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COVID-19 Vaccination

Willingness and Practice in Bangladesh

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Executive Summary

With the launch of the nationwide vaccination program in Bangladesh on 7 February 2021, the country—intending to immunize 80% of the population in three phases—is gearing up to take the next step in combating the novel Coronavirus. This report by the BRAC Institute of Governance and Development (BIGD), BRAC University aims to shed light on the COVID-19 vaccination program in Bangladesh by means of three surveys conducted over various periods of time, from late January to the end of March 2021. We begin by tracing out the events starting from the first discussions on the vaccine in Bangladesh to all the way up to the end of March this year with the help of media tracking, and then proceed to capture the factors which determine one's willingness to be vaccinated (WTV) in Bangladesh, with a focus on governance-related factors. We also investigate the differences of the borderline cases. Additionally, we analyze the temporal differences for the youth in terms of WTV. We then discuss our findings of WTV among the urban slum residents. Finally, we present the findings of vaccine registration-related factors among urban slum and rural respondents. This will enable policymakers to gauge the degree of vaccine acceptability and what may have worked or not worked towards it, and identify subgroups of the population that may require special attention to ensure immunization.

A rather high WTV at the start of the program in February 2021 among the general population may mean that some of the anticipated demand-side challenges in adult immunization will not serve as an impediment in the vaccine rollout, and more respondents were certainly willing than willing with some hesitancy. In the nationally representative sample, the following subgroups were relatively more inclined to be vaccinated: those with a higher perceived health risk to self, preferring stringency of lockdown, having a higher perceived effectiveness of the Bangladesh Government's response to the COVID-19 crisis management, and exhibiting greater confidence in the vaccine distribution efficiency. Examining the differences for the borderline respondents revealed that the same factors contribute towards a person willing with certainty as opposed to probably willing or unsure. Additionally, it was found that those having a higher self-assessment of personal health risk and viewing the relief operation as having more irregularities are more conflicted in their opinions regarding WTV. Respondents in the affirmative or unsure about their willingness were more conflicted regarding their satisfaction with the relief operations. On the whole, it appears that the perceived personal health risk and perceived good governance play a role in respondents' decision-making. There is also a lack of other-regarding behaviour in this sample; for instance, having elderlies or household members with underlying medical conditions did not have any significant bearing with WTV.

The most common reason for not willing to be vaccinated was the perceived lack of necessity, followed by distrust in the vaccine. Additionally, those definitely not

willing feel the lack of necessity of the vaccine proportionately more, whilst those probably unwilling think they cannot afford the vaccine more.

A fall in the youth's WTV was found in March 2021 from February 2021, while the WTV status of urban slum respondents in February 2021 also revealed some concerning aspects. Overall willingness was the lowest in urban slums when compared with the nationally representative general and youth samples surveyed during the same period of time. The highest share of definitely unwilling respondents is also observed among the urban slum dwellers. However, the differences between the urban residents as a whole and urban slum dwellers are not significant. The majority of the unwilling respondents believed there is no necessity for the COVID-19 vaccine and the second most common reason was concerns regarding the safety of the vaccine. Interestingly, around a third of urban slum respondents informed religion was also a factor behind their decisions. A significantly higher proportion of unwilling slum respondents felt the lack of necessity of a vaccine when compared with the overall urban respondents. Urban slum dwellers were more likely to be very confident about the efficiency of vaccine distribution while urban residents were more likely to be moderately confident.

Moving on to the practical aspects of the immunization program in rural and urban slum areas in March 2021, approximately two-thirds of respondents in each sample reported having heard about the vaccine registration. Proportionately more urban slum dwellers had heard about the COVID-19 vaccine registration compared to rural residents. This highlights a possible benefit of the higher access to information prevalent in urban regions. Relatively more men had heard about the COVID-19 registration compared to women in both regions. In terms of occupations, in rural areas, homemakers, day labourers, drivers or helpers, housemaids, and the unemployed knew the least, whereas in urban slums, this was the case for homemakers, farmers, and fishermen. Jobholders and entrepreneurs knew the most in both regions. The youngest group of people and the oldest group has shown the highest lack of knowledge in comparison with other age groups, and the latter is more concerning. Social networks and mass media were found to be a vital source in spreading information. Differences across both samples suggest announcements via mike and TV/radio were more informative for urban slum respondents.

There was an overall lack of interest in further information regarding the vaccine, and it was particularly more pronounced in rural regions. Among those that did want to know, most respondents wanted to know details regarding how to register for the vaccine; other information respondents wanted were the venue for vaccination and whether any fee is applicable. Additionally, a significantly higher proportion of urban slum respondents wanted to know whether they can register without National Identity Card (NID) and whether any vaccine card will be provided, compared to rural respondents.

The majority of the respondents who knew did not register, and mostly not because of self-reported ineligibility or confusion regarding eligibility, but other reasons. Significantly more urban slum respondents said they did not register due to reasons not concerning eligibility. The highest registration rate is observed in Barishal division, while the lowest was in Mymensingh division. Mymensingh division also reported the highest lack of knowledge regarding registration. In rural areas, a greater proportion of men had registered compared to females. A higher percentage of rural male respondents had not registered due to being unsure about their eligibility than women. Across both areas, proportionately more men had not registered due to other reasons. Respondents aged over 40 years who are misinformed about their eligibility status are proportionately higher in urban slums. As noted earlier, a large

proportion of eligible respondents did not also register due to other reasons, and the percentage is higher among urban slum residents. Occupationally, the registration rate is highest among jobholders, with the rural rate being higher, while the lowest registration rates were recorded for homemakers, day labourers, drivers or helpers, and housemaids. Rural unemployed respondents also had a very low registration rate.

Excluding ineligibility and confusion regarding eligibility status, top reasons across both samples for not registering included being uninterested to be vaccinated, being unable to manage time, not knowing how to register, not knowing who to ask to get registered, and fear of getting sick if vaccinated. The lack of interest in being vaccinated was significantly higher in urban slums than in rural areas. Significantly more rural respondents raised the issue of distance from their home to the vaccination centre, and held the belief that poor people would not receive the vaccines than urban slum dwellers.

Among those who did register, most respondents had registered online with the help of an acquaintance, or went to a shop to get registered. This was followed by self-registration online. Almost all respondents said that they had not faced any issue while registering, but it is worth mentioning here that this question was only asked to those who had successfully completed their registration.

Overall, a high level of compliance can be observed among those who have registered and received confirmation via the short message service (SMS), or their appointment has already passed. The role of our social networks has been once again instrumental for vaccination, as the majority of those who took the vaccine cited them as the source of encouragement.

Potential intra-household spillovers were present as a household head's knowledge regarding the registration and registration status was linked to the registration status of other household member(s), and the head's compliance was also related to the compliance of other member(s).

Insofar, the GoB has been adaptive to local developments, as demonstrated by lowering the age limit to 40 years and bringing in teachers under the first phase (Sujan, 2021). Although, supply disruptions had caused halts in the rollout, the focus of this report is on demand-side aspects. Thus setting aside supply-side challenges such as procurement and equity in terms of vaccine distribution, a number of demand-side challenges has been identified here: ensuring vaccine uptake by increasing registration rates, addressing the gender gap in vaccine registration knowledge and completion, communicating vaccine necessity and details of the eligibility status and registration process, and tackling misconceptions and mistrust. Although our survey period did not cover the commencement of second dose of the vaccine, ensuring full or complete immunization is also important.

To conclude, while there exists uncertainty in the effectiveness of the vaccines, especially in the event of new strains of the virus, the ideal option right now is to trust the results of the vaccine trials and ensure maximum participation in the inoculation. Effective communication strategies and other lessons learnt from the Expanded Program on Immunization (EPI) can be of great value here to address the challenges in WTV. Adopted measures should include creating awareness about the health risk of the virus and vaccine necessity, effectiveness, and safety; bringing confidence in vaccine distribution efficiency; addressing religious concerns (especially in urban slums); presenting information about registration eligibility and step-by-step guidelines for registration. Convincing

people of vaccine necessity is crucial while informing them of registration details, as there appears to be a prevailing disinterest in knowing more about the registration process as well. Information campaigns regarding the registration process should especially target the rural population and women. Frequent mobile phone message reminders, social media, community-level vaccination awareness program and partnership with Non-Governmental Organisations and other development organisations might be fruitful. Setting up booths designated for registration will help to eliminate intermediaries and may reduce the cost burden on the people, as most registration appears to be occurring by secondary means. Organizational support for vaccine registration can also be extended by employers. Policymakers need to bear in mind both supply- and demand-side features to ensure the ultimate success of the vaccination program.

Chapter 1

Introduction

With the launch of the nationwide vaccination program in Bangladesh on 7 February 2021, the country—intending to immunize 80% of the population in three phases—is gearing up to take the next step in combating the novel Coronavirus. This is essentially a long-term solution. Bangladesh was fortunate to have relatively low infection and mortality rates in the first wave of early 2020. On top of that, the procurement of vaccines was strategically efficient initially, with early deals made with vaccine-producing countries. Besides the second wave and the halt in the supply of vaccines (Islam, 2021, April 14), one of the primary aspects to be concerned about now is vaccine uptake, i.e., a person's willingness to be vaccinated (WTV). In a country that is no stranger to vaccination programs and largely considered to be vaccine-friendly, the authority is presently dealing with adult immunization, in contrast with the past child immunization program. It is also important to understand the WTV for key socioeconomic groups, such as the youth and urban slum dwellers. Additionally, in order to infer WTV in practice, we need to analyze vaccine take-ups by using data on vaccine registrations and vaccine compliance. The vaccination registration and compliance reflect the actual uptake, practices, and hindrances which is insightful for program implementation. Figure 1.1 reveals that daily vaccinations peaked in late February but there is a downward trend towards the end of March.

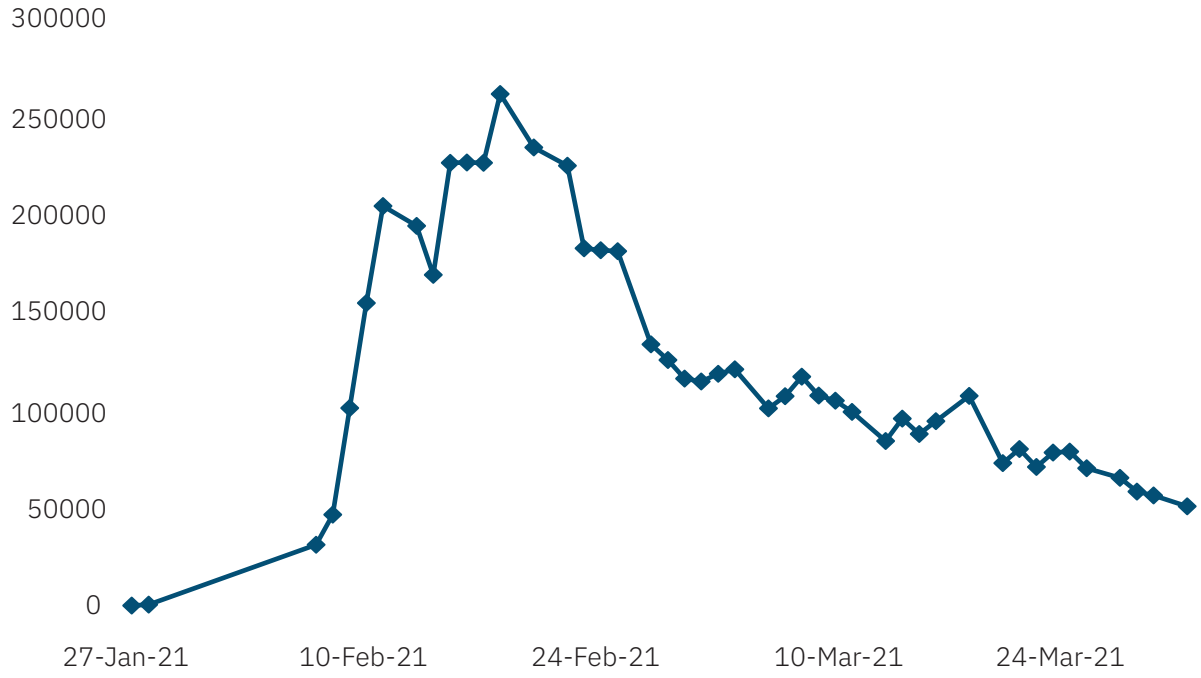

Figure 1.1. 1st Doses Administered Over Time in Bangladesh (27 Jan'2021 to 31 Mar'2021)
Source: Directorate General of Health Services, 2021.

This report by the BRAC Institute of Governance and Development (BIGD), BRAC University aims to shed light on the above issues by means of three surveys conducted over various periods of time, from late January to the end of March 2021.[1] We begin by tracing out the events starting from the first discussions on the vaccine in Bangladesh to all the way up to the end of March this year with the help of media tracking, and then proceed to capture the factors which determine one's WTV in Bangladesh, with a focus on governance-related factors. We also investigate the differences of the borderline cases. Additionally, we analyze the temporal differences for the youth in terms of WTV. We then discuss our findings of WTV among the urban slum residents. Finally, we present the findings of vaccine registration-related factors among urban slum and rural respondents. This will enable policymakers to gauge the degree of vaccine acceptability and what may have worked or not worked towards it, and identify subgroups of the population that may require special attention to ensure immunization.

In the first analysis of this report, this research attempts to study the role of governance in the demand-side aspect of the vaccination program, i.e., WTV, from the sample of a nationwide survey that took place from late January to early February 2021. New developments in the COVID-19 vaccination towards the end of 2020 brought forth concerns regarding procurement, logistics, and acceptability of the vaccine itself, among other plausible challenges. Bearing the demand-side issues in mind, BIGD undertook a survey early this year to assess the perceptions of Bangladeshis regarding their WTV for COVID-19. This survey constituted of three sampling frames—a nationally representative general sample, youth, and an urban slum sample. We also collected data on factors that may have contributed to forming those decisions. While this portion largely focuses on the general sample, the youth and urban samples are also analyzed, as explained below.

We extend the previous analysis to incorporate data from a nationwide youth survey that took place in March 2021, upon realizing the importance of knowing the perception of the youth cohort—the most economically active demographic group of the country. This analysis of youth dynamics based on two surveys one month apart could be useful, for instance, while planning for educational institutions reopening and determining expected compliance when revising vaccination age-limit restriction.

The last portion of this analysis involves examining the urban slum dwellers' WTV and understanding their perspectives on COVID-19 vaccines, using the slum sample from the first survey. Due to the high population density in slum settlements, these territories were regarded as the hotspots for COVID-19 transmission. However, studies suggested the infection rate was, in fact, low compared to the speculation (Mollah & Islam, 2020). Zaman et al. (2021) reinforced the importance of governance from below or community-level governance in an urban slum study during the COVID-19 crisis. The urban slum residents mostly come from the informal sector and in such areas, the governance from below plays a significant role, as the authors showed how community-level interventions in the Korail slum helped to tackle the transmission of COVID-19. Even then, it is important to understand the nature of WTV among the urban slum residents as the immunization is occurring through formal channels. The findings of this analysis could aid in deciding whether a more targeted policy for the urban slum residents is needed for the COVID-19 immunization program.

The second part of the report studies the behavioural aspect regarding the vaccination rollout, using rural and urban slum samples from another survey

[1]Details of the surveys are presented in Appendix A.

conducted in March 2021 by the Power and Participation Research Centre (PPRC) and BIGD, BRAC University. This survey asked process-oriented questions that underline the vaccination program. This helps in comprehending the registration practices and difficulties. The analysis of this sample would be vital towards formulating effective policies based on the different factors to induce vaccine registration and compliance in the urban slum and rural areas.

The outline of the report is as follows: In chapter 2, we provide the background story for the COVID-19 vaccination in Bangladesh, collating media reports from various sources. We then present our discussion on the findings of the role of governance in WTV for a nationally representative survey in chapter 3, which also delves into the youth's WTV dynamics using two surveys conducted a month apart, and examines the state of WTV specifically in the urban slum areas. Chapter 4 covers vaccine registration behaviours and attitudes using rural and urban slum samples, followed by our concluding remarks in the final chapter.

Chapter 2

Background

This chapter covers the major updates, available in different media and news sources, on the COVID-19 vaccine research, procurements, and distribution. We also provide information on the inoculation program—number of vaccination registration and number of vaccinated cases (first dose). All three different surveys used in the report took place in different time periods between January and March 2021. The background information continued till the last date of March 2021 serves as the foundation for understanding why we decided to conduct a survey early this year, and the various aspects of COVID-19 vaccination later in line with the findings from the surveys. We included the dates of the reports in the parentheses alongside the year for the ease of following news updates on vaccines.

