**The impact of COVID-19 and public health measures on healthcare seeking behaviour and the utilization of healthcare services among community members in Vietnam**

Thao Huong Dang
Vietnam

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58th Master of Public Health/International Course in Health Development

Royal Tropical Institute
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**The impact of COVID-19 and public health measures on healthcare seeking behaviour and the utilization of healthcare services among community members in Vietnam**

A thesis submitted in partial fulfilment of the requirement for the degree of Master of Science in Public Health

By

Thao Huong Dang
Vietnam

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## ABSTRACT

**Background:** Covid-19 has burdened the health system and livelihoods in major ways, leading to the cancellation and delay of healthcare services. In this study, we aimed to examine the factors that influence healthcare seeking behaviour (HSB) and healthcare utilization (HCU) in the context of COVID-19 pandemic in Vietnam.

**Method:** This is a mixed method study using data from the first phase of a multicenter study called SPEAR (Social Science and Public Engagement Action Research) project. For the qualitative data, we analyzed in-depth interview scripts collected from purposive participants (community members and healthcare workers living in Hanoi, Nam Dinh, Dak Lak and Ho Chi Minh City in Vietnam). We used thematic network analysis method (Nvivo-12) to assess the data based on Andersen's behavioral model to identify the factors that influenced HSB and HCU from January to May 2021. For quantitative data, online surveys collected from January to July 2021 were analyzed. We used R program to describe the demographic characteristics of the study population, proportion and frequency of different factors associated with HSB and HCU.

**Results:** For qualitative themes emerging: i) environmental factors (including public health measures(PHM) and prioritizing resources policy for COVID-19) influence the disruption of the essential health care service; ii) the delay and cancellation of medical appointments among people due to the fear of getting infected; iii) mental health and the neglected of professional care services; iv) the change in the pattern of the resort of HCU in patients with flu-like symptoms; v) the negative impacts of COVID-19 and PHM on livelihood and access to care.

For quantitative results: One in every ten survey respondents delayed or cancelled medical appointments during the pandemic (11% of all participants). This delay or cancellation was mainly due to the disruption of health services, with 31% of all responses recorded (including 22% due to healthcare provider cancellation appointments and health facilities closure 9%). Vaccinations for children accounted for 29% of all delayed or cancelled health services, followed by routine health check-ups (20%) and dental care (19%) of recorded responses. There was a significant difference in the self-care action of participants when they had symptoms such as cough, sore throat and fever before and during Covid-19 pandemic ($P < 0.001$).

**Conclusion:** The COVID-19 pandemic and the public health measures implemented affected participants' socioeconomic status, health services utilization, their psychological well-being and social relationships. These impacts could also have consequences for healthcare access and HCU. The findings suggest the need for a holistic approach including health system protection and social protection policy to enhance equitable access to healthcare and improve HCU amid the pandemic crisis.

**Keywords:** Healthcare seeking behaviour, Healthcare utilization, access to healthcare, Covid-19 Pandemic, Vietnam

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## LIST OF ABBREVIATIONS

| | |
|---|---|
| COVID-19 | : Coronavirus disease 2019 |
| HCMC | : Ho Chi Minh City |
| HCW | : Healthcare Worker |
| HSB | : Healthcare Seeking Behaviours |
| HCU | : Healthcare Utilization |
| LMICs | : Low- and middle-income countries |
| PHM | : Public Health Measures |
| SARS-CoV-2 | : Severe Acute Respiratory Syndrome Corona Virus 2 |
| ASEAN | : The Association of Southeast Asian Nations |
| SPEAR | : Social Science and Public Engagement Action Research |

DEFINITION OF TERMS

**Access to care:** actual use of personal health services and everything that facilitates or impedes their use. Access means not only visiting a medical care provider but also getting to the right services at the right time to promote improved health outcomes(1).

**Healthcare seeking behaviour (HSB)**: any action or inaction undertaken by individuals who perceive themselves to have a health problem or to be ill for the purpose of finding an appropriate remedy(2)

**Healthcare Utilization (HCU):** is the quantification or description of the use of services by persons for the purpose of preventing and curing health problems, promoting maintenance of health and well-being, or obtaining information about one's health status and prognosis(3)

**Public Health and Social Measures (PHSM):** Public health and social measures (PHSMs) are measures or actions by individuals, institutions, communities, local and national governments and international bodies to slow or stop the spread of an infectious disease, such as COVID-19(4).

**Psychosocial characteristics:** is a term used to describe the influences of social factors on an individual's mental health and behavior(3).

**Social capital**: features of social organization, such as trust, norms, and networks that can improve the efficiency of society by facilitating coordinated actions(5)

**Medical pluralism:** Medical pluralism can be defined as the employment of more than one medical system or the use of both conventional and complementary and alternative medicine for health and illness(6).

**Pattern of resort:** The strategies that people employ to decide which option to use at which stage of the illness(7)

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INTRODUCTION

Since the beginning of the COVID-19 pandemic, many studies have shown changes in the habit of seeking health and medical information and using medical services(8–16). These changes are related to adopting public health measures (PHMs) to contain the spread of COVID-19. These changes included reducing a broad type of essential medical services and increasing some special services such as telehealth(9,15,16). A survey by WHO showed disruptions to health care services, the largest in countries hit hard by the pandemic and low-income countries(17).

Some alarming numbers come as access to essential maternal and child care is disrupted, which could result in an additional 1 million deaths among children(18). In addition, the impact of the pandemic can lead to unnecessary, excessive and inappropriate care, which can cause harm, such as the overuse of antibiotics(11). Systematic studies in 20 countries worldwide have also shown delays or cancellations of health visits because of fear of being infected when visiting healthcare facilities or being unable to access health services due to travel restrictions or disruption of services from healthcare providers(15).

In Vietnam, while the proportion of people participating in health insurance increased every year from 68.47 (2015) to 87.98 million (2020), the number of health insurance visits gradually increased from 130.2 (2015) to 184.1 million (2019) and reduced to 167.6 million in 2020(19–22). There were no reports of total non-public medical visits found. The use of health services continued to decline in the following year as data in the preliminary report of the Department of Health in the two largest cities in Vietnam, Hanoi and Ho Chi Minh City (HCMC) also recorded a significant decrease in health insurance medical visits(23,24). Especially in the biggest city of Vietnam, Ho Chi Minh City, in 2020, outpatient visits decreased by 29.2%, and inpatient hospitalization decreased by 18.8% compared to 2019. In 2021, the number of outpatient examinations and treatments continued to decrease by 37.9%, and the number of inpatient treatments decreased by 32% compared to 2020(23).

The use of health services in Vietnam in 2020 has decreased, but more data and evidence are needed to explain this decline. There have also been changes for other preventive care services such as vaccination rates for children under one year of age. The percentage of fully vaccinated children under one year old from 2015-2019 has consistently been above 94%, but by 2020, this rate had dropped to only 87%(19–22).

As the COVID-19 pandemic continues, studies on its impact on life and health-seeking behaviour, access to healthcare and health service utilization play a key role. This study will add scientific evidence and data to inform policy-makers to devise health responses and strategies tailored to the situation at each time and in each unique context, such as Vietnam.

# CHAPTER 1

### BACKGROUND

### 1.1.   GEOGRAPHY AND DEMOGRAPHY OF VIETNAM

Vietnam shares borders with China to the North, Laos and Cambodia to the West, the East Sea to the East and the Pacific Ocean to the South (Figure 1). The population of Vietnam was approximately 98,5 million in 2021, making it the 13th most populous country globally. The population density was approximately 297 people/km$^2$ in 2021(19).

Vietnam has 54 ethnic groups with Kinh (Viet) people occupying nearly 85,32% of the total population(21). In 2021, the proportions of the rural and urban population over the total population were 62.9% and 37,1%, accordingly. The population structure by gender was 50,16% females and 49,8% males(19).



Figure 1: Map of Vietnam (25)

### 1.2.   MACRO ECONOMY AND SOCIOECONOMIC STATUS OF VIETNAM

The consequences of 20 years of war made Vietnam one of the poorest countries in the world with a GDP of only one-sixth compared to the average GDP of Low-Income-Countries in the 1980s(26). However, the country gained tremendous achievements with rapid developmental progress, turning the nation into Lower-Middle-Income Country (LMIC) in 2010(27). GDP growth rates continuously increased in the following years, with remarkable increases in 2018 and 2019, when they peaked at 7.08% and 7.02%(28), making Vietnam the fastest-growing economy in the region(29). As a result, the poverty rate (percentage of people living under 1.9 USD per day/total population) declined from 60% (2010) to below 5% (2020)(27).

However, the unprecedented outbreak of COVID-19 pandemic in early 2020 resulted in the national GDP growth rate bottoming to only 2.91% (Figure 2) (29–31). As a result, the annual growth rate of GDP per capita was about 5-6% throughout 2015-2019, while that of 2020 dropped to only 2%, the lowest increase in the recent five years. This led to Vietnam's GDP per capita in 2020 being 2,785 USD, a very mild increase of 70.4 USD compared to 2019(Table 1).

| Year | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| GDP per capita (USD) | 2,085.1 | 2,192.2 | 2,365.5 | 2,566.4 | 2,715.3 | 2,785.7 |
| GDP per capita - Annual increase | N/A | 107.1 | 173.3 | 200.9 | 148.8 | **70.4** |
| GDP per capita growth (annual %) | 5.6 | 5.1 | 5.7 | 6.0 | 6.0 | **2.0** |
| Population (million) | 92.7 | 93.6 | 94.6 | 95.5 | 96.5 | 97.3 |

Table 1: Vietnam Development Indicator - GDP indicator from 2015 to 2020 (28)

Despite the impacts of COVID-19, Vietnam successfully maintained a positive GDP growth rate during the pandemic period(28,31) (Figure 2) and is still one of the sixth-largest economies in The Association of Southeast Asian Nations (ASEAN)(32). However, even though total GDP had slightly increased, its contribution was different among different market sectors. For example, compared to 2019, financial, banking and insurance activities increased by 6.87%, the transport and warehousing sector decreased by 1.88%, and the accommodation and dining services sector also fell by 14.68%(21).



GDP growth (annual %) in 2020 of major ASEAN economies
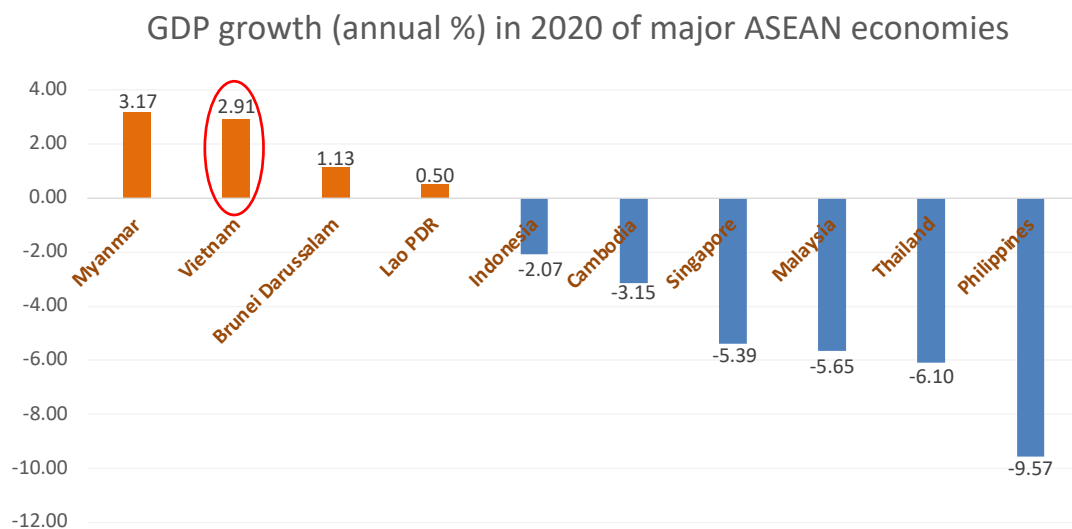
Source: World Development Indicators (WDI), World Bank data

Figure 2: GDP growth (annual%) in 2020 of major ASEAN economies

### 1.3. AGING POPULATION

Vietnam witnessed a decrease in fertility and an increase in life expectancy. According to the World Bank, this country became an ageing society in 2015 and is projected to become aged in 20 years (Figure 3)(33). Ageing society changes in the workforce's structure, affecting future economic growth and development. The ageing population also puts pressure on social security for the elderly (e.g. pension policies) and the health system due to the double burden of communicable and non-communicable diseases(33).
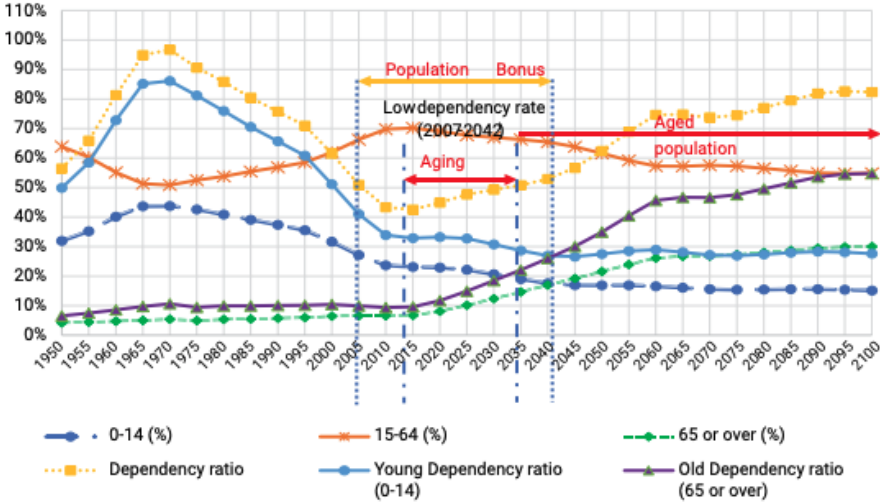


Notes: The total dependency ratio (TDR) is the ratio of the number of dependents 0 to 14 years of age and over the age of 65 to the total population 15 to 64 years of age.

