



COVID-19 Vaccine Uptake and Associated Factors among Healthcare Workers in Lower Juba Region of Jubaland State in Somalia

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Background: Somalia's health systems were weakened by decades of conflicts, and this was made worse by the coronavirus pandemic that hit the nation like the rest of the world. Despite the existence of different types of COVID-19 vaccines, there has been a reluctance to take the vaccine by the general population and ironically by healthcare workers.

Objective: The purpose of this study was to evaluate the uptake of the COVID-19 vaccine in the Lower Juba Region of the Jubaland State in Somalia among healthcare providers.

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Methods: The research study used a quantitative descriptive design to describe the levels of COVID-19 vaccine uptake among healthcare workers. The study recruited 191 study respondents. Stratified and simple random sampling methods were used. All the significance tests were conducted with two tails, and the threshold for statistical significance was set at P less than 0.05.

Results: From this study, 46.6% of the study respondents had been vaccinated with the Covid-19 vaccine. Among the vaccinated group, 55.1% (49) received astrazeneca vaccine, 52.8% (47) received received 2 doses and males made up 51.5% (52). Regression analysis revealed that the observed differences in covid vaccine uptake for age, gender, education and work experience are not statistically significant. Trust in the protection of the vaccines (61.5%) and influence from family and friends (55.1%) were rated as having the highest influence on the participants' decision to be vaccinated against covid.

Conclusion: From this research, close to half of the study respondents had been vaccinated with COVID-19 vaccines. No significant differences have been shown in different gender, age groups, education level work experience on vaccination status. Building trust for vaccines, encouraging family/friends support and making vaccines easily accessible are seen as ways to improve uptake.

Keywords: COVID-19; vaccine; vaccine uptake; vaccination; Somalia; HCWs.

1. INTRODUCTION

In late winter 2019-2020, unidentified pneumonia cases emerged in Hubei, China. COVID-19 was later described as the causal culprit [1]. In the weeks and months that followed, the virus became a global pandemic. It was initially considered as pneumonia of unknown cause. It spread faster, within China and the rest of the world. On the 30th of January 2020, the WHO proclaimed an international concern in the public health emergency, and then on the 11th of March 2020, they declared it a pandemic [2]. As of 10th March 2022, there were more than 451 million cases in the world with more than 6 million deaths worldwide. The Somali government's first case was announced on March 16th, 2020 in Mogadishu and the first death was reported on April 8 same year. As of 10 March 2022, the country had recorded 26,400 cases and 1,348 deaths. There is a weak infrastructure in Somalia's healthcare; The Health Security Global Index puts Somalia at 194th out of 195 countries [3].

The effects of the virus were enormous ranging from loss of lives to restriction of movements. As the virus mutated, even the young were not spared the severe disease requiring hospitalization and ICU care. No cure was found but several supportive treatments were tried with some success [4]. The development of the vaccine was also hastened by COVAX leading to several different vaccine types being approved for use globally (Ibrahim et al., 2021). Vaccines provide the best public health protection, but only if they are widely used. In the present COVID-19 pandemic, significant vaccination coverage is

required to provide indirect public protection, restore society to normalcy, and reopen the world's economy (Al Mutair et al., 2020). The first coronavirus vaccinations arrived in Somalia from China on April 11, 2021. Healthcare workers were given priority in the mass vaccination exercise. If health professionals are not safeguarded, healthcare systems will likely be overburdened, and the most vulnerable children and women in the states will continue to be denied access to essential services, jeopardizing decades of growth and causing the children from poor to fall farther behind [5]. As of 11th March 2022, almost a year later, 1.84 million doses were administered with 938,000 being fully vaccinated. This meant that 5.9% of the targeted people were vaccinated, far lower than the global average of 56.16% [6]. The vaccination exercise targeted at-risk groups and other frontline staff like healthcare workers, the elderly (above 65), those with chronic illnesses, teachers, and the security forces [7].

