

# Investigating Resistance to COVID-19 Vaccines and its Underlying Causes: A Descriptive Study of Young Adults in Sri Lanka

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**Abstract:** *The coronavirus disease has posed a significant threat all over the world. Vaccination has been identified as the most effective and safest solution to recover from the pandemic. However, vaccine hesitancy stands out as the foremost barrier to global vaccination coverage. The purpose of this study is to explore the prevalence of the COVID-19 vaccine hesitancy among young adults in Sri Lanka. This research was carried out as a quantitative cross-sectional survey, which is majorly based on five districts in Sri Lanka. An online questionnaire collected data from 601 young adults aged 15 to 35 years, who were selected through crowdsourcing and a simple random sampling technique. According to descriptive statistics, COVID-19 vaccine hesitancy has gradually increased over three phases of hesitancy: initial doses (37%), booster doses (59%), and response to future vaccination (60%). Females, married respondents, and Sinopharm recipients were the most hesitant, with side effects and allergy issues being the most common concerns. In terms of vaccine awareness, the majority show less awareness, owing to their increased exposure to social media information (60%). Furthermore, 34% of respondents, the vaccine was prescribed because it was mandated by a third party. Besides This study provided extensive information about the COVID-19 immunization program and its impact on vaccine hesitancy and refusal. The study's findings are concerning, and stakeholders must consider the identified gaps in order to execute mitigation plans in future vaccination programs.*

**Keywords:** COVID-19, Hesitancy, Young adults

## 1. Introduction

The COVID-19 pandemic has turned the world upside-down, which has negatively impacted almost every sector and every corner of the world. As a huge step forward in our global effort to end the pandemic, vaccination has been identified as the most protective and safe measure to protect against COVID-19 disease. However, around COVID-19 infection as well as with regard to other infectious diseases, there are concerns that vaccine hesitancy may be a barrier to the rapid roll-out of a new vaccine.

Due to the rapid increase in COVID-19 cases in Sri Lanka, the government has prioritized the vaccination program against the virus that causes COVID-19 in response to the current pandemic. Although the government has made significant progress toward the vaccination program in Sri Lanka, there has been a spread of various types of perceptions and concerns about receiving COVID-19 vaccines in different social groups. Misinformation and myths about novel vaccines emerge to be severely influencing most people into hesitating against vaccination. It has created negative perceptions and attitudes toward the COVID-19 vaccine among Sri Lankans, which has led to lower vaccination acceptance. In particular, the Sri Lankan government has identified the young vaccine-eligible population as a high hesitancy group compared to the other priority

groups for vaccination. Based on the current critical challenge of COVID-19 vaccination hesitancy among the vaccine-eligible youth population, this research was employed to explore the prevalence of the COVID-19 vaccine hesitancy among young adults in Sri Lanka. Furthermore, current research evaluated various factors that have significant associations with a perception of COVID-19 vaccination namely: attitudes and knowledge about vaccination as well as the role of information sources towards the COVID-19 vaccine hesitancy.

An exhaustive literature review revealed that immunization hesitation has been a complex public concern in Sri Lanka as well as in numerous nations around the world. There are a significant number of studies in the world that have been done to distinguish various types of public perceptions toward a vaccine against COVID-19. This study will provide a novel contribution to the current unique range access literature by exploring vaccine hesitancy along with subsequent vaccine doses and vaccine brand preference in exceptional reference to the youth population in Sri Lanka.

This study will provide valuable insights to policymakers and health authorities to restructure inoculation systems. That will have a positive impact on achieving sufficient vaccine coverage by improving communication transparency about the different types of currently available COVID-19 vaccines in Sri Lanka. According to the understanding of the authors, this sort of exploratory study is lacking in the Sri Lankan context. As a timely assessment, it is imperative to explore the prevalence of COVID-19 vaccine hesitancy in Sri Lanka, which would be critical at this time.

## **2. Methodology And Experimental Design**

This study was conducted as an online descriptive survey among young adults aged 15 to 35 living in Sri Lanka, with a focus on the most densely populated districts of Kurunegala, Colombo, Gampaha, Kandy, and Galle. The cross-sectional survey was conducted in the period from March to May 2022. The crowdsourcing sampling technique and simple random sampling technique are used to distribute the online questionnaire via social media platforms (WhatsApp, Facebook, and Telegram). Primary recruitment was conducted through targeted social media groups and final recruitment was employed by utilizing a simple random sampling technique to create an unbiased representation of the sample. The minimum sample size for this study was 601, calculated with a 95% confidence interval at a 4% margin error.

