, we

aimed to understand whether participants' vaccine hesitancy can be influenced by people they interact with. In addition, to understand the potential influence of others on people's behavior, we also directly asked the participants about external pressures in their lives that might affect their hesitancy towards the Covid-19 vaccines.

Community level

On a community level, interactions with people beyond the participants' closest social circle can affect their behavior (Kilanowski, 2017; Bronfenbrenner, 1979). Asking the participants about potential pressures in their lives affecting their vaccine hesitancy helped us reveal whether and what members within the community level can affect the Covid-19 vaccine hesitancy. In addition, we asked the participants whether they trust their doctors and health care providers, who are considered members of the community, about recommendations regarding the Covid-19 vaccines in order to understand their impact on the participants' hesitancy towards taking the Covid-19 vaccines.

Organizational level

On an organizational level, organizations such as schools, workplaces indirectly affect people's behavior (RHI, n.d., McLorey et al, 1988). Questions regarding the external pressures affecting the participants' behavior and the most common and trustworthy information sources about the Covid-19 vaccines helped us find out whether organizations have an influence on the participants' vaccine hesitancy.

Public Policy level

On a public policy level, local, state or international laws and regulations can affect individuals' behavior (Poux, 2017). Therefore, to understand whether and how the regulations adopted at the state level affect people's vaccine hesitancy, we asked the participants if they trust and follow the recommendations of the Swedish government regarding the Covid-19 vaccines.

In addition, to understand whether other external factors outside the socio-ecological factors also affect the Covid-19 vaccine hesitancy, we asked a few questions relevant to the 3C model.

Confidence

In order to understand the influence of the "confidence" factor of the 3C model on vaccine hesitancy, the participants were asked whether they trust the government, health care providers, and the Covid-19 vaccine producing companies regarding their recommendations about the vaccines. Moreover, to understand the perceived risks specifically associated with the Covid-19 vaccines, the participants were asked if they consider new vaccines, such as the Covid-19 vaccines, riskier and more harmful than older vaccines. Furthermore, the participants were asked to share their main concerns regarding the Covid-19 vaccines, which helped us understand

whether their confidence level towards the effectiveness and safety of the Covid-19 vaccines affect their hesitancy towards the vaccines.

Complacency

In order to understand the impact of the "complacency" factor of the 3C model on vaccine hesitant people, we asked the participants' opinions about vaccines being mandatory in general. The participants' answers helped us understand whether they regard all the vaccines as unnecessary, which would explain their hesitancy to take the Covid-19 vaccines.

Convenience

In order to understand whether the "convenience" factor of the 3C model affects the participants' vaccine hesitancy, we asked them if the distance for traveling to the health clinic and costs associated with getting the Covid-19 vaccine affects their behavior.

4.5 Code of Ethics

Many authors have realized the importance of ethical codes and practices when conducting management and business research (Easterby-Smith et al., 2015; Burns & Bush, 2014; Bell & Bryman, 2007). Bell and Bryman (2007) have identified eleven categories of ethical principles which concern the interests and the integrity of the research participants: harm to participants, dignity, informed consent, privacy, confidentiality, anonymity, deception, affiliation, honesty and transparency, reciprocity, and misrepresentation. Our interviews were conducted in accordance with the above-mentioned ethical principles. Thus, we started our interviews with a short introduction of ourselves and informing the interviewees about the nature and purpose of our research study. In order to ensure the honesty and transparency of our research, the interviewees were also asked if they can be recorded to better remember the conversation, thus, some of the interviews were recorded. Other ethical aspects concerning the privacy of the interviewees were also taken into account: the anonymity and confidentiality of the participants. According to Bell and Bryman (2007, p. 69), anonymity refers to the protection of the interviewee's identity by "… concealing their names or other identifying information," while confidentiality refers to "… the protection of information supplied by research participants from other parties." Therefore, we assured the interviewees that their identities would be kept confidential: their names wouldn't be associated with the responses and wouldn't be provided to a third party. However, we gave nicknames to each interviewee, to make sure we refer to each response individually in the data analysis section. In addition, we avoided asking questions that might have harmed the dignity of the interviewees and caused any discomfort; otherwise, the interviewees were informed that if they felt uncomfortable at any point, they could stop the interview. Thus, our introduction provided the interviewees with enough information to decide if they wanted to proceed with the interview.

4.6 Sampling

In general, gathering data from every individual in a given market is impossible and impractical (Easterby-Smith et al., 2015). Therefore, researchers collect data from a sample, which enables researchers to draw conclusions about a larger group of individuals from the sample chosen from a population (Easterby-Smith et al., 2015). Other reasons for using samples are that gathering data from larger groups of individuals can be very costly, as well as, hard to analyze the huge amount of data acquired from the population (Burns et al., 2014). "A population is defined as the entire group under study as specified by the objectives of the research project" (Burns et al., 2014, p. 210). Meanwhile, "a sample is a subset of the population that suitably represents that entire group," and "a sample unit is the basic level of investigation" (Burns et al., 2014, p. 211). In our case, the population refers to the whole set of individuals living in Sweden who are hesitant to take the Covid-19 vaccines and who belong to the age group of 18 years and older. The population for our research study excludes individuals under the age of 18 years, as according to Swedish authorities, they are not recommended to take the Covid-19 vaccines (Krisinformation, 2021b).

4.6.1 Sampling design

Before collecting the actual data, it is essential to develop a sampling strategy that informs the selection of potential research participants (Easterby-Smith et al., 2015). When deciding on the sampling design, it is also important to take into account two key principles, representativeness and precision, in order to ensure the legitimacy of the claims made from the sample data (Easterby-Smith et al., 2015). The representativeness of the sample depends on the similarities of the sample and the population characteristics, while precision refers to the credibility of the sample chosen (Easterby-Smith et al., 2015).

4.6.2 Non-probability sampling

There are two categories of sampling design: probability and non-probability (Burns et al., 2014). In probability sampling, each member of the population has a known chance of being chosen into the sample (Burns et al., 2014). The main advantage of using probability sampling is the precision of the relationship between the population and the selected sample, in other words, the results from the sample can be generalized into the population (Easterby-Smith et al., 2015). Meanwhile, in non-probability sampling, the chances (probability) of selecting members from the population into the sample are unknown; therefore, it is harder for the researcher to be confident that conclusions drawn from the sample can be applied to the larger group, that is, the population (Burns et al., 2014; Easterby-Smith et al., 2015). Moreover, according to Burn et al. (2014), non-probability sampling is sometimes called "haphazard sampling" since it involves human intervention; thus, non-probability sampling is more prone to human error and even

subconscious biases. Despite this challenge, we decided to use the non-probability sampling design considering the time limit and the difficulty in discovering the size of the population.

As a part of the non-probability sampling design, we used convenience and referral sampling methods.

During convenience sampling, the sample units are chosen based on how easily accessible they are (Easterby-Smith et al., 2015). In general, for researchers, the most convenient areas in terms of reduced time and effort are high-traffic areas, such as shopping malls or busy pedestrian intersections (Burns et al., 2014). The main disadvantage of convenience sampling is that since the choice of the place and the participants are subjective, the sampling process will automatically exclude certain members of the population, such as people who infrequently visit or do not visit the particular high-traffic area (Burns et al., 2014). For our research study, we used convenience sampling by choosing the participants based on the ease of reaching out to them and their willingness to participate in our interviews. We searched for vaccine-hesitant Swedes on Facebook groups that were aimed to discuss the side effects of the Covid-19 vaccines and other information regarding the vaccines. This was the most convenient and fastest way to contact vaccine hesitant Swedes online and ask for interviews.