Figure 3: Vietnam key demographic indicators (33)

The population pyramid of Vietnam (Figure 4) expanded in the middle, indicating that most of the population is in the working age group, with more than 50% of the population between the ages of 15-54. In 2020, the workforce, including those 15 years old and older, was approximately 54.8 million people, a reduction of 924,500 people compared to 2019. The proportion of male/female workers was 52.6% and 47.4%, respectively(21). The structure of the labour force divided into urban and rural areas also had a significant disparity, despite the increase of the workforce in urban areas in these recent years. In general, the labour force in Vietnam is still mainly concentrated in rural areas, with 66.9%(21).
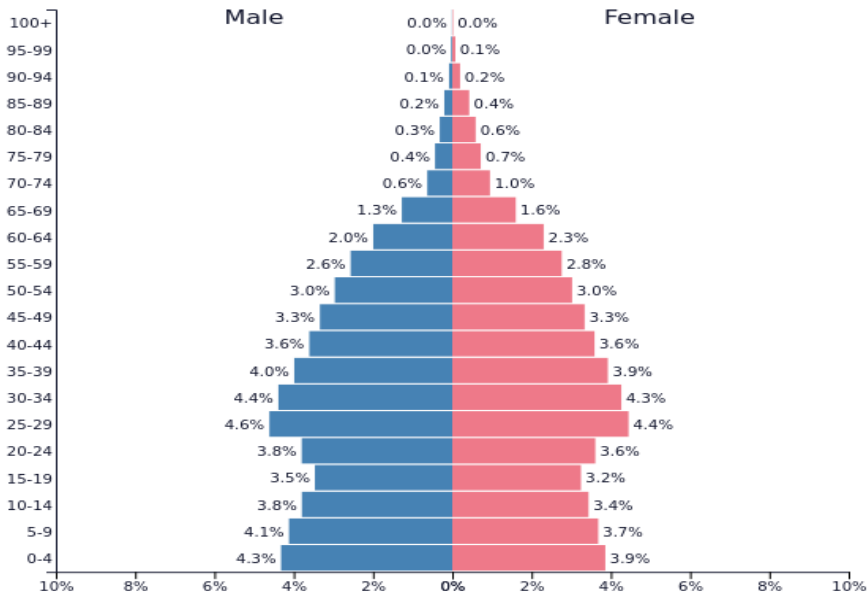
Figure 4: Age pyramid of Vietnam in 2019(34)

### 1.4. COVID-19 PANDEMIC SITUATION IN VIETNAM

At the beginning of the pandemic, Vietnam was considered one of the most successful countries in controlling the COVID-19 pandemic with a Zero-COVID strategy(35). However, since the Delta variant appeared in April 2021 it led to a fast transmission rate beginning in June 2021(Figure 5).
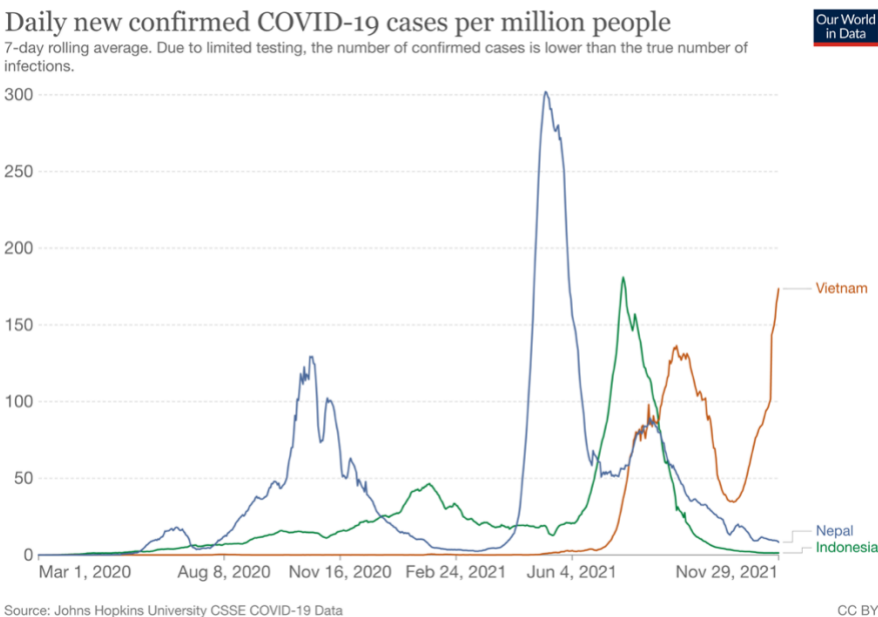


Figure 5: Daily new confirm COVID-19 cases per million people in Vietnam from Mar 2020 to Nov 2021(36)

**The first wave (23rd January – 16th Apr, 2020)**

The first positive case of COVID-19 was detected in a person returning from Wuhan, China, on 23 Jan 2020. This was considered the initial milestone of the first wave of the COVID-19 pandemic in Vietnam. Even though the pandemic hit China, Vietnam's neighbour country, with unprecedented destruction, the Vietnam government managed to control the first pandemic wave within two months. Since the last locally transmitted case was detected on 16 Apr 2020, for the remaining 85 days, the total accumulation cases reported as of 19 Jul 2020 were 383 cases with no deaths. Of the 383 reported cases then, only 28% were community-spread cases[37].

**The second wave (25th July – 1st December, 2020)**
By the end of July 2020, 43 new locally transmitted cases were reported marking the second wave of the COVID-19 pandemic in Vietnam[38]. With the biggest cluster in Da Nang General Hospital, COVID-19 attached hospital and broke an important link in Vietnam's healthcare system in the country's central region. As the major tourism city in the central region of Vietnam, from Da Nang, SARS-CoV2 spread to other provinces across the country. By 31 July 2020, the first death caused by COVID-19 was also reported[38]. On 20 August 2020, the number of positive confirmed cases in Vietnam exceeded 1,00[39]. The second pandemic wave, lasting for 129 days, ended on 1 December 2020, with more than 1300 cumulative cases, including 554 community cases and 35 deaths in total[40–42].

**The third wave (28th January – 25th March, 2021)**
The third pandemic wave started on 28 January and lasted 57 days until 25 March 2021 in Hai Duong province[41,43,44]. As of 31 January 2021 total of 240 community-transmission cases were reported, all cases linked to Hai Duong migrant workers[44]. The COVID-19 pandemic had expanded to 13 different provinces across Vietnam and was considered the most severe wave until that time.

The Viet Nam Ministry of Health reported 910 community-spread cases with asymptomatic or mild symptoms (98.25% total cases) in young and healthy people, leading to only a small number of severe cases with no deaths reported[41,45]. The national hotspot was Hai Duong (726 cases), followed by other provinces/ cities, Quang Ninh (61 cases), HCMC (36 cases), Ha Noi (34 cases) and so on (Figure 6).
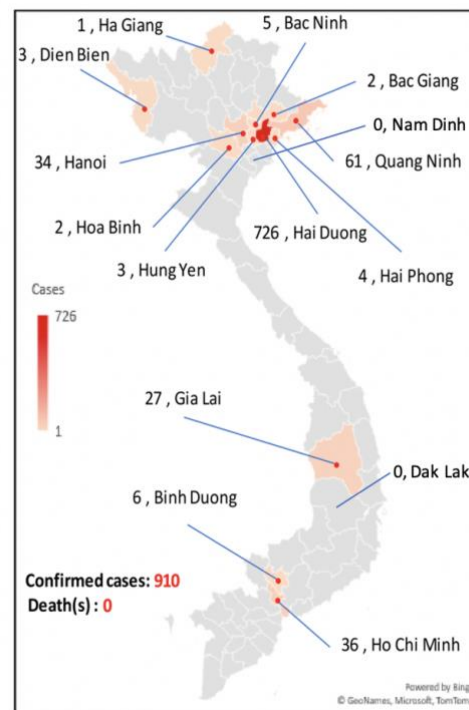


Figure 6: Distribution of COVID-19 confirmed cases by provinces in Vietnam, as of 28 Mar 2021 (45)

**The fourth wave (27th Apr, 2021 – October, 2021 and endemic stage)**

The fourth wave began on 27 April 2021 in a northern province located 200 km north of Hanoi with the appearance of the Delta variant(46). On 2 May 2021, Vietnam reported 25 locally-acquired cases from 5 provinces in the North, with the highest number of cases in Ha Nam (12 cases) and one city in the south(46). On the same day, Ha Nam imposed lockdown in several districts and social distancing measures for the province. Other regions also tightened COVID-19 preventative measures such as closures of non-essential services, crowd gathering bans, and social distancing were applied(46). On 7 May, Bac Giang province, the neighbour city between Nam Dinh and Hanoi, confirmed the first positive case linked with a cluster from K-hospital (National cancer hospital) in Hanoi. One week later, Bac Giang decided to lockdown four industrial zones to quarantine 67,000 migrant workers to prevent the transmission of diseases(47).

On 19 May, HCMC confirmed the first case of the Delta variant and from 31 to 8 July, social distancing measures were implemented following the Prime Minister's Directive 15. Tighter public health measures were applied: no gathering of more than five people outside offices, schools, hospitals, or public places; travel restriction with check-points; people over 60 years old could only leave their homes when it was absolutely necessary; limited access to medical examinations and treatment facilities, except in urgent cases(48).

On 9 July, HCMC was under lockdown. The total number of positive confirmed cases was 10,295(48) and about 2,422,643 vaccine doses were administered at this time(49). Due to the fast transmission rate of the Delta variant, the former strategy of zero COVID with mass testing, contact tracing and quarantine was no longer successful(35). As of 18 July 2021 total of 50,201 community-spread cases were reported from 58/63 cities/provinces since the beginning of the fourth wave(50). HCMC had the highest incidences with 31,391 cases, followed by Bac Giang (5,784 cases), Binh Duong (2,644 cases), Bac Ninh (1,690 cases) and Dong Thap (5,784 cases)(50). On 19 July, the Prime Minister decided to apply lockdown measures for 19 provinces in the South of Vietnam, home to more than 36 million people(19).

The spread of COVID-19 began to soar around mid-July. It peaked at about 15,000 infections per day in August, overwhelming the health system in many regions, especially HCMC, the epidemic centre(51,52). As the major cities of Vietnam, Hanoi and HCMC applied mass-testing in the community. A Colour indicator based on infection risk was applied to guide the responsive strategy with different levels of restrictions in Hanoi(51).

On 28 July, HCMC deployed the pilot program for home treatment for COVID-19 patients with mild symptoms to reduce the burden on the health system. According to this program, about 40% of COVID-19 patients applied for home treatment(48). On 30 July, the Ministry of Health approved the project to prioritize resources for COVID-19 intensive care across the country with 12 centres/hospitals specialized for COVID-19 treatment with 200 to 3000 beds in each centre(53). From 23 August to 6 September, military troops were assigned to manage the implementation of quarantine, ensure the provision of relief packages and access to necessities for citizens, support in diagnostic testing and treatment for COVID-19 patients and so on during the lockdown period(54,55). On 31 August, the mortality rate in Vietnam peaked at 440 death/day, half of which came from HCMC(51). By the end of October 2021, HCMC and other provinces could partially control the pandemic, reduce the transmission rate, and enter an

endemic phase. As of 28 November 2021, Vietnam had passed one million confirmed cases with more than 24,000 deaths since the fourth pandemic wave began(Figure 7)(56).
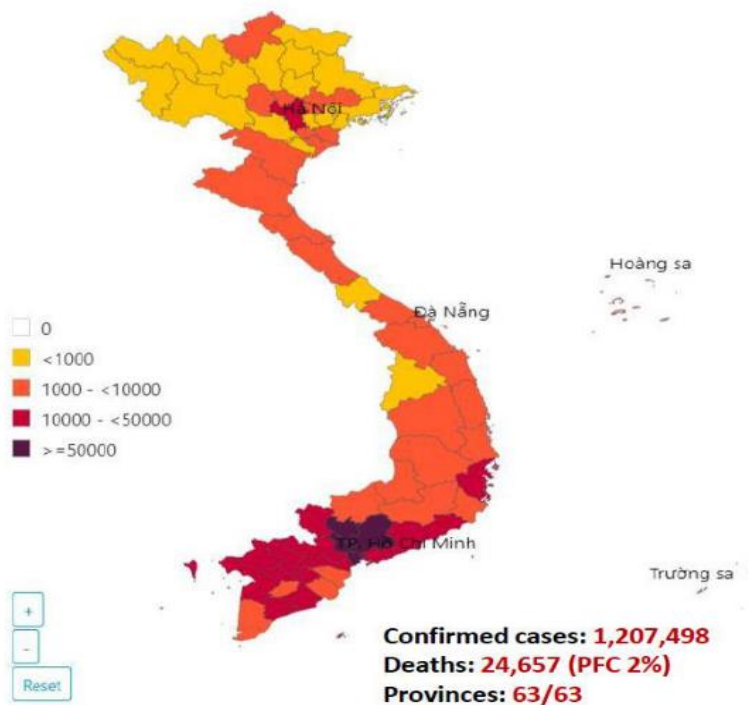