The reluctance to uptake is much more widespread in the African continent, which already suffers from inadequate healthcare infrastructure and a shortage of medical professionals. The World Health Organization (WHO) announced in November 2021 that only 27% of health workers in Africa had received the full COVID-19 vaccination [8]. This means that the majority of the workforce that is working on the frontlines of the pandemic is not protected. Based on an analysis of the data that was submitted by 25 nations, the findings indicate that only 1.3 million health workers as of March 2021 can be classified as fully vaccinated [9]. Countries that have reached 90% or more were

only six, while those with less than 40% of their health workers fully vaccinated were nine countries. In stark contrast, the World Health Organization (WHO) conducted a global assessment of 22 nations, the majority of which have high incomes, and found that more than 80 percent of their healthcare staff are fully vaccinated [10].

Hospitals have tried several methods to raise worker vaccination rates. Some hospitals employ circulating carts to deliver immunizations to staff briefing or nursing stations [11]. Vaccine decliners may be required to sign waivers admitting the danger they are taking for their patients and themselves or to wear protective suits during this season. All of these methods are intended to make vaccination as easy as feasible, and avoidance as difficult [11]. Unfortunately, even though these measures to attain voluntary compliance have been shown to enhance vaccine uptake slightly, vaccination rates remain below 50% (Adedeji-Adenola et al., 2022). Despite the demonstration by research that vaccines are safe, there is growing skepticism about immunization. Vaccine hesitancy has led to a decrease in vaccine uptake as well as an increased prevalence of diseases preventable by vaccines, both of which are concerning. Hesitancy in vaccination is a significant impediment to the development of herd immunity. Somalia has been hampered by decades of insecurity which limited movement within the country, limited resources to procure or transport vaccines, largely uneducated population and unregulated health facilities that will not enforce government directives. These played a large role in access to and acceptance of covid-19 vaccines.

Given all of this, the study's purpose was to examine the COVID-19 Vaccine uptake among healthcare workers in the lower Juba region of Jubaland state in Somalia.

2. METHODOLOGY

2.1 Research Design

A descriptive research design was selected for this study.

2.2 Study Area

The Lower Juba region of the Jubaland state located in the Somalia region served as the location of this study's data collection. In

southern Somalia, the administrative region is known as Lower Juba. Lower Juba is bordered to the north by Middle Juba and Gedo, to the west by Kenya, to the northeast by Middle Juba, and to the east by the Indian Ocean. There are four districts in this region, and their names are Badhaadhe, Afmadow, Jamaame, and Kismaayo.

2.3 Study Population

The population targeted was 359 healthcare workers. There are 21 health facilities in the lower Juba region of Jubaland state in Somalia with a total of 359 healthcare workers.

2.4 Sample Size Determination

The number of sample respondents was calculated using Slovin's formula for the known population with a population of 359, a confidence interval at 95 percent and setting the margin of error at 5 percent. This resulted in a sample size of 189.

$$n = \frac{N}{1 + \frac{Ne^2}{359}}$$
$$n = \frac{359}{1 + 359 \times 0.05^2}$$
$$n = \frac{359}{1.8975} = 189$$

2.5 Sampling Technique

Stratified and proportionate sampling procedures were used to allocate the respective quota for each district out of the 191 sample sizes. Sample sizes were first allocated to districts based on the proportion of health workers in that district. Within each district, they were further allocated by gender based on the proportion of health workers in that district per gender. The sample includes doctors, nurses, midwives, laboratory technicians, pharmacy technicians, and their assistants.

2.6 Data Collection Method and Instruments

For this study, primary data was utilized, and it was gathered utilizing an online close-ended and structured questionnaire. The WHO BeSD model for HCWs' vaccination uptake was modified for the survey guide. The researcher developed a poll that was completed anonymously online. An invitation to participate in the survey along with

the questionnaire web link was distributed by utilizing Google Forms and sending it to the selected participants through email or WhatsApp. This was done through the District Medical officers in each district.

2.7 Data Processing and Analysis

The majority of the data from the study was descriptive data. After coding the data, the researcher then checked for any potential errors, incompleteness, or inappropriate data. The cleaned data was loaded and imported onto an SPSS version 21 software where the analyzed data was retrieved. To determine the determinants of vaccine uptake among the HCWs, a multivariable logistic regression analysis was additionally carried out. Based on the data analysis completed, the conclusion was postulated.