The self-administrative and semi-structured questionnaires were aligned based on prior studies and surveys. Mainly COVID-19 hesitancy was assessed utilizing establish questionnaires by Caribbean Development Research Services Inc (CADRES) with the agreement of UNICEF and USAID (UNISEF, 2021). The authors modified the questionnaire to align with the current study objectives and Sri Lankan context. The questionnaire covered the main three sections, including socio-demographic characteristics, vaccine-related information, and knowledge about COVID-19 vaccines. Data analysis was performed using excel and IBM SPSS Statistics Version 24. Descriptive analyses were primarily used to examine the results of research variables which were presented as frequencies and percentages. The study measured vaccine hesitancy for three phases of vaccination, namely: vaccine hesitancy for initial doses, vaccine hesitancy for booster doses, and future

COVID-19 vaccines related to the dependent variable.

### 3. Results

#### A. Background characteristics of the study sample

The results of the study encounter 601 responses gathered between March to May 2022. The current survey has assessed six different types of socio-demographic variables, which are age, gender, marital status, religion, education level, and geographical location of respondents. The total number of respondents is categorized into four main age categories as age 15-19, 20-24, 25-29, and 30-35. The highest number of participants represented the 20-24-year age category which is 52.28%. The gender distribution consists of 50.92% as male and 49.08% as female.

A high proportion (80%) of respondents including the unmarried category, and nearly two-thirds of participants (427, 71.05%) were Buddhist in religion. Others incorporated 11.98% of Christians, 6.16% of Muslims, and 10.82% of Hindus.

Current education levels of young adults in Sri Lanka are categorized under five educational levels and the majority are pursuing bachelor's degrees which are 48.59% while the least prevalence of respondents represents Professional Qualifications with a percentage of 12.98%. Among the five districts that were selected for the study, Colombo has the highest elevated portrayal (26.79%) and the other districts, respectively, 17.30% from Gampaha, 21.80% from Kurunegala, 17.97% from Kandy, and 16.14% from Galle.

#### B. Hesitancy levels of COVID-19 vaccine among young adults in Sri Lanka.

The findings of the qualitative analysis revealed that different types of mental and physical underlying reasons under the fifteen

thematically analyzed themes were behind the COVID-19 vaccine hesitancy among young adults in Sri Lanka.

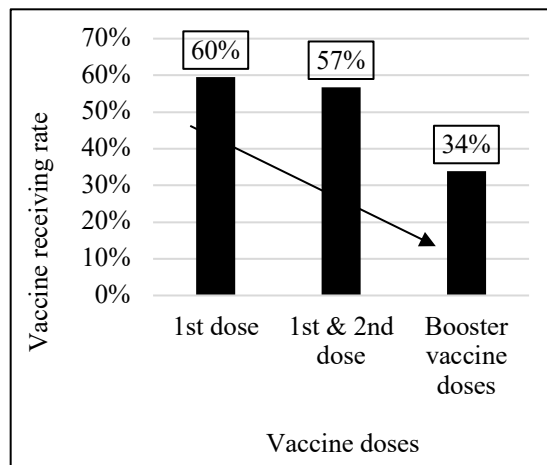


Figure 1. COVID-19 vaccine receiving levels

Source: Based on authors' compilation

Figure 1 demonstrates the COVID-19 vaccine receiving levels among young adults in Sri Lanka. The above chart illustrates the percentage of respondents who have received the COVID-19 vaccine across the three main dosages. According to the figure, 60% of respondents have received at least one dose of any vaccine available in Sri Lanka. Then, 57% of respondents can be identified as fully vaccinated individuals who have received both their 1st and 2nd dose of COVID-19 vaccines.