Our sample was also drawn through a referral sampling method, known as snowball sampling, where each participant provides the names of prospective participants (Burns et al., 2014). We have chosen this sampling method since we were not familiar with many Swedish people and also the fact that there were not many individuals who were reluctant to take Covid-19 vaccines. Initially, we interviewed a few qualified participants, and at the end of the interviews, we asked each participant to provide us the contacts of their friends or acquaintances, who would also qualify for our interview.

4.6.3 Sample size

The most accurate sample is a census since every member of the population is selected, so there is no error in selection; however, choosing a census is impossible because of its costs and practical reasons (Burns et al., 2014). Therefore, in order to be able to generalize the conclusions drawn from the sample, it is necessary to choose random samples of sufficient size (Easterby-Smith et al., 2015). Also, what matters the most is the size of the specific sample rather than the sampling proportion, that is, how big a proportion the sample is of the population (Easterby-Smith et al., 2015). Since, for our study, we are using a non-probability sampling method, the sample size is not related to the accuracy of the conclusions drawn; instead, we take into account the value of the information we can gain from the sample (Burns et al., 2014). We ended up interviewing 20 people since, at that point, interviewing more individuals would not help us gather more and new information for answering our research question.

5. Data collection

5.1 Pre-test

Before conducting the interviews, we also carried out a pretest to make sure that there were not too many questions to bore the participants, as well as the questions were understandable to the interviewees. In general, a pretest includes the conduction of a survey/interview with a small but representative sample of participants to find out and correct errors related to the questionnaire before launching the survey or conducting the interviews (Burns et al., 2014). It is also important for the pretest participants to be representative of the target population of the specific research study (Burns et al., 2014).

The pretest is usually performed with five to ten participants so that it is possible to detect the most common problems related to the interview questions (Burns et al., 2014). Thus, before the actual usage, we pretested the questionnaire on a sample of six participants who partially met the target population of our study. Since it was difficult to find and interview participants of our target population (Swedes who are hesitant to take Covid-19 vaccines) in the first place, we have used a convenience sampling method when choosing our pretest participants that included our friends and relatives who were reluctant to take the Covid-19 vaccines. Moreover, since the actual interviews were supposed to be conducted in English, we also made sure to include participants who knew English. Before conducting the pretest interviews, we informed each interviewee about the interview intentions and asked for their cooperation in revealing to us the problems related to the questionnaire. The pretesting was also conducted to help us understand the average duration of the interviews and cut down questions that might have made the interviewees uncomfortable.

After completing the pretesting stage, we have written down all the remarks mentioned by each participant and decided about what alterations could be done to the questionnaire. We decided to make changes to certain aspects of the questionnaire only if the same problem was mentioned by the majority of the participants (at least three participants). The main issue mentioned by the majority was the sequence of the questions; therefore, we changed the order of some questions in order to ensure that the questionnaire flows in a logical order. Only a few participants had difficulty understanding a few questions; however, we did not change the wording of the questions and decided to elaborate on the questions if needed during the actual interviews.

5.2 Data collection process

To reach our target sample, initially, we searched for relevant Facebook groups and sent requests to become members of the groups. We managed to find two Facebook groups: "Vi som inte kommer ta vaccin mot coronaviruset" (translation: We who will not vaccinate against the coronavirus) and "Covid-19 Fakta Vaccin Biverkningar Hälsotips Information" (translation: Covid-19 Facts Vaccine Side Effects Health Tips Information). After getting approval from the

Facebook group admins, we made two posts where we included our names, the aim of the research we are doing, and then asked for their participation in our interview. The posts (See Appendix B) were written in Swedish in order to grab the attention of the group members; however, we also mentioned that the interviews would be conducted only in English.

After sharing the posts on the Facebook groups, we got only a few reactions from people who were willing to participate in our research. Therefore, we started sending private messages to the group members who met our interview qualifications and asked them directly if they wanted to take part in our interviews. This helped us acquire more participants, but not enough to reach our sample target. As mentioned earlier, we have also used a referral sampling method, which helped us acquire additional prospective participants due to the help of the previous interviewees. In total, we have interviewed 20 participants since, at that point, similarities were found among their responses, and we were not able to gather new information. The average duration for the interviews was around 25 minutes.

5.3 Data analysis

After conducting the in-depth interviews, we have transcribed the recordings and the notes of each interview and gathered all the data together in a separate word file. For analyzing our qualitative data, we have adopted an applied thematic analysis method, which, in the gathered data, identifies and explains implicit and explicit ideas, also known as themes (Guest, MacQueen & Namey, 2012). According to Saldaña (2009, p. 139), a theme is "a phrase or sentence that identifies what a unit of data is about". After carefully reading the interview transcripts a few times, we identified common concepts/ideas/opinions that were explicitly and implicitly mentioned and discussed by the majority of the interview participants. Afterward, the shared ideas and opinions were grouped together and were categorized into distinct themes. Eventually, we ended up with 13 recurring themes that were also relevant to our research objective, that is, understanding what factors of both the SEM model and the 3C model affect the Covid-19 vaccine hesitancy. In addition, the participants' relevant quotes were added to each theme in order to better demonstrate a particular theme. Though there were also a few quotes corresponding to several themes, we avoided adding the same quote to various themes and tried to add each quote to the most relevant and matching theme. After incorporating the quotes, the themes were revised one more time in order to ensure their relevance to our research objective. After the identification and revision of the themes and their related quotes, we divided our vaccine hesitant participants into two groups: vaccine refusers and vaccine deniers. The factors affecting the participants' hesitancy towards the Covid-19 vaccines were identified from the themes and were further assigned to corresponding groups of vaccine hesitant individuals. This method helped us understand and demonstrate what were the major factors of both the SEM model and the 3C model that affected each of the two mentioned groups of vaccine hesitant individuals: vaccine refusers and vaccine deniers.

5.4 Research Quality

For the research to be considered useful, the relevancy, credibility, and attractiveness of the study conducted should be taken into account (Easterby-Smith et al., 2018). The quality of qualitative research can be assessed in accordance with eight criteria introduced by Tracy (2010).

Worthy topic: our research topic is about a recent phenomenon (Covid-19 pandemic), and there is a limited amount of research done on this topic; thus, our study can contribute to existing literature.

Rigour: our research study is based on relevant information from similar studies and makes use of concepts that are appropriate to a qualitative research method.

Sincerity: our research study includes transparent documentation and explanation of the whole research process, which can enable other researchers to evaluate the quality of our study.

Credibility: our research study also presents an in-depth description of background knowledge about the topic and relevant studies existing in the current literature.

Resonance: our research study involves a sample group of Swedes aged 18 and older, which might affect the appropriate generalizability of the research findings to a bigger population.

Contribution: our research study employs qualitative research methods that can contribute to the existing literature by bringing in new perspectives into the SEM model and introducing relevant managerial implications.

Ethics: as mentioned earlier, our study takes into consideration ethical issues related to conducting the research by ensuring the confidentiality of the interview participants and honesty in presenting the research findings.

Meaningful coherence: our research study connects the existing literature with the research findings by applying relevant methods and techniques.