Figure 7: Distribution of COVID-19 laboratory confirmed cases by province, 27 Apr – 28 Nov 2021, Viet Nam (56)

### 1.5. COVID-19 VACCINATION IN VIETNAM

Mass vaccination for community members was implemented until June 2021, when the fourth pandemic wave started. At that time, the priority was only for front-line staff. As of October 2021, Vietnam had the lowest vaccination rate in the region, with administered doses per 100 people less than 50 (Figure 8), although the vaccination campaigns in Vietnam launched in Mar 2021. By the end of October 2021, Vietnam had  45,496,123 vaccine doses administered, covering 50.2% population with the first dose(57).
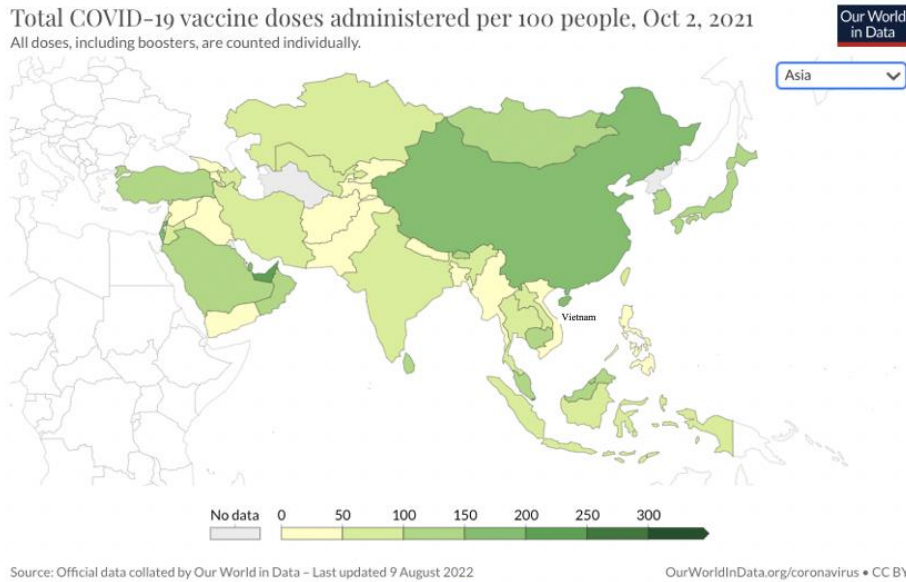
Figure 8: Vietnam total COVID-19 vaccine dose per 100 people, as of 2nd Oct,2021(58)

### 1.6. STUDY SITES

Hanoi is a landlocked city in the North of Vietnam, located in the Red River Delta region(Figure 9), with a total area of 336,000 Km$^2$(59). Hanoi is Vietnam's capital city and the country's second-largest city with a population of 8,330,800 in 2021. The ratio of males/100 females was 98.4 and the regional structure urban: rural was about 50% of the population for each region. As major Vietnam's political and cultural centre, Hanoi attracts many immigrants from many areas, with immigrants falling into about 7.7% of the population(19).

Similar to Hanoi, Nam Dinh is also a Northern province of Vietnam, located in the Red River basin, about 90 km from Hanoi southeast (Figure 9). Although the total area(166,900 km2) is only ranked 52/63 provinces, it is the 13th province in terms of population(1,8 million) and a population density of about 1,100 people/km$^2$(19). Nam Dinh has about seven provincial-level industrial parks and about 17 district-level industrial parks, attracting migrant workers and accounting for about 1% of the province's population. The sex ratio of the province in 2021 is 96 males per 100 females(19).

Ho Chi Minh City is the largest city in Vietnam, covering an area of 209,500 km2 and with the highest population in the country with about 9,166,800 people. HCMC is located in the south of Vietnam(Figure 9), with the highest population density in the country with about 4,375 people /km2. HCMC is an important economic, cultural and political centre contributing to about 1/4 of the country's GDP. According to 2021 estimates, migrant workers account for about 25.4% of the city's total population. The ratio of males to 100 females is around 96.9 with about 79% of the population living in urban areas and 21% living in rural areas(19).

Dak Lak is located in the central highlands of Vietnam, 320 km away from HCMC and is the fourth-largest province in the country (Figure 9). In 2021, the province's total population was about 1,909,000 with an average population density of 146 people/km2. The gender structure is about 102 males per 100 females. The urban population accounts for about 80%, and the rural

population accounts for the rest. The proportion of immigrant population is about 1.2% of the province's population(19).



Figure 9: Map of study sites (60)

PROBLEM STATEMENT AND JUSTIFICATION

## 2.1. PROBLEM STATEMENT

Since 2019, the novel coronavirus SARS-CoV-2 strain has spread in Wuhan, China (61), leading to the unprecedented COVID-19 pandemic on 11<sup>th</sup> March, 2020 (62,63). Public health measures (PHM) were implemented globally to constrain the transmission and mitigate the tremendous impact of the pandemic(64). Multidisciplinary approaches including institutional and behavioural-change measures were selectively applied, depending on different contexts and countries' experiences with similar epidemics in the past (65,66). Behavioural-change measures such as maintaining hand hygiene, mask-wearing, and physical distancing brought back several benefits in terms of reducing transmission(67,68). Many studies in the U.S, UK, China, Turkey, Iran, France, Russia showed that before achieving herd immunity by vaccination, at the early stage of the COVID-19 pandemic, when the new infected cases of COVID-19 were low, these non-medical PHM were the key interventions to slow down the pandemic growth (67–69).

However, the results obtained from these interventions remain a debatable topic. Many controversial ideas arose around appropriate time when these measures should be applied and to what extent the benefits overweight their drawn backs. For example, the prolonged lockdown, school and business closure introduced disruption to people's daily life including physical and psychological health(68). The answers to these issues are yet to be concluded.

The impacts of the COVID-19 pandemic coupled with the prolonged lockdown introduced consequences to the health and well-being of the people such as changes in healthcare-seeking behaviours (HSB) and healthcare utilization (HCU), compared to the intended outcomes by public health officials(65). Studies conducted in European countries found that lockdowns, prohibiting mass gatherings, and the fear of virus infection negatively impacted patients' HSB, such as cancellation or delays in medical appointments to avoid crowded and highly infected places(64,70–72). Another study in India also showed that the prolonged lockdown disrupted the supply chains of medicine and healthcare services, leading to difficulties accessing medical care, especially for people in remote areas(73,74). These changes significantly impacted the demand for healthcare, healthcare access and HCU(70).

COVID-19 is thought to deepen the existing inequities among different socioeconomic classes in the community, thus leading to inequitable access to healthcare, especially in the poorest populations, due to the loss of income and the increasing cost of essential living goods(75,76). Approximately 7.8 million workers in Viet Nam have lost their jobs, while 17.6 million lost part of their income due to the pandemic(77). All of these factors may contribute to the changes in self-care and HSB, as well as the HCU among the communities. Thus, research on the impacts of COVID-19 and PHM needs to be done to address the barriers that could hinder the use of health services. This can provide evidence to inform guidance to support the population in need and improve equity in health services access and HCU for future epidemics.

## 2.2. JUSTIFICATION

HSB is a critical determinant of an individual's health outcome, directly affecting the well-being of people. Poor HSB results in low HCU and thus increases the burden of mortality and morbidity of some predictable and curable diseases(78). The study on HSB thus plays an essential role in control strategies of communicable and non-communicable diseases, especially during the pandemic times in resource-limited settings such as Vietnam. The evidence from this study can provide more data on barriers/enablers for equitable, effective and efficient access to care and HCU, informing policy makers for future pandemic preparedness.

This study aims to describe the different impacts of COVID-19 and PHM and the influence factors to the changes in HSB among Vietnamese community. From this viewpoint, we also explored the experiences, perceptions and changes in HCU during COVID-19 pandemic.

Understand the role of contextual and individual characteristics from the community side and the healthcare provision side helps us better understand the healthcare seeking process, healthcare access and HCU. This will, in turn, provide the opportunity for appropriate allocation of resources and prompt response strategy to manage and mitigate the burden of diseases and emergency preparedness models for future epidemics.

Until now, there is scarce of publication in Vietnam specific context, analysing the relationship or the impacts of the COVID-19 pandemic and its PHM on the HSB and HCU of Vietnamese. The findings of this study will not only provide insights into the impacts and context-specific interventions for promoting appropriate HSB in the community but also provides evidence for guiding strategic response to mitigate the downside impacts of COVID-19 in Vietnam.

## 2.3. OBJECTIVES

### 2.3.1. OVERALL OBJECTIVE

To identify the environmental and individual factors that influence HSB and HCU and understand the interrelationship among these factors to mitigate the impacts of future pandemics and PHM and promote equitable access to healthcare amongst the community.

### 2.3.2. SUB-OBJECTIVES

- To examine whether external environmental factors, health system and population characteristics influence HSB and HCU in the context of COVID-19
- To explore the role of individual psychological factors and psychosocial factors influencing HSB and HCU
- To explore and compare patterns of HSB and HCU before and during COVID-19 pandemic
- To identify and describe the impacts of COVID-19 and PHM on livelihood, health and well-being of Vietnamese people during COVID-19 pandemic
- To provide evidence for interventions to inform guidance on strengthening support for improving equity in healthcare access

CHAPTER 3

METHODOLOGY

3.1.    STUDY DESIGN

We performed secondary data analysis from a portion of the SPEAR (Social Science and Public Engagement Action Research) data set. Only phase 1 data from Vietnam was extracted. The received data was anonymized, meaning no identifying information was included to avoid disclosure of personal information of participants.

We applied different triangular methods to increase the study's validity as follows. Firstly, both Vietnamese language transcript and English translation scripts were used during the qualitative data analysis process to ensure the content of the data was understood and interpreted according to the context that accompanies the interview process. Secondly, to understand the interview context, we held two discussion meetings with colleagues from the host institutes, including site PIs, data coordinators, and interviewers. The first meeting aimed to understand the data in its context, including when and where the interviews took place. The second meeting was held to discuss the data analysis progress and to verify the theme findings with the research team. These meetings not only helped us assess the data from different critical perspectives but also to recognize the strengths and address the study's limitations. Lastly, we applied triangulation by integrating both qualitative and quantitative data. The qualitative data analysis aimed to describe and explore the enabling/disabling factors and their possible influences on HSB and HCU and describe the impact of COVID-19 on Vietnamese livelihood. The quantitative method is intended to describe sociodemographic characteristics of the study population and give numerical results for comparison with themes or patterns found in qualitative research by providing. For example, the proportion of avoidant/non-avoidants in the total population, the difference in frequency of self-care and disease prevention behaviours before and during the pandemic and the proportion of healthcare services missed or delayed and the reasons for this missed/delaye. The combination of the two methods balanced the weaknesses of each method, therefore providing stronger evidence and increasing the validity and confidence of the findings.

3.2.    DATA ANALYSIS

For the qualitative data, we used Nvivo-12 to facilitate the analysis of the in-depth interviews. Seventy-nine participants, including 33 community members and 46 healthcare workers, joined in-depth interviews. All of these interviews were valid and included in the study. The majority of data collected from January to May 2021 fall into the third and the beginning of the fourth wave of the COVID-19 pandemic.

Firstly, we used the themes/categories from Andersen's framework as the initial codes to code the data. We repeated this process several times until all the ideas were well arranged into Andersen's themes. During the coding procedure, several quotes could be arranged into different themes. We acknowledged this fact and would re-examine the general themes or split these prominent themes into specific ones. For the outlier cases (if any), we will assess them within their context to understand why these ideas appeared. This process could increase the consistency of the coding process and therefore increase the reliability of the results. During the

coding process, when new themes appeared, we would create new nodes for the themes and continue the coding process until no new themes appeared. The coding process for new themes will be repeated at least once to avoid misinterpretation of the information and enhance the consistency of the data analysis.

For quantitative data cleaning and validation, first of all, we used Excel and R programs to create the list of queries needing validation. This list included the answers or comments with free text and questions containing missing or conflicting data. A total of 512 people participated in online surveys. However, only 496 data sets from the survey were valid for analysis as they could meet the inclusion criteria (Vietnamese nationality with more than 50% of answers completed). 496/512 community participants including people coming from Dak Lak(151), Hanoi(72), HCMC(70), Nam Dinh(138), other provinces of Vietnam(45) and not mentioned(20). 16/512 excluded participants, including 14 foreigners (without answering the place where they are currently living) and two cases missing more than half of the data required. Most surveys were completed from January to July 2021, which fell during the third and fourth waves of the pandemic.

For statistical analysis, "R" was used to analyze the data collected from the community. This delivered the demographic information of the study population, the proportion and the frequency of different factors that could affect the proportion of cancellations or delayed medical appointments. The variables were collected as categorical and/or numeral variables and will be described in the following.

**Operational of quantitative variables**

We described the demographic characteristic of the study population both from the qualitative (N=79) and quantitative study (N=496). For the qualitative study, demographic data were presented in percentages for the whole population. For the survey study, demographic data were presented according to stratified groups: we separated the study population into two groups based on their answer to the question," since the beginning of the pandemic, have you missed/delayed any medical appointment?". Group 1: avoidant (people had at least once cancelled/delayed any medical appointment since the pandemic began) and Group G2: non-avoidant (people had not cancelled/delayed any medical check-up).