Figure 2.1 portrays the key developments on the path to COVID-19 vaccination in the context of Bangladesh till 11 February 2021. The first COVID-19 patient was diagnosed on 8 March 2020 ("First Coronavirus Cases Confirmed," 2020, March 8), and the first death reported on 18 March 2020 ("Bangladesh Reports First," 2020, March 18). With many countries being forced to undergo a national lockdown to contain the spread of the virus by the end of the first quarter of 2020 ("Coronavirus: The World in Lockdown," 2020), researchers from all around the world started developing a vaccine to immunize the global population. The University of Oxford and AstraZeneca company collaborated in April 2020 to develop a vaccine ("AstraZeneca and Oxford University 2020," April 30). However, the World Health Organization (WHO) expressed their doubts regarding the chances of getting a vaccine by the end of 2020. (Cher, 2020, May 4).

Amid the health and economic crisis, the Government of Bangladesh (GoB) showed foresight regarding COVID-19 vaccination management. Back in May 2020, the health secretary informed the public that Bangladesh would be among the first countries to receive vaccines free of cost, as the country falls under the developing country category ("Bangladesh to Be Among First," 2020 July 20). As a developing country, realizing its resource-wise limitations to develop vaccines, the GoB prudently started approaching countries that were already ahead in terms of vaccine development. In an article published on ("Bangladesh to Get 100,000," 2020, September 11), stated that the GoB managed to confirm an order of 100,000 vaccines on a mutual agreement with Sinovac Biotech Ltd., a Chinese firm, provided they could conduct their third phase of the trial in Bangladesh. However, Sinovac Biotech Ltd. asked the GoB to co-finance the trial runs in Bangladesh (Sujan, 2020 October 3), which the GoB did not agree to, as it was not mentioned in the contract (Paul, 2020). The GoB also successfully signed a deal with India, for 30 million doses of the Oxford-AstraZeneca (Oxford-AZ) vaccine to be manufactured by the Serum Institute of India (SII), as reported by Paul (2020, November 11) on Reuters.

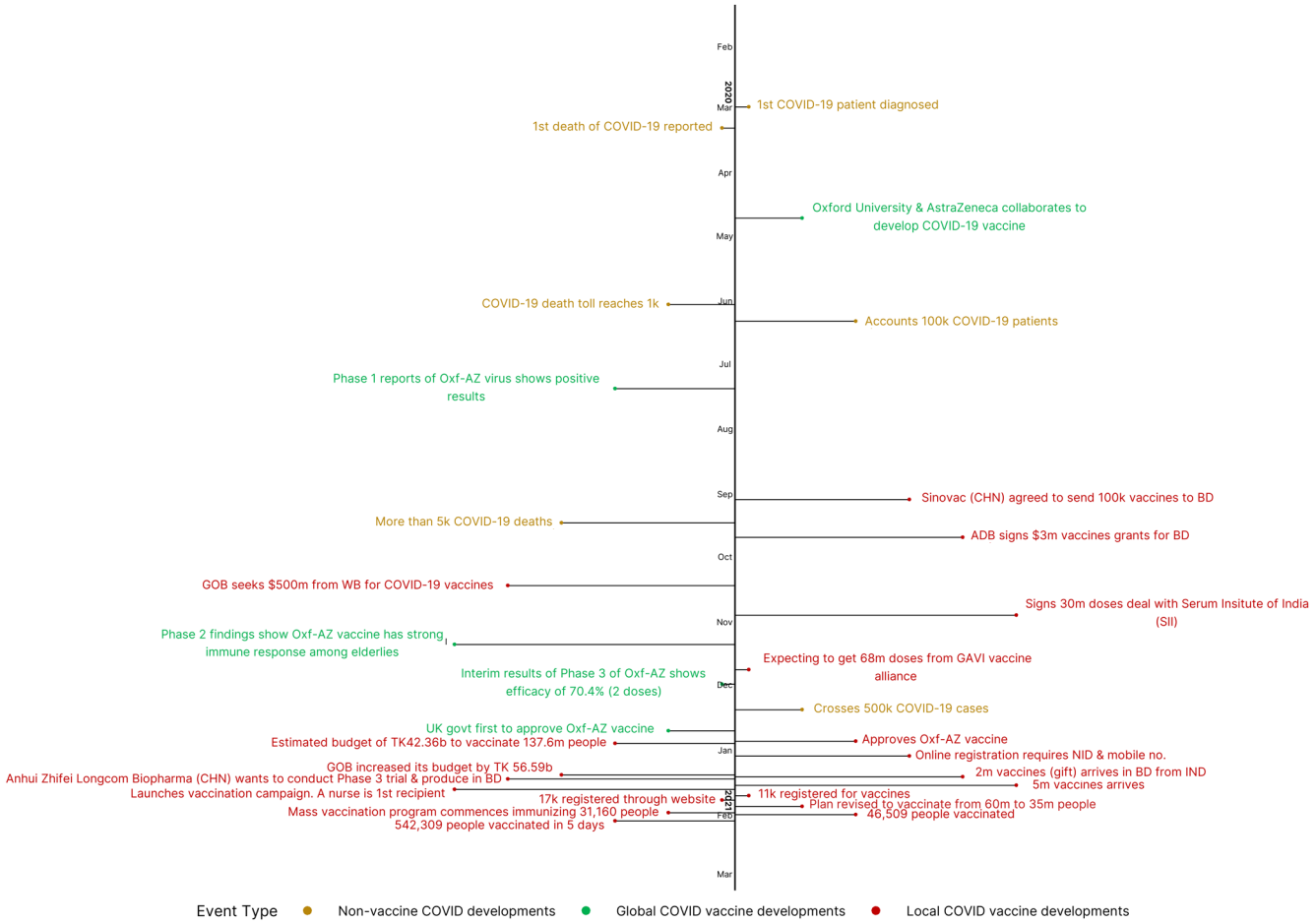

Figure 2.1: Key Events of COVID-19 Vaccination in Bangladesh Till 11 February 2021

Sources: AstraZeneca media release, BBC, bdnews24.com, CNBC News, Dhaka Tribune, Prothom Alo, Reuters, The Business Standard, The Daily Star, and UNB.

With the persistent economic downturn from March 2020 and the struggle to recover from it, the GoB faced an additional challenge in financing vaccine procurement. In pursuit of adequate funds for importing vaccines from abroad, the GoB managed to sign an agreement worth USD three million grant from the Asian Development Bank (ADB), sanctioned by the Government of Japan ("COVID-19: Govt, ADB Sign Agreement for $3m Grant, 2020," September 29). On 25 November 2020, as per DT reports ("Bangladesh Seeks USD 500 Million From WB," 2020, November 25), the GoB requested a fund of USD 500 million from the World Bank (WB) to help the country procure vaccines. In the following week, the GoB announced that they expect the arrival of the vaccines bought from India by early February ("Bangladesh Expects to Receive First," 2020, December 1).

With the signs of progress made in producing vaccines and also the procurement, a report (Tajmim, 2020, December 28) wrote about the growing interest among social elites to get vaccines for the members of various elite clubs in the country. The article inquired from the clubs' authorities that they have requested vaccines from Beximco Pharmaceutical Ltd (henceforth Beximco), the organization that will import 30 million vaccines for the GoB from SII and three million for the private sector.

Meanwhile, the Oxford-AZ vaccine, having received positive responses from all of its clinical trial phases, got approved first by the UK government for mass use on 29 December 2020 (Gallagher & Triggle, 2020, December 30). After reviewing the clinical trial reports of the Oxford-AZ vaccines, the GoB approved the vaccine | the vaccine, and permitted Beximco to import it for emergency use ("Bangladesh Government Approves Oxford-Astrazeneca COVID-19 Vaccine," 2021, January 4). The GoB announced an estimated budget of BDT 42.36 billion to vaccinate 138 million people across the country ("Govt to Spend TK 42.36b for Procuring, Transporting, Distributing COVID-19 Vaccines," 2021, January 5). On the next day, however, Byron and Sujan (2021) wrote a report about the revision of the budget for the preparedness project, now increased to BDT 67.86 billion, and also mentioned the decision to inoculate around 140 million people in phases. According to the plans, as per the reports of Moral (2021, January 10), the first phase of the program will immunize 15 million people in the first six months, essentially targeting 2.5 million people per month, and subsequently, the inoculation will be conducted to reach 80% of the population.

To begin the vaccination process as soon as the vaccines arrive in the country, the GoB designed the registration framework. As per the instructions published by The Business Standard (TBS) ("How you can register for COVID-19 vaccine,", 2021, January 11), the registration needs to be completed online or via the mobile application. The recipients would require their National Identity Card (NID) and mobile number to register for the vaccination program. In an online report ("India's Serum to Sell COVID-19 Vaccine," 2021, January 13), unofficial sources suggested that the price of the vaccine would average out to USD 3 per dose over time.

While we were in the process of launching our first survey for the State of Governance Bangladesh 2021 (SOG'21), in yet another remarkable development in vaccine diplomacy, on 18 January 2021, India announced a gift of two million vaccines to Bangladesh that was expected to arrive two days after their announcement ("India to Gift Bangladesh 20 Lakh Doses of COVID-19 Vaccine; Will Arrive on Jan 20," 2021, January 18). The finance minister addressed the public regarding the price of vaccines and said that the GoB's COVID-19 immunization will be conducted free of charge and the planning does not include the population below the age of 18 in the initial phases ("COVID-19: Govt to Gradually

Vaccinate All Bangladeshis Over 18 for Free," 2021 January 20); the statement highlights that the program is more focused on adult immunization.

The SII-produced Oxford-AZ vaccine, called Covishield, arrived in the country on 21 January 2021 at 11:23 a.m., as reported by *The Daily Star* ("'Gift from India': COVID-19 Vaccines Arrive in Dhaka," 2021, January 21). As a result, by the time we started our first survey two days later, the vaccines had already made their way into the country. On the following day of the arrival of Covishield day, it was reported that a Chinese pharmaceutical company, Anhui Zhifei Longcom Ltd., informed the GoB they would provide a large (unspecified) number of vaccines as a gift if the third trial of their vaccines was a success (Ejaj, 2020, January 22). In the meantime, the Directorate General of Health Services (DGHS) clearly stated that no one will be inoculated without online registration, and they would use this data for analyses. ("Online registration must for vaccination", 2021 January 25)

A nurse was the first person to be vaccinated with the Covishield vaccine ("Vaccination Starts January 27, Nurse Will Be the First," 2021, January 23). With the vaccination program running on a small scale, the GoB was preparing itself to start the mass inoculation once enough vaccines were procured for the first phase. Beximco received another five million vaccines on 25 January 2021, which were preserved in their warehouses and would be sent to all the 64 districts in the country ("Five Million COVID-19 Vaccine," 2021, January 25). One thousand people registered on the first day of the launch of the official website for COVID-19 vaccine registration, surokkha.gov.bd, on 27 January 2021. However, the website faced problems initially, dealing with bulk information of the registration applications, especially in prioritizing the applicants (Hasan, 2021, January 28). The state minister for information and communication technology (ICT) was among the first public figures who took the vaccine to gain the trust of the masses ("Frontliners Lead From the Front," 2021, January 29). The report also stated 541 people, including 296 doctors, immunized themselves on the first day of the trial run of vaccination. As of 30 January 2021, 11,000 people had registered for the program through the website ("DGHS: 11,000 People Registered for COVID-19 Vaccine," 2021, January 30). Moreover, the launch of the app got delayed and on-spot registration has been introduced for people who are unable to register online. On 2 February, Sujan (2021, February 2) reported that the Dhaka district would get 0.4 million shots from the initial stock of two million gifted by SII and five million vaccines would be distributed to 61 districts before mass immunization starts. He also stated that the number of vaccines was yet to be allocated for Gazipur and Narayanganj districts. In global news, through the COVAX program initiated by WHO and the GAVI Alliance, China announced that the country would provide 10 million vaccines through this initiative to help developing countries prevent the spread of the virus ("China to Send 10 Million Coronavirus Vaccine Doses Abroad," 2021, February 3).

Upon observing a poor response to online registration, the GoB revised the targeted vaccination reach in the first month from 6 million to 3.5 million (Molla, 2021, February 4) to avert instances of incomplete dosages. The revised plan included the deployment of a total of 7,344 teams across districts and subdistricts to conduct the mass campaign. As of 4 February, 14,688 vaccinators and 29,736 volunteers have been trained to administer the vaccine doses. There would be three vaccine centres in every subdistrict for the convenience of everyone to commute. the Oxford team reassured that the Oxford-AZ vaccines would be effective in fighting the dominant United Kingdom (UK) variant; however, they were not certain whether

this would be the case with any variants ("Oxford-AZ Vaccine 'Effective Against Dominant UK Variant'," 2021, February 5).

Mass inoculation commenced on 7 February 2021—with 2,400 teams of vaccinators across the nation ("Mass Vaccination: Poor Response," 2021). As we proceeded to start the mass immunization program using Oxford-AZ vaccines, findings from a research questioned its effectiveness against then novel South African variant of COVID-19 (Rawlinson & Sample, 2021, February 8). The findings showed that the efficacy rate is merely 10% against the new variant. In Germany, the incident of an outbreak in a nursing home, affecting 14 residents despite taking two doses, has cast doubt on the prospect of the COVID-19 vaccines ("Coronavirus Digest: German Nursing Home," 2021, February 8). An article by Molla and Sujan (2021) gave updates on the first two days of vaccination stating around 75,000 people got vaccinated at 1,005 vaccination centres in the country since the campaign started. Moreover, the report also talked about the changes brought by the GoB in terms of age floor in the first phase, bringing it down to 40 years, in order to enhance the pace of the vaccination program. As of 11 February 2021, which was the last day of the SOG'21 survey, according to a DT report ("Bangladesh Vaccinates 542,309 People," 2021, February 11), the campaign had successfully vaccinated 542,309 people. *Thereby, our first survey in effect captured the public perception from the arrival of the vaccine right up to the early days of the mass immunization program (from 23 January 2021 to 11 February 2021)*. This means that our findings can be compared with earlier surveys, such as the one by the North South University ("NSU Institute Surveys COVID-19 Vaccine," 2021, January 25), the Institute of Health Economics, Dhaka University (Shovon, 2021, January 26) and Abedin et al. (2021) on similar topics, in order to capture the changing viewpoints, if any.

On 15 February 2021, the Managing Director of Beximco Pharmaceuticals Ltd. announced that the government is expecting to receive the second consignment from SII containing 0.2–0.3 million Covishield vaccines by 22 February 2021 ("20-30 Lakh More Doses of COVID-19," 2021, February 15). With the first dose of vaccination given to many already, news broke out regarding a senior government official posting on social media that he tested positive despite taking the first dose of vaccine (Hasan, 2021, February 20).Since the vaccination program initiated, around 2.1 million people got the first dose of the vaccine, as of 21 February 2021 (Tajmim, 2021, February 21). To address the concerns of many citizens on the possible risk of vaccines, in the following day, Dr Shamsul Haque, member secretary of the COVID-19 management task force, informed the public about the low risk of side effects (Ahmed, 2021, February 22). In the vaccination race, Bangladesh has achieved 11th position in terms of daily vaccination rate, which was considered a testament to its successful implementation (Hassan, 2021, February 23rd). On 23 February 2021, Bangladesh received the second consignment of two million Covishield vaccines ("COVID-19 Vaccine: 20 Lakh Doses Arrive," 2021, February 23). the GoB was planning to import three million more vaccines from different sources, and also expecting to receive both the 1.25 million COVAX vaccine and the remaining orders of SII vaccine by the end of June 2021 ("Bangladesh Plans to Import," 2021, February 27).