According to Easterby-Smith et al. (2018), the research quality is also based on three key factors: validity, reliability, and generalizability. Thus, it is also important to evaluate the quality of our research also based on the following factors.

Reliability

The reliability of a study refers to the transparency of the data collection and interpretation (Easterby-Smith et al., 2018). Regarding the reliability of our research study, we have been

transparent and explicit in presenting and explaining how our research study was conducted, what kind of data was collected from the interviewees, where and how the data was collected, why we have applied several sampling methods when choosing the interview participants, as well as how we have analyzed the research results. The transparent and detailed explanation of all the mentioned aspects can contribute greatly to the enhancement of our study's reliability.

Validity

The validity of a study refers to whether the study gains access to the experiences of participants in the research setting (Easterby-Smith et al., 2018). With regards to validity, our research study has validity since it employs a qualitative research method which allows us to gain a thorough understanding of the factors affecting Swedes' hesitancy to take Covid-19 vaccines through the conduction of in-depth interviews. However, since our interviews were conducted only in English, we might have excluded prospective participants who could not speak English or the individuals who participated in the interviews might have not expressed their feelings or attitudes completely since English is not their mother tongue.

Generalizability

Finally, the generalization of a study is related to the relevance and applicability of the research concepts and findings to other future studies in different research settings (Easterby-Smith et al., 2018). Since our research study employs a non-probability sampling method and only Swedes were interviewed, the conclusions drawn from our chosen sample might not be applied to other similar research studies and generalized to a larger population.

6. Data Findings

This section of the paper provides general information about the interviewees and interview interpretations from vaccine hesitant individuals in Sweden according to several factors. In each section, we represent direct citations from the interviews, while interpreting those to gain knowledge on vaccine hesitancy in Sweden.

Table 1 provides the demographics of our 20 interview participants. From ethical considerations, the actual names of the participants are kept confidential; however, we decided to give nicknames for each participant.

Participant Nicknames	Gender	Age	Education	Employment	Religion
Emma	Female	49	High School	Horse Therapist	None
Maria	Female	51	Master in Social Science and Law	Administrator at Swedish Public Employment Service	None
Monica	Female	46	Master in Economics, Psychology	Administrator	None
Sofia	Female	26	Master in Humanities	Unemployed	None
Emilia	Female	68	Master in Genetics and Physiology	Agronomist/ Horse consultant	Nature Religion (Swedish: Naturreligion)
Nina	Female	45	Master in Accounting	Accountant	Christian
Ellen	Female	66	High school	Preschool Teacher	None
Charlotte	Female	55	Bachelors in Nursing	Nurse practitioner	Cristian
Sigrid	Female	26	Masters in Architecture and Design	Unemployed	Christian

Lovisa	Female	46	Masters in English Language and Linguistics	Translator	Muslim
Eva	Female	58	High School	Warehouse worker	Christian
Nathalie	Female	25	Masters in Business Administration	Business Operations Manager	None
Ulf	Male	24	Bachelors in Medicine	Sales assistant	None
Oskar	Male	60	High School	Entrepreneur	Christian
Marcus	Male	31	Masters in Nursingand Health	Nurse	Christian
Emil	Male	30	High School	Cook	Christian
Thomas	Male	39	Masters in English literature	High school english teacher	Christian
Stefan	Male	33	Bachelor in Mechanics engineering	Mechanic engineer	Christian
Andreas	Male	35	Masters in Economics	Manager	Christian
Peter	Male	34	Bachelors in Electrical Engineering	Businessman	Christian

Table 1: Demographic information collected from 20 interview participants

6.1 Personal attitudes shaped by the participant's own research

The majority of the participants seek information about the Covid-19 vaccines from the Internet and decide themselves to trust or not to trust particular information. According to some of them, their attitudes towards the Covid-19 vaccines are not influenced by others but mostly by the knowledge they possess about the vaccines. The participants' hesitancy can also be attributed to the fact that there is not enough data and statistics about the side effects of the Covid-19 vaccines.

"I check everything by myself for many hours. I search for information around real science, but try to search on Google." (Emma)

"...Now it's like, you have to search for the information. It is available. But you have to search for it because it is not served to you. We are expecting them to serve us information, but we realize that's not what they are doing now. Instead of waiting to be served, we have to go and search for it." (Nina)

"And then the things that I have been reading, what is inside them, and it's not a pleasant story and I can't remember what it was, but when I read it, I thought this is not going to be in my body. It was some doctor who put it up. I read it." (Ellen)

"I've seen the trials, I've read them. I haven't read about Moderna, but I've read the trial. What is released to the European committee from the companies, they haven't released everything, they don't need to. When you ask for, what do you call it, temporary permission as they have, you don't need to release all the data. So I have read all the data they have released from Pfizer and AstraZeneca, and I would never, ever approve any vaccination on that ground because it's not enough data and all." (Charlotte)

"I don't trust anyone but myself. I do read information, statistics, reports, ingredients, but I have my own opinion." (Maria)

"I started reading about vaccines 35 years ago. I myself study so I have my own opinion first, I don't let anyone tell me what to think." (Emilia)

Thus, the participants' attitudes towards the Covid-19 vaccines are shaped by the information they gather about the vaccines; however, the participants decide to trust information that corresponds to their beliefs. In addition, the limited information available on the effects of the Covid-19 vaccines causes their skepticism towards the vaccines' effectiveness and safety.

6.2 Knowledge shared by others

According to many participants, they gather information about the Covid-19 vaccines from others. The participants also refer to their acquaintances whom they consider as more trustworthy since they are believed to be experts in the field. Thus, the knowledge shared by such individuals is another determinant in the shaping of the participants' attitudes towards the Covid-19 vaccines.

"I talked to a scientist from the Karolinska institute. He told me that I do not have to take the vaccine. I always refer to him when I have questions about the Covid-19 vaccines." (Monica)

"I spoke to a homeopath and she said that I do not have to get vaccinated. My homeopath also told me that the kids, the small babies, especially, should not get vaccinated." (Ellen)

The participants who did not have direct contacts with scientists but who also considered them as trustworthy, tried to get information about the Covid-19 vaccines from well-known scientists through other sources. The knowledge shared by the famous scientists from social media and their personal blogs had one of the greatest impacts on the participants' negative attitudes towards the Covid-19 vaccines.

"We have a very well known scientist and he clearly said that this virus was made in a laboratory. ... That opened my eyes, like what is going on here? So this is the first thing that really made me understand clearly that there is no pandemic, there is a virus, but it was man-made… I found a lot of valuable information on the internet, from doctors and scientists who have their own webpage and their research. Some doctors have had zoom meetings. And I've been searching alternative sites also because YouTube is not reliable anymore. So I've been searching the personal websites of doctors and scientists." (Nina)

"I go to the people who are working with it (referring to the Covid-19 vaccines), scientists. I started searching and I found someone who was doing the same. He was a doctor here. And then this doctor knew a scientist in England and one in Germany. And then we found out that these scientists working with viruses were experts." (Charlotte)

Therefore, the knowledge about the Covid-19 vaccines that was shared by the participants' close acquaintances as well as famous scientists whom they regard as trustworthy has an influence on the participants' hesitancy to take the Covid-19 vaccines.

6.3 Previous experiences with vaccines

Another reason behind the participants' hesitancy to take the Covid-19 vaccines is their previous experiences with other vaccines. Some participants claimed that after getting the vaccines against other major viruses such as swine flu, they have noticed changes in their physical conditions. The previous bad experiences have made people change their views about vaccines in general; thus, some of the participants even decided not to give consent for vaccinating their children.