The categorical variables were presented as frequencies, and to describe the difference of variables between the two stratified groups mentioned above, McNemar's chi-squared test ($\chi$2test) with the p-value <.001 was used for analyzing the categorical, paired proportions (before-after) (Annex3).

### 3.3. CONCEPTUAL FRAMEWORK

Andersen's 1995 behavioural model(Figure 11) was used for the theoretical coding themes. The emerging themes (if any) were added and reconfigured (mentioned in the Data analysis part). Andersen's framework is one of the most widely-used models in the study of HSB and healthcare utilization(78,79). This model has been used to assess main pillar factors (predisposing, enabling and need for care factors) in a specific context, how and why these

factors could influence HSB and HCU in LMICs such as Albania(79), Myanmar(80), Ghana(81) and Vietnam(82,83).
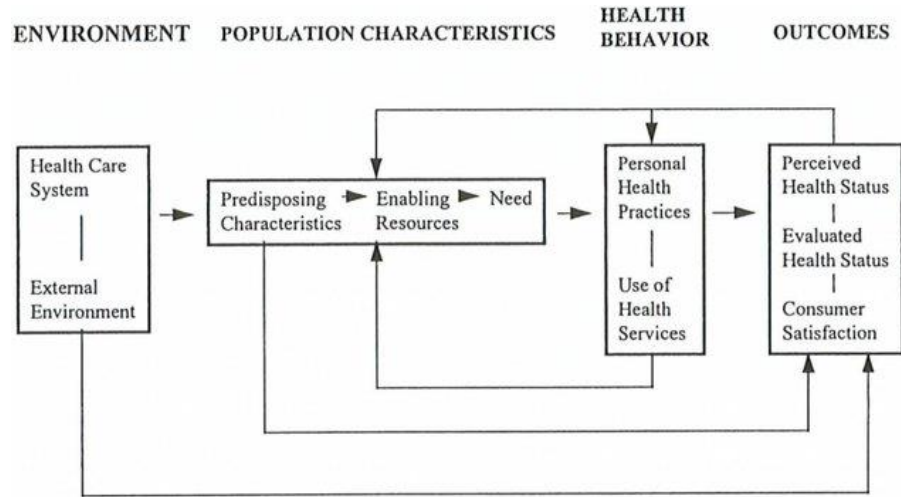


Figure 10: Andersen's behavioural framework(84)

In short, the main components of the model were described to evaluate the impact of the COVID-19 pandemic and public health interventions, including the environment, health system, predisposing, enabling and need for care factors. By describing these factors and their interlinkages, we gained insight into the changes in HSB and HCU Vietnam during the pandemic. It is critical to understand the patterns of HSB and HCU, provide evidence for improving equitable access to healthcare, and better prepare and plan responsive strategies and policies for healthcare access measures in the future pandemic.

CHAPTER 4

RESULTS

We divided the findings of this study into two parts. The first section is the descriptive statistic on the socioeconomic and demographic characteristics of the interviewees (Table 2 and Table 3) and survey study participants (Table 4). The second part presents the results from both in-depth interviews and survey data, sorted into components/themes of Andersen's model or emerging components/themes that arose during the data analysis process.

4.1.    DEMOGRAPHIC CHARACTERISTICS OF STUDY POPULATIONS

Table 2 below describes the demographic characteristics of 33 community members in in-depth interview. The percentage of females was 58%, and the rest, 42%, was males. Hanoi and Nam Dinh participants accounted for more than 72%, 21% from HCMC, and only 6%  from Dak Lak. The proportion of people residing in urban areas was 58%, and in rural areas, it was 42%.

| Demographic characteristic of community members – Qualitative study | | |
|---|---|---|
| **Gender** | **N =33** | **Percentage** |
| Male | 14 | **42%** |
| Female | 19 | **58%** |
| **Study site** | | |
| Ho Chi Minh City | 7 | 21% |
| Hanoi City | 12 | 36% |
| Nam Dinh Provice | 12 | 36% |
| Dak Lak Province | 2 | 6% |
| **Site** | | |
| City (urban) | 19 | 58% |
| Countryside (rural) | 14 | 42% |
| **Age group** | | |
| 20-29 | 4 | 12% |
| 30-39 | 8 | 24% |
| 40-49 | 9 | 27% |
| ≥50 | 6 | 18% |
| Not stated | 6 | 18% |
| **Main occupation** | | |
| Businessperson | 5 | 15% |
| Factory worker | 1 | 3% |
| Farmer | 2 | 6% |
| Freelancer | 1 | 3% |
| Service workers (e.g hospitality, restaurant…) | 6 | 18% |
| Housewife | 2 | 6% |
| Manual labour | 2 | 6% |
| Motorbike taxi driver | 1 | 3% |

| | | |
|---|---|---|
| Office worker / civil service | 6 | 18% |
| Retirees | 2 | 6% |
| Student | 1 | 3% |
| Teacher | 4 | 12% |
| NGO | 0 | 0% |

Table 2: Demographic characteristic of community members – Qualitative study

Table 3 shows the qualitative study's demographic characteristics of 46 healthcare workers (HCWs) from various medical centres across four main study sites. Females accounted for nearly 2/3 of all interviewees. The profession of medical staff was quite diverse, with nursing occupying the highest proportion (35%), followed by management staff (15%) and doctors (13%). 65% HCWs came from tertiary hospitals (30/46 total participants), 26% (12/46 participants) came from community health centres, and the remaining came from District health centres. No psychiatrists participated in the interviews.

| Demographic characteristic of HCW – Qualitative study | | |
|---|---|---|
| **Gender** | **N=46** | **Percentage** |
| Male | 17 | **37%** |
| Female | 29 | **63%** |
| **Study site** | | |
| Ho Chi Minh City | 13 | 28% |
| Hanoi City | 11 | 24% |
| Nam Dinh Provice | 12 | 26% |
| Dak Lak Province | 10 | 22% |
| **Site** | | |
| Urban | 24 | 52% |
| Rural | 22 | 48% |
| **Age group** | | |
| 20-29 | 5 | 11% |
| 30-39 | 11 | 24% |
| 40-49 | 7 | 15% |
| ≥50 | 6 | 13% |
| Not stated | 17 | 37% |
| **Profession** | | |
| Administration | 3 | 7% |
| Doctor | 6 | 13% |
| **Nurse** | **16** | **35%** |
| Laboratory | 1 | 2% |
| Contact tracer | 3 | 7% |
| Driver | 2 | 4% |
| Head of PHC | 1 | 2% |
| Management Staff | 7 | 15% |
| Psychiatrist | 0 | 0% |
| Nutritionist | 1 | 2% |

| | | | |
|---|---|---|---|
| Health Assistants | 4 | 9% | |
| Security | 1 | 2% | |
| Other | 1 | 2% | |
| **Type of Health Facilities** | | **Level of referal system** | |
| Community health center | 12 | Primary healthcare center | |
| District hospital | 4 | Secondary hospital | |
| National hospital | 22 | Tertiary hospital | |
| Provincial hospital | 8 | Tertiary hospital | |

Table 3: Demographic characteristic of HCW – Qualitative study

Regarding survey data (table 4), the proportion of females and males in the population (N=496) was 65% and 34%, respectively. Other gender took a minor proportion with less than 0.5% of the total population. This ratio was similar to the gender ratio in group G2 (N=389) of non-avoidant. The gender ratio (females and males) within group G1(avoidant) was 78% and 22%.

The average age of study participants was 35-36 years old. Around 74-76% of participants were married, 20-21% were unmarried and divorced/separated and widowed took the rest 4-5% (Table 4). Participants'marital status in both groups was similar to the overall prevalence of the whole study population.

Regarding the main occupation, most participants were farmers (34%). In the avoidant group, the farmer took 26% and the non-avoidant group 37%.

About half of the participants completed secondary/high school education and this level occupied the largest share in all four levels of education(table 4). This prevalence was similar in group G2 (non-avoidant) and within the total population, while in group G1(avoidant), this figure was only 35%.

| Population demographic characteristics - Survey data | | | | |
|---|---|---|---|---|
| **Characteristics** | **The whole Study population** | **Stratified by missing or delaying medical appointments** | | |
| | | **G1: Avoidant** | **G2: Non-avoidant** | **No Answer** |
| | N = 496 (100%) | N = 55 (11%) | N = 389 (78%) | N = 52 (10%) |
| **1. Gender** | N = 492 | | | |
| Female | **321 (65%)** | **43 (78%)** | **255 (66%)** | 23 (46%) |
| Male | 169 (34%) | 12 (22%) | 131 (34%) | 26 (52%) |
| Other | 2 (0.4%) | 0 (0%) | 1 (0.3%) | 1 (2.0%) |
| **2. Age** | N = 479 | | | |

| | | | | |
|---|---|---|---|---|
| Mean (SD) | 36 (13) | 35 (11) | 36 (13) | 36 (13) |
| **3. Marital Status** | N = 476 | | | |
| Divorced/Separated | 18 (4%) | 0 (0%) | 15 (4.0%) | 3 (6.5%) |
| **Married** | **351 (74%)** | **41 (76%)** | **281 (75%)** | 29 (63%) |
| Unmarried | 99 (21%) | 11 (20%) | 75 (20%) | 13 (28%) |
| Widowed/Widower | 8 (2%) | 2 (3.7%) | 5 (1.3%) | 1 (2.2%) |
| **4. Education Level** | N = 479 | | | |
| No formal education and incomplete primary education (*) | 15  (3%) | 3 (5.8%) | 11 (2%) | 1 (2.2%) |
| Completed primary education | 27 (6%) | 2 (3.8%) | 25 (6.6%) | 0 (0%) |
| **Completed secondary/high school education** | **231 (48%)** | **18 (35%)** | **197 (52%)** | 16 (35%) |
| Intermediate education/ Undergraduate | 174 (36%) | 23 (42%) | 128 (33%) | 23 (44%) |
| Postgraduate degree | 32 (7%) | 6 (12%) | 20 (5.2%) | 6 (13%) |
| (*):compulsory education | | | | |
| **5. Main Occupation** | N = 483 | | | |
| Driver (bus, train, taxi) | 6 (1%) | 0 (0%) | 6 (1.6%) | 0 (0%) |
| Driver for delivery of food and goods | 1 (0%) | 0 (0%) | 0 (0%) | 1 (2.2%) |
| Factory worker | 27 (6%) | 5 (9.3%) | 21 (5.5%) | 1 (2.2%) |
| **Farmer** | **164 (34%)** | **14 (26%)** | **142 (37%)** | 8 (17%) |
| Freelancer/Self-employed | 5 (1%) | 0 (0%) | 4 (1.0%) | 1 (2.2%) |
| Healthcare worker | 31 (6%) | 5 (9.3%) | 20 (5.2%) | 6 (13%) |
| Service workers (e.g hospitality, restaurant…) | 12 (2.5%) | 0 (0%) | 11 (2.8%) | 1 (0%) |
| Housewife, Stay at home to care for kids/elderly | 42 (9%) | 3 (5.6%) | 35 (9.1%) | 4 (8.7%) |
| **Manual labourer, construction worker** | **64 (13%)** | **7 (13%)** | **49 (13%)** | 8 (17%) |
| Not applicable | 3 (1%) | 0 (0%) | 2 (0.5%) | 1 (2.2%) |
| **Office worker / civil servants** | **60 (12%)** | **12 (22%)** | **41 (8%)** | 10 (20%) |
| Other | 6 (1%) | 0 (0%) | 6 (1.6%) | 0 (0%) |
| Shop/retail worker | 24 (5%) | 3 (5.6%) | 19 (5.0%) | 2 (4.3%) |
| Street vendor | 3 (1%) | 1 (1.9%) | 2 (0.5%) | 0 (0%) |

| | | | | |
|---|---|---|---|---|
| Student | 17 (4%) | 2 (3.7%) | 15 (3.9%) | 0 (0%) |
| Teacher | 13 (3%) | 1 (1.9%) | 9 (2.3%) | 3 (6.5%) |
| Tourism (tour guide, tour operator, travel agent) | 5 (1%) | 1 (1.9%) | 3 (0.8%) | 1 (2.2%) |

Table 4: Population demographic characteristics - Survey data

## 4.2. EXTERNAL ENVIRONMENT

Environmental components are the contextualized factors, including public policies, health policies and the organization of healthcare system. Health policies are governmental decisions to obtain health or influence the pursuit of health(1). They can be made by the authorities/government at all levels (from local to central levels) for regulation of all activities which influence individual/population's health(1). Health system refers to the distribution of healthcare facilities, the availability of HCW and medical resources and operation procedures to offer health services in a specific context, where and when people can receive the service they need at the right time to achieve good health outcomes(1).

### 4.2.1. OVERALL PICTURE OF THE ECONOMY

Participants said that the Covid-19 pandemic was a shock to the economy leading to the disruption of supply chain and services, causing strong negative impacts in all aspect of life in short term and long term. One business woman in HCMC presented her ideas on the economic impact: "You know, until now (Mar 2021), the effect is still strong and persistence, the market is very quiet and empty, not many sellers and buyers." 07SR-2-1-1-5-002, female, unknow age, HCMC).