Figure 2 displays the rate of hesitation for COVID-19 immunizations in each vaccination phase, including initial doses of the COVID-19 vaccine and the booster vaccine stage. As well, as future vaccine perception among the young population in Sri Lanka. During the initial vaccination phase, 63% of the sample had no hesitation about receiving the vaccine, while 37% of the vaccine-eligible sample showed

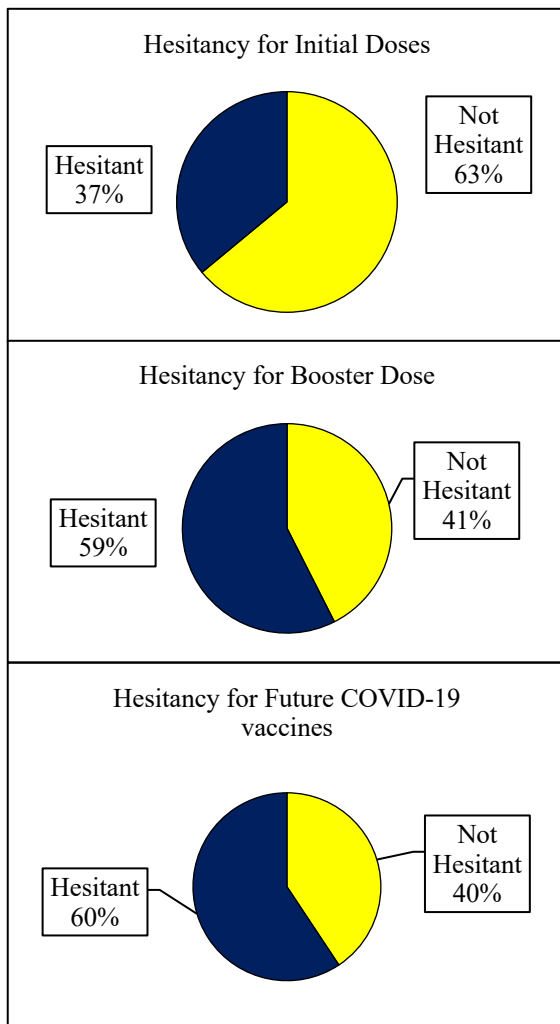


Figure 4 exhibits the concerns that respondents have regarding COVID-19 vaccines. It obviously shows how the respondents reacted to the concerns found in the past literature and its presentation. The highest percentage of concerns are due to side

reluctance towards initial doses of the COVID-19 vaccine. However, when it comes to booster dosages, the percentage of non-hesitant people drops dramatically. The highest proportion of hesitancy was reported in the booster vaccine stage, which is 59%. Furthermore, there is a trend that shows improved reluctance for future vaccines, as shown in the last pie chart, where hesitancy is further raised compared to booster doses discussed.

Figure 2. COVID-19 vaccine hesitancy by dosage

Source: Source: Based on authors' compilation

Figure 3 illustrates the breakdown of vaccine hesitancy based on the vaccine brand received by Sri Lankan young adults. The survey responses indicated that four types of COVID-19 vaccine brands were received by the respondents. As per the results, most of the respondents had received the Sinopharm vaccine with a high prevalence of hesitancy (66%), which represented two-thirds of the proportion compared to other vaccine brands. Furthermore, 24% of Pfizer vaccine recipients were hesitant to receive the vaccine, whereas the Sputnik Vaccine had a lower level of hesitancy, which was only 1%.

effects and allergy issues. It shows a level of 68%. Although the remaining reasons show a tremendous hole of under half, the safety and efficacy issues (33%), misinformation (29%), and concerns with vaccine brand (23%) have managed to be a significant reason for vaccine hesitancy.

