

# COVID-19 Vaccination Uptake in Kenya

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## ABSTRACT

SARS-CoV-2 virus is the major cause of viral disease, COVID-19 which is highly infectious, WHO did its roll out for coordination, policy and technical guidance. About 64.5% of the population globally have had one dose of COVID-19 vaccine. Close to vaccines have been administered with 18.3 million daily. In low middle Countries, approximately 14.5% have received atleast a single dose. A number of researches have come up with vaccines to curb COVID-19 disease. A researches conducted among the exposed people -60 years and above, who are frontline workers, health care workers, persons with comorbidities. Different researches have been carried out in different cities like Quantitative data presented descriptively and qualitative, thematically. A number of factors dictated the willingness to take up the vaccine, these included confidence in the vaccine, more than personal factors of participants. The respondents revealed mistrust from most people both in developed and non-developed countries, believe in God's protection and ignorance in vaccine development. On the other hand, peer pressure and effectiveness of the vaccination programmes among childhood diseases contributed to low uptake of the vaccine.

**Conclusion:** attention ought to be given to factors promoting vaccine uptake and misconceptions should be expelled concerning the disease.

**Recommendations:** Strengthen disease surveillance at all stages and regularly updating of COVID-19 data to national level by vaccinating counties, Counties are required to increase researches on more about the disease, use COVID-19 data for decision making in terms of curbing the disease and give refresher course on health care workers surveillance.

**Keywords:** COVID, Kenya, uptake, vaccination.

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## I. BACKGROUND

The quick emerging of corona virus in the late 2019 and early 2020 brought the world to a standstill in terms of health matters. To finish the pandemic, the speed with which the entire world has responded to discover the COVID-19 vaccination has been satisfactory. Over a year now, World Health Organization (WHO) has confirmed coronavirus as a great threat to the whole world [1]. Recently, studies have shown that there are working vaccines to decrease the magnitude of the effects of the disease. Just like any other infectious diseases, vast encouragement of the use of the vaccine in reduction of the effects of the disease is crucial in order for the whole population in the whole world to gain group immunity [2].

COVID-19 vaccination is a personal choice but also a necessity to all as enshrined in the Kenyan constitution and should be taken positively by all as they place a request for it. This is a need and right that so many people don't want to enjoy by refusing to receive the vaccine, one researcher by the name MacDonald describes it as "procrastination in readily available vaccine [3]. Kenya is among the 115 countries and areas to which the UHC (Universal Health Care) in Partnership with various European countries like

Europe, Belgium, France, United Kingdoms in order to achieve health for all through the initiative of Universal Health Care to all the people of the world [4].

### A. Statement of the Problem

Researches have been done on vaccine uptake across several studies in third world countries 15 survey samples in ten low- and middle-income countries (LMICs) i.e Asia, Africa and South America, Russia (an upper-middle-income country) and the United States with 44,260 study persons [5]. These studies have highlighted that there was a positive attitude towards covid 19 vaccine in our LMIC samples (mean 80.3%; median 78%; range 30.1 percentage points) in relation with the United States (mean 64.6%) and Russia (mean 30.4%) [6].

Willingness in vaccination in LMICs is majorly shown willingness in personal responsibility to distance from COVID-19 infection. Some studies have shown that adverse reactions following immunization is a very key factor in vaccine rejection. Hospital/Health personnel are the most important people in advocacy of COVID-19 vaccine [2]. There is proof from these studies that first priority to global distribution of vaccines brings about high appreciation of the need for all to be vaccinated [3]. All strategies put in place to increase vaccine uptake should be geared towards convincing