The majority of participants noted the gloom of the economic situation and its impact on their total income. In particular, unemployment and reduction in working hours caused the loss of income (or a part of income) for almost all people with different levels of employment. People working in manufacturing, retail trading, tourism, transportation, restaurants and hotels were therefore highly affected. On the other hand, the prices of some commodities showed signs of continuously increase due to the demand of hoarding of goods and the disruption of supply chain at the beginning of pandemic. One person living in Hanoi demonstrated their idea: "The spending of one single family can increase significantly. Normally, it may cost us only this much to buy groceries and household supplies, but with COVID, it can multiply by 1.5, or even 2-3 times." 07SR-2-1-2-1-007, male, unknown age, Hanoi)

### 4.2.2. PUBLIC HEALTH MEASURES AND REGULATIONS

Some public health measures and regulations were applied according to the situation and different phases of the pandemic. A wide range of interventions, including individual-level and social level, applying to contain COVID-19 transmission in Vietnam were assessed to understand the contextual factors that may influence people's health service choices in this part.

According to interviewees, at the beginning of the pandemic, when no vaccination was available to the community and no effective treatment regimen was recognized, public health measures

were considered the most effective intervention to contain the pandemic. The information about these methods was widely applied and propagated via mass media channels.

In Vietnam, social distancing was strictly applied to reduce the crowds and traffic on the streets such as home-working and online-learning. The highest level of social distancing intervention was lockdown. Although the majority of people said that the travel restriction didn't cause many problems for them in looking for necessary health services, still, some people felt inconvenienced because of the movement restriction during quarantine or lockdown period. Difficulties arose for the patients as they needed to obtain the administration travel passes to visit the hospital if they lived in isolation areas. For example: "April [was] national lockdown. I was quarantined during that period…. It was very strict back then in Saigon, you went out after 10pm then the police will ask you immediately, if you could not tell a reason, they will escort you back to the ward, and fine you money. The fine is increasing by now." (07-SR-2-1-1-5-001, male, unknown age, HCMC)

Indeed, the survey data also showed that about 13% (12/89) of total recorded answers were due to travel restriction making people cancel their medical appointments. This means, to a certain extent, travel restriction was the barrier to access to healthcare services during the pandemic(Annex1).

Another non-pharmaceutical measure widely applied was the "5K" strategy. It is a set of protective behaviours promoted by the government to limit the spread of COVID-19. "5K message" includes masks, hand sanitizing, maintaining a 1.5m physical distance, no gathering, and health declaration when visiting public areas. While most participants said it was easy to apply 5K, several people argued that they felt annoyed, mainly because the health declaration increased the waiting time because it is a compulsory part of COVID-19 screening at hospitals. For example, one participant shared her story during birth delivering time: "When I went to the hospital to give birth to my baby, it was more difficult. I should …write the health declaration about COVID before admission to the hospital". 07SR-2-1-3-5-016, female, 24 years old, Dak Lak

### 4.2.3. SOCIOECONOMIC POLICIES DURING THE PANDEMIC

**Supportive policies for enterprises**

Some social security policies have been mentioned in interviews, such as supporting enterprises and employees in reducing the obligation to contribute to social insurance and unemployment social insurance funds. One business man shared his story "We didn't have to pay unemployment insurance for employees as usual. That is the social security agency's policy" (07SR-2-1-2-1-006, male, 47 years old, Hanoi)

According to some participants' opinions, the adjustment of policy, especially corporate tax and payroll tax, didn't meet the expectation or reflect real situations. This limited the access to funding, loans, as well as reinvesting or maintaining small and medium scale enterprises across the country.

**Supportive policy for low-income population**

Some relief packages were also implemented, focusing on those most in need by distributing money or in-kind directly. However, the quantity and quality of the relief packages hadn't met the population's basic need. We also recognized that COVID-19 pandemic could have bigger impact on the urban people working in informal sectors (i.e. migrant workers) than the ones residing in rural areas. This idea was emersed according to the sharing of one participant, explaining that the subsidy packages were divided equally per capita: *"We got plenty rice and food from the local government. In terms of money, I think we got about 180,000 VND for each person"*(07SR-2-1-2-1-002, female, 59 years old, Hanoi).

The COVID-19 pandemic could have more considerable impacts on the urban people working in informal sectors (i.e. migrant workers) than the ones residing in rural areas. Several unemployed people in urban areas had no means to buy food except when receiving it from donations from government support or based on their saving-accounts. In contrast, people in rural areas could do home gardening to produce their food. Furthermore, immigrant workers in cities faced more difficulties when dealing with the problem of losing their accommodation because they could not pay rental fees. To demonstrate this idea, the woman in Hanoi said: "Most of them were factory workers and they rented a place to stay in the town. All of the workers were asked to stay home and their lives were very hard at the time. They had some support from the authorities and other organizations but it couldn't…compare to their salary. (07SR-2-1-2-1-002, female, 59 years old, Hanoi).

Another issue emerging was the inequity of access to supportive packages for people working in theinformal sector as they didn't have unemployment/social insurance. Most of them couldn't enjoy the same basic forms of protection as people in formal sectors, including income protection, sick leave and medical care. In addition, Social Health Insurance (SHI) policies to subsidize premium and treatment costs for the poor and near-poor have not been adjusted following the pandemic situation. For example, the standard to define low-income populations (i.e., poor and near-poor families) was no longer appropriate for the current situation. It failed to address some groups that were made poorer during COVID-19 pandemic. One 46-year-old lady raised her worry when her family was no longer receiving support from SHI: "We are not the near poor anymore as they (local authority) said we had a flat roof (concrete roof) like that, so they cut us off (SHI).", said a woman in Nam Dinh (07SR-2-1-4-5-006, female, 44 years old, Nam Dinh)

In short, supportive policies aimed to mitigate the impact of COVID-19 on people's livelihoods. It acted as an enabling factor to support families to a certain extent by improving financial capacity, which has a high degree of mutability to the behaviours of healthcare-seeking and service use of people. Further details will be elaborated in the following sections of Enabling factors – Family resources and financial capacity.

### 4.2.4. HEALTH SYSTEM

**From HCW perspective**
The impact of COVID-19 on healthcare systems has resulted in four significant consequences ,including 1) the depletion of resources, 2) disruption to primary service delivery (.i.e shortage of HCW, disruption of medical supply chain and stockouts), 3) increased barrier to healthcare access, 4) reduction in quality of care. All of these led to loss of trust and possibly reduced HCU.

When the COVID-19 pandemic broke out, the reprioritisation strategy was employed for COVID-19-related services. The available resources were limited while the demand for COVID-19 management increased. Four resource types in a critical deficient stage were finance, physical space (need more expansive space quarantine beds), medical equipment and HCWs.

Even though hospitals received financial and in-kind support from many donors, it often wasn't enough. The inadequate resources didn't allow the health system to fulfil routine work and COVID-19 management simultaneously. Many hospitals had to switch functions or shut down non-urgent services to share the resources with COVID-19 tasks. Some HCWs said that their hospitals prioritised emergency operations and intensive care requiring timely treatment during the outbreak. At the same time, other services, such as the outpatient ward, were reduced in scale and switched to teleconsultants to minimise direct contact. However, the disruption was sporadic, depending on the duration of the outbreak and the type of healthcare centre (tertiary vs primary healthcare facilities). To explain this, one HCW at district health centres posited: "During peak time, all other activities were postponed to prioritize working on Covid. At the beginning of the pandemic, all of our resources were working together to handle the positive cases. Then after the outbreaks, things gradually got back to its normal pace…" (07SR-1-1-2-1-010, female, unknown age, HCW, Hanoi)

The unintended consequence led to the cancelling or rescheduling of many screening and consultant appointments a primary healthcare center. Therefore, patients had to seek for alternative options to their health issues. A HCW working in HIV/AIDS program at a primary healthcare centres said:"There were patients who look for my consultation to take HIV testing because they are at high risk for HIV. But I had to focus on COVID-19 task and didn't have time to consult them….. So if their appointment is rescheduled for unsuitable dates, they might seek for another consultation at somewhere else which suits their schedule" (07SR-1-1-4-3-002, female, HCW, 45 years old, Nam Dinh)

In short, the disruption of essential health care services due to the prioritizing of resources for COVID-19 had created the cancelation or delay of medical treatment, health consultant service for preventative care in Vietnam.

**From community perspective**: During the COVID-19 pandemic, the function and responsibility assigned to each healthcare unit weren't clear enough, making patients confused about finding the right treatment/testing places for their diseases. This was a hindrance to the quality of care, and it potentially prevented the service utilization of the community as one patient felt "very pissed at the hotline of MOH" because "Each side (hospital versus hotline) said different things" ((07SR-2-1-1-5-002 female, 59 years old, HCMC) to illustrated her experience while looking for online consultant service.

Several participants said that it was difficult to access some hospitals because of the changes in operation times. Some people had to wait for longer time until the hospitals opened or they could cancel the visit because the unappropriated schedule. The prolonged waiting time also rooted from the high load of people who need COVID-19 screening test which was similar to the ideas from HCW. This introduced inconveniences to patients and reduce the satisfaction of patients

and could reduce the use of health services. As a security staff of hospital in HCM explained the situation when patients had to wait for a long time to get access to health facility: "Some people came here at midnight, they took a coach from countryside, they didn't know that the hospital does not open until 4 a.m. They thought that it opens at normal time. They don't know that because of pandemic it changes the opening time." (07SR-2-1-1-5-001, male, unknown age HCMC)

## 4.3. POPULATION CHARACTERISTICS

### 4.3.1. PREDISPOSING FACTORS
Predisposing factor including demographic factor (which already presented in the demographic characteristic of study population), genetic factor (not emerged in this study), social factors which are content, type and source of health information; social network, psychosocial characteristics (ability of one people deal with health problems) and social network. All of these factors help to form knowledge, perception and belief and attitude of one person that can influence perception of need, HSB and HCU(1)

## **CONTENT OF HEALTH KNOWLEDGE AND HEALTH INFORMATION**

### **Knowledge on other health conditions and co-morbidity**

The study found positive impacts on other knowledge relating to one's health condition. For example, the common understanding after reading health information was that "people with poor immune systems" will have a higher chance of getting infected by the SARS-CoV-2 virus and potentially developing severe diseases than young people with good health backgrounds. Besides, underlying diseases could potentially increase the severity of COVID-19 disease and cause dangerous complications. More than 50% of interviewees answered that people are susceptible to COVID-19 due to "those who have the comorbidities" and "people will have a higher risk to acquire the disease and higher risk of death".

Besides this physical health mentioned above, there was a 33 years old male participant mentioning about mental health problems that there was a "community disease when we receive too much information from the community".

### **Health knowledge and the change in Self-care**

One finding of the qualitative study was that knowledge led to the improvement of healthier lifestyles if there was no disabling factor such as financial depletion. The majority of the participants said that they adhered to COVID-19 protocols and took public health interventions seriously. Many participants also adopted healthier lifestyles, such as improved nutritious food and vitamin uptake, regular exercises and positive thinking. About half of the participants in qualitaty study showed their understanding that improving physical exercise (14/33 participants) and nutrition uptake (15/33 participants) could boost the immune system to prevent or mitigate COVID-19 negative impacts on health.
The findings from survey data (table 5) showed a significant improvement in the number of people performing nutrient care-related behaviours. After COVID-19, this rate increased to 83%,

compared to the time before the pandemic, with only 58%. The Pre- and post-pandemic increase was significant, with 25% higher (P<.001).

| The table compares the frequency of actions for nutrition care before and after COVID-19. | | | | |
|---|---|---|---|---|
| **Characteristic** | **Before** N = 494[1] N (%) | **After** N = 494[1] N (%) | McNemar's chi-squared | **p-value**[2] |
| **Nutrition care** (including Eating healthy food, Taking vitamins or supplements, drink more fluids) | | | 95.36424 | <.001 |
| G1:avoidance (Yes) | 287 (58%) | 408 (83%) | | |
| G2:non-avoidance (No) | 207 (42%) | 86 (17%) | | |
| *1 n (%)* *2 McNemar's Chi-squared test with continuity correction* | | | | |

Table 5: Comparing the frequency of actions for nutrition care before and after COVID-19

However, qualitative data revealed some interesting issues. For example: even though participants understood the benefits of a healthier lifestyle, they failed to pursue this due to the barrier of financial capacity, business closure leading to increased spare time, and lack of incentive. Many participants had to reduce the volume of nutritious foods as they couldn't afford the price. Some of them changed their routine activities and developed risk behaviours such as increasing alcohol consumption and over-slept. One man in HCMC said "Actually, my health has been going down since covid. My job is normal but a lot of my friends lost their jobs so they have a lot of free time. So, they asked me to come over for drinking." 07SR-2-1-1-5-005, male, 35 years old, HCMC)

Long time stay indoor may affect to children as they need external activities for their physical and mental health development. Immersing in virtual world is "two-edged sword" as it made students addicting to game online, disrupting their routine activities, according to a worry of a mother: "From what I think, the phone acted as a two-edged sword, and the children can easily get addicted by it. They can get addicted to games" (07SR-2-1-4-5-001, female, 42 years old, Nam Dinh

## ATTITUDE AND ADHERE TO PUBLIC HEALTH MEASURES

### COVID-19 protocol and PHMs

From the interviewees' point of view, daily figures updating on the COVID-19 transmission rate and the low number of deaths in Vietnam compared to the global pandemic situation were considered strong evidence for the effectiveness and success of public health measures. People also believed the "5K-message" was essential and almost all participants valued this strategy as it was a simple and highly effective method to protect themselves and surrounding people as "it is easy, nothing is complicated. My children and husband can do them all" (07SR-2-1-2-1-009, female, 43 year old, Hanoi).