3. RESULTS

3.1 Rates of Uptake by Healthcare Workers of the 1st and 2nd Doses of COVID-19 Vaccine

According to Fig. 1, 89 of the respondents representing 46.6% of the interviewees have been vaccinated against COVID-19.

3.2 Types of COVID-19 Vaccines Taken

As indicated in Fig. 2, According to the findings, only AstraZeneca and Jansen vaccines were taken by the respondents. Respondents who took the AstraZeneca vaccine were 49 representing 55.1% and the rest took Jansen vaccine.

Have you received any vaccination against COVID-19? (Waligaa maqaadatay talaalka COVID-19?)
191 responses

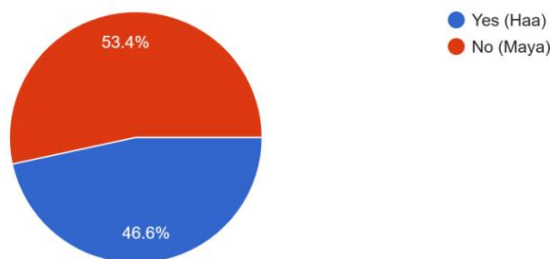


Fig. 1. COVID-19 vaccine uptake

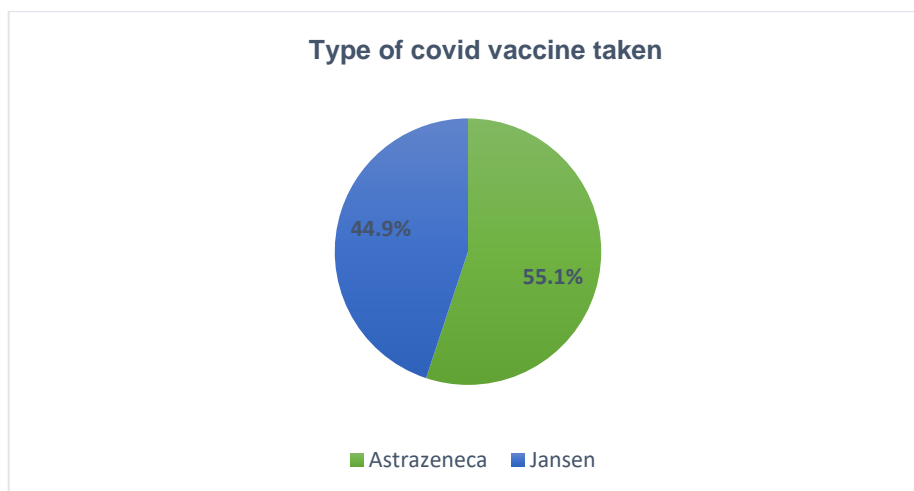


Fig. 2. Type of COVID-19 vaccines taken

3.3 Number of COVID-19 Doses Taken

As indicated in Fig. 3, Most of the respondents (47) representing 52.8% had received two doses while the remaining 42 respondents representing 47.2% had taken one dose only.

3.4 Social Demographic Characteristics of the Study Respondents

It was required of the respondents that they identify their gender. According to the examination of the collected data, 101 out of the 191 people who responded to the question were male. This accounted for 52.9% of responses. The data collected indicated that the majority of the respondents representing 107 (56%) worked in Kismayo, 130 (68.1%) had a work experience

of more than 2 years as shown in Fig. 4, 66 (34.6%), had a degree and 52.9% earn around 201-400 USD.

3.5 Social Demographic Characteristics Associated with the Uptake of the COVID-19 Vaccine

Regression analysis was done to check whether the observed differences in age, gender, education and work experiences were significant. Results are as shown in Table 2.

Each of these variables has a p-value larger than 0.05, suggesting that the observed differences in the sample may be the result of random variation rather than real differences in the larger population.