people to welcome vaccination positively. Social mobilization, vaccine advocacy on importance of vaccination and alleviating anxieties and fears is key in dispelling any misconceptions about the vaccine hence many people will be convinced to receive it in LMICs [7]. Specifically in Kenya, All 47 counties have cumulatively reported cases in the past two years as follows: Nairobi (130966), Kiambu (20158), Mombasa (17937), Nakuru (17057), Uasin Gishu (10543), Kisumu (7798), Machakos (7621), Kajiado (7597), Kilifi (7000), Busia (6538), Siaya (6419), Nyeri (5865), Kericho (5773), Kitui (4893), Murang'a (4441), Kakamega (4200), Meru (4084), Kisii (3720), Migori (3352), Laikipia (3219), Bungoma (3150), Makueni (3075), Nyandarua (2986), Turkana (2667), Garissa (2665), Embu (2634), Trans Nzoia (2365), Nandi (2360), Kirinyaga (2257), Homa Bay (2113), Nyamira (2080), Taita Taveta (2046), Baringo (1682), Bomet (1678), Narok (1370), Kwale (1344), Tharaka Nithi (1241), Vihiga (1096), Marsabit (997), West pokot (855), Isiolo (773), Lamu (770), Elgeyo Marakwet (532), Tana River (409), Samburu (315), and Wajir (300) [8]-[10]. The rise in statistical infections is evident enough that there is need for mass vaccination coverage to give herd immunity to all [10].

## B. Study Objectives

### 1) Broad objective

This is a desktop review to investigate the COVID-19 vaccination uptake globally.

### 2) Specific objectives

1. To identify scope and trends in COVID-19 vaccination globally
2. To investigate factors promoting reluctance of COVID-19 vaccination
3. To explore strategies promoting COVID-19 uptake

## C. Research Questions

1. What is the scope and trend in COVID-19 vaccination globally?
2. Which factors promote reluctance of COVID-19 vaccination uptake?
3. What strategies employed in increasing COVID-19 vaccination uptake?

## II. LITERATURE REVIEW

### A. Introduction

This chapter presents information according to the three specific objectives as follows.

#### 1) Scope and trends in COVID-19 globally

The current world problem (COVID-19) has seen 257 million people, 5.1 million perished. Both curative and preventive measures were put in place to reduce infections of confirmed cases and reduce case fatalities [5]. However, the preventive measures to solve this problem failed over a period of time. Therefore, it is important to reach group immunity in order to reduce infections. Allowing nature to take its path by exposing many people to the disease by not availing vaccines can give rise to a very serious problem like depleting health resources and resulting to a huge number of deaths, up to 30 million of people [11]. All immunizations not necessarily COVID-19 are key means in curbing faster spread of viral

diseases and reduce deaths yearly. Despite the negative attitude towards vaccination, many vaccinating programs have been on an upward trajectory in curbing many infectious diseases [12]. Today there are different types of vaccines administered [13].

The available COVID-19 vaccines have been listed for use by WHO [14]. They give rise to adverse undesirable effects following immunization from insignificant to severe which can include death but in rare cases. However, studies have shown that all vaccines are harmless with (60-95%) success rate. The vaccines prevent the infection from becoming worse. Large population vaccination programs have been into being but their success has been hampered by refusal of some people to receive the vaccine jab [5].

In a clinical setting, COVID-19 vaccination programs focus on reduction of mortality, hospitalization, and serious illness. Basing on the WHO Worldwide COVID-19 Vaccination plans and expecting one or more useful vaccines in the coming days which would depend on important initial supply deterrents, the National Vaccines and Immunization programme (NVIP) set out to provide vaccine supply fairly and equitably [12]. The World Health Organization ensured that by end of 2021, approximately 20% of the world's population would have received vaccination of about 2 billion doses [15]. This would be enough to vaccinate the vulnerable and with co morbidity ailments against a severe disease and death [5].

#### 2) Contributing factors to low uptake of COVID-19 vaccine

Sluggishness in receiving COVID-19 vaccines is witnessed all over the world. Studies have come up with reasons for vaccine refusal in different set ups including individual reasons. COVID-19 preventive measures, and the perceived adverse effects of the vaccines [16]. Despite the reluctance, there is need for vaccines for some time, differences in vaccine accessing the country and outside is important. COVID-19 cases have been on an upward trajectory in Sub Saharan Africa Southeast Asian countries, and the COVID-19 pandemic affecting the lives of everyone, including health care workers, in various ways, including mental health [17].