The survey data also provided further information explaining the increase in the adherence to social distancing, one of the five elements of the "5K message" among community. The table 6 showed that after COVID-19, the percentage of people who stay at home and minimize contact with others when they have flu-like symptoms significantly increased from 51% to 73% (p<.001) compared to before the pandemic.

| The table compares the frequency of actions for symptoms such as cough, sore throat, and fever before and after COVID-19. | | | | |
|---|---|---|---|---|
| Characteristic | Before N = 494[1] N (%) | After N = 494[1] N (%) | McNemar's chi-squared | p-value[2] |
| **Stay at home and minimise contact with others** | | | 68.54645 | <.001 |
| Yes | 250 (51%) | 363 (73%) | | |
| No | 244 (49%) | 131 (27%) | | |

Table 6:  The frequency of actions for flu-like symptoms before and after COVID-19

On the contrary, some opinions still state that the implementation process needed to be synchronized and caused many obstacles to people's daily lives. For example, transportation restrictions could create difficulties in visiting healthcare centres. Some people raised their concerns when there was cross-transmission in healthcare centres, leading to the closure of hospitals (For example, the closure of Bach Mai General hospital in Mar 2020). This could be indicated that the isolation of healthcare facilities could disrupt the provision of essential health services for hundreds of patients.

The survey data also provided evidence to prove this disruption. The percentage of reason for cancel or delay using of healthcare services which caused by the closures of healthcare facilities was 31% (28/89) of total recorded answers (Annex 1).

4.3.2.

4.3.3.

### 4.3.4. INDIVIDUAL PSYCHOLOGICAL CHARACTERISTICS

**STRESS AND ANXIETY**
Almost all participants we interviewed expressed anxiety and stress from the negative impacts of the pandemic and the consequences of strict public health measures. First of all, the variety of anxious related to the pandemic itself for instance the concerns about the risk of contact to the virus (19/33) and the scenario of being infected (10/33), worry about the fast transmission rate (15/33) and worry the dangerous of COVID-19 disease that may harm themselves, family members and their friends (13/33).

Refer to the downside aspects of public health interventions to individual health, the majority impacts of school closure leading to online-study were the increase many health concerns for both parents (anxious) and children (both mental and physical issues). According to the idea of one teacher, the long time studying on screen was harm children's eyes as "it's not good for the children to look at the screen to much, it's too hard for them to make out the words from the small screen of the phone" (07SR-2-1-2-1-012, female, 51 years old, Hanoi).

**PANIC AND FEAR**

The high level of panic happened in COVID-19 patients. Most participants who had the experience during treatment expressed their fear of developing severe diseases. Some people also expressed their panic about the future scenario when COVID-19 disease could threaten their life or family members of friend. found different types of fear: the fear increased with the severity of clinical symptoms, the prolonged duration of hospitalization, the fear of tests that patients have to take every day and the fear that poor individual health conditions could could increase the complications. Mental health issues also led to several illnesses and risk behaviours, such as self-harm in COVID-19 patients. One COVID-19 patient told his story to demonstrate this point:"There were two nights when I wanted to bang my head against the wall because I couldn't take it anymore. My head hurt throughout the night, I couldn't possibly stand it, and being unable to sleep made it even worse. My body ached all over when I lay down; I felt restless in my limbs. It was really hard to describe. I couldn't stand it"(07SR-2-1-2-1-007, male, unknown age, Hanoi).

Many different fears appeared in the interviews. However, the fear of getting infected was the dominant theme and was mentioned by almost all participants. This fear led to the avoidance of visiting crowded places, including hospitals and pharmacies, during the outbreak time.  Survey data showed that the proportion of reasons for cancellation of medical appointments due to the fear of being exposed to COVID-19 was 22% (22/89) of total recorded answers from avoidant group(Annex 1).

### 4.3.5. PSYCHOSOCIAL CHARACTERISTICS AND SOCIAL NETWORK

**SOCIAL NETWORK**
This study, we found that in a group of COVID-19 patients, person with good interpersonal and critical thinking skill, knowledge, experience with COVID-19, having high social position and no benefit conflict with other member took the main role. They usually active in initiating the discussion, validating information and giving advice to encourage/discourage other members.

They were considered as the key informants who could provide advice and trust-worthy information to other group's members. To illustrate this idea, one man in HCMC said: "There was an older lady. She was re-positive so she was really worried that I had to reassure her that it was residue of virus. Back then, I had to assure her a lot that she has to trust me that she was fine. I phoned her and consulted her"( 07SR-2115-007, male, unknown age, HCMC)

### 4.3.6. ENABLING FACTORS

## **COMMUNITY RESOURCES**

### **Transportation**

Transportation during lock down was reduced for both public and private transportation. Even people avoid public transportation due to the fear crowded place, they had alternative options such as using of private vehicles to go to hospitals so the affect from transportation restricted to access to healthcare services remained low. For example: a man shared his idea: "The transportation is not a problem in my area. It's still the same. For example, the 5am bus still passes by my lane right there. Then I catch a bus to go there(hospital)"( 07SR-2-1-4-5-007, male, 71 years old, Nam Dinh).

However, for some people without any private means of transportation, this had posted the barrier in access to the healthcare services, leading to the delay or cancellation of medical appointments, especially for people in rural areas. The survey data showed that the reason for cancellation these appointments due to no public transportation accounted for only about 4% (4/89) of total recorded answers (Annex 1)

## **FAMILY RESOURCES**

### **Financial capacity**

The impact of COVID-19 and its public health interventions on financial capacity was mentioned by almost all participants (25/33 participants). The consequences to the financial capacity of participants were: i) Loss of jobs and income of the primary breadwinners; ii) depletion of saving funds; iii) increase in debt. Loss of income or a part of income due to business disruption was the main reason leading to inadequate financial ability to cover normal livelihood activities.

Some participants felt even more stressed as they could not purchase healthy foods. Some people had to significantly reduce the quantitative and qualitative of food, such as "Normally I eat rice three times a day, now I eat rice once, two meals of instant noodles", said a motorbike taxi driver (07SR-2-1-2-1-010, male, 39 years-old, Hanoi). Financial hardship didn't allow them to apply healthier lifestyles even though they knew well about the importance of nutrition as a foundation for good health.

Participants working in the informal sector such as farmers in suburban or rural areas, suffered and worried more about the future as they couldn't sell their products or do farming while their savings accounts were small. Some other people working in formal sectors couldn't receive full

salary and annual bonus. People working in services sectors had double burdens of no interest gained and unchanged in business operation expenditures. Other add-in burdens need to be considered, such as extra expenditures related to online learning and the increased price of essential products.

On the other hand, most people said that they received subsidized Social Health Insurance (SHI) for medical treatment, which plays an integral part in their decision of healthcare utilization. However, SHI hasn't covered the whole population and left someone behind. There was a gap in policy to address poor and near-poor populations (mentioned in part on Availability and access to community supports), leading to the termination of subsidization for the Social Health Insurance premium for the low-income groups, which was made poverty due to COVID-19.

> "I still need to take medications monthly (for heart disease) so it would be good to have that type of medical insurance (Social Health Insurance), but if there was no more, then I would need to accept it" (07SR-2-1-4-5-006, female, 44 years old, Nam Dinh)

Financial burden during the COVID-19 pandemic may become disabling factor, affects to the HSB and the choice of healthcare utilization. Survey data recorded a portion of people cancel or delay treatment due to the financial hardship during pandemic 2% (2/89) of total recorded answers. Even this portion was small, but this disclosed the inequity in the access of health service of the low-income group(Annex 1)

### 4.3.7. NEED FOR CARE
This section illustrates the perceived need, meaning how people acknowledge their health status. It also included the experience and feeling toward the disease, severity of symptoms and worry about their health condition(1).

## PERCEIVED SELF-EFFICACY AND PERCEIVED RISK/SEVERITY OF HEALTH CONDITION

### Perceived self-efficacy and perceived risk/severity of COVID-19
Many people showed their perception that COVID-19 was a dangerous disease. This came from the understanding that there was no vaccine nor specific medicine for COVID-19 yet, therefore, they tended to seek for knowledge to help them avoid infection, improve health status, how and what to do if being infected, firstly by themselves and secondly from community resources. During pandemic, participants showed high carefulness on monitoring COVID-19 symptoms, especially when they came with other unfavored health conditions.

Table 7 provided evidence of a significant increase in the number of people who applied actions to tackle the flu-like symptoms (cough, sore throat, and fever) before and after the pandemic. Significant higher participants (22% higher, $p<0.001$) stayed at home and minimized the direct contact during the pandemic compared to before (before vs. after: 51% v.s 73%). Self-prescribe leading to self-purchasing medicine at the drug store, was the most common habit with the highest proportion compared to the other two actions. Before COVID-19, the percentages of participants who bought antibiotics and other medicine were 76% and 86%. After COVID-19, these proportions increased to 90% and 94%. The increases were significant, with 14% for antibiotics and 8% for other drugs ($p<0.001$) in comparison before and after the pandemic.

However, we also observed new pattern in HSB among the interviewees. First, people will monitor their symptoms carefully in combination with other assessments such as experience, knowledge and epidemiological factors. When the symptoms are clear, they will contact healthcare providers for health declaration or go directly to healthcare centres to take COVID-19 tests and receive appropriate treatment. This could lead to the increase of using COVID-19-related services at healthcare centres. Survey data (table 7) also provided us an insight into the significant increase (p<0.001) in the number of people seeking hot-line consultant service (among the whole study population) by 8% (before 82% and after 90%) when they have cough, sore throat or fever. Similarly, visiting hospitals for COVID-19 symptoms also witnessed an increasing trend with a significant increase (p<0.001) in the percentage of participants who visited primary health centres (18%), followed by clinics and private and public hospitals (16% increase). It is worth noticing that, before and after COVID, the proportion of people who use private hospitals and clinics remained the highest among the whole study population (before 80% vs after (96%), public hospitals (before 74% vs after 90%) and primary healthcare centres (before 70% vs after 88%) took the second and third place.

| The table compares the frequency of actions for symptoms such as cough, sore throat, and fever similar to COVID-19 symptoms before and after COVID-19 happened. | | | | |
|---|---|---|---|---|
| **Characteristic** | **Before** N = 494[1] **N (%)** | **After** N = 494[1] **N (%)** | McNemar's chi-squared | **p-value[2]** |
| **Stay at home and minimise contact with others** | | | 68.54645 | <.001 |
| G1:avoidance (Yes) | 250 (51%) | 363 (73%) | | |
| G2:non-avoidance (No) | 244 (49%) | 131 (27%) | | |
| **Buy antibiotics from a pharmacy or drug shop** | | | 40.71028 | <.001 |
| G1:avoidance (Yes) | 377 (76%) | 444 (90%) | | |
| G2:non-avoidance (No) | 117 (24%) | 50 (10%) | | |
| **Buy other medicine (apart from antibiotics) from a pharmacy or drug shop** | | | 16.40506 | <.001 |
| G1:avoidance (Yes) | 424 (86%) | 462 (94%) | | |
| G2:non-avoidance (No) | 70 (14%) | 32 (6.5%) | | |
| **Call a healthcare provider or hotline and speak to someone on the phone** | | | 22.71622 | <.001 |
| G1:avoidance (Yes) | 405 (82%) | 447 (90%) | | |
| G2:non-avoidance (No) | 89 (18%) | 47 (9.5%) | | |
| **Go to a government primary healthcare centre** | | | 71.04587 | <.001 |
| G1:avoidance (Yes) | 346 (70%) | 435 (88%) | | |
| G2:non-avoidance (No) | 148 (30%) | 59 (12%) | | |
| **Go to a public hospital** | | | 60.23762 | <.001 |
| G1:avoidance (Yes) | 368 (74%) | 446 (90%) | | |
| G2:non-avoidance (No) | 126 (26%) | 48 (9.7%) | | |
| **Go to a private hospital or clinic** | | | 70.92062 | <.001 |

| G1:avoidance (Yes) | 394 (80%) | 474 (96%) | | |
|---|---|---|---|---|
| G2:non-avoidance (No) | 100 (20%) | 20 (4.0%) | | |
| *1 n (%)*<br>*2 McNemar's Chi-squared test with continuity correction*<br>*Question: Before COVID-19, what would you normally do if you had symptoms like cough, sore throat, fever?*<br>*And*<br>*What did you do to manage this illness with symptoms like COVID- 19?* | | | | |

Table 7: The table compares the frequency of actions for flu-like symptoms before and after COVID-19

**Perceived risk/severity of other diseases or other risk factors**

Most participants raise a deep concern about the development of complications of COVID-19 when they have unfavoured health conditions such as old age, underlying diseases or other recurrent illnesses. The perceived risk was supposed to affect health knowledge and experiences, the attitude from the social environment and other repositing and enabling factors mentioned above. People would consider the risk of complications if infected and the danger of cancelling/delaying treatment for their chronic diseases to determine their intervention choices.

In addition, patients tended to cancel or delay treatment if they thought their illness wasn't as dangerous as getting COVID-19. Many patients only visit the hospital when the symptoms get worse or need medical treatment when the symptoms are not lifted.