On 28 February 2021, the second survey of the report, National Youth Survey 2021 (YS'21), was launched. The educational institutions were planned to be reopened from 31 March and the prime minister instructed the teachers to get the vaccine before 30 March ("Teachers Must Get Vaccinated by Mar 30," 2021, February 28). lthough decisions were made on reopening the educational institutions, the students were not eligible for vaccines which was a

problem, especially, for the students who lived in dormitories that were set to reopen on 17 March 2021. (Abdullah, 2021, March 3). The Bangladeshi Prime Minister received her first dose of the COVID-19 vaccine on 4 March 2021 ("PM Hasina Receives Her First Shot of COVID-19 Vaccine," 2021, March 4). Austrian authority raised concerns on Oxford-AZ vaccines after the death of a woman ("Austria Suspends Inoculations With AstraZeneca Vaccine After Death," 2021, March 7). The authority reported the death caused by severe blood coagulations suspecting the occurrence due to the vaccines. The YS'21 concluded on 7 March 2021, approximately a month after the SOG'21 which consisted of a youth sample itself. *Consequently, this created the scope for studying the dynamics of the youth's WTV from the early days of the vaccination to when the program was running full-fledged.*

The third survey considered in the report, "Livelihoods, Coping, and Support During the COVID-19 Crisis (Phase III) Survey 2021 (LS'21)", began on 10 March 2021. *As mentioned earlier, the vaccination program was a month old now, thus giving us the opportunity to study the registration and compliance aspects, which was the focus of this survey in terms of vaccination*. With the plans of reopening the schools and universities, 1.1 million teachers will be given vaccines on an urgent basis, although still leaving out around 4.1 million teachers. (Kamol, 2021, March 11. By now, the Oxford-AZ vaccines have been used in many countries for inoculation of COVID-19; however, concerns were raised by a few European Union (EU) countries on possible "blood clot" risk due to this particular vaccine ("'No Indication' Oxford-astrazeneca Vaccine Linked," 2021, March 12).I In Bangladesh, 5,462,165 people registered and 4,218,127 got vaccinated, as of 11 March ("More Than 4.2 Million People," 2021, March 11). In the following day it was reported that the daily number of new COVID-19 cases suddenly surged over 1,000 in consecutive three days' reports ("Bangladesh's Daily COVID-19 Cases," 2021, March 12). The former director of DGHS stated that it would take up to two weeks after two doses of vaccines to be fully immunized from the current Coronavirus vaccines ("No Risk of Contracting COVID-19," 2021, March 15). With the spread of the new South African variant across different countries, it was reported that the new variant was apparently found in February in the country and vaccines might not be effective to combat the new strain ("South Africa Covid Variant," 2021, March 16). In other news, WB announced the approval to finance USD 500 million to Bangladesh to vaccinate 54 million people ("$500M World Bank," 2021, March 18). In spite of the recent increase in COVID-19 transmission across the country, Moral & Rahman (2021, March 23) reported that both the vaccinated number (first dose) per day and registration number per day had decreased. Although there were concerns surrounding the safety of Oxford-AstraZeneca vaccine, a British-Bangladeshi scientist highlighted the risk is significantly low as one in one million may develop blood clot after taking the vaccine ("AstraZeneca Vaccine Safe, No Risk of Blood Clot," 2021, March 23)

As a gift on the 50th anniversary of Bangladesh's independence, the Indian Prime Minister visited Bangladesh and brought 1.2 million doses of Covishield for the country ("Gift From India," 2021, March 27)., Due to increased death rates and daily cases significantly rising over 3,500 with the spread of the new variant in the country and, the authorities the plans to reopen educational institutions on 22 May 2021 from the initial date of 31 March 2021 ("New Covid Variants: Bangladesh," 2021, March 28). As of 31 March 2021, the last day of the third survey, 6,802,442 people had registered for the first dose and the GoB had vaccinated 5,370,431 people, among which 3,339,298 were male and 2,031,133 were female ("COVID-19: Bangladesh Vaccinates," 2021, March 31).

Overall, the initial relative success in vaccine distribution is a testament to the well-thought-out immunization program formulated by the GoB—effectively implementing the plans through a collective and adaptive approach from all of its involved administrative bodies. However, as observed in the month of March, the daily vaccination rate and registration rate decreased significantly which should be a matter of concern for the authorities in order to achieve immunization within the planned time.

Chapter 3

Willingness to Be Vaccinated (WTV)

This chapter uses the SOG'21 survey to understand demand-side perceptions regarding the COVID-19 vaccine. The nationally representative general sample is analyzed first to examine the respondents' WTV across various demographic and governance dimensions, with an emphasis on the latter. The results are reflective of WTV during an eventful period in the course of COVID-19 vaccination in Bangladesh, specifically from late January to early February 2021, as detailed earlier in Chapter 2. Details of the empirical strategy employed here are presented in Appendix B. Secondly, the temporal change in WTV of the youth cohort is discussed by constructing a pseudo-panel from the two surveys, SOG'21 and YS'21. Thirdly, we present the overall WTV among the urban slum dwellers, and contrast it with urban respondents of the SOG'21 general sample.

The chapter proceeds as follows: the first section deals with the role of governance in WTV using the SOG'21 general sample. We then present our findings for changes in youth's WTV over time. We wrap up by discussing the status of demand for immunization among the urban slum dwellers and presenting the chapter's highlights.

3.1 The Role of Governance in Willingness to Be Vaccinated

3.1.1 Descriptive Analysis

The respondents were asked about their willingness to vaccinate if the COVID-19 vaccine was made available, termed as the willingness to be vaccinated (WTV). From Figure 3.1, we find a generally high level of WTV in the sample, with the percentage of those who are definitely or probably being 82%. However, more people are willing with certainty (59.6%) compared to willing with some hesitancy (22.5%). The former can be termed as leaders or early adopters, whilst the latter can be referred to as early followers. A large difference in the intensity of opinions is not observed among those unwilling. Only about 5% of respondents were undecided.

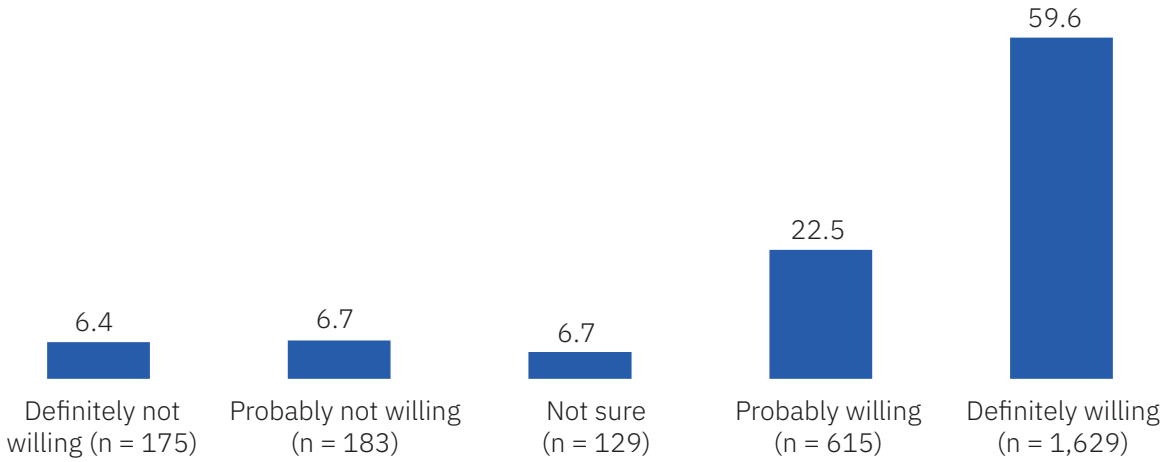

Figure 3.1 Willingness to Be Vaccinated (WTV) (n = 2,731)

Source: SOG'21.

The unwilling and probably unwilling respondents were asked to state their reason(s) in a multiple response question. Table 3.1 presents the findings. Overall, 47% of the respondents do not perceive the vaccine as a necessity, followed by distrust in the vaccine (31%), concerns regarding effectiveness (29%), and fear of side effects (28%).

Table 3.1. Reasons for Not Wanting to Be Vaccinated

Reason	% of respondents
No need	47.2
No trust in vaccine	31.3
Not sure of the effectiveness	29.3
Fear of side effects, such as fever, pain, etc.	28.2
Religious belief	20.4
Not sure of safety	17.6
Cannot afford	6.2
No trust in government	3.6
Other	2.2
n	358

Note: Multiple responses were allowed.
Source: SOG'21.

Given the above was a multiple response question, it might be the case that many respondents have said they do not need the vaccine first without much deliberation, followed by their actual reason(s). This could have been a possible explanation for the high prevalence of no need of vaccines as one of the reasons. To account for this possibility, we disaggregated the respondents into those saying only no need, those saying no need plus other reason(s), and those saying other reason(s) except no need. It is observed that 22% said no need as their standalone reason for not vaccinating vs. 26% coupling no need with other reason(s). Thus, that possibility does appear to have been the case and many respondents actually do not feel the necessity to be vaccinated.

We further examined if there are any significant responses in the reasons stated by those certainly unwilling and those probably not willing. Table 3.2 reports that those definitely not willing feel the lack of necessity of the vaccine proportionately more, whilst those probably unwilling think they cannot afford the vaccine more.

Table 3.2: Reasons for Not Wanting to Be Vaccinated by Degree of Unwillingness

Reason	% of respondents		$\chi^2(1)$
	Definitely not willing	Probably not willing	
No need	55.4	39.3	9.286*
No trust in vaccine	33.1	29.5	0.550
Not sure of the effectiveness	27.4	31.2	0.597
Fear of side effects, such as fever, pain, etc.	26.3	30.1	0.627
Religious beliefs	25.7	15.3	5.976
Not sure of safety	14.9	20.2	1.773
Cannot afford	0.6	11.5	18.441***
No trust in government	4.6	2.7	0.865
Other(s)	2.9	1.6	0.607
n	175	183	

Notes: Pearson $\chi^2(1)$ with Bonferroni-adjusted p-values. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Multiple responses were allowed.

Source: SOG'21.

In the following subsections, we analyze WTV from four broad dimensions: regional, demographic, general COVID-19 factors, and governance-related COVID-19 factors. Only the independent variables which were found to have a significant relationship with WTV at $p < 0.10$ (see Table C1) have been discussed below. We then present our regression results for WTV on those significant variables in the econometric analysis portion.

3.1.1.1 Regional Distribution

The WTV (definitely and probably) is significantly higher in the rural areas at 84%, as opposed to 78% willingness among the urban respondents, as shown in Figure 3.2. There were no significant differences in the reasons for not wanting to vaccinate by locality.

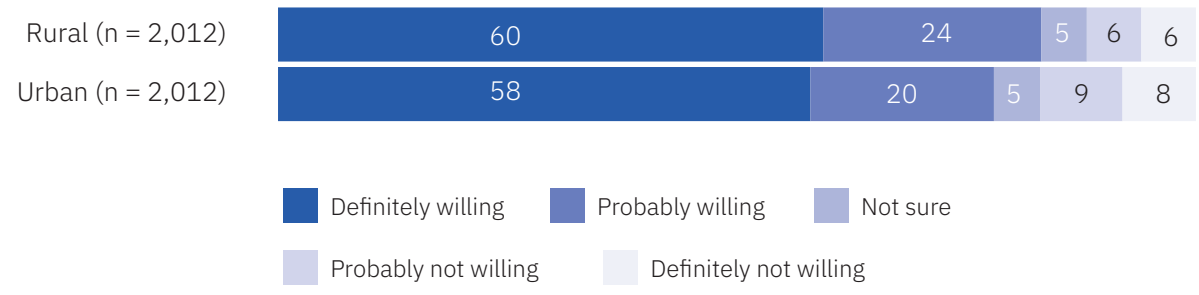

Figure 3.2. WTV by Locality (n = 2,731)

Source: SOG'21.

3.1.1.2 Demographic Characteristics

Only gender was found to have a significant effect on WTV, and that too only in the rural region. Figure 3.3 reveals that there was no overall difference by gender. However, in rural areas, women are less certainly willing than men (57% vs. 62%). In urban regions, men are less willing (definitely and probably) than women, but the difference is not statistically significant. There were no significant differences in reasons for unwillingness by gender.

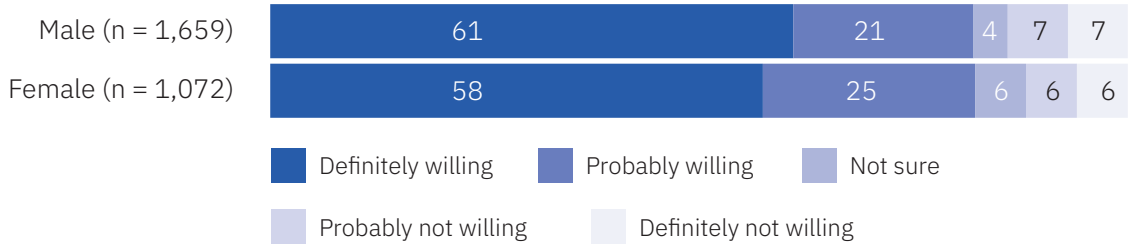

Figure 3.3. WTV by Gender (n = 2,731)
Source: SOG'21

3.1.1.3 General COVID-19 Related Factors

Perceived Health Risk

From Figure 3.4, it is evident that the perceived health risk of contracting COVID-19 to both self and family plays a significant role in one's WTV, where WTV rises as one's perceived health risk rises. Although Spearman's correlation coefficient suggests a weak positive relation (see Table C1), given our sample size and significance of the relationship, this simply implies that there are other factors that can help explain the variation in WTV. It is worth noting here that the presence of elderlies or members with underlying conditions in the household were found to not bear any significant relationship with WTV (see Table C1), which signals an overall lack of other-regarding behaviour among the respondents.

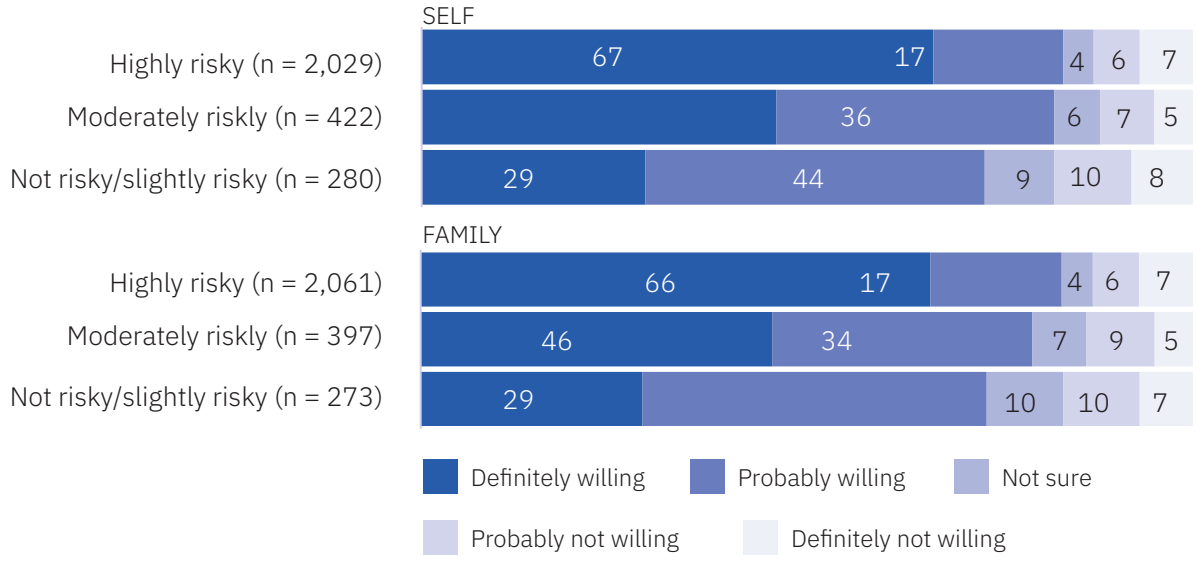

Figure 3.4 WTV by Perceived Health Risk to Self & Family (n = 2,731)
Source: SOG'21.

Overall Perceived Impact on Life

We also asked the respondents about the overall harmful impact of COVID-19 in their lives as opposed to just the health aspects. When asked to attach a value for their perceived impact from 0 to 10 (0 being the least and 10 the most), 68% of the respondents chose a number between 5 and 10, and 7% responded that they do not know. This means that at least two-thirds of the sample suffered some adversities in their day-to-day life due to the pandemic. There is a general pattern of greater demand for immunization among those with higher perceived detrimental impact (see Figure 3.5), and the positive linkage is statistically significant. It also appears this relationship holds for definite willingness.