A number of researchers as expressed in various journals did numerous studies to examine the COVID-19 vaccine successfulness, uptake, and refusal in compared to Southeast Asian countries. They evaluated reasons for reluctance in receiving vaccination. They have been trying to curb the spread in various ways, including mass vaccination. Considering what triggers vaccination acceptance is important in scaling up acceptance to reduce infections. Unfortunately, similar studies to COVID-19 vaccine refusal have been narrowed down in relation to these nations. Though started with AstraZeneca in the first phase, Pfizer, Sinovac, and Covax vaccines are accessible in East Asian countries. The refusal to receive the COVID-19 vaccine may be an obstacle curbing spread of COVID-19 disease and the world need for vaccines [18]. To solve this problem and look for solutions in scaling up COVID-19 vaccination uptake [17].

### 3) Strategies used to scale up covid 19 vaccine uptake

These solutions briefly outlined the urgent interventions needed by the world to vaccinate large number of people against COVID-19 by mid-2022. The aim is to scale up broad protection among the people worldwide in order to prevent adverse effects [19]. COVID-19 vaccines can only be effective in ending infections if globally people can work together in a hasty way maximizing the ways of utilizing the few vaccines available. Studies have shown the significance keeping away from rumors concerning the disease. This trend illicit divisions that further ignites the issue. Researches on vaccine refusal is key in finding the root cause of the refusal [20]. Social mobilization is key in sensitization of the need for the [16]. The following were employed to increase vaccine uptake. Established avenues such as stakeholders meetings, advocacy, campaigns, public address system announcements were key in sensitization of people on the need for, dispelling rumors and misconceptions on the vaccine safety and use of mass media to sensitize multitudes of people e.g use of media such as Facebook, WhatsApp groups [19].

## III. RESEARCH METHODS

### A. Study Area

Hospitals in middle- and low-income countries.

### B. Study Design

This was a desk top review of a number of cross-sectional studies.

### C. Data Collection Tools

Self-administered questionnaires distributed with anonymity were used by researchers. Research team prepared

questionnaires in the language familiar to participants in areas of research, validated for reliability [21]. Content validity index used to test for validity of the study. Half split test used to test for reliability [22]. Closed ended questions employed to examine participants' perception on COVID-19 vaccine efficacy, approval, and factors thought to be necessary for deciding whether to acknowledge COVID-19 vaccines [23].

### D. Statistical Analyses

The articles under review used Statistical Product and Service Solutions (SPSS) 24.0. Data presented in form of frequencies and proportions. Pearson's Chi-square test was used to measure association amid socio-demographics and the COVID-19 vaccine-associated variables and between-country differences. All variables related with vaccine indecision in bivariate analyses at a level of  $p$  value  $< 0.05$  were included in the multivariable regression analyses [24].

## IV. RESULTS

### A. Epidemiological Results

A total of 323,383 established cases and 5,647 deaths (CFR 1.7%) have been enlisted. Fig. 1 and 2 below shows trends of victims and deaths for the last one year [25].

### B. Laboratory Testing

Evidence of reducing pandemic is when less than 5% of available samples test negative for two consecutive weeks with comprehensive scrutiny and investigation rate of suspected victims, is most favorable at least 1/1000 population/week. The laboratory investigation rate is at 73643.2 samples per 1,000,000 people. Fig. 3 shows the weekly investigation rate/1000 people /week for the last one year [26].