"I think I have a problem after taking the swine flu shot. I became more exhausted after that. I think it's related to it." (Emma)

"I have had a severe allergic reaction to a vaccine. I had main vaccinations but after that my kids did not take any vaccines." (Maria)

"In 2009, there was a small flu pandemic (referring to swine flu). I didn't want to take it, I was required to take it, but I didn't feel well afterwards." (Sofia)

Some of the participants, who did not have any personal bad experiences with vaccines, gave examples of their close family members' negative experiences with vaccines. According to those participants, such events have also affected their attitudes towards vaccines in general; thus, this fact can also be attributed to their hesitancy towards taking the Covid-19 vaccines.

"Something strange happened to one of my children just after a vaccination when he was 7. He became different in some way." (Peter)

"My mother got pneumonia from taking the vaccine. So it's a very big risk." (Emilia)

In addition, some participants are hesitant towards any vaccinations since they have not had experiences with vaccines at all; therefore, they regard getting the Covid-19 vaccines as unnecessary.

"I have never received a shot of any vaccine in my life. My family protected me from vaccines and now I feel like if I could live my whole life without any vaccination and not have any serious viruses, then it is indeed unnecessary. Why should I be vaccinated with the Covid-19 vaccine?" (Marcus)

"I haven't taken any vaccines in my life. So I think not getting the Covid-19 is not going to negatively affect me by any means." (Eva)

Thus, the participants' hesitancy to get the Covid-19 vaccines have also been affected by both their personal and their family members' negative experiences with other vaccines. It is interesting to note that the hesitancy is not only related to the negative experiences of getting vaccines but also positive experiences of not getting any vaccines throughout their lives.

6.4 Distrust towards healthcare workers

Even though some participants have stated that they trust doctors and healthcare workers regarding recommendations about the Covid-19 virus and vaccines; however, the majority have expressed their distrust towards them. The main reason behind their distrust is that the doctors are not well educated on the topic: they are unaware of the side-effects of the Covid-19 vaccines; thus they only provide positive information about the vaccine. Some participants also believed that the workers feel obliged to give vaccinations by complying with the decisions made by the

government. Other participants also accused the government for not giving proper instructions to doctors on how to report the serious side-effects of the Covid-19 vaccines.

"In Sweden between 1-5 percent of serious side-effects are not reported by the doctors as they don't know how to report them ... They are not informed. If the government says you need to vaccinate all the people, they just do that. It's their job, they don't question anything. They don't look into it. They don't wonder what this is, if all the people need the vaccine. They are not well informed. I don't trust them regarding the Covid-19 vaccines." (Maria)

"I think I know more than they do. They haven't read enough; they are not informed." (Emilia)

Another reason behind the participants' distrust towards the doctors is that they intentionally do not inform about the side effects of the Covid-19 vaccines since they are sponsored by the big organizations that produce the Covid-19 vaccines. Thus, it is not in the best interest of the doctors to share the negative information about the Covid-19 vaccines.

"You know, there are some doctors that are supporting the narrative of the government and they are also very good well-known doctors. But then we found out that long ago, these doctors were sponsored already, by big pharma. There is something called conflict of interest; thus, a lot of doctors have conflict of interest and of course they support that narrative." (Nina)

"No, since they don't provide any information about the possible side-effects or risks, while doctors usually tell about such things. They only talk about the positive effects of the vaccine. I cannot trust them." (Emma)

Thus, participants do not have confidence in the Covid-19 vaccine recommendations by the health care providers since the workers are either not well informed about adverse effects of the Covid-19 vaccines or they deliberately do not provide negative information about the vaccines out of their own interests.

6.5 Personal health conditions affecting attitudes towards Covid-19 vaccines

Some of the participants also expressed their concerns regarding the Covid-19 vaccines because of the potential risks they may have caused to their health. Participants with other health problems stated that they are prone to serious health problems if they took any type of vaccine even if they were not anti-vax. Those participants were frustrated since they are being pressured to take the vaccine because they are in a higher risk group.

"My immune system is weak due to the medicines, which I got in the past. My immune system is hyper allergic. I couldn't even take them (refers to the Covid-19 vaccines) if I wanted to ... I've

been operated on. And when I went to a surgery, they could hardly wake me up. I get in a coma and I know I'm not the only one. So what about us? Are we segregated from the rest of the world?" (Charlotte)

Therefore, some participants believed that their health conditions, which prevent them from getting vaccines, are not being taken into consideration, which caused their distrust towards the government and the Covid-19 vaccine producing companies and resulted in their hesitancy to take the Covid-19 vaccines.

6.6 Conspiracy theories shaping participants' attitudes

Another major reason behind people's hesitancy to take the Covid-19 vaccines is the strong beliefs they have about the Covid-19 pandemic. The majority of the participants believed in several conspiracy theories that exist regarding the Covid-19 pandemic.

Though some participants believed that the Covid-19 virus was natural, many participants also deeply believed that the Covid-19 virus was man-made, meaning that it was intentionally created in a lab by some powerful people; however, the participants did not have any assumptions about the potential reasons for the intentional creation of the Covid-19 virus.

"I think the virus is man-made, produced in the lab." (Emma)

"I think it's man-made. I think it's a combination of Coronavirus and another virus." (Charlotte)

"It is man-made. We have a very well known scientist and he clearly said that this virus was made in a laboratory. At that point, he said, I don't know the intention because you can not really know the intention." (Nina)

Some of the participants also believed that the Covid-19 virus was created for the sake of making money out of the vaccines. Thus, people had distrust towards the Covid-19 vaccine producing companies by also highlighting the fact that the vaccines should not be created by private companies since they are not controlled by the government.

"It's just a business."(Stefan)

"I think the vaccine companies just want to earn a lot of money." (Ellen)

"In fact, they are just doing business. They have no interest in us being completely healthy because then they are out of business. So their interest is to keep us sick and even worse." (Nina)

Many participants also expressed their skepticism about the existence of the Covid-19 virus: some believe that people who have the common type of flu are falsely being diagnosed with the "non-existent" Covid-19 virus. Some people even referred to the Covid-19 virus as bio-weapons that are created for depopulating the world.

"It's an evil plan. We are under an experiment. I don't know if it's even a virus. I know people get sick but what's the reason? Maybe they label it to Covid-19 but they just have a common cold."
(Monica)

"Maybe it isn't a virus, but rather another kind of pathogen like bacteria, parasite, heavy metal toxin or a combination." (Peter)

"They are bio weapons. They (referring to private companies) actually have been making these for many, many years. And they've tried them out as weapons, on small populations and many people have died. Actually, until 2020, it was under bioweapon administration." (Charlotte)

Thus, many participants believed in various conspiracy theories regarding the Covid-19 pandemic, which made them regard the virus as man-made or as bio-weapons. The hesitancy to take the Covid-19 vaccines for these reasons can be attributed to people's distrust towards the private companies producing the Covid-19 vaccines.

6.7 Skepticism towards the term "Covid-19 vaccines"

Almost all of the participants have heard or researched about the Covid-19 vaccines; however, some of them did not consider Covid-19 vaccines as actual vaccines and referred to them as "gene therapy" or "gene-based experimental shots". According to them, they are intended to alter the DNA; thus, causing serious health problems to individuals. Also, some of the participants believed that those types of shots tend to give individuals the Covid-19 virus instead of boosting their immunity against the virus.