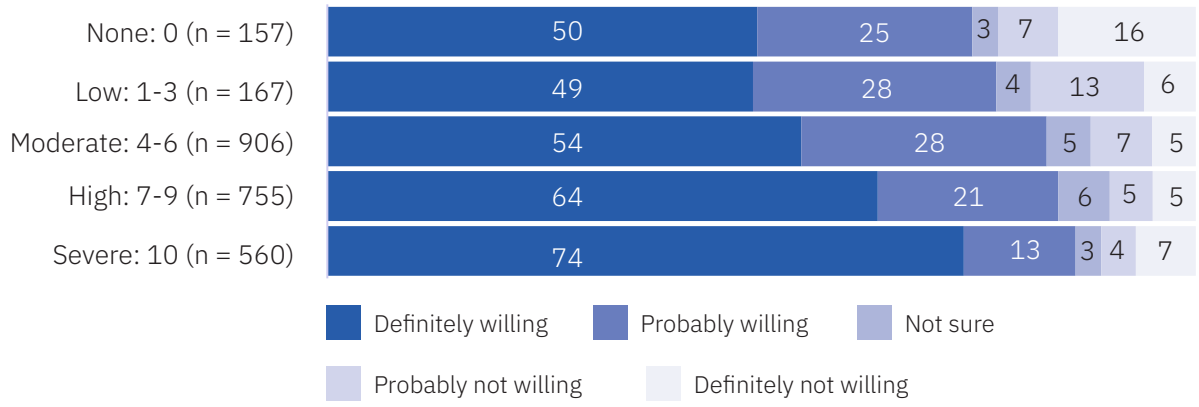

Figure 3.5. WTV by Overall Perceived Impact in Life (n = 2,545)

Notes: Respondents reporting "Don't Know/No Response" (n = 186) not included here. The scale has been grouped here for presentability.
Source: SOG'21.

Lockdown Perception

Proponents of strict lockdown, relaxed lockdown, and no lockdown constituted about one-third each, while less than 2% chose the other option or did not comment. However, lockdown perceptions can vary by socioeconomic factors, such as locality, income, wealth, etc., depending on the respondent's perceived or actual impact on major life aspects, such as earnings, but the survey only recorded the locality amongst these. Locality of the respondent was found to have a significant effect on their preference for the stringency of lockdown measures, with $\chi^2(1) = 15.444$, p-value = 0.0001, whereby urban respondents preferred more stringent measures. Rural respondents were more in favour of no lockdown than urban (34% vs. 27%), whilst urban dwellers preferred strict lockdown compared to rural ones (36% vs. 29%). In Figure 3.6, we see that the respondents advocating for stricter lockdown are more willing to be vaccinated without hesitancy, and there appears to be a significant positive correlation. Disaggregated correlation tests reveal that the strength of the positive relationship is slightly stronger for urban respondents than rural ones. Descriptive also support this: those preferring no lockdown in the rural sample are more willing to be vaccinated (79% definitely or probably willing) than their urban counterparts (68% % definitely or probably willing), despite this positive trend.

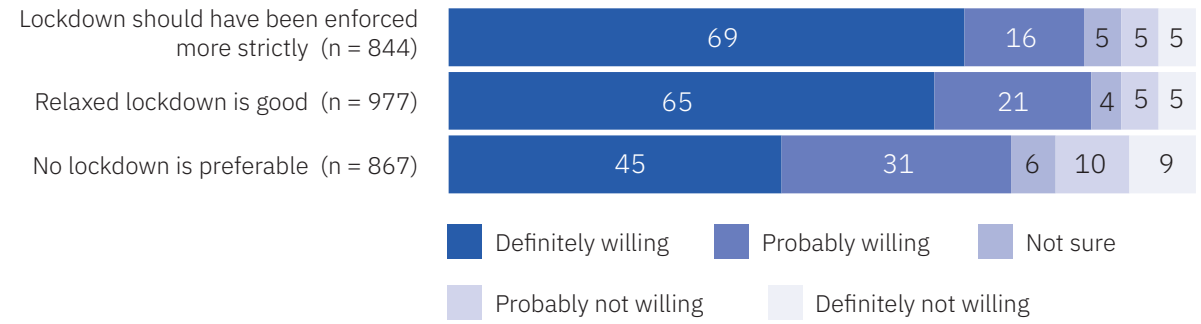

Figure 3.6. WTV by Lockdown Perception (n = 2,688)

Note: Respondents reporting "No comment/Others" (n = 43) not included here.
Source: SOG'21.

3.1.1.4 Governance-Related COVID-19 Factors

Relief

Sixty-eight per cent of respondents thought that there were some irregularities in the relief distribution. The rural-urban distribution was almost symmetric except that a higher number of respondents in the rural region reported they do not know (9% in rural vs. 4% in urban) and a higher proportion of urban dwellers thought there were some irregularities involved (66% in rural vs. 73% in urban). In Figure 3.7, we see a significant negative relation between the perceived degree of irregularities and WTV for both rural and urban regions. However, for those viewing the process as having a lot of irregularities, urban dwellers are more averse towards vaccination than their rural counterparts, as revealed by both the descriptives—59% of urban dwellers thinking the distribution had a lot of irregularities are definitely or probably willing vs. 77% for rural—and magnitude of the correlation coefficient in Table C1.

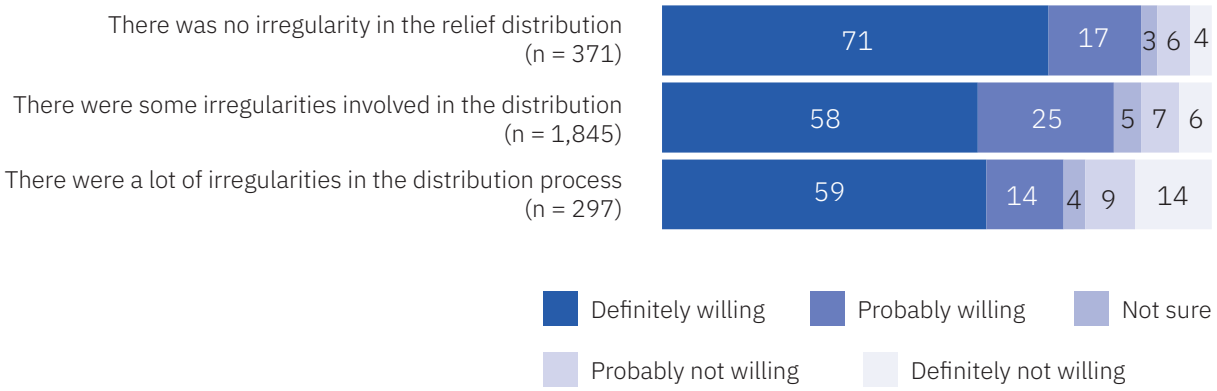

Figure 3.7. WTV by Perceived Irregularities in Relief Distribution (n = 2,513)

Note: Respondents reporting "Don't know" (n = 218) not included here.
Source: SOG'21.

The majority of respondents (58%) reported being mostly satisfied with the relief operation, while 11% were very satisfied, 24% were mostly unsatisfied and 7% were not at all satisfied. From Figure 3.8, we notice that there is a significant positive association between the level of satisfaction and WTV. However, unsatisfied urban dwellers are somewhat less willing than their rural counterparts (Table C1).

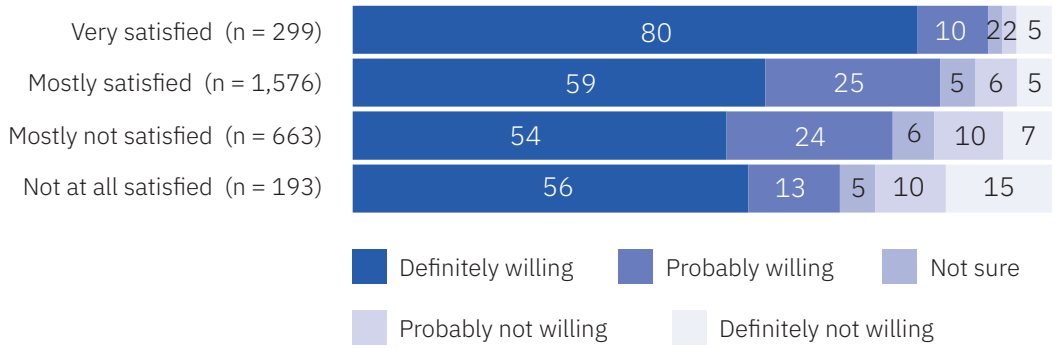

Figure 3.8 . WTV by Level of Satisfaction With the Relief Operation (n = 2,731)

Source: SOG'21.

Evaluation of the Government's Response to Managing the COVID-19 Crisis

Fifty-four per cent of respondents thought the GoB's response to crisis management was somewhat effective, followed by 36% thinking it was effective. Only about 6% thought it was not very effective, whereas 4% said they did not know; respondents not commenting or thinking it was entirely ineffective each constituted less than 1%.

Respondents in the rural region reported they do not know more, (4% in rural vs. 2% in urban) while those in the urban area reported it as not very effective more (5% in rural vs. 8% in urban). In Figure 3.9, we see that as the degree of perceived effectiveness falls, WTV falls—the fall is much greater in the urban sample compared to rural (not shown), which is expected given a slightly larger correlation coefficient for the urban sample in Table C1.

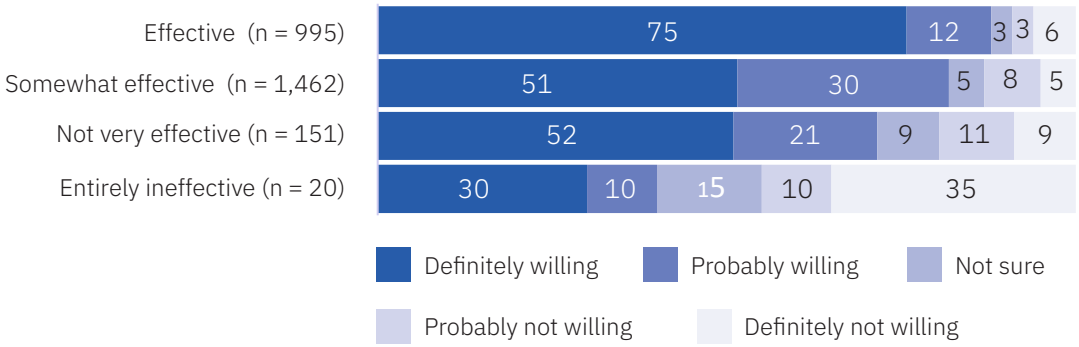

Figure 3.9. WTV by Perceived Effectiveness of the Government's Response (n = 2,628)

Note: Respondents reporting "Don't know/No comment" (n = 103) not included here.
Source: SOG'21.

Confidence in Efficiency of COVID-19 Vaccine Distribution

Seventy-six per cent of respondents are either very confident or moderately confident that the COVID-19 vaccine will be distributed efficiently in Bangladesh. There was not much difference in the rural and urban distribution. In Figure 3.10, there is a significant positive linkage between the degree of confidence and WTV, but the urban rise in WTV due to higher confidence is lower than the rural increase, as also shown by the smaller urban correlation coefficient in Table C1.

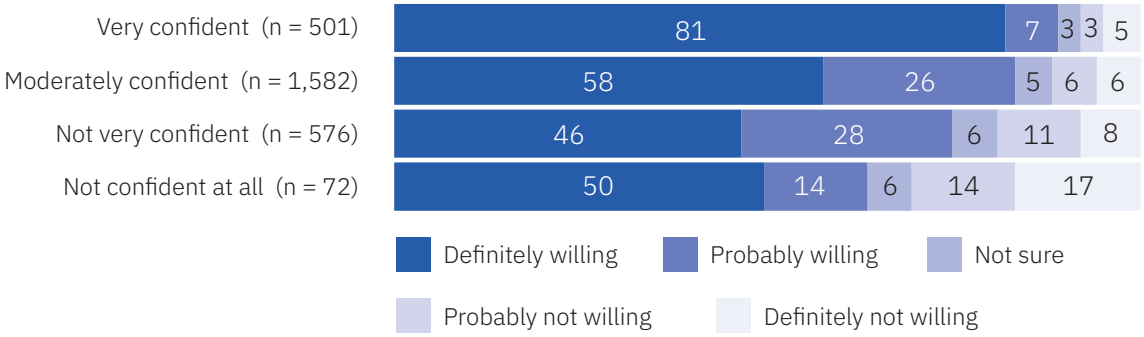

Figure 3.10. WTV by Confidence in Efficiency of COVID-19 Vaccine Distribution & Locality (n = 2,731)

Source: SOG'21.

3.1.2 Empirical Analysis

Using only the independent variables having a significant relationship with WTV as per Tables C1 and C2, we perform regression analysis on our two models—one with the dependent variable being WTV (5 point scale), referred to as Model 1 here, and another with "Definitely Willing" vs. "Probably Willing or Unsure," which is Model 2. Upon observing significant gender effect on WTV in the rural sample, we also added an interaction term for locality and gender in both models.

We began by estimating an ordinal logit model for Model 1, and the Brant test showed that the parallel odds assumption had been violated by 7 out of 11 variables. As discussed in Appendix B, the proportional odds assumption might also be violated in the presence of heterogeneity. This, together with the other appealing features described in Williams (2009), compels us to estimate the heterogeneous choice model for both Models 1 and 2.

The raw coefficients from the regression are presented in Table C3. The interaction term was found to be insignificant in both our regressions. Stepwise selection led the variables perceived health risk to self and perceived irregularities in the relief operation to be included in the variance equation for Model 1, and satisfaction with the relief operations for Model 2. All three variables are significant in both the choice and variance equations. In Model 1, the positive effect in the variance equation implies that those having a lower self-assessment of personal health risk are less variable in their views regarding WTV and vice versa; likewise, those viewing the relief operation as having fewer irregularities exhibit less conflicted opinions on WTV. On the other hand, in Model 2, the negative coefficient in satisfaction with relief operations suggests that those less satisfied exhibit greater variance in their opinions on WTV, and this, in turn, explains the counterintuitive negative coefficient in the choice equation, as explained in Appendix B.

Table 3.3. Marginal Effects From Heteroskedastic Ordered Logistic Regressions

Variables	Definitely not willing	Probably not willing	(1) Not sure	Probably willing	Definitely willing	(2)* Definitely willing
Locality						
Urban vs. rural	0.0105	0.0101	0.0056	0.0132	-0.0394	0.0001
p-value	0.0461	0.0481	0.0455	0.0311	0.0382	0.9975
Std Err	0.0053	0.0051	0.0028	0.0061	0.0190	0.0208
Gender						
Female vs. male	-0.0039	-0.0037	-0.0020	-0.0047	0.0144	-0.0173
p-value	0.3420	0.3762	0.4060	0.4151	0.3830	0.6562
Std Err	0.0042	0.0042	0.0024	0.0058	0.0165	0.0388
Educational qualification						
+1						0.0125
p-value						0.0425
Std Err						0.0062
Perceived health risk to self						
+1	0.0169	-0.0071	-0.0085	-0.0495	0.0483	0.1128
p-value	0.0443	0.1699	0.0038	0.0000	0.0416	0.0000
Std Err	0.0084	0.0052	0.0029	0.0092	0.0237	0.0271
Perceived health risk to family						
+1	0.0021	0.0021	0.0012	0.0029	-0.0084	-0.0230
p-value	0.7836	0.7824	0.7804	0.7753	0.7800	0.5514
Std Err	0.0077	0.0078	0.0044	0.0101	0.0300	0.0386
Overall perceived impact on life[b]						
+1	-0.0053	-0.0054	-0.0032	-0.0082	0.0222	0.0174
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Std Err	0.0009	0.0009	0.0006	0.0014	0.0035	0.0033

Variables	Definitely not willing	Probably not willing	(1) Not sure	Probably willing	Definitely willing	(2)* Definitely willing
Lockdown perception[b]						
+1	-0.0146	-0.0152	-0.0093	-0.0267	0.0659	0.0595
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Std Err	0.0025	0.0025	0.0017	0.0052	0.0108	0.0101
Perceived irregularities in relief distribution[b]						
+1	0.0229	-0.0022	-0.0057	-0.0403	0.0253	
p-value	0.0270	0.5980	0.0134	0.0000	0.1583	
Std Err	0.0103	0.0041	0.0023	0.0099	0.0179	
Level of satisfaction with the relief operation						
+1	-0.0071	-0.0073	-0.0043	-0.0112	0.0299	-0.0209
p-value	0.0331	0.0353	0.0404	0.0553	0.0403	0.1812
Std Err	0.0033	0.0034	0.0021	0.0059	0.0146	0.0156
Perceived effectiveness of the government's response[b]						
+1	-0.0169	-0.0177	-0.0109	-0.0323	0.0779	0.0961
p-value	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000
Std Err	0.0036	0.0040	0.0026	0.0090	0.0183	0.0135
Confidence in efficiency of COVID-19 vaccine distribution						
+1	-0.0232	-0.0246	-0.0155	-0.0501	0.1135	0.0863
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Std Err	0.0029	0.0030	0.0022	0.0071	0.0131	0.0111

Notes: Robust standard errors reported. Discrete changes of dummy variable from 0 to 1 and by 1 for ordinal variables presented.
[a] AMEs for primary occupation not shown for the sake of brevity as they were all insignificant.
[b] "Don't know", "No response", "No comment" and/or "Others" answers were set to missing for establishing meaningful relationships and greater interpretability of results, resulting in a lower number of observations.
Source: Authors' own calculations from SOG'21.