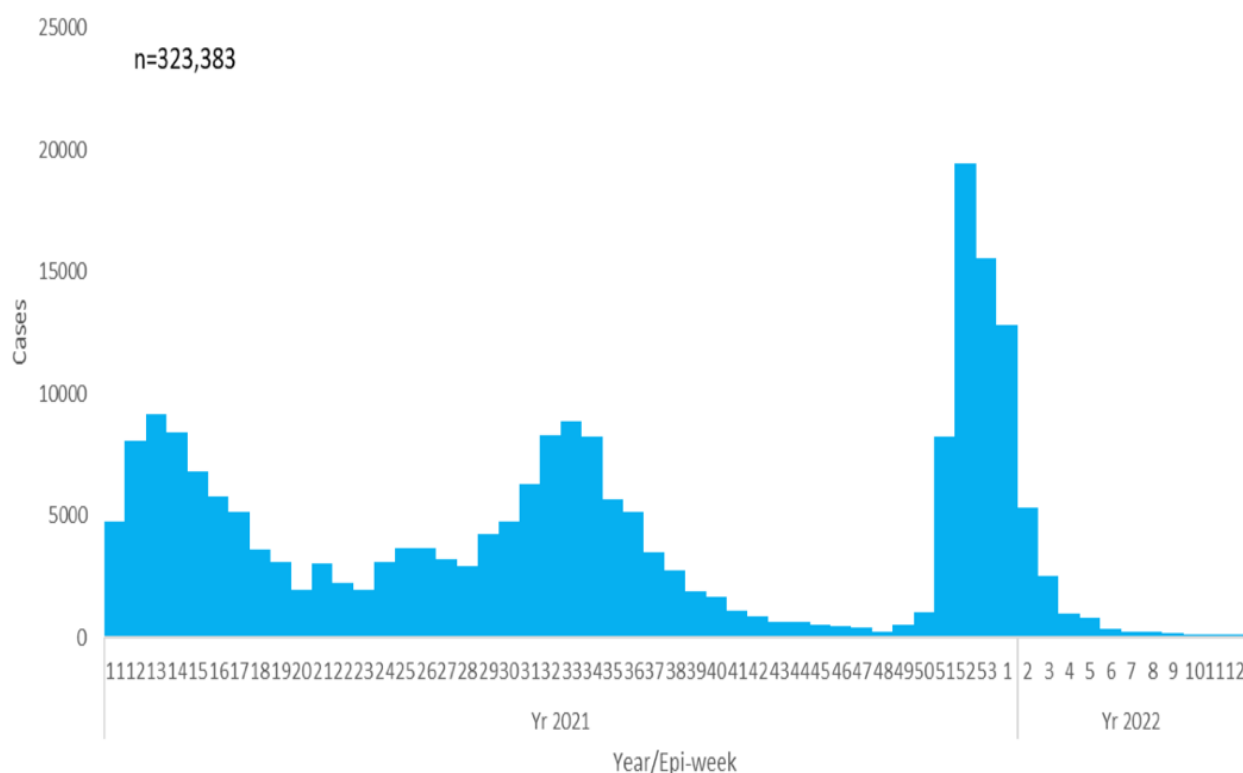


Fig. 1. COVID-19 cases recorded weekly per year.