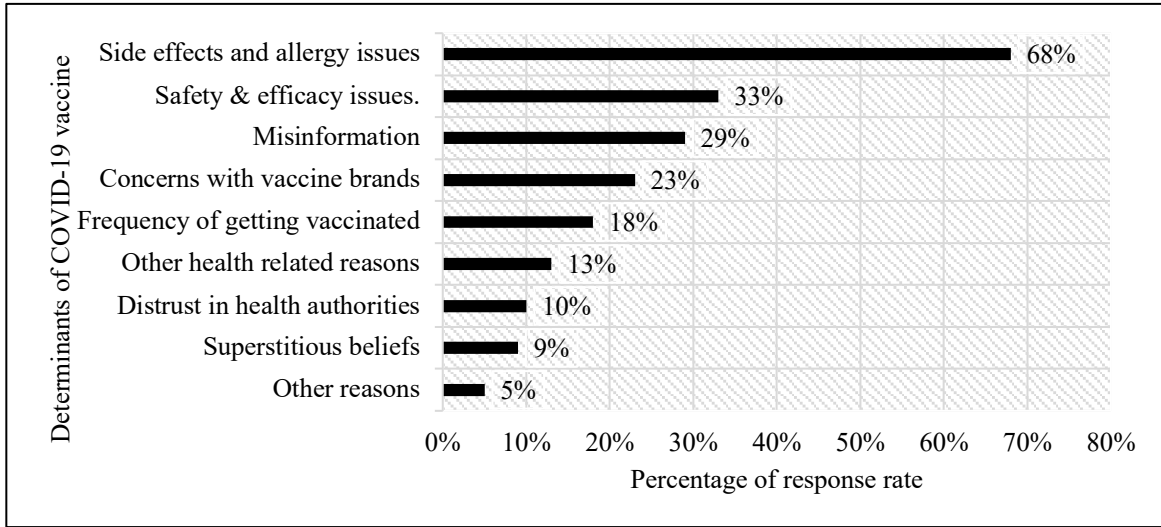


Figure 3. COVID-19 vaccine hesitancy by individual vaccine brand preferences  
 Source: Source: Based on authors' compilation

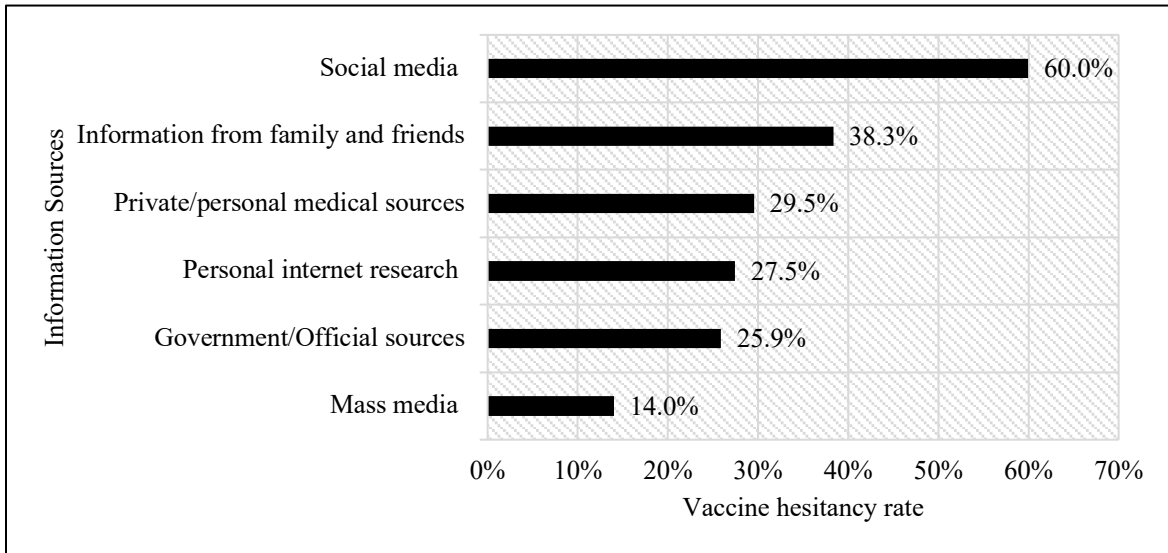


Figure 4. Determinants of COVID-19 vaccine hesitancy  
 Source: Source: Based on authors' compilation

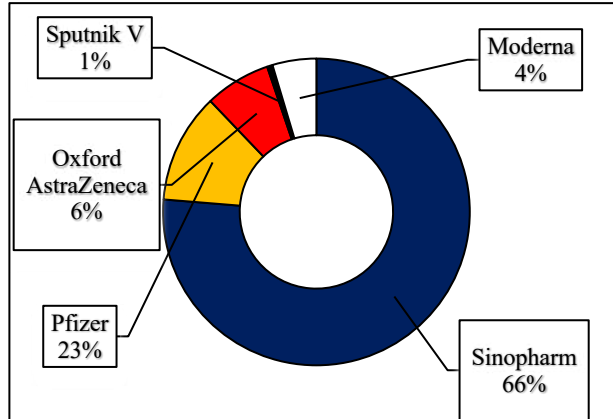


Figure 5. Information sources influenced for COVID-19 vaccine hesitancy  
Source: Source: Based on authors' compilation