Table 3.3 reports the average marginal effects (AMEs) from the regressions. In Model 1, an increase in perceived health risk to self significantly increases the probability of definitely not willing and definitely willing by 1.7% and 4.7%, respectively, and decreases the probability of others. This is reflective of the significant variability in opinions we noted above for this variable. Increases in the preferred stringency of lockdown, perceived effectiveness of GoB's response to the COVID-19 crisis management, and confidence in the vaccine distribution efficiency significantly improves the probability of definitely willing on average by 6.6%, 7.8%, and 11.35%, respectively, but decreases the probability of other outcomes. Thus greater trust and satisfaction in the COVID-19 governance can be said to have a positive effect on being certainly willing to be vaccinated.

On the other hand, in Model 2, a rise in perceived self-risk translates into an 11.3% increase in the probability of willing for certain as opposed to hesitantly willing or being uncertain in taking the vaccine. Greater preference for the stringency of lockdown, perceived effectiveness of GoB's response to the COVID-19 crisis management, and confidence in the vaccine distribution efficiency significantly improves the probability of definitely willing by 6.0%, 9.6%, and 8.6%, respectively—which are very similar to Model 1.

3.2. Youth and Willingness to Be Vaccinated

We analyzed the temporal change in WTV of the youth cohort by constructing a pseudo-panel from the two surveys, SOG'21 and YS'21. This is important because as pointed out in Chapter 2, the last phase of SOG'21 and the end of YS'21 was mired by negative and unclear news in the media, news of ineffectiveness of the vaccine against new variants, and death due to blood clots. Opinions and hence WTV may have been influenced by these, and we already noted falling vaccination numbers in Figure 1.1 from February 2021 to March 2021. It is also reasonable to assume that the youth are very active on social media where misinformation can be spread easily and they are also large consumers of global news. As mentioned earlier, the youth form the most economically active demographic group of the country, thus ensuring their immunization should be one of the top priorities. In that regard, understanding their evolving WTV is particularly helpful in planning since their actual behaviour can only be observed when the age floor for vaccination is lowered.

The youth sample of SOG'21 is denoted by February 2021 and the youth sample of YS'21 is denoted by March 2021 in this section. There was no significant difference in the balance test between the two youth samples that have been considered for the temporal analysis, as can be seen in Table C4. In this analysis, for the purpose of standardizing responses across the two surveys, the responses of "Definitely Willing" and "Probably Willing" were aggregated to "Yes," while the reverse responses fell under the umbrella of "No." The respondents who were not sure is represented by the response "Uncertain."

3.2.1 Willingness to Be Vaccinated

The WTV over time had decreased among the youth, as shown in Table 3.4. There is almost a decrease of 13 percentage points in the positive response category of WTV from February to March 2021. Moreover, the vaccine hesitancy increased by almost seven percentage points over time.

Table 3.4. WTV Over Time: Youth (%)

	Feb'21	Mar'21	Difference
Yes	80.6	67.4	-13.2***
No	15.9	22.0	6.2**
Uncertain	3.6	10.6	7.1***
n	448	1,899	

Note: * p < 0.05, ** p < 0.01, *** p < 0.001.
Sources: SOG'21 and YS'21.

3.2.2 Perceptions Regarding the Vaccine Distribution System in Bangladesh

In Table 3.5, we compare the confidence or expectation regarding an efficient vaccine distribution in Bangladesh observed in February 2021 against the realized satisfaction with the government's vaccine distribution system in March 2021. These observations give an inference on ex ante and ex post perceptions on vaccine distribution efficiency. In February 2021, the majority of the respondents were either moderately or highly confident regarding the vaccine distribution system in the country. About 40% of respondents were moderately confident and around 32% were very confident regarding this efficiency. In March 2021, when respondents were asked about their satisfaction with the ongoing vaccine distribution system, the responses were found to be consistent with the expectations. Around 33% of respondents in March 2021 informed they were somewhat satisfied, and about 57% said that they were very satisfied with the whole vaccine distribution system efficiency in the country. Thus overall satisfaction was actually higher (90%) compared to the reported high confidence earlier (79%).

Table 3.5. Confidence in Efficient Vaccine Distribution in Bangladesh in Feb'21 vs. Satisfaction With Government's Vaccine Distribution System in Mar'21: Youth (%)

	%
Panel A: Confidence in Feb'21	
Not confident at all	6.7
Not very confident	21.7
Moderately confident	39.7
Very confident	31.9
n	448
Panel B: Satisfaction in Mar'21	
Not satisfied	0.5
Less satisfied	3.8
Somewhat satisfied	33.1
Very satisfied	57.3
Not willing to answer	0.5
No opinion	4.8
n	1,899

Sources: SOG'21 and YS'21.

3.3 State of the Willingness to Be Vaccinated in Urban Slums

This section discusses the findings regarding WTV amongst the urban slum dwellers, which are drawn from the urban slum sample of SOG'21. Comparisons are made against the urban subsample of SOG'21 general sample wherever relevant. An illustration of expectations regarding the effectiveness of the vaccine distribution among the urban slum and urban respondents of SOG'21 is also provided. As discussed earlier, the urban slums have been a paradoxical case study in Bangladesh and we found evidence of community-level governance being highly effective in containing infection rates. However, how this informal system fares in terms of immunizing the residents is yet to be observed. Hence, an early assessment of demand-side factors may provide the basis for deciding what interventions might be necessary for this vulnerable socioeconomic group.

3.3.1 Willingness to Be Vaccinated

Overall, in February 2021, WTV (definitely or probably) was the lowest in urban slums (73%) when compared with the general and youth samples of SOG'21, as already presented earlier in sections 3.1 and 3.2 (see Figure 3.11). The highest percentage of definitely unwilling respondents (18%) is also observed among the urban slum dwellers. A chi-square test further revealed that differences between the urban residents as a whole and urban slum dwellers are not significant, with $\chi^2(1) = 1.980$, p-value = 0.1594. Figure 3.11 supports that.

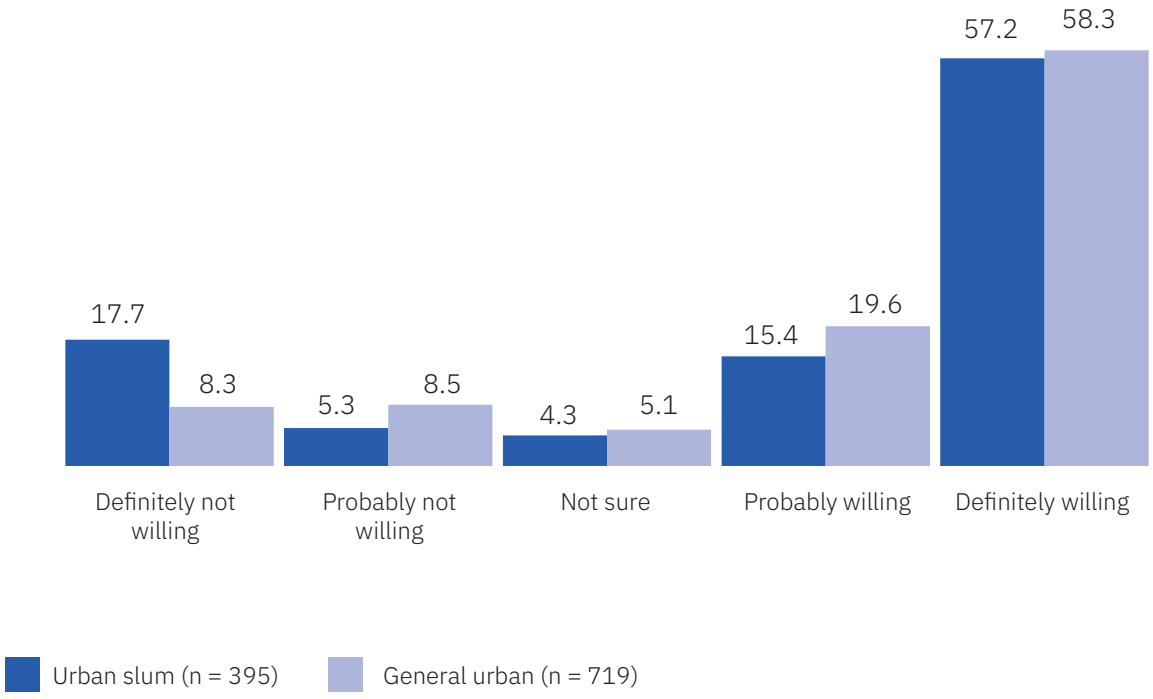

Figure 3.11. WTV Among Urban Slum (n = 395) and General: Urban (n = 719)

Source: SOG'21.

The unwilling urban slum respondents, either certainly or probably, were asked to state the reasons behind their reluctance, same as in section 3.1. In Table 3.6, the majority of the respondents (75%) believed there is no necessity for the COVID-19 vaccine. The second most common reason (34%) was concerns regarding the safety of the vaccine. Interestingly, around 30% of urban slum respondents informed religion was also a factor behind their decisions. When compared against the reasons stated by urban respondents of the SOG'21 general sample, it was found that a significantly higher proportion of unwilling slum respondents felt the lack of necessity of a vaccine. Within the urban slum sample, there were no significant differences in the reasons by gender.

Table 3.6. Reasons for Not Wanting to Be Vaccinated: SOG'21 General: Urban vs. Urban Slum

Reason	% of respondents		$\chi^2(1)$
	General: Urban	Urban slum	
No need	45.1	74.7	18.771***
Not sure of safety	18.9	34.1	6.375
Not sure of the effectiveness	32.0	30.8	0.035
No trust in vaccine	32.8	30.8	0.098
Religious beliefs	18.9	29.7	3.396
Fear of side effects, such as fever, pain, etc.	29.5	26.4	0.253
Cannot afford	4.1	6.6	0.663
No trust in government	3.3	0.0	3.041
Other(s)	2.5	0.0	2.270
n	122	91	

Notes: Pearson $\chi^2(1)$ with Bonferroni-adjusted p-values. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Multiple responses were allowed.

Source: SOG'21.

3.3.2 Confidence in Efficiency of COVID-19 Vaccine Distribution

The prevailing confidence regarding the success of vaccine distribution in Bangladesh among urban slum residents is also worth exploring. According to Figure 3.12, the majority of the respondents (73%) were either very or moderately confident regarding the efficiency of COVID-19 vaccine distribution in the country. However, urban slum dwellers were more likely to be very confident while urban residents were more likely to be moderately confident, and the difference was significant, with $\chi^2(1) = 8.149$, p-value = 0.0043. Only 17% of urban respondents stated that they are very confident about the distribution. It appears that respondents with extreme views on both ends of the spectrum are proportionately higher in urban slums, and in-between cases are higher among the overall urban sample.

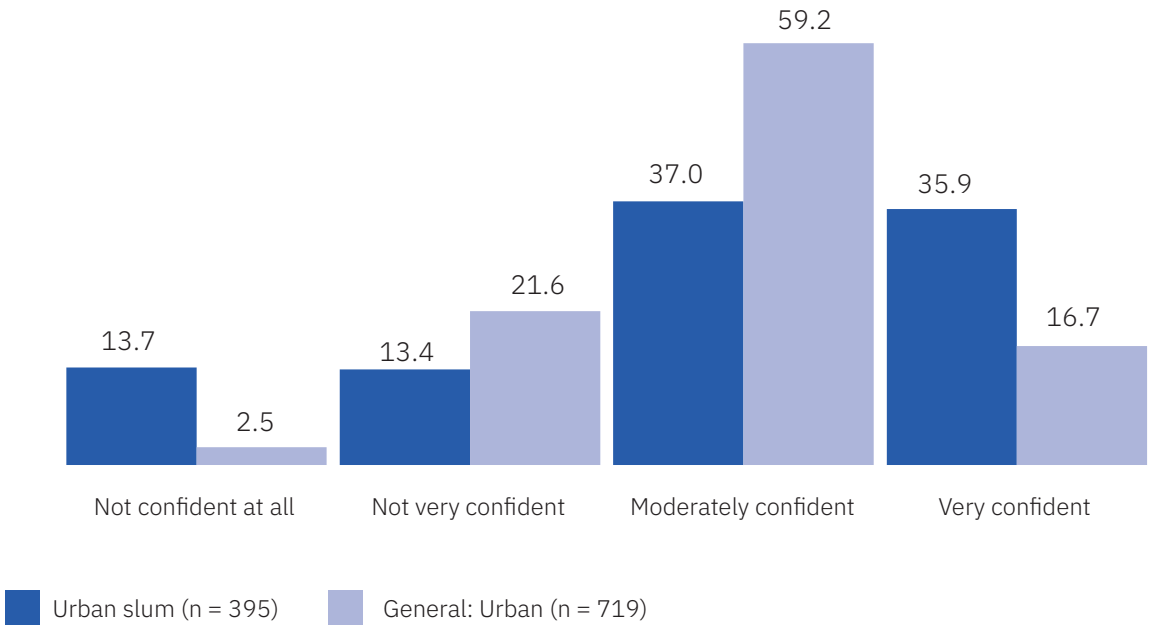

Figure 3.12. Confidence in Efficiency of COVID-19 Vaccine Distribution, SOG'21: General: Urban (n = 719) vs. Urban Slum (n = 395)

Source: SOG'21.

3.4. Highlights

The key messages of this chapter regarding WTV are as follows:

- There was a rather high WTV prevailing nationally in early February 2021.
- Majority of those unwilling to be vaccinated do not feel the necessity of it.
- Perceived health risk of contracting COVID-19 and governance perception affects WTV among general population.
- There was a decline in WTV among youth one month apart—from February to March 2021.
- Prevailing WTV is the lowest among the urban slum dwellers in early February 2021 compared to the nationally representative general and youth samples.

Chapter 4

Registration Behaviour and Practices in Rural Regions and Urban Slums

This chapter deals with the behavioural aspect of COVID-19 vaccination on the basis of registration and compliance-related data collected in the rural and urban slum samples of LS'21. While previous chapters dealt with expressed behaviour, this one looks into the realized behaviour and other practical issues associated with the vaccination process. A summary of the vaccination decision process is presented in Figure 4.1. The organization of the chapter can be broadly divided into the analysis of the following: registration knowledge, registration action, compliance, and potential intra-household spillover. A brief overview of key messages is also presented towards the end.

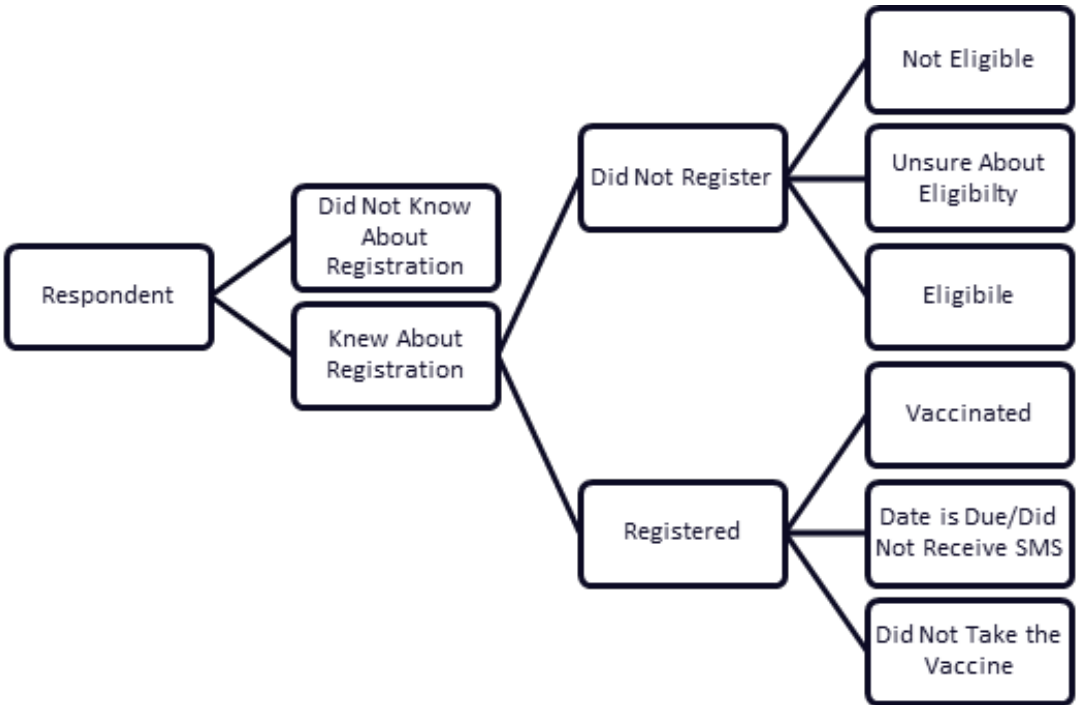

Figure 4.1. Decision Tree of Vaccination

4.1. Knowledge About COVID-19 Vaccine Registration

4.1.1 Regional Distribution

Overall, approximately two-thirds of respondents in each sample reported having heard about the registration. There is a statistically significant relationship between the COVID-19 registration knowledge factor and the type of locality the respondent resides in, as per Table 4.1. Proportionately more urban slum dwellers had heard about the COVID-19 vaccine registration compared to rural residents. This highlights a possible benefit of the higher access to information prevalent in urban regions.