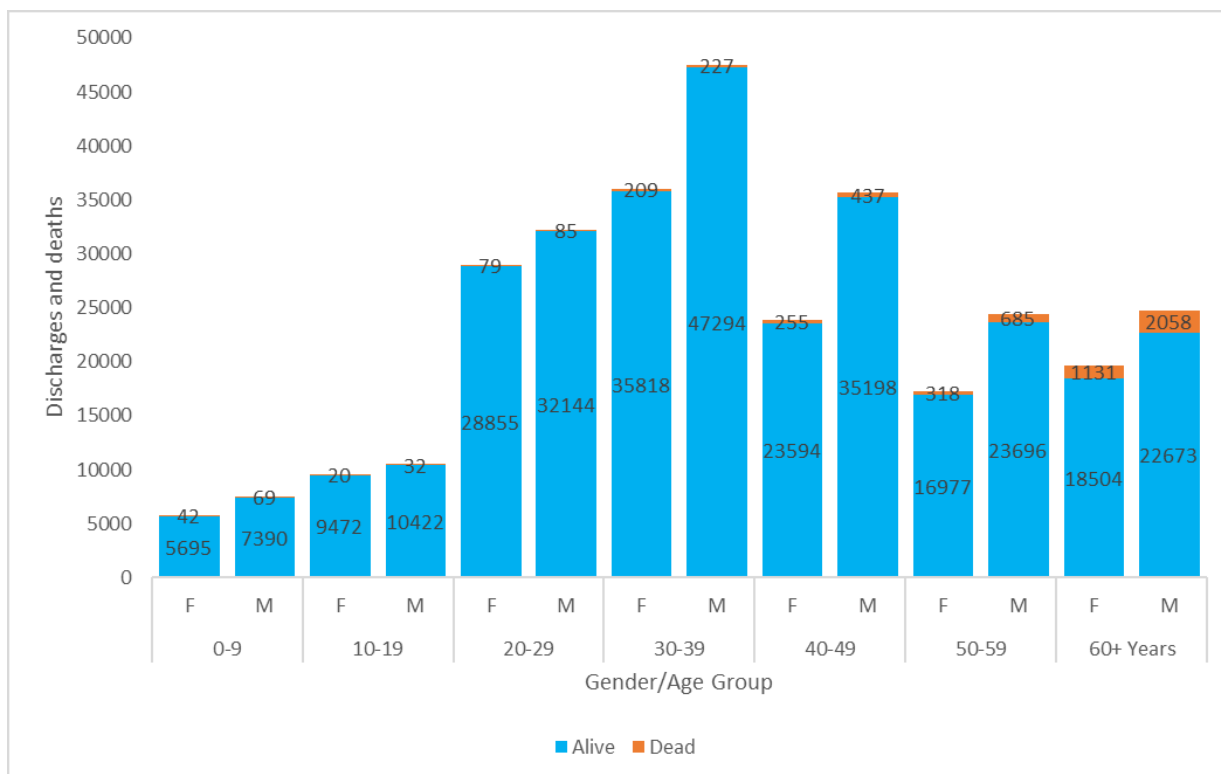


Fig. 2. The age and sex distribution of COVID-19 cases by the outcome.

C. COVID Confirmed Cases and Deaths by Age and Sex

A sum of 182,414 (56%) of the collective victims are males and 140,969 (44%) are females. Majority cases, 83,549 (26%) are in between 30-39 years. Of the 5647 collective deaths, 3,593 (64%) are males and 2,054 (36%) are females [27].

D. Kenya COVID-19 Vaccination Updates [28]

Partially vaccinated: Adults- 2,715,613 15 to <18 years- 831,632

The Kenya Ministry of Health launched the National COVID-19 vaccinations on the 5th of March 2021. As of 27th March 2022, a total of 2,715,613 people were vaccinated with the 1<sup>st</sup> dose, and 8,054,612 persons were completely vaccinated.

TABLE I: VACCINE DOSES DISPENSED AS OF 27<sup>TH</sup> MARCH 2022 VACCINE

	Total doses Administered
Partially vaccinated adults	2,715,613
Fully vaccinated adults	8,054,612
Booster doses	276,497
Sum doses (All Vaccines + Sputnik)	17,535,200
Partly Vaccinated 15- below 18 years	831,632
Completely Vaccinated 15- below 18 years	189,094
% of adults fully vaccinated	29.6%

The highest proportion of fully vaccinated people is Nyeri with 50.0% and the lowest is Marsabit with 9.6%. Factors associated with uptake of COVID-19 vaccination from the bivariate scrutiny (Table I) on the uptake of COVID-19 vaccination was related to current employment condition ( $p<0.002$ ), perceived health status ( $p<0.003$ ), perceived mental health status ( $p<0.001$ ), in touch with the obvious suspected case(s) of COVID-19 ( $p<0.019$ ), presumed contact to COVID-19 ( $p=0.004$ ), perceived knowledge of COVID-19 ( $p<0.002$ ), alleged awareness of COVID-19 vaccines

( $p<0.001$ ), healthcare providers as a basis of awareness about COVID-19 ( $p=0.004$ ), healthcare providers ( $p=0.016$ ) and flyers, posters, and other written materials ( $p=0.003$ ) as basis of knowledge about COVID-19 vaccines, perception about family members being at risk of COVID-19 infection ( $p=0.031$ ), and buoyancy in shielding themselves against COVID-19 ( $p=0.032$ ) [27].