"It's not a vaccine, it's a gene therapy. Vaccines are meant to give you anti-gene against the disease and when you have the anti-gene you cannot get ill. But this vaccine can make you ill."
(Emilia)

"According to the common definition, there are no vaccines for Covid-19. However, I think WHO will change the definition of "vaccine" soon in the same way they have done for the terms "pandemic" in 2009 and "heard immunity" in 2020." (Peter)

"This is not a vaccine in some way. If you check the government's policy about what a vaccine is, this is not a vaccine. I don't want to call it gene therapy, I call it gene-based experimental shot

because it's not even a therapy for something. This is more dangerous than any vaccine in the world." (Emma)

Therefore, some of the participants were skeptical about choosing the word vaccine when referring to the Covid-19 vaccines; they believed that these gene-based shots were created to alter the individuals' DNA and make them ill. This phenomenon can indicate people's distrust toward the Covid-19 vaccine producing companies.

6.8 Alternative methods to prevent or cure Covid-19

Some of the participants mentioned that they seek alternative methods to prevent or cure the Covid-19 virus. Moreover, some referred to Covid-19 as a natural virus and stated that a strong immune system and healthy lifestyle are the key to prevent and cure Covid-19. Others talked about the importance of taking vitamins and having a strong immune system to be safe from being infected by the virus.

"People panic, they make the wrong decisions. It is a natural virus. I know people who are sick. There are other ways to cope with the virus besides vaccines. I can see nature can cope with viruses. We are not truthful enough about nature. Nature knows what to do. Trust your own immune system. Trust nature. Getting vitamin D from the sun. When getting sick, go to the doctor earlier. Take pharmaceuticals earlier in the process." (Emilia)

"A healthy life is important and having a body that exercises. And this is what was very strange because everything that keeps us healthy was taken away from us." (Nina)

"Vitamin D, C, zinc, magnesium, psyllium. I go to a homeopath and I believe in that. And then don't eat so much, exercise. CBD oil is helpful as well." (Ellen)

Some of the participants actually were more fond of alternative methods to prevent or cure the Covid-19 virus. From what they talked, daily vitamin intake, exercising and following homeopathy were mostly mentioned as preventative methods against Covid-19. Those participants mostly referred to Covid-19 as a usual flu that doesn't require strong medical interactions or preventative methods, such as vaccination against Covid-19.

6.9 Vaccines kill

Throughout the interviews, participants talked negatively about vaccination against Covid-19. Different participants mentioned that Covid-19 vaccination is harmful for health and has side-effects. Though some participants were critical of vaccination in general, most of them showed a distrust towards vaccination against Covid-19 because it is new.

"... The side-effects are serious. It will damage your life or kill you … It doesn't protect people. It doesn't kill the disease, doesn't give you anti-genes. The side-effects are extremely serious or deadly." (Maria)

Thus, we can see the negative responses that people left about vaccination against Covid-19. Interestingly, few also brought the example of AstraZeneca and talked about the deaths associated with the vaccine.

6.10 Mass media and the Covid-19

As most participants are vaccine hesitant based on individually researched and gathered information, Mass media plays an important role in shaping vaccine hesitancy among individuals about Covid-19. The role of mass media was critically evaluated by some and news on TV was mentioned to be the most distrustful source to learn about the virus and vaccination.

"I don't watch TV to get informed. I watch TV to see what they want me to think." (Peter)

"I don't trust the news on the TV. They promote vaccination of one company against another. It's business, as always." (Andreas)

Hereby, we can see that most of the participants do not trust TV programs and news in shaping their opinions about vaccinations. They consider them to be manipulative in shaping perception towards vaccination against Covid-19.

6.11 Distrust towards the Swedish Government and institutions

The interviewees mainly talked negatively towards the approach that the Swedish Government and other public institutions adopted in overcoming the Covid-19 pandemic. However, this negative outlook towards the Swedish Government caused by Covid-19 may also be a result of some participants not trusting the government at all.

"I don't trust anyone but myself. I do read information, statistics, reports, ingredients, but I have my own opinion. The government has been wrong so many times. In Sweden between 1-5 percent of serious side-effects are not reported by the doctors as they don't know how to report them."
(Maria)

"I don't trust the government. I am sorry to say that. I know too much." (Emilia)

"I trust the government the least, because their rules were the most nonsense I've ever heard ... What is very strange with this situation is that we used to trust our government, but with the COVID-19, we'll find out that the government is the one who tries to bring us into a trap. So, I don't trust them at all." (Nina)

Thus, we can see that vaccine hesitant individuals in Sweden do not trust the Swedish government and the approach it has adopted against the pandemic. However, the distrust towards them may be caused by distrust to any government decision or action.

6.12 Religious beliefs

As most of the participants are not religious and as the responses indicated, religious beliefs did not play a major role in shaping vaccine hesitancy against Covid-19 vaccination among people in Sweden. Only, one participant mentioned that her colleague rejects any vaccination due to religious beliefs.

"Not religious, not political. This is about health. They didn't say this is about choosing a political side. Even now we can see it. It is more political than anything else, but in the beginning, people were listening to what's happening to make a health decision. So I don't know people who don't want to take it because of religion or because of politics, but then now people, we don't want to take it because of scientific and factual facts." (Nina)

"My religious colleague doesn't want to take the vaccine because of her beliefs." (Ulf)

Thus, we can see that religious beliefs do not shape vaccine hesitancy in Sweden as much as they could do in other countries.

6.13 Timing for creating the Covid-19 vaccines

Most people are vaccine hesitant towards Covid-19 vaccination specifically due to the lack of laboratory testing and the fast creation of the vaccine. Some people mentioned that they are not vaccine hesitant to some other vaccines, however they would not take Covid-19 vaccine in the short-run because they think it is dangerous and may have a lot of side-effects.

"They made it really fast. The new vaccine might protect you from the virus but can also give you other illnesses." (Sofia)

"Not tested enough, it's not a vaccine, it's a gene therapy ... They are built in another way than the older ones. We are all in a trial, it will end in 2023. They are doing the test on us. You don't

know the long-term effects. We know the short-term effects: they get sick. My mother got pneumonia from taking the vaccine. So it's a very big risk." (Emilia)

"I like vaccines. It's good. And if they have tested it for many years. It's a lot of good vaccines, you know ... I think it's (referring to the Covid-19 vaccine) not good for your health for a long term. And I don't want to be one of those who get this and die. I don't want that poison in my body and it's not tested, you know, taking a vaccine in one year. My God, I don't believe in that. And then the things that I have been reading, what it says inside them, and it's not a pleasant story and I can't remember what it was, but when I read it, I thought this is not going to be in my body. It was actually some doctor who put it up. I read it. And it's, you can go into the healthcare in Sweden too and read. So it's the same I read." (Ellen)

As we can see, the short timing for the creation of the vaccines against Covid-19 affect perception on vaccination negatively, and are strong bases for shaping vaccine hesitancy among individuals in Sweden.

This section of the paper introduced direct citations from the interviews, and provided an overall analysis on the phenomenon of vaccine hesitancy in Sweden.