4.1.2 Demographic Characteristics

Gender

The analysis of vaccine registration knowledge by locality and gender yields a statistically significant relationship between registration knowledge and gender in both rural and urban slum regions (see Table 4.2). The findings suggest relatively more men had heard about the COVID-19 registration than women in both regions.

Table 4.1. COVID-19 Vaccine Registration Knowledge by Locality (%)

	% of respondents	
COVID-19 vaccine registration knowledge	Rural	Urban slum
Did not know about registration	37.0	33.2
Knew about registration	63.0	66.8
n	2,710	3,389
χ2	9.6498**	

Note: * p < 0.05, ** p < 0.01, *** p < 0.001.
Source: LS'21.

Table 4.2. COVID-19 Vaccine Registration Knowledge by Locality & Gender (%)

	Rural		Urban slum	
COVID-19 vaccine registration knowledge	Male	Female	Male	Female
Did not know about registration	34.7	50.2	31.3	42.3
Knew about registration	65.3	49.8	68.7	57.7
N	2,304	406	2,814	575
χ2	35.8823***		25.6618***	

Note: * p < 0.05, ** p < 0.01, *** p < 0.001.
Source: LS'21.

Age Groups

Table 4.3 shows the knowledge distribution across various age groups. Only in urban slums, there is a significant relationship between age groups and knowledge about the registration process. The youngest and the oldest urban slum groups have shown the highest lack of knowledge in comparison with other age groups.

Primary Occupation

There is also a statistically significant relationship between knowledge and primary occupation in both samples (see Table 4.4). In rural areas, homemakers, day labourers, drivers or helpers, housemaids, and the unemployed knew the least, whereas in urban slums, this was the case for homemakers, farmers, and fishermen. Jobholders and entrepreneurs knew the most in both regions.

Table 4.3. COVID-19 Vaccine Registration Knowledge by Locality and Age Category (%)

COVID-19 vaccine registration knowledge	Below 20	20–29	30–39	40–49	50–59	60–69	70+
Panel A: Rural							
Did not know about registration	28.6	37.5	38.1	35.2	36.3	35.6	54.1
Knew about registration	71.4	62.5	61.9	64.8	63.7	64.4	45.9
n	14	296	904	755	455	225	61
$\chi 2$	9.8577						
Panel B: Urban slum							
Did not know about registration	45.5	37.8	33.6	31.3	29.0	37.5	44.2
Knew about registration	54.5	62.2	66.4	68.7	71.0	62.5	55.8
n	11	365	1141	901	614	280	77
$\chi 2$	17.1874**						

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Source: LS'21.

Table 4.4. COVID-19 Vaccine Registration Knowledge by Locality & Primary Occupation (%)

COVID-19 vaccine registration knowledge	Farmer and fisherman	Day labourer/ driver or helper/ housemaid	Jobholder	Self-employed/ entrepreneur	Unemployed	Homemaker	Others
Panel A: Rural							
Did not know about registration	37.9	42.7	26.4	28.4	40.4	51.7	35.8
Knew about registration	62.1	57.3	73.6	71.6	59.6	48.3	64.2
n	467	931	519	363	136	174	120
$\chi 2$	66.9198***						
Panel B: Urban slum							
Did not know about registration	40.0	35.5	30.3	29.4	32.2	43.9	38.3
Knew about registration	60.0	64.5	69.7	70.6	67.8	56.1	61.7
n	55	1102	966	647	286	171	162
$\chi 2$	22.3832**						

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Source: LS'21.

4.1.3 Information About COVID-19 Vaccination (If Knew About Registration)

The respondents who said they knew about the registration were then asked regarding the supply of and demand for information regarding the COVID-19 vaccine in multiple response questions. The results are discussed below.

Source of Information About COVID-19 Vaccination

Table 4.5 reports that the most common source of information was relatives, friends, and neighbours, with about 80% of respondents citing it as one of the sources in both samples. This was followed by TV and radio in both areas. The rest of the sources were reported by less than 20% of respondents. Thus our social networks and mass media clearly played a vital role in spreading information. In terms of differences between the two samples, announcements via mike and TV/radio were cited by a higher proportion of urban slum respondents in terms of spreading registration knowledge than rural respondents.

Table 4.5. Source of Information About Vaccination by Locality (If Knew About Registration)

Source of information	% of respondents		$\chi^2(1)$
	Rural	Urban slum	
Relative/friend/neighbour	82.7	83.7	0.758
TV/radio	60.0	68.4	29.588***
Announcement via mike	14.1	18.1	11.660**
Public representative	17.1	15.0	3.000
Teacher/respected person	16.9	13.9	6.868
Newspaper	13.6	14.4	0.585
Facebook	8.7	9.8	1.333
Politician	2.4	3.4	3.104
Other(s)	2.5	2.2	0.410
n	1,707	2,264	

Notes: Pearson $\chi^2(1)$ with Bonferroni-adjusted p-values. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Multiple responses were allowed.
Source: LS'21.

Demand for Information About COVID-19 Vaccination

The respondents who knew were then inquired about their demand for information regarding the COVID-19 vaccination. The findings are presented in Table 4.6. The two most common responses received were that they either do not need or are uninterested in any, or they wanted to know details regarding how to register for the vaccine. The former response was significantly higher among rural respondents (42% in rural areas vs. 37% in urban slums). Other information respondents wanted were the venue for vaccination and whether any fee is applicable. A significantly higher proportion of urban slum respondents wanted to know whether they can register without NID and whether any vaccine card will be provided than rural respondents.

Table 4.6. Demand for Information About Vaccination by Locality (If Knew About Registration)

Demand for information	% of respondents		$\chi^2(1)$
	Rural	Urban slum	
No need of any information/uninterested in any information	41.9	37.0	10.115*
How to register?	37.4	39.7	2.040
Where to go to take the vaccine?	28.0	27.5	0.136
Will any fee be required?	19.6	20.7	0.660
Can those with long-term medical conditions be vaccinated?	16.9	17.8	0.512
Can children be vaccinated?	14.2	15.7	1.588
Can pregnant women be vaccinated?	6.6	6.5	0.020
How to register if does not have NID?	2.8	7.8	46.280***
Will a vaccine card be provided?	3.6	6.7	17.689***
Can breastfeeding women be vaccinated?	5.0	4.5	0.488
Other(s)	4.1	5.5	3.967
n	1,707	2,264	

Notes: Pearson $\chi^2(1)$ with Bonferroni-adjusted p-values. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Multiple responses were allowed.

Source: LS'21.

4.2 COVID-19 Vaccine Registration

4.2.1. Registration Status

Only those who had heard about the registration were asked if they had registered themselves or not. From Table 4.7, it is evident that most of the respondents who knew did not register, and mostly not because of self-reported ineligibility or confusion regarding eligibility but other reasons. Urban slum respondents said they did not register due to reasons not concerning eligibility proportionately more than rural ones.

Division

There is a statistically significant relationship between vaccination registration and administrative divisions, according to Table 4.8. The highest registration rate is observed in Barishal division, while the lowest was in Mymensingh division. Mymensingh division also reported the highest lack of knowledge regarding registration (45%).

Table 4.7. Registration Status by Locality (%)

	% of respondents	
Registration status	Rural	Urban slum
Did not know about registration	37.0	33.2
Registered	6.2	5.8
Did not register due to ineligibility	14.4	15.3
Did not register as unsure about eligibility	16.6	16.1
Did not register due to other reasons	25.8	29.7
n	2,710	3,389
$\chi 2$	15.8253**	

Note: * p < 0.05, ** p < 0.01, *** p < 0.001.
Source: LS'21.

Table 4.8. Registration Status by Division (%)

Registration status	Chattogram	Dhaka	Khulna	Rangpur	Barishal	Mymensingh	Rajshahi	Sylhet
Did not know about registration	34.5	36.0	34.4	31.2	33.0	44.5	36.8	40.9
Registered	6.5	4.9	5.8	5.9	8.1	4.0	5.8	6.4
Did not register due to ineligibility	15.5	15.1	13.2	17.5	16.2	12.0	15.2	7.7
Did not register as unsure about eligibility	15.1	15.7	17.5	14.8	17.8	16.5	18.6	19.1
Did not register due to other reasons	28.4	28.2	29.0	30.6	24.9	23.0	23.5	26.0
n	1,196	1,321	1,248	947	506	200	446	235
$\chi 2$	55.6008**							

Notes: * p < 0.05, ** p < 0.01, *** p < 0.001. Does not cover urban non-slum areas.
Source: LS'21.

Gender

Significant gendered differences in registration status are present in both samples (see Table 4.9). In rural areas, a greater proportion of male respondents had registered compared to females. A higher percentage of rural male respondents were also unsure about their eligibility (and consequently had not registered) than their female counterparts. Moreover, across both areas, proportionately more men had not registered due to other reasons than women.

Table 4.9. Registration Status by Locality & Gender (%)

	Rural		Urban slum	
Registration status	Male	Female	Male	Female
Did not know about registration	34.7	50.2	31.3	42.3
Registered	6.9	2.2	6.0	4.5
Did not register due to ineligibility	14.3	15.3	15.7	12.9
Did not register as unsure about eligibility	17.6	11.3	16.0	17.0
Did not register due to other reasons	26.6	20.9	31.0	23.3
n	2,304	406	2,814	575
$\chi 2$	47.3065***		31.3212***	

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Source: LS'21.

Age Group

The registration rates are higher in the 40+ years age category, as expected, in Table 4.10. As we had recorded responses for not registering due to self-reported ineligibility, it can be seen that many respondents aged 40 years and above in both rural and urban slum areas had chosen that option, but clearly, they were unsure about their eligibility status.[2] This group of misinformed respondents was higher in urban slums. A large proportion of eligible respondents did not also register due to other reasons, and the percentage is higher among urban slum residents.

Table 4.10. Registration Status by Locality and Age Group (%)

Registration status	Below 20	20–29	30–39	40–49	50–59	60–69	70+
Panel A: Rural							
Did not know about registration	28.6	37.5	38.1	35.2	36.3	35.6	54.1
Registered	0.0	1.0	2.7	8.5	10.5	10.7	6.6
Did not register due to ineligibility	64.3	29.1	24.4	5.7	4.6	4.0	3.3

[Table 4.10 contd...]

[2]The age floor had been revised to 40 years old by the time this survey took place. See Chapter 2.

[...Table 4.10 contd.]

Registration status	Below 20	20–29	30–39	40–49	50–59	60–69	70+
Did not register as unsure about eligibility	7.1	16.9	15.7	18.5	17.1	14.2	13.1
Did not register due to other reasons	0.0	15.5	19.1	32.1	31.4	35.6	23.0
n	14	296	904	755	455	225	61
χ2	350.4923***						
Panel B: Urban slum							
Did not know about registration	45.5	37.8	33.6	31.3	29.0	37.5	44.2
Registered	0.0	1.1	2.1	8.1	9.6	10.4	7.8
Did not register due to ineligibility	18.2	29.0	25.7	7.1	4.1	8.9	2.6
Did not register as unsure about eligibility	18.2	12.3	16.8	16.4	17.8	16.4	6.5
Did not register due to other reasons	18.2	19.7	21.8	37.1	39.6	26.8	39.0
n	11	365	1,141	901	614	280	77
χ2	404.9652***						

Note: * p < 0.05, ** p < 0.01, *** p < 0.001.
Source: LS'21.

Primary Occupation

From Table 4.11, we can see that in both rural and urban slum areas, the registration rate is highest among jobholders, with the rural one being higher (14%). In rural areas, the lowest registration rates were recorded for homemakers, the unemployed, day labourers, drivers or helpers, and housemaids. In urban slums, this is true for homemakers, farmers and fishermen, day labourers, drivers or helpers, and housemaids.

Table 4.11. Registration Status by Locality & Primary Occupation (%)

Registered: Self (if eligible)	Farmer and Fisherman	Day labourer/ driver or helper/ housemaid	Job-holder	Self-employed/ entrepreneur	Unemployed	Homemaker	Others
Panel A: Rural							
Did not know about registration	37.9	42.7	26.4	28.4	40.4	51.7	35.8
Registered	5.8	2.7	13.7	8.0	2.2	1.7	7.5
Did not register due to ineligibility	10.1	12.8	21.0	15.7	15.4	14.4	10.8
Did not register as unsure about eligibility	17.8	18.4	13.9	18.2	14.7	8.6	20.0
Did not register due to other reasons	28.5	23.4	25.0	29.8	27.2	23.6	25.8
n	467	931	519	363	136	174	120
$\chi 2$	168.3872***						
Panel B: Urban slum							
Did not know about registration	40.0	35.5	30.3	29.4	32.2	43.9	38.3
Registered	3.6	3.7	7.5	6.8	6.6	2.3	8.0
Did not register due to ineligibility	12.7	14.3	18.3	14.8	12.9	12.9	12.3
Did not register as unsure about eligibility	20.0	18.2	14.9	15.6	14.7	12.9	16.0
Did not register due to other reasons	23.6	28.2	29.0	33.4	33.6	28.1	25.3
n	55	1,102	966	647	286	171	162
$\chi 2$	57.4313***						

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Source: LS'21.

4.2.2. Reasons for Not Registering (If Eligible But Not Registered)

We then asked the respondents to state their reasons for not registering despite knowing about the registration and being eligible. These are the group of respondents who did not register due to other reasons in Table 4.11. Table 4.12 presents the responses received in this multiple response question. Top reasons across both samples included being uninterested to be vaccinated, being unable to manage time, not knowing how to register, not knowing who to ask to get registered, and fear of getting sick if vaccinated. The lack of interest in being vaccinated was significantly higher in urban slums than in rural areas. Significantly more rural respondents raised the issue of distance from their home to the vaccination centre, and held the belief that poor people would not receive the vaccines, than urban slum dwellers.

Table 4.12. Reasons for Not Registering by Locality (If Eligible But Not Registered)

	% of respondents		
Reason	Rural	Urban slum	$\chi^2(1)$
Uninterested to take vaccine	29.9	38.2	12.402**
Could not manage time	27.1	27.0	0.003
Do not know how to register	21.4	19.8	0.605
Do not know who to ask to get registered	15.6	14.3	0.540
Will get sick if got vaccinated	11.6	15.4	5.031
Vaccination centre is very far	8.3	4.7	9.396*
There is no Corona anymore	3.2	3.9	0.633
Have other health complications	3.4	3.1	0.165
Poor people will not receive vaccines	4.9	2.1	10.197*
Saw negative information on social media	1.4	2.7	3.047
Family and others told not to (societal and religious pressure)	0.9	2.0	3.501
Do not have any device (mobile/PC/laptop) to get registered	1.6	1.4	0.095
Will not take Indian vaccine	1.3	1.3	0.000
Tried to register but facing problems with registration form	1.2	1.0	0.090
Do not have NID	0.1	0.5	1.472
Doctor told not to	0.4	0.1	1.918
Other(s)	7.5	4.7	5.786
n	698	1,005	

Notes: Pearson $\chi^2(1)$ with Bonferroni-adjusted p-values. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Multiple responses were allowed.
Source: LS'21.