The outcome from backward multivariable logistic regression scrutiny revealed that the participants whose jobs were preceded by COVID-19 (OR 4.93, 95% CI 1.18 to 19.76), had an income foundation (OR 2.00, 95% CI 1.19 to 3.62), perceived good/excellent physical health positions (OR 5.09, 95% CI 1.17 to 22.08), perceived experience to COVID-19 (OR 2.69, 95% CI 1.28 to 5.65), perceived to have good/excellent awareness of COVID-19 (OR 2.65, 95% CI 1.43 to 4.93), reported learning about COVID-19 vaccines from flyers, posters and other written materials (OR 1.95, 95% CI 1.05 to 3.63), and alleged their family was in danger of COVID-19 infection (OR 4.02, 95% CI 1.08 to 14.87) were positively related to vaccination uptake. On the other hand those who reported learning about COVID-19 from the internet were less expected to receive a COVID-19 vaccine (OR 0.50, 95% CI 0.26 to 0.98) [27].

V. DISCUSSION

A. Scope and Trends in COVID-19

Several studies have been done to find out contributing factors promoting vaccination among the population during this period of the pandemic globally. In sampled studies, Close to 70% of the participants received at least one dose of the vaccine, which is higher than the officially announced vaccination uptake rate (~50%) two local cross-sectional studies during the same study period [29]. However, as much as there were those who welcomed the vaccination, still there

were persons who were not ready to be vaccinated within the period of study. Pointed out reluctance of vaccine uptake in our participants. This result reflected other local public health studies in which the major fears by those avoid the vaccine were adverse effects and safety [30]. It was well recognized or cause of vaccine hesitancy globally. This shows a lot has to be done in public knowledge with evidence-based messages on the efficacy of the COVID-19 vaccine in order to influence decisions to accept the vaccination [31].

Studies have established that employment was the common socio-demographic cause influencing vaccine uptake on the upward trajectory [32]. Most employers like vaccination compared to testing and treating workers before hiring them. Unvaccinated employees were compelled to pay for scrutiny often which affirmed to be more costly than receiving vaccination [9]. Similarly, several of studies have shown that unemployed people who do not seek for any job did not go for vaccinated [33]. This shows that vaccination campaigns may efficiently highlight vaccination's financial or economic profit to the employed population (such as resuming normal business conditions and more job opportunities). However, efforts should also be done to support the various importance of vaccination to the unemployed population, such as a steady return to normal life after achieving group immunity [19].

#### B. Factors Influencing COVI-19 Vaccine Uptake

This research highlighted several knowledge-related reasons influencing vaccination uptake. In the bivariate analysis, both professed awareness of COVID-19 and its vaccines were linked to vaccination uptake, but only alleged knowledge of COVID-19 is an important reason [19] in the multivariable model. Likewise, a recent British population-based survey showed that the insight of adequate information/knowledge about COVID-19 and the vaccine was positively linked with the purpose of vaccination [20]. from information sources, our study found that those who learnt about the COVID-19 vaccines through promotional materials, posters, and other printed materials were more likely to receive the vaccine [34]. In [34] fascinatingly, those who alleged they learnt from the internet were less likely to be vaccinated. One likely alludation for these findings is that printed materials are more likely to be manufactured by authoritative bodies. Past studies also highlighted the rumors led healthcare professionals to get information from accurate and exact source [35]. A recent randomized controlled trial in the UK and the USA recommended that experience to online misinformation can decrease the public's purpose to vaccinate [36].

In line with the results that shielding friends and family is the main reason for vaccination, Studies established that persons who professed their family members were at in danger of being infected with COVID-19 were more likely to be vaccinated than those who have not recorded this experience [5]. Likewise, a number of reports revealed that reflection of others, especially nuclear family, following dander of COVID-19 affects vaccination purpose taken together, these findings suggest that vaccination promotion messages should enforce the general importance of vaccination to benefit others and society at large, for example, the efficacy of vaccination in decreasing the infection risk at