7. Discussion

The findings of the following research study have identified key factors affecting vaccine hesitancy in Sweden. The study highlights the influence of socio-ecological and other external factors on individuals' hesitancy to get the Covid-19 vaccines. Based on the data gathered from our interviews and based on existing literature on vaccine hesitancy, we have identified two types of vaccine hesitant people, whom we refer to as vaccine refusers and vaccine deniers. Vaccine refusers are those individuals who are hesitant to take any type of vaccination. Meanwhile, vaccine deniers are those individuals who are not hesitant to take vaccines in general, however, are specifically reluctant to take the Covid-19 vaccines. Therefore, for our discussion, we distinguish between the two types of vaccine hesitant individuals or groups and the factors that affect vaccine hesitancy among those two groups.

7.1 Vaccine Deniers

According to WHO (2017), vaccine deniers are the individuals who have a strong negative attitude towards vaccination and their attitudes are not prone to any changes despite any scientific evidence or good argumentations about the effectiveness and safety of vaccines. Vaccine deniers are referred to as individuals or groups who have characteristics that are very much similar to other types of deniers in any scientific field and religious/political fanatic individuals or groups, so it is impossible to change their initial thinking or beliefs (Popper, 2005). We also refer to this second group of our participants as vaccine deniers, since throughout our analysis we found that those individuals refused to get any type of vaccines; thus, their negative attitudes towards the Covid-19 vaccines were mostly affected by their denial to accept vaccines in general. In our research sample, vaccine deniers mostly read information about the Covid-19 vaccines on the Internet and regard the news on the TV as least trustworthy. Vaccine deniers also express a strong distrust towards the government and healthcare providers since they assume that they possess more information than the government and the healthcare workers. Moreover, vaccine deniers do not trust the Covid-19 vaccine producing companies and assume that such companies are interested only in making money rather than providing safe and effective vaccines for preventing the Covid-19 virus. In addition, vaccine deniers strongly believe in conspiracy theories related to the Covid-19 virus and the vaccines. The most common beliefs mentioned by vaccine deniers are that there is no real pandemic, the virus was produced in the lab and people are under experiment, and the Covid-19 vaccines are not actually vaccines but rather gene-based shots. The main concerns of vaccine deniers were also related to the perceived health risks of taking the Covid-19 vaccines. Thus, in our research study, we conclude that vaccine deniers have strongly held beliefs towards the Covid-19 virus and the vaccines, which has an influence on their vaccine hesitancy.

Individual level

When it comes to vaccine deniers, factors constituting the individual level of the SEM model play a key role in shaping their behavior towards the Covid-19 vaccines. Since vaccine deniers strongly believe in conspiracy theories regarding the Covid-19 pandemic and the vaccines, and continually educate themselves about the side-effects of vaccines, vaccine deniers have already shaped knowledge and beliefs about the effects of vaccines, which has a strong direct impact on their hesitancy towards getting the Covid-19 vaccines. Thus, vaccine deniers are overly confident in their own knowledge, which, in its turn, shapes their negative attitudes towards not only the Covid-19 vaccines but also towards vaccinations in general.

Interpersonal, Community, Organizational, and Public Policy level

Since vaccine deniers strongly believe in conspiracy theories and show distrust towards others, such as the government, healthcare workers, and the Covid-19 vaccine producing companies, factors outside the individual level might not be considered to be part of the adopted version of the SEM model. Based on our findings, the vaccine deniers have already shaped beliefs, knowledge, attitudes towards vaccines; therefore, despite the pressures coming from their surroundings, vaccine deniers' hesitancy towards taking the Covid-19 vaccines is not affected due to their initial knowledge or shaped attitudes towards the vaccines in general.

3C Model

Based on our research findings, only two factors of the 3C model, confidence, and complacency, affect the hesitancy of vaccine deniers. Firstly, vaccine deniers have a lack of confidence in the effectiveness of the Covid-19 vaccine because of their distrust towards the government, healthcare professionals, and vaccine producing companies. In addition, as already mentioned, vaccine deniers believe in conspiracy theories and regard the risks of the Covid-19 virus as low, therefore, they are more likely to think that the vaccine is not necessary. Finally, since the travel distance and costs associated with getting the Covid-19 vaccines do not affect vaccine deniers' decision to take or not take the vaccine, the convenience factor of the model does not have a direct impact on vaccine deniers as well.

7.2 Vaccine Refusers

As defined by the WHO (2017), vaccine refusers are considered those individuals who are hesitant to accept the recommended vaccine, but who might also be persuaded by others' opinions, scientific evidence, or by strong argumentation. Among our participants, vaccine refusers were those individuals who were not against vaccines in general, but who were hesitant to take the Covid-19 vaccine. As opposed to vaccine deniers, vaccine refusers do not believe in

conspiracy theories and think that the virus exists and is natural rather than man-made. When gathering information about the Covid-19 vaccines, vaccine refusers turn to the Internet; however, unlike vaccine deniers, they also turn to their friends or family to learn more about the Covid-19 vaccines. Vaccine refusers also regard TV as an untrustworthy medium for getting informed about the Covid19 vaccines. Also, vaccine refusers refer to the Swedish Public Health Agency when seeking up-to-date information about the Covid-19 vaccines. In addition, vaccine refusers trust the Swedish government, and healthcare professionals more than the Covid-19 vaccine producing companies, whom they criticize for being interested in making profit out of the vaccines. Last but not least, vaccine refusers are mainly concerned about the timing of the Covid-19 vaccine development, as well as the perceived health risks and the long-term side-effects associated with the Covid-19 vaccines.

Individual level

The SEM model's initial version fails to take into account the factors on the individual level affecting individuals' behavior; it mainly focuses on the impact of relationships between the individual and its surroundings (Bronfenbrenner, 1979). However, our research findings show that vaccine refusers mostly get informed about the Covid-19 vaccines through their own research on the Internet. Thus, the knowledge that vaccine refusers have regarding the Covid-19 vaccine, have an impact on their behavior, that is their hesitancy to take vaccines.

Interpersonal/Community level

When gathering information about the Covid-19 vaccines, vaccine refusers usually refer to their closest friends; thus, their behavior is also shaped by the knowledge and experience shared by their close social networks. Moreover, when getting information about the Covid-19 vaccines, vaccine refusers also referred to people outside their close social circle, such as famous scientists, whom they regard as trustworthy. Therefore, interactions with others both on an interpersonal and community level can influence the behavior of vaccine refusers. We decided to combine interpersonal and community levels since throughout the data analysis section, we found that both factors affect Covid-19 vaccine hesitancy by the same extent.

Organizational level

According to the SEM model, organizations also play an essential role in forming individuals' behavior (McLorey et al, 1988). However, during the interview analysis we found out that vaccine refusers have not implicitly or explicitly mentioned any institution that might have a potential impact on their behavior. Though they use the Public Health Agency of Sweden as a source to look up constructed and natural information on Covid-19 in Sweden, they indicate that this institution does not impact their behavior. Furthermore, our findings do not indicate another

organization or institution which affects vaccine hesitancy among people in Sweden. Thus, we conclude that vaccine refusers usually do not shape their behavior against Covid-19 vaccination due to this factor and, thus, we exclude the organizational level from the adopted version of the framework.

Public policy level

Public policy is considered as one of the most interesting factors to look at, as it is not fully connected to individual decision-making. In Sweden, vaccination is not mandatory and people can choose to be vaccinated or not (Folkhälsomyndigheten, 2020); thus, the public policy level does not have a direct impact on the individuals' vaccine hesitancy. However, due to the changeable nature of laws/policies regarding the Covid-19 pandemic, for vaccine refusers, public policy may impact the Covid-19 vaccine hesitancy in the long run.