*C. Reasons for COVID-19 vaccine hesitancy and acceptance*

Table 1. Factors that changed respondents' minds to be vaccinated

Factors that changed respondents' mind	
It was required from school/university/Place of employment.	34%
I was given more scientific or medical information.	18%
The rapid increase of getting sick/dying from COVID-19.	16%
It was required for me to travel overseas.	11%
It would allow me to access social activities more freely.	10%
It was required by government regulations.	8%
I saw influential people who opposed the vaccine change their decision.	3%

Source: Source: Based on authors' compilation

Table 1 illustrates the factor that changed respondents' minds to be vaccinated among the youth population in Sri Lanka. Additionally, this outcome incorporates the respondents also who were initially hesitant to have

vaccinated but received after for any of the above reasons. According to the findings, the motivation behind why an ever-increasing number of respondents is being immunized is that it has been required in schools, universities, and places of employment. 34% of respondents expressed that reason as their enabling factor for getting vaccinated.

*D. Knowledge and attitudes about vaccination*

In modern days, there are a plethora of ways that information reaches people. Figure 5 depicts the seven primary information sources from which respondents received information, as well as the percentage change in hesitance for each source. According to our research, the highest percentage of hesitancy level is shown by the individuals who use social media as their main source of information. Followed by information received by family and friends which is 38.3%.

Figure 6 demonstrates the knowledge and awareness about novel vaccines against coronavirus among younger generations in Sri Lanka. Knowledge about vaccination was measured by the respondent's awareness of the development of the COVID-19 vaccine, its

effectiveness and efficacy, and the impact of the COVID-19 vaccine on the immunization system. Approximately half of the respondents had no proper awareness of the COVID-19

vaccine, while 61% of participants showed a high level of poor awareness about the development of the novel vaccine.

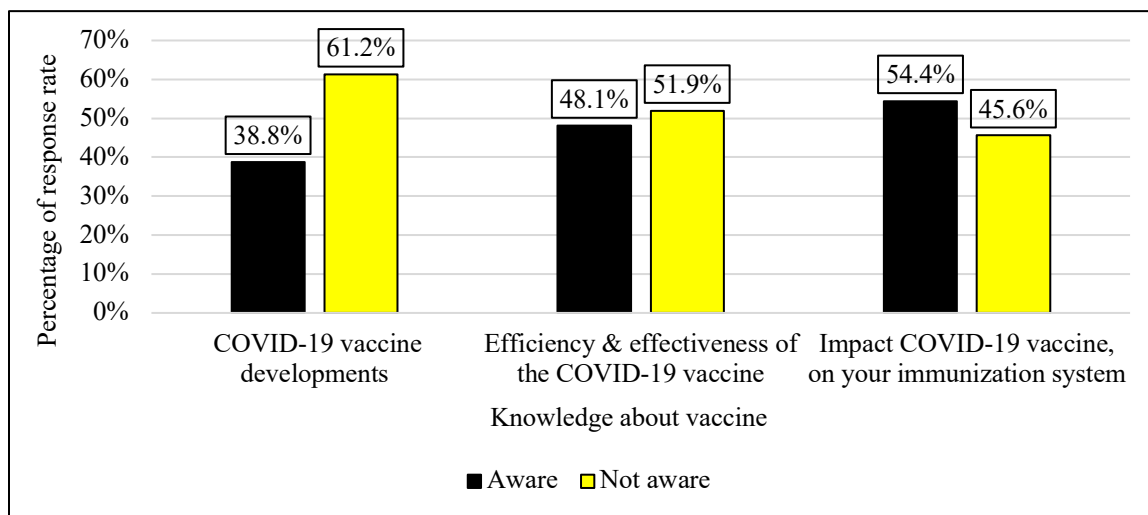


Figure 6. Knowledge & awareness about COVID-19 vaccines

Source: Source: Based on authors' compilation

#### 4. Discussion

Most of the findings that are generated from the study are inextricably linked to previous research, while others were made in opposition to previous findings. The low Coronavirus immunization recognition rate recorded in various countries may pose significant challenges in global efforts to control the current COVID-19 pandemic (Maraqqa et al., 2021).