individual and collective levels [37]. In this research, people's feelings of COVID-19 exposure independently predicted their vaccination recipiency. To our knowledge, this factor has not been reported as an analyst of vaccination perception or acceptance in previous studies. It can be suspected that those who felt that they are prone to the COVID-19 may not feel the need of vaccination, leading to vaccine delay [16]. Remarkably, the final fall off model was understood to have good/excellent physical health status was the major factor for vaccination uptake [37]. Similarly, this factor has been found to envisage the meaning of vaccination against COVID-19 among the general population in China. and real vaccination uptake in a sample of the elderly population in Germany. Our multi-country study of six countries of the Southeast Asian region gives essential insight into the feeling of COVID-19 vaccines, hesitancy, and factors associated with delay in the vaccine uptake [37]. Most respondents believed that vaccination efficiently prevents and controls COVID-19 and would accept COVID-19 vaccines when they become accessible [11]. They agreed that health providers' advice, vaccination convenience, and vaccine costs are essential for deciding whether to accept COVID-19 vaccines. However, about half articulated their hesitancy to receive the COVID-19 vaccines. The highest rate of vaccine hesitancy has been observed in Russia (72%), whereas the lowest in Vietnam (27%). Studies have identified several socio-demographic factors associated with hesitancy in COVID-19 vaccine uptake, including age, residential area, education level, family economic status, employment status, and country of residence [13]. Similarly, rural residents had a higher level of hesitation in the COVID-19 vaccine than urban residents. These findings are similar to other studies conducted in Bangladesh and Philippines. Higher levels of accessibility, affordability, education, and standard of living are related to vaccine acceptability among people living in urban areas [36]. Having more exposure to the different sources of information, urban residents can create more comprehensive access to more accurate information through media and other reliable sources regarding vaccines [9]. Exposure to negative information about the vaccines was associated with a high level of vaccine hesitancy in Philippines. There is the need for accurate information on the COVID-19 vaccine, which is very important for its proper management [38]. Education level was also associated with hesitancy in COVID-19 uptake in this study. People with tertiary education were more likely to support COVID-19 vaccines' effectiveness and uptake than those with lower education. They were also more likely to believe that vaccination expediency, health providers' advice, and costs of vaccines are important for people to decide whether to receive COVID-19 vaccines. Similarly, people with less education more delayed when asked whether they would accept COVID-19 vaccines than people with tertiary education [49]. Higher educated persons have better knowledge about the vaccines and vaccination process, which creates more heightened regarding the risks and benefits of the vaccination [20]. The level of delay decreases when the level of awareness about the COVID-19 vaccine and its associated processes increases. Better knowledge of the vaccination development was a significant factor associated

with vaccine hesitancy in previous studies in Bangladesh, Malaysia, India, Kenya, Myanmar, and Thailand [40].

## VI. RECOMMENDATIONS

### A. To the Civil Society, Community Organizations, and the Private Sector

Advocate locally, nationally and internationally for fair access to COVID-19 vaccines, tests and treatments, calling for and monitoring the specific actions required of manufacturers, governments and multilateral actors. Organize and allow communities, including through social media and community networks, to create strong vaccine need and tackle rumors and myths leading to vaccine delay. Give support to the in-country delivery of vaccination programs. Continue to enable countries to more rapidly access the capital and external support needed for in-country programmatic vaccine delivery, prioritizing low-income settings and especially targeting support to the technical, logistics and human capital required. Connect even more fully with COVAX/ACT-Accelerator and AVAT, with incorporated operations and real-time sharing of information to maximally support equitable access. Support international procurement and allocation mechanisms to allow all countries to accomplish the COVID-19 vaccine targets justifiably, resourcefully and swiftly. Maintain vaccine distribution plans and a fight to communicate the life-saving magnitude of approved COVID-19 vaccinations.

### B. Strengths and Confines

Despite these strengths, this study has several limitations. Response biases could be one of the critical limitations of the study. In addition, data were collected using the snowball technique, which could hamper the heterogeneity in the sample [4]. Another significant limitation is the representativeness of the sample population. A higher proportion of the sampled population were highly educated and residing in urban areas. Since, indecision was slightly lower among educated and urban residents, overrepresentation of these groups could lead to underestimation of vaccine hesitancy [41].

## VII. CONCLUSION

This research provides a vital understanding of the populations' perception required to design effective COVID-19 vaccine programs in Southeast Asia. Further studies on COVID-19 vaccine acceptance and delay should be a priority. We can use the studies' results to inform contextualized vaccination programs and information-sharing, ultimately resulting in increased confidence in and uptake of the available vaccines [18].

## CONFLICT OF INTEREST

Authors declare that they do not have any conflict of interest.

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