3C Model

Based on our research findings, vaccine refusers are only affected by the confidence factor of the 3C model. Vaccine refusers delay their decision about taking the vaccine by considering the timing of the creation of the Covid-19 vaccine. According to them, since the Covid-19 vaccines were developed in a short period of time, the long-term side-effects of the vaccines are unknown. Thus, their perceived health risks of taking the Covid-19 vaccines affect their vaccine hesitancy. In addition, we believe that the complacency factor refers to the low-perceived risks of the virus itself. However, since vaccine refusers believe that the Covid-19 virus is real and poses threat to their health, the complacency factor does not affect their hesitancy towards the Covid-19 vaccines. Vaccine refusers are not concerned about the costs of getting the vaccine, thus, the convenience factor does not have an impact on their vaccine hesitancy.

8. Theoretical Implications

Based on our research analysis, the application of the SEM model, two different frameworks were developed for each group of vaccine hesitant individuals.
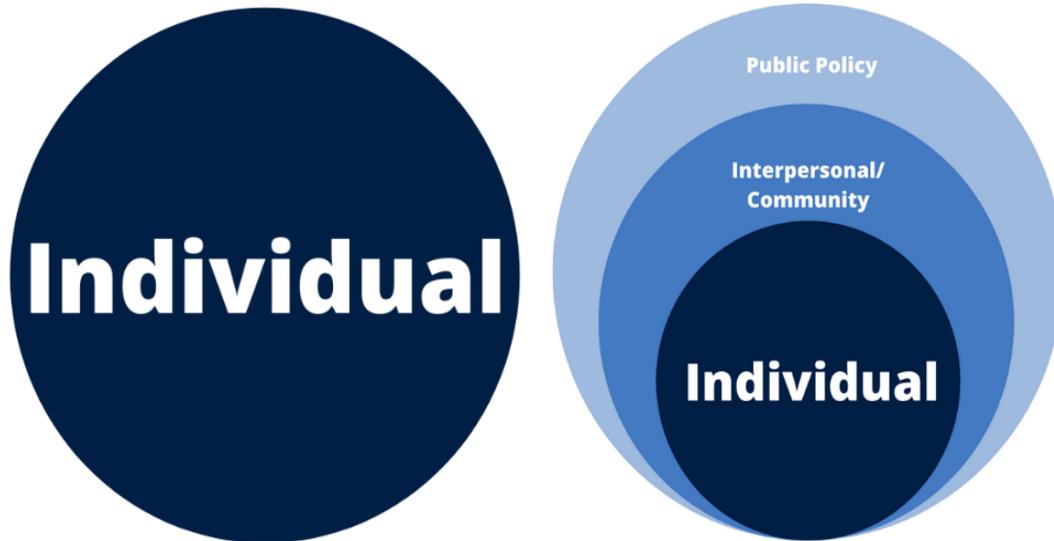

Figure 6: Adopted SEM model (factors affecting vaccine hesitancy among vaccine deniers)
Figure 7: Adopted SEM model (factors affecting vaccine hesitancy among vaccine refusers)

The first model of the adopted version of the SEM model suggested by us refers to vaccine deniers, who are majorly influenced by only their prior knowledge towards any type of vaccination. Throughout our analysis, we found that this is indeed the case, even though Covid-19 is a novel virus. However, we do not see this behavior be changed in the future, since we believe that vaccine deniers tend to have radical opinions about vaccination.

The second model shows factors affecting individuals known as vaccine refusers. At the core of the model is the individual level as our analysis has shown that people mostly depend on their own knowledge towards the Covid-19 vaccine and that outside factors have a little effect on shaping vaccine hesitant behavior; thus, interactions with others on interpersonal and community level have the second-largest impact on vaccine refusers' hesitancy. On the other hand, factors outside the individual level affect vaccine refusers in the long run and their behaviors towards the Covid-19 vaccines. Vaccine refusers are reluctant to take the vaccination at the beginning, however, in the long run, they are more sensitive to be affected by the other factors (interpersonal, community, organizational, public policy) if they are more confident in the effectiveness of the Covid-19 vaccine.

The main takeaway of our theoretical implication is that at different stages of the consumer decision-making process (in our case, refusing all vaccines altogether, and accepting vaccines in general but rejecting a specific vaccine), socio-ecological factors affecting people's behavior vary. Factors outside the SEM model can also affect individuals' decisions to take the Covid-19 vaccine. For vaccine refusers, the perceived health risks of the Covid-19 vaccines have especially a major influence on their hesitancy to take the Covid-19 vaccines. What refers to vaccine deniers, their perceived risks of the virus, their inconfidence towards the effectiveness of the vaccine, and mistrust towards the government, healthcare workers and the vaccine producing companies are other determinants for their negative attitudes and behavior towards the Covid-19 vaccine. Thus, we suggest two adopted versions of the SEM framework - one for vaccine refusers and the other for vaccine deniers.

9. Practical implications

Our study provides useful implications for the public healthcare providers, social marketers, the government and other stakeholders concerned with the phenomenon of vaccine hesitancy during the Covid-19 pandemic.

Since knowledge plays an essential role in shaping people's attitudes/behaviors towards vaccination, and vaccine hesitant people complain about the limited availability of data on the Covid-19 vaccines, the vaccine producing companies, and the government need to provide more information about the vaccines. Thus, both those companies and the government may engage in direct communication with vaccine hesitant individuals and educate them on matters that concern them the most. Revealing more information about vaccine efficiency may help to reduce vaccine hesitancy. To directly target vaccine hesitant individuals or groups, those stakeholders can conduct face-to-face or online meetings with vaccine hesitant individuals, since it can also allow them to answer their questions in real-time. Also, information regarding such meetings can be announced through social media since vaccine hesitant individuals or groups can be found on social media actively searching for information about the Covid-19 vaccines.

Since one of the main concerns among vaccine refusers is the safety and the effectiveness of the Covid-19 vaccines, in order to change the behaviors of vaccine refusers, social marketers need to focus on communicating the "value" of the Covid-19 vaccines by advocating the positive effects of vaccines in the long-term. However, as mentioned in the literature, social marketing strategies might not be effective enough when directed towards individuals or groups that are completely against vaccination. Therefore, social marketing strategies should not be focused on changing the behaviors of the vaccine deniers, because of their strongly held beliefs, attitudes towards vaccines, and distrust towards the government, healthcare workers, and vaccine producing companies. The main emphasis of such strategies should be put on vaccine refusers, who are more likely to change their behavior towards the Covid-19 vaccines in the long run.

According to our data analysis, vaccine hesitant people have also expressed their distrust towards healthcare workers, because of their lack of knowledge about the Covid-19 vaccines and their potential side effects. Thus, the government should work together with public health organizations and create educational programs aimed at training and educating healthcare workers about the safety of vaccines.

Last but not least, our findings have shown that vaccine hesitant individuals do not fully trust the Covid-19 vaccine producing brands for providing them with safe and effective vaccinations since according to vaccine hesitant people, such private companies are only interested in making money. It is essential to foster trust towards Covid-19 vaccine producing brands and

communication is the key factor in building the trust. Therefore, the government should cooperate with those brands by communicating the safety of the Covid-19 vaccines.

10. Limitations and Future Research

Since our research aims to thoroughly understand a recent phenomenon, hesitancy to take Covid-19 vaccines, our study will contribute greatly to the current literature; however, our study also has few limitations. The description of our research limitations can help prospective researchers improve and expand the research on the topic.