Vaccine hesitance has been a worldwide worry for quite a long time, and the circumstance is turning out to be more argumentative with the flow of COVID-19 vaccination due to the infodemic and paranoid notions encompassing the infection. Vaccine hesitancy can become under different aspects. Especially South Asian countries encounter different forms of vaccine hesitancies (Hawllader et al., 2022). But,

according to the authors' knowledge, this is the first study that investigates vaccine hesitancy for different doses and evaluates the vaccine hesitancy for upcoming doses for COVID disease. As per the results hesitancy was gradually increased over initial doses, booster doses, and hesitancy for future COVID-19 vaccines.

A special scenario can be identified from those results is respondents showed a low hesitancy level for initial doses and they really wanted to have the vaccine. But the hesitancy has progressively increased as more doses have been prescribed. The frequency of vaccine intake can be attributed to this hesitancy. Therefore, the authors revealed that if it will be available in fourth or fifth doses, Sri Lankan youth might be unvaccinated.

Another aspect of hesitancy is brand preference. It was a highly seeable concern initial stages of the vaccination in Sri Lanka. However, the brand preference severely affected all the COVID immunization programs world widely (Rzymiski et al., 2021). Although brand preference is not available these days, the study explored how people become hesitant about those vaccines based on past brand preferences. Respondents who received Sinopharm revealed a high level of hesitancy (66%) than other brands and it is a great proportion compared to the other brands. Therefore, it can be concluded that the majority of the Sinopharm-received young adults would not have been confident about the vaccine that they had.

Before the presentation of COVID-19 shots in mid-December 2020, generous stresses over the vaccine's safety, viability, and cost were communicated by individuals from varying backgrounds (Fisher et al., 2020). Mainly hesitancy was driven by a bunch of reasons which were revealed by several studies. It was revealed that regardless of the country the reasons for the vaccine hesitancy. According to this study, typically Sri Lankan youngsters' have side effects and allergy issues, safety and efficacy issues, and misinformation regarding vaccination.

When comes to information is the most crucial role of any vaccination program. Because the vaccinated individuals' decisions are entirely based on the accuracy of information (Karabela et al., 2021). Cause of this, the authors paid attention to what sources of information influenced youngsters to be more hesitant. The results revealed that the information received from social media tended to be more hesitant about vaccination. Knowledge is the most critical aspect of taking decisions regarding vaccination. As the underlying driver of hesitancy, it very well may be distinguished, the lack of awareness about

vaccines and understanding of the course of vaccine development (Yan et al., 2021). According to the results, the awareness of vaccines among youth in Sri Lanka is somewhat less (38%, 48%, 54%). Compared to the other South Asian countries it shows some higher value (Mahmud et al., 2021). But some African countries showed high awareness about vaccine development than Sri Lankans (Abebe, Shitu and Mose, 2021).

In any case, regardless of the justification behind this hesitation, the level of getting vaccinated in Sri Lanka was relatively high. The study results also illustrated that 60% of receiving levels for initial doses. It was greater than the study of previous Sri Lankan studies conducted at the end of 2020 (Wijesinghe et al., 2021). Therefore, the study investigated why hesitant respondents were tempted to get the vaccine. According to the respondents' opinion, they tend to receive any COVID-19 vaccine since it was required by any third party. Because the majority stated that they vaccinated cause of requirements made by schools, universities, working places, and government, not only Sri Lanka, but also some African countries showed third-party influence (Abebe, Shitu and Mose, 2021).

The current study has different limitations that should be noted while assessing the outcomes. Regardless, the utilization of an internet-based overview might cause test predisposition, bringing about outcomes that are not generalizable to the overall young population, as confirmed by the shortfall of portrayal from a few territories. From the current study, it had the option to find a great deal that the hesitancy rate is most noteworthy in the young generation.