Table 8 below summarizes the proportion for cancelling medical appointments, grouped by health conditions. Overall, the percentage of answers saying that people have comorbidity diseases but didn't cancel appointments made up a majority with 80% (110/137) of total recorded answers. The most common disease in the group cancelled treatment was Hypertension & Cardiovascular diseases and Depression or Other mental health problems, with 19% (5/27) of total recorded answers for cancellation of followed-up treatment. Chronic kidney diseases followed by 15% (4/27). In the group of no cancellation treatment, the highest proportion was Hypertension & Cardiovascular diseases, with 37% (41/110) of the total selected answers. Smoking took second place with 15% (16/110), and diabetes followed with 11% (12/110) of total recorded answers.

| **Have any health conditions or risk factors** | **Missed or delayed any medical appointments** | |
|---|---|---|
| | **Yes = 27 (20%)** | **No = 110 (80%)** |
| Diabetes | 2 (7%) | 12 (11%) |
| Hypertension & Cardiovascular diseases | 5 (19%) | 41 (37%) |
| Obesity | 3 (11%) | 7 (6%) |
| A chronic infectious disease like HIV, Hepatis B or Hepatitis C | 2 (7%) | 3 (3%) |
| TB | 0 (0%) | 1 (1%) |

| | | |
|---|---|---|
| Asthma | 1 (4%) | 4 (4%) |
| COPD | 0 (0%) | 1 (1%) |
| Other lung diseases | 1 (4%) | 1 (1%) |
| Chronic kidney disease | 4 (15%) | 2 (2%) |
| Cancer | 2 (7%) | 5 (5%) |
| Depression or Other mental health problems | 5 (19%) | 6 (5%) |
| Alcohol or substance use disorder | 0 (0%) | 0 (0%) |
| Current smoker | 0 (0%) | 16 (15%) |
| Pregnant | 0 (0%) | 3 (3%) |
| Other health conditions | 2 (7%) | 8 (7%) |
| *Question: Since the beginning of the COVID-19 pandemic, have you needed to postpone any medical or dental procedures, missed any scheduled appointments, or missed taking any medication? This does not include testing or treatment for COVID-19.* <br> *And* <br> *Do you have any of the following health conditions or risk factors? (Multiple choice question)* | | |
| N: Total number of selected answers for multiple choice question | | |

Table 8: Health conditions and risk factors grouped by cancellation or delay health services

**Perceived risk/severity of preventative medicine**

The study revealed people's perception of preventative care such as vaccination program, most participants said they would adhere to the schedule as they believed it is essential to get the vaccine on time, especially for children.

However, the use of healthcare services depends on the knowledge and perceived risk of an individual's health condition. Thus, compared to the risk of getting COVID-19, the booster doses of some vaccination programs were considered "not that necessary to risk going out during the outbreak" and "My grandchild could still get the hepatitis shot the other days"(07SR-2-1-2-1-012, 51 year old, female, Hanoi)

Table 9 below further describes the quantitative study findings on the frequency of cancellations or postponements time of healthcare services during the COVID-19 pandemic. There were 80 recorded (from 55 people in the avoidant group) answers to the question: "Which procedures did you or someone you live with miss or delay?". According to this table, expanded immunization-related services for children were cancelled or delayed the most, accounting for nearly 29% (23/80) of real answers. Routine check-ups and dental procedures occupied the following positions with about 20% (16/80) of total responses from avoidant group. Screening procedures (e.g. blood test, X-ray, CT scan, MRI) were the 4th most cancelled service group, with a rate of about 10% (8/80) of all recorded responses.

| Type of health services were missed/delayed | N=80 |
|---|---|
| Operation procedure | 3 (4%) |

| | |
|---|---|
| Cancer treatment | 2 (3%) |
| Screening procedure (e.g. blood test, X-ray, CT scan, MRI) | 8 (10%) |
| **Dental procedure** | **15 (19%)** |
| Medicine refill | 6 (8%) |
| **Routine check-up** | **16 (20%)** |
| Antenatal care | 2 (3%) |
| Giving birth at a health facility | 1 (1%) |
| Postnatal care | 4 (5%) |
| **Vaccination for you or your child** | **23 (29%)** |
| N : Total number of recorded answers for multiple choice question | |

Table 9: Type of health services were missed/delay

# CHAPTER 5

## CONCLUSION AND DISCUSSION

### 5.1. EXPANDING ANDERSEN'S BEHAVIOURAL FRAMEWORK: THE IMPORTANCE OF PSYCHOSOCIAL FACTORS AND SOCIAL NETWORK IN HEALTH SEEKING BEHAVIOUR AND HEALTHCARE SERVICE UTILIZATION

Andersen's behavioural framework fit quite well with the data as it could explain almost all factors that lead to an individual's health behaviour including HSB and healthcare service utilization. In the 1995 Andersen's revised framework, individual psychological factors were embedded into the predisposing factors within the population characteristics component (84,85). Nonetheless, the psychological characteristics only included three variables which were cognitive impairment, mental dysfunction and autonomy(84). We believed that the psychosocial characteristic did not receive enough attention as it should be. For this factor, Anderson (1995) also mentioned the importance of involving social structure by measuring three concepts: education, occupation and ethnicity factors. He also acknowledged the necessity of involving sociologists in the studies of healthcare utilization and access to care because health services make a large part of the growing economy(84). However, in the context of COVID-19 pandemic, these factors and their association to sociocultural aspect have become more complex because the COVID-19 pandemic has changed the way our society works and interacts (86). In addition, because psychosocial characteristics can be seen as the development of individual's psychology in the context of their sociocultural environment(3), therefore it is closely correlated and has high degree of mutability and may interrelate to other factors in different ways within one individual's social networks in the context of pandemic(85,87). Therefore, we argue that if we put psychosocial factors under the predisposing factors, it will likely underappreciate the impact that this factor has on other factors such as socio-environmental, health system, enabling and need for care factors. On the other hand, other variables found in this study such as social network, social norms and capital are the other domain of psychosocial factors, which were identified as the determinants of health seeking behaviour, leading to the need of expanding the Andersen's framework.

### 5.2. MENTAL HEALTH PROBLEM AND COPING STRATEGIES IN THE CONTEXT OF ABSENCE OF PROFESSIONAL MENTAL HEALTHCARE SERVICES

From the results of the thematic analysis, mental health issues were discussed by many participants with different levels of severity. Specifically, for COVID-19 patients, the severity of COVID-19 disease showed the probability of developing more severe mental health problems. The longer a patient was bedridden, the higher the prevalence of developing depression and anxiety(88,89). This was similar to one observational study that found that the severity of mental health symptoms was associated with COVID-19 diagnosis.

Another important finding in this study was how the lack of information about one's health status could trigger worry and anxiousness in people waiting for the COVID-19 results or those

under treatment. Another study also proved the benefits of understanding health status and its contribution to health outcomes(90). This suggests that there is a need for a guiding process to disclose information about one's health status to reduce mental distress and protect patient autonomy in making treatment choices.

Therefore, according to this study's results, one person's mental health status was affected not only by individual psychological factors but also by other factors coming from their broader context and social networks. The perceived self-efficacy is closely linked to self-coping methods, such as mindfulness meditation, preparedness for bad situations, leisure and physical activities. This was similar to other studies suggesting that self-care, such as physical exercise and meditation, was recognized as effective in reducing the adverse effects of stress and anxiety(88).

One significant gap that this study found was the high number of people suffering from different types of mental distress while their perceived risk of illness was low. Furthermore, professional services for mental health problems were also neglected. This posited other questions for future research on the necessity of professional mental health prevention and intervention and identifying the barriers to the utilization of mental health services and how to combat these barriers and improve access to these services in the context of Vietnam.

### 5.3. DEFINITION OF PANDEMIC VULNERABILITY HAS BEEN CHANGED ACCORDING TO PANDEMIC SITUATION, SOCIOECONOMIC AND SOCIODEMOGRAPHIC FACTORS.

The level of vulnerability depended on variables such as predisposing factors, susceptibility and the adaptive capacity of individuals. Different combinations of these variables in different settings created different vulnerability levels (Annex 2). Therefore, the procedure to define vulnerability is the matrix of combinations of various variables in different circumstances. It is quite complex due to the diversity of the environment, society, public security policies, availability of resources such as public service systems (including social insurance and health insurance), demographic factors, and social psychology of each individual according to the situation of the pandemic. In our study, we also found that the vulnerability of population levels may relate to the outbreak and the responsive public health measures applied at that time. The type of vulnerability was also different among different groups. For instance, the financial vulnerability was dominant as the business closures had negative impacts on the income and depleted saving accounts of families. This was a challenge to the pro-poor strategies of the government when many people have pushed under the poverty line again and couldn't receive government support due to the old inclusion criteria failing to reflect the fast change of the actual situation.

Another type was biological vulnerability which can be applied to people with risk factors (comorbidity, substance abuse, elderly). Social insecurity happened with people working in informal sectors compared to formally employed people. For example, people working in informal sectors were considered vulnerable due to their low ability to access specific social security resources such as unemployment and social insurance. Unemployed people in informal sectors living in urban areas seemed to suffer more due to multiple burdens of loss of income and high living costs (e.g. accommodation fee, price of food) and the inability of being able to find alternative resources for daily life (i.e. unable to produce foods in urban areas). The importance

of identified vulnerability groups was also discussed in the recent study on pandemic vulnerability(91), which mentioned the complexity of vulnerability in the context of the pandemic..

5.4.    HSB AND HCU

From the qualitative data, we found differences in the health-seeking patterns for medical services based on the type of symptoms and severity. For the suspected COVID-19 disease, there were two main patterns applied. Before COVID-19, people often self-medicated at home using traditional methods or western medicine for symptoms such as cough, sore throat, and fever. Purchasing un-prescribed medicines at pharmacies was an effective method due to its low cost, simplicity, and time-saving for medical examinations. People only visited healthcare centres if the symptoms were not relieved. A similar HSB pattern also occurred in Eastern Mediterranean Region Countries In this study, before COVID-19, the proportion of people using health services in the private sector was 80% of the total number of people using services, higher than the public sector with 74%. This was similar to the findings in other studies in Indonesia(92), Pakistan(93) and Bangladesh(94), where the authors found that the place of first health services contact was private healthcare providers

After COVID-19, most people still applied for self-treatment, but they also applied for health declarations with local health authorities and visited the healthcare centre for further diagnosis and treatment. There was a significant increase (p<.001) in the number of people seeking hot-line consultant services before and after COVID-19, from 82% to 90%. This trend was similar to the findings in a multi-national study which mentioned the increasing trend of shifting to new medical consultation forms, from in-person to phone visits(16). Purchasing antibiotics for self-treatment significantly (p<.001) increased up to more than 94% of the total participants (in table 7). This could be explained by the fact that people would buy drugs for hoarding and to avoid going out multiple times during the outbreak. We didn't have further information on the actual use of the purchased drugs. Similar trends were also found in a study in  Eastern Mediterranean Region countries such as Jordan when pharmacists distributed more antibiotics (increases of up to 127%) without prescriptions than before the pandemic(11).

Regarding non-COVID-19 symptoms, the most cancelled type of medical procedures was vaccination for children (29%), routine check-ups (20%) and dental procedures (19%). A study in Hongkong also has similar findings that primary healthcare services were reported with the most significant reduction(9). Another study in Taiwan also depicted a reduction in dental services(95).

**Advantages and Limitations:**

This study has provided an advantage due to the low positive care and death due to COVID-19 in Vietnam compared with other countries in the same period. However, the results of this study couldn't provide an overall picture of the pandemic's impacts on HSB and HCU for the entire duration of the pandemic as the study was cross-sectional in design.

We also acknowledge some limitations: Firstly, the calculation of the percentages based on the general questions may only reflect some of the components of the type of health conditions and health services used. Secondly, the study participants' data cannot represent the entire community because this is an online survey, so the study participants needed the devices to connect to the internet. This will limit the presentative of data for the vulnerable population. In addition, self-reporting surveys can be affected by the likelihood of recall bias and social desirability. Moreover, this survey is cross-sectional research, and due to the limitation of data, some comparisons about the significant change in health service utilization before and after the pandemic couldn't be tested.

**Conclusion**

The study's results showed HSB and HCU are associated with external environmental factors, health systems, and population characteristics. Knowledge and attitude, health perceived status, social structure and network, community and family resources, individual perception of risk and need for care are the decisive determinants of HSB and HCU patterns. This study also points out the importance of social networks and psychosocial characteristics in determining HSB and HCU, which need more attention. The study concludes that the COVID-19 pandemic and the public health measures introduced a wide range of negative impacts on socioeconomic status, health service disruption, variable effects on health belief, psychosocial characteristics, availability of resources and personal knowledge and perception. The findings suggest a more comprehensive and sustainable approach to enhance equity in access to health services amid the pandemic crisis.

5.5.    POLICY RECOMMENDATIONS

**Health system protection recommendations**

1) **Maintaining essential health services**: According to the findings, Health system has been overwhelmed by COVID-19 pandemic with the shortage of HW, medical resources and clinical space. During the pandemic, with a reprioritizing policy for COVID-19, health services disruption was found in almost all levels of healthcare system especially outpatient services (TB monitoring and treatment, oral care etc..), preventative care (expanded immunization programs especially the delay or cancel booster doses) and outreach programs (HIV/AIDS). To prevent the collapse of the health system, the government needs to balance its functions and responsibilities between managing and controlling the COVID-19 pandemic and ensuring essential health services to avoid the double burden of diseases (COVID-19 and other existing communicable and non-communicable diseases) in the post-COVID-19 period. Thus, it is recommended that interventions for maintaining basic healthcare services and encouragement of healthcare utilization should include services from primary healthcare to hospital level. For example, to reduce hospital avoidance due to the fear of getting COVID-19 infection, healthcare providers need to enhance classification system to channel patients flow at healthcare facilities by health declaration, screening tests, triage and referral schemes for COVID-19 suspected patient and non-COVID-19 patients with consideration specific protocol for emergency cases such as birth delivering.