The main limitation of our research study was the choice of the non-probability sampling method. As we have mentioned already in the methodology section, by using the non-probability sampling technique, the finding drawn from the sample might not be generalized to a larger population. The main reason for not using the probability sampling method was that it was difficult to find people who were hesitant to take the Covid-19 vaccine, and also get their consent for interview participation. Since we could contact the potential participants only via private messages, some individuals either did not agree to participate or have missed the messages, so the only choice was the non-probability sampling method. Besides, because of limited time, we have used only social media platforms, mainly Facebook, for finding our potential participants. The use of this kind of convenience sampling method might have also prevented us from reaching prospective qualified participants. For future research, the non-probability sampling method might still be more convenient and more applicable, however, to somewhat decrease the sampling bias, researchers can interview individuals from sources beyond social media platforms. This can help the researchers include more qualified researchers and be more confident in generalizing their research findings to a larger population.

Another major limitation of our research is our choice of a broad age group for our sample since differences in factors affecting the vaccine hesitancy might have existed between different age groups. For instance, those people in the risk groups may be more concerned about their health and thus be less sensitive to vaccination than those who are not in the risk groups. Moreover, our research results are country-specific since the sample includes participants only from Sweden. This can affect the quality of our study since the results might not be generalized to other countries considering the differences among nationalities. Future researchers interested in conducting a similar study can choose a more narrow age group for their sample, as well as include a sample group of people from different nationalities. Future researchers can also compare different studies and see if the Covid-19 vaccine hesitancy is specific to demographics and what factors affect the hesitancy in different sample groups.

Another more technical limitation of our research study was the interviewing language. Since our research study was conducted only in English, some Swedes refused to participate in the interviews because of their lack of English language knowledge. This phenomenon again could have prevented us from including our potential participants. Also, the participants who

participated in the interview might have not fully expressed and communicated their true feelings and attitudes since English is their second language. For future research, in order to overcome the issue of the language barrier, the interviews can be conducted in the mother language of the participants to make the research findings more reliable.

Another limitation of our research study is related to the conduction of the interviews. Because of the Covid-19 pandemic and impracticability and the cost of traveling between different parts of Sweden, the interviews were conducted remotely with the help of online zoom meetings. Digital communication has made it difficult to observe the body language of the interviewees and control distractions that might affect the participants' attention throughout the interview. When conducting similar studies, future researchers can reduce or avoid the possible interruptions while interviewing individuals in person, however, also considering the potential costs of commuting.

Finally, for our research study, the use of qualitative research method is not necessarily considered as a limitation since the hesitancy towards the Covid-19 vaccines is a recent phenomenon; thus, the use of qualitative research method was essential to gain a more in-depth understanding of the new phenomenon. However, our qualitative research study can serve as a basis for future similar research studies, where researchers can apply a quantitative research method and test hypotheses.

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12. Appendix

Appendix A Interview Questionnaire

1. What is your opinion about Covid-19 pandemic?
2. Have you been infected by Covid-19 so far? Did you have mild symptoms?
3. What are some of the preventative methods that you have used so far to not get infected by Covid-19?
4. Do you think vaccinations should be compulsory or not?
5. Have you ever received or heard negative information about vaccination? Y/N If yes, please give an example.
6. Do you know anyone who does not take a vaccine because of religious, cultural, or political reasons?
7. Was there an event in the past that has discouraged you from getting a vaccine(s) for yourself or your family? If yes, please describe the event(s) What was the reason you decided not to take the vaccine?
8. Have you heard about the Covid-19 vaccine producing companies?
9. What is the most common information source you turn to for information on Covid-19 vaccines?
10. Whom do you trust the least for information regarding Covid-19 vaccines?
11. Do you trust that your government is making decisions in your best interest with respect to what vaccines are provided?
12. Do you trust your doctor/health care provider/government recommendations about Covid-19 vaccines?
13. Do you believe that Covid-19 vaccine producers are interested in your health? Do you trust them to provide safe and effective vaccines?
14. Do you think that new vaccines (like Covid-19) carry more risks than older vaccines?
15. Has distance, timing of clinic, time needed to get to clinic or costs associated with taking the Covid-19 vaccine prevented you from getting a vaccine? Y/N. If yes, please explain.
16. Are there other pressures in your life that prevent you from getting vaccines? Y/N If yes, specify.
17. To sum up, what are your main concerns regarding Covid-19 vaccines?

Demographic questions:
1. What is your age?
2. What is your religion?
3. What is your education?
4. What is your profession?
5. What is your income?

Appendix B Facebook Group Posts

Vi som inte kommer ta vaccin mot coronaviruset

🌐 Public group · 278 members

About · **Discussion** · Announcements · Rooms · Topics · Members · More ▾

Tatevik Nazaryan
April 15 · 🌐

Hej alla. Nella Karapetyan och jag Tatevik Nazaryan avslutar för närvarande vårt magisterprojekt i Lunds universitet för att förstå människors attityder till covidvacciner. Vårt uppsatsprojekt syftar till att förstå vilka faktorer som påverkar människors vilja eller motvilja att ta covidvaccinet.
För vår forskning behöver vi människor som är villiga att delta i en kort Zoom-intervju med oss på engelska. Intervjuerna kan också genomföras fysiskt beroende på dina önskemål och tillgänglighet. Intervjuens svar är konfidentiella och anonyma och kommer endast att användas för forskningsändamål enligt Lunds universitets riktlinjer.
Ditt deltagande kommer att uppskattas mycket. Vänligen kommentera under inlägget eller skicka oss ett PM om du är intresserad av att delta. Därefter kommer vi att ge mer information om vårt forskningsprojekt och intervjuprocessen. Ser fram emot dina svar. 😊

About

Här kan vi följa och diskutera utvecklingen kring coronavaccin

🌐 Public
Anyone can see who's in the group and what they post.

👁 Visible
Anyone can find this group.

👥 General

Covid-19 Fakta Vaccin Biverkningar Hälsotips Information

🔒 Private group · 1.1K members

About · **Discussion** · Topics · Members · Events · Media

Tatevik Nazaryan
April 24 at 9:40 AM · 🌐

Hej alla. Jag Tatevik Nazaryan avslutar för närvarande vårt magisterprojekt i Lunds universitet för att förstå människors attityder till covidvacciner. Vårt uppsatsprojekt syftar till att förstå vilka faktorer som påverkar människors vilja eller motvilja att ta covidvaccinet.
För vår forskning behöver vi människor som är villiga att delta i en kort Zoom-intervju med oss på engelska. Intervjuerna kan också genomföras fysiskt beroende på dina önskemål och tillgänglighet. Intervjuens svar är konfidentiella och anonyma och kommer endast att användas för forskningsändamål enligt Lunds universitets riktlinjer.
Ditt deltagande kommer att uppskattas mycket. Vänligen kommentera under inlägget eller skicka oss ett PM om du är intresserad av att delta. Därefter kommer vi att ge mer information om vårt forskningsprojekt och intervjuprocessen. Ser fram emot dina svar. 😊

About

Gruppen tittar på båda sidor av myntet gällande Covid-19. Vi tillhandahåller science, fakta, hälsotips och övrig information såsom rapporter om ... See More

🔒 Private
Only members can see who's in the group and what they post.

👁 Visible
Anyone can find this group.

👥 General