4.2.3. Details of the Registration Process (If Registered)

The respondents who had registered were next enquired as to how they had registered themselves for the vaccine, and whether they had faced any hurdles while doing so. Understanding this is vital for ensuring maximum participation in the immunization program.

Medium of Registration

Table 4.13 states that most respondents had registered online with the help of an acquaintance, or went to a shop to get registered. Therefore, most of the completed registrations had occurred by secondary means. This was followed by self-registration online. On-spot registration also appeared to be quite popular. We neither find any significant differences between rural and urban slum regions, nor by gender within each sample.

Table 4.13. Medium of Registration by Locality (If Registered)

	% of respondents	
Medium of registration	Rural	Urban slum
Online, by myself	19.8	12.8
At a shop	22.8	24.6
Online, by an acquaintance	29.3	38.5
By Union Parishad	8.4	4.6
On-spot, at vaccination centre	13.2	11.8
Others	6.6	7.7
n	167	195
$\chi 2$	7.3205	

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Source: LS'21.

Problems Faced in Registration

The registered respondents were also asked if they had faced any problems while registering in a multiple response question (see Table 4.14). It is evident that almost all respondents said that there was no problem and the responses do not vary across the two samples. It is, however, worth mentioning here that this question was only asked to those who had successfully completed their registration.

Table 4.14. Problems Faced While Registering by Locality (If Registered)

	% of respondents		$\chi^2(1)$
Problem	Rural	Urban slum	
No problem	98.8	99.5	0.513
Internet issues arose	1.2	0.5	0.513
n	167	195	

Notes: Pearson $\chi^2(1)$ with Bonferroni-adjusted p-values.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Multiple responses were allowed.
Source: LS'21.

4.3 Vaccine Compliance

4.3.1. Compliance Rate

This subsection focuses on those who had completed their registrations. An overall high level of compliance can be observed among those who have registered in Table 4.15, but it is worth noting that the proportion of respondents who had registered was very low to begin with. There is no significant difference across samples in this regard.

4.3.2. Reasons for Not Vaccinating (If Registered But Did Not Take the Vaccine)

We examined the reasons for non-compliers, as identified in Table 4.15, in a multiple response question. There were only 27 such cases as per Table 4.16 (14 in rural and 13 in urban slum). In both groups, most respondents cited being unable to manage time as the reason.

Table 4.15. Compliance by Locality (%)

Compliance	Rural	Urban slum
Vaccinated	90.3	88.5
Registered but not vaccinated	9.7	11.5
n	144	113
$\chi 2$	0.2139	

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Respondents who registered but did not receive their SMS yet (n = 98) or whose date is due (n = 7) are excluded here.

Source: LS'21.

Table 4.16. Reasons for Not Vaccinating by Locality (If Registered But Did Not Take the Vaccine)

Reason	% of respondents		$\chi^2(1)$
	Rural	Urban Slum	
Could not manage time	64.3	61.5	0.022
Fell sick	28.6	15.4	0.678
Later came to know there are side effects	0.0	30.8	5.057
Out of fear	7.1	15.4	0.464
The Vaccination Centre is Very Far	7.1	0.0	0.964
n	14	13	

Notes: Pearson $\chi^2(1)$ with Bonferroni-adjusted p-values. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Multiple responses were allowed. Respondents who registered but did not receive their SMS yet (n = 98) or whose date is due (n = 7) are excluded here

Source: LS'21.

4.3.3. Source of Influence to Be Vaccinated (If Vaccinated)

The vaccinated respondents were asked who encouraged them to be vaccinated. Friends, colleagues, family members, relatives, and neighbours were the most cited sources of inspiration in both samples. Thus, once again, the role of our social networks has proven to be instrumental in vaccination. Moreover, friends and colleagues were the most common sources, and the latter may have some connection with livelihood.

Table 4.17. Source of Influence to Be Vaccinated (If Vaccinated)

Source	% of respondents		$\chi^2(1)$
	Rural	Urban slum	
Friends	33.1	29.0	0.437
Colleague	32.3	26.0	1.080
Family	23.9	30.0	1.098
Relative	23.1	26.0	0.262
Neighbour	23.1	22.0	0.037
No one	13.9	11.0	0.416
Social media	10.0	13.0	0.507
Local announcement via mike	9.2	7.0	0.371
Other(s)	13.9	10.0	0.782
n	130	100	

Notes: Pearson $\chi^2(1)$ with Bonferroni-adjusted p-values. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Multiple responses were allowed.
Source: LS'21.

4.4. Potential Spillover

This particular survey had reached out to household heads as respondents. In the context of Bangladesh, usually, the major household decisions are undertaken by this member. As such, it is worth exploring if their characteristics and behaviour had influenced other household members in terms of registration and compliance.

4.4.1. Head's Registration Knowledge

Table 4.18 reports a significant relationship in both samples between a head's knowledge about the registration and the registration status of any other household member, whereby in households of heads who had heard about the registration, other member(s) had registered proportionately more.

Table 4.18. Head's Registration Knowledge vs. Registration Status of Household Member(s) by Locality (%)

		Registration status of anyone else in the Household					
		Rural			Urban slum		
		Registered	Did not register	n	Registered	Did not register	n
Head's Knowledge	Did not know about registration	0.9	99.1	1,003	0.4	99.6	1,125
	Knows about registration	6.0	94.0	1,707	5.2	94.8	2,264
	χ2	42.0736***			48.8397***		

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Source: LS'21.

4.4.2. Head's Registration Status

Households with registered household heads reported another member having registered proportionately more, and these differences were significant in both rural and urban regions (see Table 4.19). Thus there is a positive linkage between the registration status of a head and anyone else in the household.

Table 4.19. Registration Status: Head vs. Anyone Else in the Household, by Locality (%)

		Anyone else in the household					
		Rural			Urban s		
	Registration Status	Registered	Did not register	n	Registered	Did not register	n
Head	Registered	37.1	62.9	167	36.9	63.1	195
	Did not register	2.0	98.0	2,543	1.6	98.4	3,194
	χ2	488.9472***			655.7177***		

Notes: * p < 0.05, ** p < 0.01, *** p < 0.001. Household heads, i.e. respondents, who had not heard about the registration treated as having not registered for symmetry with the status of other household members.
Source: LS'21.

4.4.3. Head's Vaccine Compliance

There is also a clear positive relation in vaccine compliance between the household head and anyone else in the household, as shown in Table 4.20.

Table 4.20. Vaccine Compliance: Head vs. Anyone Else in the Household, by Locality (%)

		Anyone else in the household							
		Rural				Urban slum			
	Compliance	Vaccinated	Registered but not vaccinated	Did not register	n	Vaccinated	Registered but not vaccinated	Did not register	n
Head	Vaccinated	36.9	0.0	63.1	130	28.0	6.0	66.0	100
	Registered but not vaccinated	14.3	28.6	57.1	14	7.7	38.5	53.8	13
	Did not register	1.5	0.5	98.0	2,543	0.9	0.7	98.4	3,194
Reg	χ2	682.6055***				632.3888***			

Notes: * p < 0.05, ** p < 0.01, *** p < 0.001. Household heads, i.e. respondents, who had not heard about the registration treated as having not registered for symmetry with the status of other household members. Respondents who registered but did not receive their SMS yet (n = 98) or whose date is due (n = 7) are excluded here.
Source: LS'21.

4.5. Highlights

The main findings of this chapter is outlined below:

- Proportionately more urban slum dwellers had heard about the registration compared to rural residents.
- Women are falling behind in terms of both registration knowledge and completion. The same is also true for certain occupation groups.
- Social networks and mass media are vital sources of information, and the former is also a major source of encouragement.
- There is a lack of interest or necessity in knowing further information regarding vaccination among the respondents who knew, especially in the rural region. Among those that did want to know, most respondents reported not knowing the details of the registration process despite hearing about it.
- Majority of the respondents who knew did not register, and mostly not because of self-reported ineligibility or confusion regarding eligibility but other reasons.
- Excluding ineligibility and confusion regarding eligibility status, top reasons across both samples for not registering included being uninterested to be vaccinated, being unable to manage time, not knowing how to register, not knowing who to ask to get registered, and fear of getting sick if vaccinated. The lack of interest in being vaccinated was significantly higher in urban slums than in rural areas.
- Majority of the registrations had occurred with the help of intermediaries.
- There is a high level of compliance among the few who have registered, excluding those who had not received the SMS or their date is due.
- Potential Intra-household spillovers observed from HH head's behaviour.

Chapter 5

Concluding Remarks

With the beginning of the first phase of vaccination, the GoB has begun executing its plan to ensure maximum COVID-19 immunization coverage, and 3.3% of the population of the country had received the first dose as of 31 March 2021 (Mathieu et al., 2021). On 8 April 2021, GoB started giving the second doses of Covishield and successfully fully immunized over 81,000 people ("Over 81,000 People Receive Second Dose," 2021, April 8). This report has attempted to present a chronological narrative of developments associated with the COVID-19 vaccination program in Bangladesh and highlighted underlying factors which may have played a role in the WTV of the population at large in early February 2021 and the role of governance in it. An analysis of temporal changes in youth's WTV has been presented, followed by the state of WTV in urban slums. In the end, practical aspects of the vaccination process have been discussed for the rural and urban slum regions in March 2021.

Insofar, the GoB has been adaptive to local developments, as demonstrated by lowering the age limit to 40 years and bringing in teachers under the first phase (Sujan, 2021 February 10). Although, supply disruptions had caused halts in the rollout, the focus of this report is on demand-side aspects. Thus setting aside supply-side challenges such as procurement and equity in terms of vaccine distribution, a number of demand-side challenges has been identified here: ensuring vaccine uptake by increasing registration rates, addressing the gender gap in vaccine registration knowledge and completion, communicating vaccine necessity and details of the eligibility status and registration process, and tackling misconceptions and mistrust. Although our survey period did not cover the commencement of second dose of the vaccine, which was on 8 April 2021 as mentioned earlier, ensuring full or complete immunization is also important.

To conclude, while there exists uncertainty in the effectiveness of the vaccines, especially in the event of new strains of the virus, the ideal option right now is to trust the results of the vaccine trials and ensure maximum participation in the inoculation. Effective communication strategies and other lessons learnt from the Expanded Program on Immunization (EPI) can be of great value here to address the challenges in WTV. Adopted measures should include creating awareness about the health risk of the virus and vaccine necessity, effectiveness, and safety; bringing confidence in vaccine distribution efficiency; addressing religious concerns (especially in urban slums); presenting information about registration eligibility and step-by-step guidelines for registration. Convincing people of vaccine necessity is crucial while informing them of registration details, as there appears to be a prevailing disinterest in knowing more about the registration process as well. Information campaigns regarding the registration process should especially target the rural population and women. Frequent mobile phone message reminders, social media, community-level vaccination awareness program and partnership with Non-Governmental Organisations and

other development organisations might be fruitful. Setting up booths designated for registration will help to eliminate intermediaries and may reduce the cost burden on the people, as most registration appears to be occurring by secondary means. Organizational support for vaccine registration can also be extended by employers. Since we found social network to be an important source of information and encouragement, “vaccinated status” through low cost signals might be effective in encouraging higher vaccine uptake (Karing, 2021). Policymakers need to bear in mind both supply- and demand-side features to ensure the ultimate success of the vaccination program.

Appendix A

Survey Methodology

The report uses six samples from three different telephone surveys. The first survey is the State of Governance Bangladesh 2021 (SOG'21) survey, denoted as Feb'21 in the discussions of the report. The telephone survey of SOG'21 includes three sampling frames (from three existing BIGD survey samples). The second survey considered for our analysis is the National Youth Survey 2021 (YS'21). In the third one, we used the rural and urban slum samples of the third phase of the study "Livelihoods, Coping and Recovery During COVID-19 Crisis (LS'21)" (Rahman et al., 2020). Both YS'21 and LS'21 are referred to as Mar'21 in the discussions. A timeline of the three surveys is presented in Figure A1 while Table A1 below summarizes the key figures.

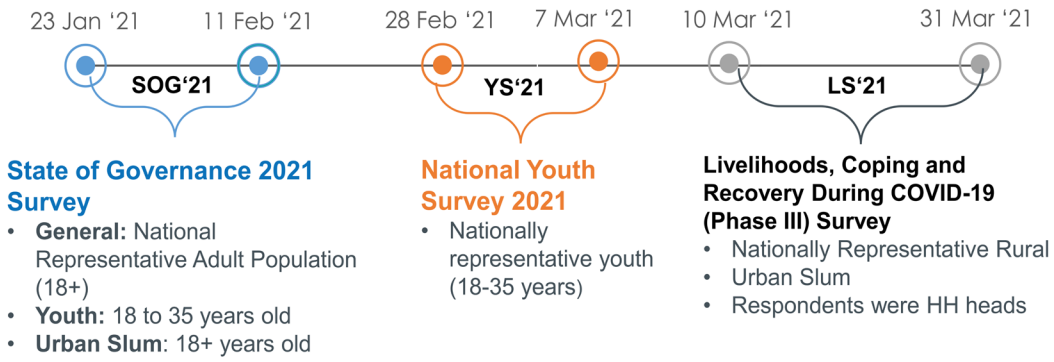

Figure A 1. Timeline of the Surveys

Table A 1. Sampling Summary

Survey	Sample	List	Approached	Surveyed	Response rate (%)	Final Sample[a]
SOG'21	General	3,856	3,856	2,751	71.34	2,731
	Youth	1,000	947	501	52.90	448
	Urban Slum	1,200	1,200	398	33.17	395
YS'21	Youth	3,790	3,790	1,943	51.26	1,929
LS'21	Rural	3,360	3,360	2,710	80.65	2,710
	Urban Slum	4,277	4,277	3,389	79.23	3,389

Note: [a]After accounting for sampling error.

A.1 State of Governance Bangladesh 2021 Survey

The SOG'21 survey took place from 23 January to 11 February 2021, interviewing 3,574 respondents.[3] We consulted two other studies—one in the US by Reiter, Pennell, and Katz (2020), and the other in Indonesia by the Ministry of Health, NITAG, UNICEF, and WHO (2020)—while developing the questionnaire for SOG'21 survey questionnaire. The survey collected responses from three different samples: general, youth, and urban slum.

The general sample is nationally representative—it was drawn from the study "The State of Bangladesh's Political Governance, Development, and Society: According to its Citizens: A Survey of the Bangladeshi People 2019 Edition" sample (Hassan et al., 2020). From a list of 3,856 respondents, 2,751 were surveyed. Therefore, about 71% of respondents participated in this survey. After cleaning, 20 respondents were dropped from this list and finally, 2,731 respondents were retained in the final sample. There was no replacement of missing persons. A person was approached at least three times and if not successful, they were dropped from the list. Any adult member (18 years old or above) from the household, not necessarily the household head, participated in the telephone survey for the general sample of this survey. The obtained general sample is disaggregated at the rural-urban level approximately (76%–24%) in line with the national rural-urban disaggregation level of 75–25% of the main survey (Hassan et al., 2020). However, the male-female (60%–40%) is not disaggregated equally in the general sample as it was in the previous survey (Hassan et al., 2020).

The sampling strategy of the general sample of SOG'21 survey is reflective of the sampling strategy followed by Hassan et al. (2020), as the sample is obtained from the previous survey.[4] The survey for this nationally representative sample was conducted across the eight administrative divisions of the country. Following a multi-stage sampling method, 32 districts were randomly selected. The samples were categorized into two units—Urban Primary Sampling Units (PSUs) and Rural PSUs.

Each Urban PSU is constituted of two mahallas that were randomly chosen from the subdistricts. On the other hand, for each Rural PSU, two villages were randomly selected from each union, which were selected randomly from 48 subdistricts of the selected districts.[5] Overall, this survey included 192 villages as a rural sample and 64 mahallas as an urban sample.

The second sample of SOG'21, the youth sample, comprises respondents aged from 18 to 35 years, which was drawn randomly from the National Youth Survey 2018 (Matin et al., 2019). In the National Youth Survey 2018 (Matin et al., 2019), the youth were selected following a systematic random sampling technique, where 840 youths from each of the five regions (Rangpur, Rajshahi, Khulna, Barishal, and Sylhet) were selected, totalling 4,200 youth. However, for SOG'21, a list of 1,000 youths (500 male and 500 female) were created randomly from the 4,200 youth sample. From the list of 1,000 youths, after taking interviews and cleaning data, the number of respondents retained is 448, about 47% of the selected list.[6]

[3] 3,647 people were surveyed, 73 respondents were dropped after data cleaning.