2) **Building mental healthcare program**: This study has revealed three important findings: i) the perception and acceptance of general Vietnamese population that mental health is common and happens for everybody during pandemic ii) the absence of professional

mental healthcare services, iii) the important of social-based mental health care resilience. To tackle these challenges, firstly, community-based mental healthcare could be a potential solution if we could make use of the existing/emerged social groups (which were formed during pandemic) to spread the message on the importance of mental healthcare, raising awareness and altering knowledge of general population. Source of information and delivering channels based on information technology could be a promising approach to gathering social attention on mental health issues. Secondly, as "no health without mental health", therefore to achieve "health for all", the health system must include mental health services as a basic benefits package (covering mental health care promotion, preventative and curative services) which is still left behind in Vietnam. Thirdly, it is also vital to acknowledge the importance of multisectoral collaborations as well as community-integrated strategies for investment and deployment of a holistic mental health care program in Vietnam, which priority is focused on the most vulnerable populations.

3) **Strengthening health system resilience and preparedness for future outbreaks focusing on health digitalization**: COVID-19 pandemic has changed people's lifestyles in almost all aspects, from direct interactions to online activities. In this study, we saw the important role of digital health (DH) in pandemic-responsive strategy as it provided the tools for disease surveillance such as contact tracing and monitoring, virtual space for health communication, cloud-storage solution for real-time health information, telehealth services for health assessment and consultant, diagnosis and treatment. Investment in digitalization in general and for DH in specific could possibly increase the effectiveness of the health system, improve the access to information, increase accuracy and accountability for the health system and turn the disease-centre into people care-centre approach by giving them more autonomy in decision making for their own health and wellness. However, several challenges remain such as insufficient financial investment, fragmented information infrastructure, the literacy of IT among HCW and the general population at all levels, the disparity between the user demand and the access to internet services, especially in elderly, low-income people and those in rural areas. In order to persuade a long-term investment, Public-Private-Partnership (PPP) could be a potential solution as the private sector could contribute the financial resources, expertise and vocational training that are needed for IT infrastructure projects with the leading role belonging to the government. From the government's perspective, the need to build up evidence-based DH standards and explicit road map for country's health system digitalization, in which data confidentiality, data governance, cost-effectiveness, equitable access, patient safety should appropriately consider.

**Social protection policy**: This study has disclosed many negative impacts of COVID-19 pandemic and its public health measures on people's livelihood. It also provided an insight into the disparities in socioeconomic factors that direct or indirect affect Vietnamese health and well-being in the context of limited resources. This study revealed that vulnerability levels have changed according to the different stages of the pandemic. It is necessary to clearly identify 6WHs-questions: who, when, where, why, how and to what extent the impact of COVID-19 has on each specific population to promptly provide support for people most in need. Government should investigate and gather evidence to build a vulnerability assessment and classification system as well as provide tools to measure how difficult people have to suffer due to the threats

they are encountering. It is also essential to study and innovate a holistic approach to social protection policies to adapt to post-pandemic times with many challenges ahead. COVID-19 pandemic has exposed both weaknesses and strong points of the current social governance system, therefore, leveraging the beneficial policies that have been implemented during the pandemic, repairing and constructing new social security systems based on human rights should be the top priority. With the baseline of "leaving no one behind", an effective and comprehensive social protection system is not only essential for social justice and equity, but also for creating the county's sustainable and resilient future.

1) **Income assurance policy**: COVID-19 pandemic has created financial hardship and significant disparities among different communities in Vietnam. Thus, financial protection policy should focus on gathering evidence to develop policies to ensure income for people of working age as they are normally the family's main breadwinners. In the short run, some temporary coping strategies such as in-cash or in-kind relief packages should continue with the improvement in both quantity and quality (e.g. waiver of unemployment insurance premium for both employers and employees during the lockdown or business closure should be maintained). However, it needs to set up the priority, depending on the level of vulnerability. In other words, these packages should support people the most in need first such as migrant workers, workers in informal sector and those who lose their job or their salaries due to pandemic, instead of approaching general population.

2) **Training and improvement of knowledge and competency for labour force in a changing world**: The pandemic also unveiled the new challenges as it created segmentation labour marker which led to the increase of more social-insecure employment such as free-lancer, self-employed job, temporary job, unvoluntary part-time job and so on, which normally unable to access to basic social protection. The disparities were deepened during pandemic period between formal vs informal sector, male vs female, urban vs rural areas, high skilled vs low and medium skilled workers, or emerged discrimination between COVID-19 infected and non-infected workers or between people who can work-from-home and who cannot. Thus, temporary unemployment assistance scheme should be launched to support people the most in need such as voluntary unemployment insurance designed specifically for worker in informal sector.

3) **Assuring access to basic social protection (except healthcare)**: Shortage of income has shown many threats to people's health and well-being as it prevents access to basic needs such as food, clean water, accommodation, education, safety need and many other essential demands. It is crucial to address environmental, demographic and socioeconomic determinants of health which are contextualized to each region, time and specific population in order to design strategic, cost-effective basic packages. It is recommended that free access to basic benefit services packages especially for children, pregnant women and elderly, poor people and people living in remote areas is crucial because of the severe and long-term consequences may have on their health. In order to design holistic and contextualized basic packages, which is tailored to people's need, we suggest that legislators should engage community members in the discussion agenda and intervention design process as they are the central stakeholders. Moreover, in terms of program operation, government should pay special attention to the service system at the grassroots level as we already witnessed the deficit of human resources, material and

financial resources at this level which can hinder the deployment of these social protection programs.

4) **Maintaining and expanding Social Health Insurance (SHI) coverage, moving toward universal health coverage (UHC)**: The pandemic has proved the essential function of SHI in terms of preventing catastrophic health expenditure which was exacerbated during crisis time. Thus, the government should have incentives and supportive measures for the community to maintain their participation in SHI as this is their right and social responsibility for the common good. It is necessary to have an awareness-raising campaign, targeting general population to help them understand the importance of SHI which is considered a proactive and sustainable social security measure, managed and protected by the government.

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ANNEX:

| What is/are the reason(s) of missing medical appointments | Yes (N=89) |
|---|---|
| Your healthcare provider cancelled your appointment because of COVID-19 | 20 (22%) |
| Your healthcare provider is/was closed because of COVID-19 | 7 (8%) |
| The pharmacy is/was closed because of COVID-19 | 1 (1%) |

| | |
|---|---|
| You couldn't get to the healthcare provider or pharmacy because of COVID-19 lockdown/stay at home order, or travel restrictions were in place | 12 (13%) |
| You had symptoms of COVID-19 so you stayed home | 1 (1%) |
| You cancelled the healthcare appointment or didn't want to go to the pharmacy for fear of being exposed to COVID-19 | 18 (20%) |
| You didn't want to take public transport for fear of being exposed to COVID-19 and had no other way to get there | 4 (4%) |
| You felt okay or good enough | 14 (16%) |
| You didn't have money or health insurance | 2 (2%) |
| There was no public transport available | 4 (4%) |
| You forgot to go/just missed your appointment | 3 (3%) |
| You felt disrespected by the office or medical staff | 1 (1%) |
| You were drinking or using drugs | 0 (0%) |
| Don't know | 2 (2%) |
| Others | 0 (0%) |
| N : Total number of selected answers for multiple choice question | |

Annex 1: The reason(s) of missing medical appointments

| Categories | Factors | Domains | Themes and sub-themes |
|---|---|---|---|
| **External environment** | **COVID-19 pandemic** | Covid pandemic situation | Covid pandemic situation |
| | | COVID-19 public health measures and policy | "5K" - Government message: |
| | | | Social distancing and reduction of mass gathering |
| | | | Contact tracing, quarantine and isolation |
| | | | Lockdown |
| | | | Transpotation restriction |
| | **Socioeconomy** | Economy | Business closure |
| | | | Increase price of necessary goods |
| | | Resiliance strategies | Policy on social sercurity<br>   - Supportive policy for enterprises<br>   - Supportive policy for low-income population |
| **Health system** | **Health system** | COVID-19 prioritizing policy, Resources & Organization | Repriorisation from basic health services to COVID-19 |
| | | | Health resources |
| | | | Basic services delivery |
| | | | Barrier to access |
| | | | Quality of care |
| **Population characteristic** | **Predisposing** | Demographic characteristics | Age<br>Gender<br>Occupation<br>Urban - Rural<br>Marrital status |
| | | Health belief | Health knowledge and awareness<br>   - Content of information<br>   - Source of information<br>   - Information channels<br>   - Access to information<br>   - Method to process information |
| | | | Attitude (toward)<br>   - Fake news<br>   - COVID-19 pandemic related news<br>   - COVID-19 protocol and public health measures and regulations |
| | **Psychological characteristic and social network** | Indicidual psychological characteristics | Anxieties and stress<br>Panic and fear<br>Stigma |
| | | Psychosocial and social network | Social structure<br>Social network |
| | **Enabling** | Community | Transportation<br>Availability and access to community supports |
| | | Household | Financial capacity<br>   - Job & Family income<br>   - Insurance<br>   - Time |
| | | | Available time and child care giver |
| | **Need for care** | Individual perception | Self-reported status |
| | | | Actual health condition |
| | | | Perceived self-efficacy |
| | | | Perceived risk/severity of health condition |
| **Behaviour** | **Behaviour change** | Life style change | Healthier life style<br>Unhealthy life style |
| | | Health seeking behaviour | HSB for coping methods for mental issues<br>HSB for chronic/ recurrent disease services<br>HSB for COVID-19 symptoms treatment |
| **Action** | **Actions/ Likelihood of actions** | Healthcare utilization | Healthcare utilization<br>Reason for delay or cancel |

Annex 2: Themes and modified domains to Andersen's behavioral framework

| No | Name | Value | Type |
|---|---|---|---|
| 1 | Sex | Male/ Female | Binary |
| 2 | Region | Urban/Rural | Binary |
| 3 | Age group | 20-29<br>30-39<br>40-49<br>≥50<br>Not stated | Nominal |
| 4 | Study Sites | Ho Chi Minh City<br>Hanoi City<br>Nam Dinh Provice<br>Dak Lak Province | Nominal |
| 5 | Main occupation | Business person<br>Factory worker<br>Farmer<br>Freelancer<br>Service workers (e.g hospitality, restaurant…)<br>Housewife<br>Manual labour<br>Motorbike taxi driver<br>Office worker / civil service<br>Retiree<br>Student<br>Teacher<br>NGO staff | Nominal |
| 6 | Profession - HCW | Administration<br>Doctor<br>Nurse<br>Laboratory<br>Pharmacist<br>Contact tracer<br>Cleaner<br>Driver<br>Head of public health center (PHC<br>Management Staff<br>Psychiatrist<br>Midwife<br>Nutritionist<br>Health Volunteers<br>Health Assistants<br>Security<br>Other | Nominal |
| 7 | Type of Health Facilities | Community health center<br>District hospital<br>National hospital<br>Provincial hospital | Nominal |

| 8 | Marriage status | Divorced/Separated<br>Married<br>Unmarried<br>Widowed/Widower | Nominal |
|---|---|---|---|
| 9 | Education Level | No formal education and incomplete primary education<br>Completed primary education<br>Completed secondary/high education<br>Intermediate education/ Undergraduate<br>Postgraduate degree | Nominal |
| 10 | Nutrition care | Yes/No | Binary |
| 11 | Stay at home and minimise contact with others | Yes/No | Binary |
| 12 | Buy antibiotics from a pharmacy or drug store | Yes/No | Binary |
| 13 | Buy other medicine (apart from antibiotics) from a pharmacy or drug store | Yes/No | Binary |
| 14 | Call a healthcare provider or hotline and speak to someone on the phone | Yes/No | Binary |
| 15 | Go to a government primary healthcare centre | Yes/No | Binary |
| 16 | Go to a public hospital | Yes/No | Binary |
| 17 | Go to a private hospital or clinic | Yes/No | Binary |
| 18 | Have any health conditions or risk factors | Diabetes<br>Hypertension & Cardiovascular diseases<br>Obesity<br>A chronic infectious disease like HIV, Hepatis B or Hepatitis C<br>Tuberculosis (TB)<br>Asthma<br>COPD<br>Other lung diseases<br>Chronic kidney disease<br>Cancer<br>Depression or Other mental health problems<br>Alcohol or substance use disorder<br>Current smoker | Nominal |

| | | Pregnant<br>Other health conditions | |
|---|---|---|---|
| 19 | Type of health services were missed/delayed | Operation procedure<br>Cancer treatment<br>Screening procedure (e.g. blood test, X-ray, CT scan, MRI)<br>Dental procedure<br>Medicine refill<br>Routine check-up<br>Antenatal care<br>Giving birth at a health facility<br>Postnatal care<br>Vaccination for you or your child | Nominal |
| 20 | What is/are the reason(s) of missing medical appointments | Your healthcare provider cancelled your appointment because of COVID-19<br>Your healthcare provider is/was closed because of COVID-19<br>The pharmacy is/was closed because of COVID-19<br>You couldn't get to the healthcare provider or pharmacy because of COVID-19 lockdown/stay at home order, or travel restrictions were in place<br>You had symptoms of COVID-19 so you stayed home<br>You cancelled the healthcare appointment or didn't want to go to the pharmacy for fear of being exposed to COVID-19<br>You didn't want to take public transport for fear of being exposed to COVID-19 and had no other way to get there<br>You felt okay or good enough<br>You didn't have money or health insurance<br>There was no public transport available<br>You forgot to go/just missed your appointment<br>You felt disrespected by the office or medical staff<br>Don't know<br>Others | Nominal |

Annex 3: Operational of quantitative variables