## 5. Conclusion

This study assessed the hesitancy of COVID-19 vaccination among young Sri Lankans by considering socio-demographic characteristics



and other factors that account for the vaccine. The main reasons for vaccine refusal are side effects and allergy issues, safety and efficacy issues, and misinformation. Most of the hesitant respondents tend to have been vaccinated cause of requirements made by a third party. The current study induced a novel outcome of vaccine hesitancy by assessing vaccine hesitancy along with three phases of vaccination in Sri Lanka, and the results revealed that reluctance to receive vaccine gradually increased through the initial doses, booster doses, and future COVID vaccines. One of the critical advantages of this exploration project is that it has given a clear understanding of the inspiration for individuals to receive available immunizations as well as the justifications for why unvaccinated individuals have decided to stay unvaccinated. It is imperative to address investigated concerns about the novel COVID-19 vaccine by policymakers, demonstrating clear, evidence-based, and transparent communication to achieve adequate vaccine coverage.

## References

Abebe, H., Shitu, S., & Mose, A. (2021). Understanding of COVID-19 vaccine knowledge, attitude, acceptance, and determinates of COVID-19 vaccine acceptance among adult population in Ethiopia. *Infection and Drug Resistance, Volume 14*, 2015–2025.

Dereje, N., Tesfaye, A., Tamene, B., Alemeshet, D., Abe, H., Tesfa, N., Gedion, S., Biruk, T., & Lakew, Y. (2021). COVID-19 Vaccine hesitancy in Addis Ababa, Ethiopia: A mixed-methods study. *Search Life-Sciences Literature*.

Fisher, K. A., Bloomstone, S. J., Walder, J., Crawford, S., Fouayzi, H., & Mazor, K. M. (2020). Attitudes toward a potential SARS-CoV-2 vaccine. *Annals of Internal Medicine, 173*(12), 964–973.

Hawladar, M. D. H., Rahman, M. L., Nazir, A., Ara, T., Haque, M. M. A., Saha, S., Barsha, S. Y., Hossian, M., Matin, K. F., Siddiquea, S. R., Rashid, M. U., Khan, M. A. S., Hossain, M. A., Rahman, M. A., Giri, M., Manna, R. M., Arafat, M. Y., Hasan, S. M. R., Maliha, R., . . . Nabi, M. H. (2022). COVID-19 vaccine acceptance in South Asia: a multi-country study. *International Journal of Infectious Diseases, 114*, 1–10.

Karabela, E. N., Coşkun, F., & Hoşgör, H. (2021). Investigation of the relationships between perceived causes of COVID-19, attitudes towards vaccine and level of trust in information sources from the perspective of Infodemic: the case of Turkey. *BMC Public Health, 21*(1).

Mahmud, S., Mohsin, M., Khan, I. A., Mian, A. U., & Zaman, M. A. (2021). Knowledge, beliefs, attitudes and perceived risk about COVID-19 vaccine and determinants of COVID-19 vaccine acceptance in Bangladesh. *PLOS ONE, 16*(9), e0257096.

Maraqqa, B., Nazzal, Z., Rabi, R., Sarhan, N., Al-Shakhra, K. and Al-Kaila, M., (2021). COVID-19 vaccine hesitancy among health care workers in Palestine: A call for action. *Preventive Medicine*, [online] 149, p.106618.

Rzymiski, P., Zeyland, J., Poniedziałek, B., Małecka, I., & Wysocki, J. (2021). The perception and attitudes toward COVID-19 vaccines: a cross-sectional study in Poland. *Vaccines, 9*(4), 382.

What you need to know about COVID-19 vaccines. (2021). UNICEF Indonesia. <https://www.unicef.org/indonesia/stories/what-you-need-know-about-covid-19-vaccines>

Wijesinghe, M. S. D., Weerasinghe, W. M. P. C., Gunawardana, I., Perera, S. N. S., & Karunapema, R. P. P. (2021). Acceptance of COVID-19 vaccine in Sri Lanka: applying the health belief model to an online survey. *Asia Pacific Journal of Public Health, 33*(5), 598–602.

Yan, E., Lai, D. W. L., & Lee, V. W. P. (2021). Predictors of intention to vaccinate against

COVID-19 in the general public in Hong Kong: findings from a population-based, cross-sectional survey. *Vaccines*, 9(7), 696.

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