[4] The survey for the paper by Hassan et al. (2020) was conducted from 18 February 2020 till 15 March 2020. The survey for the present study took place from 23 January 2021 to 11 February 2021.

[5] Two unions per subdistrict were randomly selected. The 48 subdistricts were also randomly selected from the list of selected districts.

[6] Out of 1,000, 947 youths were approached and eventually, 501 participated over telephones. Cleaning lowered the number to 448.

The urban slum sample of SOG'21 was drawn from the Urban Development Programme (UDP) 2016 (BRAC, 2018). The urban slum sample is restricted to adults who were a minimum of 18-years-old for this report. The UDP census (BRAC, 2018) recorded responses of the female respondents in 24,000 households from 35 slums in the country. So, it was difficult to get equal male-female (50/50) representation from this frame. Therefore, there were two separate lists made—male and female. One list contained 600 women with phone numbers who were drawn randomly from the survey. For the male list, the households of selected 600 women were first excluded. Then the list was created with randomly chosen 600 males who were household heads in the census. From the lists of a total of 1,200, eventually, 395 (33%) urban slum dwellers were considered after cleaning.[7]

A.2. National Youth Survey 2021

In the second survey, YS'21, the sampling strategy employed is the same as the National Youth Survey 2018 (YS'18) by Matin et al. (2019). The respondents aged 18–35 years are considered as youth for YS'21. The survey was conducted over the telephone from 28 February 2021 to 7 March 2021, and successfully reached out to 1,943 respondents, which is 51% of the YS'18 sample. After accounting for sampling error, the final sample stood at 1,929 respondents. The vaccination section was answered by 1,899 respondents, as respondents were provided the option to not continue the survey at intervals.

A.3. Livelihoods, Coping, and Recovery During COVID-19 Crisis (Phase III) Survey

The report uses the urban slum and rural samples from LS'21 in order to analyze the vaccination registration aspect. A telephone survey was conducted from 10 March 2021 to 31 March 2021 in this case. The sampling strategy is extracted from the Phase-II study of "Livelihoods, Coping and Recovery During COVID-19 Crisis" (Rahman et al., 2020).

For the urban slum sample, 6,000 households were randomly selected from the UDP 2016 survey in the Phase I study (Rahman et al., 2020), where 2,790 people were interviewed. In the second phase of the study, an addition of 4,000 households from the same urban dataset was included.

For the rural sample of this survey, in the first phase of the study, 6,000 households were initially selected and 2,000 from each of the three categories: extreme poor, poor, non-poor. The rural samples were drawn from BIGD's nationally representative survey of 26,295 households across all 64 districts for Strategic Partnership Agreement (SPA) Results Framework-2017 (Rahman et al., 2020). In the Phase I study, around 2,681 respondents participated. The rural sample for the second phase survey included an additional 2,000 respondents from the same dataset and also added 200 households of Chattogram Hill Districts (CHTs) from the Power and Participation Research Centre (PPRC) database.

In total, the rural and urban slum sample size for the second phase study was 11,671, and 7,638 people were successfully interviewed. In the third phase, i.e. LS'21, the response rate was around 80% of the total respondents (7,638) from the second phase, interviewing 6,099 respondents. In LS'21, the household's heads were the default respondents; however, if unavailable then the second income earner or the spouse was considered for the survey.

[7]From the 1,200 respondents, 947 people were approached. However, 398 people were eventually surveyed.

Appendix B

Empirical Strategy

This appendix briefly discusses the empirical methodology to probe any significant findings among the interested variables. As the report mainly focuses on analyzing the WTV, this variable will be the dependent variable in all the tests. It is important to note that WTV in SOG'21 represents an ordinal variable ranked following an order, with 5 = Definitely Willing to be Vaccinated to 1 = Definitely Not Willing to be Vaccinated.[8]

For descriptive analysis, we first conducted a set of nonparametric tests to analyze the correlation and significant differences between the independent variables and WTV. The use of nonparametric tests is justified as they do not need to assume the normal distribution of the data (Mood, 1950). The nonparametric tests, Kruskal-Wallis H test (Kruskal & Wallis, 1952) and Spearman's Rank-Order Correlation test (Spearman, 1904) are used for analysis purpose, as it allows to look into nominal vs. ordinal cases and ordinal vs. ordinal, respectively. Spearman's test has the added benefit of providing the direction and strength of the relationship, as it is an association test.[9] In the case of multiple comparison testing, however, the Type 1 error rate tends to become inflated, raising concerns about the validity of the findings (Armstrong, 2014). The Type 1 error comes from the rejection of the true null hypothesis (false positives). For this reason, to reduce the chances of Type 1 error, the Bonferroni correction (Armstrong, 2014) has been used.

Regression analysis was conducted for studying the governance aspect in WTV (see Chapter 3). The factors that showed significant correlation with WTV at $p < 0.10$ have been then retained for regression analysis, as simple descriptive results do not account for other factors that may be simultaneously affecting WTV. For this regression analysis, we mainly look into the effect of governance perception factors on the WTV. The common practice in the field of social sciences is to use Ordered Logit models when dealing with ordinal variables but Williams (2016) mentions these models are quite restrictive as it makes a strong assumption of proportional odds or parallel lines. We confirmed the violation of the assumption in our models by means of the Brant (1990) test.

On the other hand, Alisson (1999) asserted that binary regression (logit) models are susceptible to an underlying heterogeneity issue that often goes unnoticed, where residual variations lead to misleading coefficients. Fundamentally, this issue is not only limited to binary dependent variables but also in effect when dealing with ordinal variables (multiple category cases). If there is a heterogeneity issue, the estimated coefficients could be misleading—biased, inefficient, and inconsistent (Greene, 2003). Moreover, Williams (2010) stated that differences across groups in residual variability could also lead to the violation of the proportional odds assumption. In line with these arguments, the report follows the heterogeneous choice models regression which allows the use of ordinal variables (Alvarez & Brehm, 1995; Keele & Park, 2006; Williams, 2006). The Heteroskedastic Ordered Logistic Regression (a type of heterogeneous choice model, using Logit

[8] The full scale is as follows: 5 = Definitely Willing, 4 = Probably Willing, 3 = Not sure, 2 = Probably Not Willing, 1 = Definitely Not Willing.

[9] For Spearman's Rank-Order Correlation test, "Do not know,", "No response,", "No comment," and "Others" answers were set to missing in some variables to ensure they are ordinal and establish meaningful relationships with WTV. This resulted in the loss of some observations for the subsequent regression analysis as well.

function) is formulated using two equations: the choice equation and the variance equation. Using the choice equation, the determinants of the outcome are found while the difference of residual variance is depicted in the variance equation (Williams, 2010).

This report, therefore, uses this approach to analyze the effect of explanatory variables and their variance on the dependent variable, WTV. The analysis used a stepwise procedure with LR tests for selecting the independent variables for the variance equation following the recommendations of Williams (2009), as this set of variables have been found to cause heterogeneity. The borderline cases of WTV in the affirmative have also been examined in a similar manner. In that regression analysis, we considered a binary dependent variable with "Definitely willing = 1" for the leaders or early adopters, and "Probably Willing or Unsure = 0" for the early followers and hesitant respondents.[10]

For the analysis of temporal differences of youth samples in terms of WTV, we used two-sample tests of proportion ("prtest" command in Stata). The proportion test allows to estimate the existence of population difference using two samples (Gauvreau, 2006). Conceptually, prtest and t-test are very similar. We use this approach to find the significant differences in WTV over time, across different factors between youth samples of SOG'21 and YS'21.

[10]For a more in-depth understanding of the several advantages of preferring the heterogeneous choice models over other alternatives, please see Williams (2009).

Appendix C

Additional Tables

Table C 1. Summary Results of Non-Parametric Tests for Comparisons With WTV (5 Point Scale): SOG'21 General

Variable	Locality	Test statistic	p-value
Locality		H(1) = 3.373	p<0.10
Gender		H(1) = 1.274	ns
Gender	Rural	H(1) = 4.033	p<0.05
Gender	Urban	H(1) = 1.201	ns
Age group		r_s = -0.0004	ns
Age group	Rural	r_s = 0.0094	ns
Age group	Urban	r_s = -0.0311	ns
Educational attainment		r_s = 0.0222	ns
Primary occupation		H(8) = 3.695	ns
Perceived health risk to self		r_s = 0.2175	p<0.01
Perceived health risk to family		r_s = 0.2139	p<0.01
Overall perceived impact on life[a]		r_s = 0.1576	p<0.01
Overall perceived impact on life[a]	Rural	r_s = 0.1775	p<0.01
Overall perceived impact on life[a]	Urban	r_s = 0.1050	p<0.01
Lockdown perception[a]		r_s = 0.1865	p<0.01
Lockdown perception[a]	Rural	r_s = 0.1858	p<0.01
Lockdown perception[a]	Urban	r_s = 0.2001	p<0.01
Perceived irregularities in relief distribution[a]		r_s = -0.0899	p<0.01
Perceived irregularities in relief distribution[a]	Rural	r_s = -0.0747	p<0.01
Perceived irregularities in relief distribution[a]	Urban	r_s = -0.1318	p<0.01
Level of satisfaction with the relief operation		r_s = 0.1330	p<0.01
Level of satisfaction with the relief operation	Rural	r_s = 0.1251	p<0.01
Level of satisfaction with the relief operation	Urban	r_s = 0.1581	p<0.01
Perceived effectiveness of the government's response[a]		r_s = 0.2192	p<0.01
Perceived effectiveness of the government's response[a]	Rural	r_s = 0.2133	p<0.01
Perceived effectiveness of the government's response[a]	Urban	r_s = 0.2325	p<0.01
Confidence in efficiency of COVID-19 vaccine distribution		r_s = 0.2150	p<0.01
Confidence in efficiency of COVID-19 vaccine distribution	Rural	r_s = 0.2217	p<0.01
Confidence in efficiency of COVID-19 vaccine distribution	Urban	r_s = 0.1984	p<0.01

Notes: H denotes Kruskal-Wallis H test while r_s denotes Spearman's Rank-Order Correlation test. ns stands for non-significant at Bonferroni-adjusted $p < 0.10$ to account for multiple testing.
[a] For Spearman's Rank-Order Correlation test, "Do not know," "No response," "No comment," and/or "Others" answers were set to missing.
Source: Authors' own calculations from SOG'21.

Table C 2. Summary Results of Non-Parametric Tests for Comparisons With Definitely Willing: SOG'21 General

Variable	Locality	Test statistic	p-value
Locality		H(1) = 0.565	ns
Gender		H(1) = 5.770	p<0.05
Gender	Rural	H(1) = 6.563	p<0.05
Gender	Urban	H(1) = 2.470	ns
Age group		r_s = -0.0184	ns
Age group	Rural	r_s = -0.0165	ns
Age group	Urban	r_s = -0.0192	ns
Educational attainment		r_s = 0.0470	p<0.05
Primary occupation		H(8) = 14.847	p<0.10
Presence of 60 plus-year-old(s) in the household		H(1) = 0.474	ns
At least one household member has underlying condition(s)[a]		H(1) = 0.035	ns
Perceived health risk to self		r_s = 0.3015	p<0.01
Perceived health risk to family		r_s = 0.2864	p<0.01
Overall perceived impact on life[a]		r_s = 0.1585	p<0.01
Overall perceived impact on life[a]	Rural	r_s = 0.1685	p<0.01
Overall perceived impact on life[a]	Urban	r_s = 0.1295	p<0.01
Lockdown perception[a]		r_s = 0.1810	p<0.01
Lockdown perception[a]	Rural	r_s = 0.1720	p<0.01
Lockdown perception[a]	Urban	r_s = 0.2049	p<0.01
Perceived irregularities in relief distribution[a]		r_s = -0.0278	ns
Perceived irregularities in relief distribution[a]	Rural	r_s = -0.0270	ns
Perceived irregularities in relief distribution[a]	Urban	r_s = -0.0301	ns
Level of satisfaction with the relief operation		r_s = 0.0760	p<0.01
Level of satisfaction with the relief operation	Rural	r_s = 0.0774	p<0.01
Level of satisfaction with the relief operation	Urban	r_s = 0.0707	p<0.01
Perceived effectiveness of the government's response[a]		r_s = 0.2342	p<0.01
Perceived effectiveness of the government's response[a]	Rural	r_s = 0.2406	p<0.01
Perceived effectiveness of the government's response[a]	Urban	r_s = 0.2198	p<0.01
Confidence in efficiency of COVID-19 vaccine distribution		r_s = 0.2002	p<0.01
Confidence in efficiency of COVID-19 vaccine distribution	Rural	r_s = 0.2156	p<0.01
Confidence in efficiency of COVID-19 vaccine distribution	Urban	r_s = 0.1532	p<0.01

Notes: H denotes Kruskal-Wallis H test while rs denotes Spearman's Rank-Order Correlation test. ns stands for non-significant at Bonferroni-adjusted p<0.10 to account for multiple testing.
a For Spearman's Rank-Order Correlation test, "Do not know," "No response," "No comment," and/or "Others" answers were set to missing.
Source: Authors' own calculations from SOG'21.

Table C 3. Results From the Heteroskedastic Ordered Logistic Regression: SOG'21 General

	(1) Willingness to be vaccinated (5 point scale)	(2) Definitely willing
Choice		
Rural	0.7202* (0.3088)	-0.0217 (0.1127)
Female	0.6386 (0.3896)	-0.1103 (0.1902)
Rural # Female	-0.6442 (0.4436)	0.0531 (0.1732)
Educational qualification		0.0525 (0.0268)
Primary occupation (Reference: Farmers and fishermen)		
Day labourer/driver/housemaid		0.0407 (0.1535)
Jobholder		-0.1020 (0.1581)
Self-employed/entrepreneur		-0.0290 (0.1483)
Students		0.0485 (0.1888)
Unemployed		0.0768 (0.2323)
Homemaker		-0.0713 (0.2034)
Retired		-0.3799 (0.2675)
Others		0.1675 (0.3483)
Perceived health risk to family	-0.1011 (0.3621)	-0.0933 (0.1536)
Overall perceived impact on life[a]	0.2694*** (0.0485)	0.0732*** (0.0198)
Lockdown perception[a]	0.8142*** (0.1620)	0.2628*** (0.0616)
Perceived irregularities in relief distribution[a]	0.6787* (0.2962)	
Level of satisfaction with the relief operation	0.3639* (0.1789)	-0.1665** (0.0548)
Perceived effectiveness of the government's response[a]	0.9674*** (0.2641)	0.4456*** (0.0961)
Confidence in ffficiency of COVID-19 vaccine distribution	1.4359*** (0.2390)	0.3948*** (0.0790)
Thresholds		
Cutpoint 1	4.1957*** (0.8916)	2.8713*** (0.5168)
Cutpoint 2	6.2817*** (1.0058)	
Cutpoint 3	7.1856*** (1.0564)	
Cutpoint 4	10.3270*** (1.2841)	
Variance		
Perceived health risk to self	0.2616*** (0.0303)	
Perceived irregularities in relief distribution	0.2517*** (0.0651)	
Level of satisfaction with the relief operation		-0.1958* (0.0770)
Observations (n)	2,277	2,142

Notes: Robust standard errors in parentheses. * p < 0.05, ** p < 0.01, *** p < 0.001.
[a] "Do not know," "No response," "No comment," and/or "Others" answers were set to missing for establishing meaningful relationships and greater interpretability of results, resulting in a lower number of observations.
Source: Authors' own calculations from SOG'21.

Table C 4. Descriptive Statistics and Balance for Youth Samples

		(1) February 2021		(2) March 2021	T-test difference
Variable	n	Mean/SE	n	Mean/SE	(1)-(2)
Locality	448	1.2879	1929	1.3033	-0.0153
		(0.0214)		(0.0105)	
Gender	448	1.4777	1929	1.4847	-0.0070
		(0.0236)		(0.0114)	
Years of schooling	448	9.3393	1929	9.1337	0.2055
		(0.1858)		(0.0893)	
Employed	448	0.4018	1929	0.4121	-0.0103
		(0.0232)		(0.0112)	
Household size	448	5.3996	1621[a]	5.4941	-0.0946
		(0.1036)		(0.0555)	

Notes: Standard errors in parentheses. The values displayed for t-tests are the differences in the means across the groups. ***, **, and * indicate significance at the 1, 5, and 10 per cent critical level.
[a] Household size was missing for 308 observations in YS'21.
Source: Authors' own calculations from SOG'21 and YS'21.

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