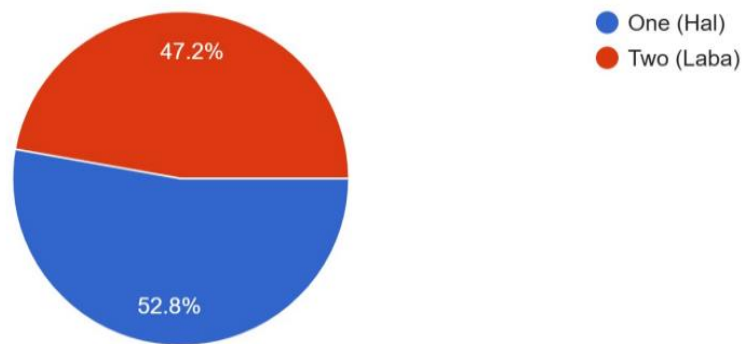


Fig. 3. Number of doses of COVID-19 vaccine taken by the respondents

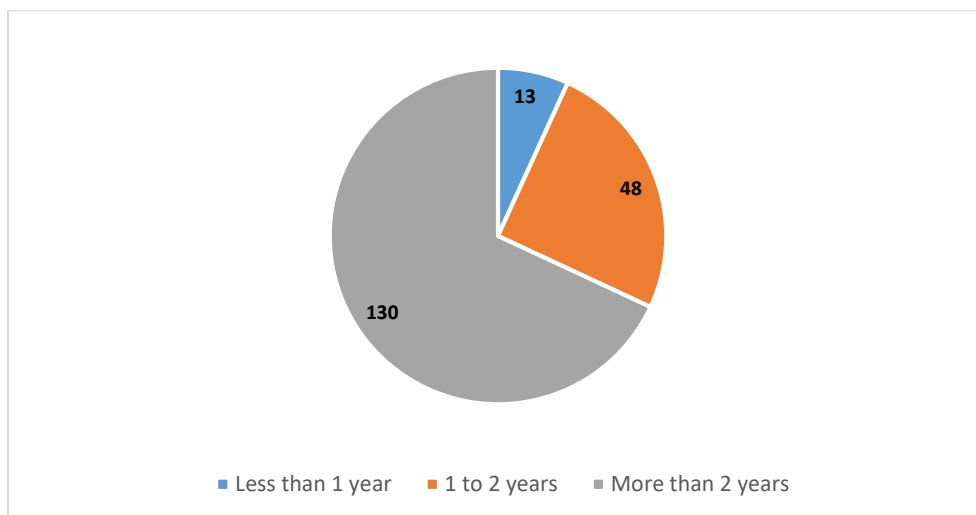


Fig. 4. Level of experience of the respondents

Table 1. Social Demographic Characteristics of the Study Respondents

Variable	Categories	Frequency	Valid Percentage%
Age	< 21 years	15	7.9
	21-30 years	76	39.8
	31-40 years	62	32.5
	41-50years	30	15.7
	Over 50years	8	4.1
Gender	Male	101	52.9
	Female	90	47.1
Workstation	Kismayo	107	56
	Afmadhow	68	35.6
	Badhadhe	16	8.4
Work experience	Less than 1 year	13	6.8
	1 to 2 years	48	25.1
	More than 2 years	130	68.1
Education level	High school	13	6.8
	diploma	63	32.9
	Undergraduate	66	34.6
	professional	49	25.7
Income	Less than 200 usd	26	13.6
	201-400 usd	101	52.9
	401-600 usd	44	23
	601-1000 usd	9	5
	More than 1000usd	11	5.5

Table 2. Regression analysis on Demographic characteristics and covid-19 vaccination status

	Odds Ratio	95% C.I	p Value
Gender			
Male	1.3958	0.7878 to 2.473	0.2532
Female	Ref		
Age of respondents			
20 years and below	Ref		
21-50 years	2.6221	0.8027 to 8.5649	0.1105
Above 50 years	1.6500	0.264 to 10.3129	0.536
Level of Education			
High school	Ref		
Diploma	2.3423	0.5868 to 9.3507	0.2282
Undergraduate	3.5417	0.8932 to 14.0438	0.0720
Masters/PhD	3.7681	0.9228 to 15.3868	0.0646

Table 3. COVID-19 vaccine uptake among the healthcare workers

	Ratings		
	1	2	3
Influence from friends and family	40 (20.9%)	60 (31.5%)	91 (47.6%)
Trust in the protection of the vaccine	43 (22.5%)	55 (28.8%)	93 (48.7%)
Religious or cultural factors	89 (46.6%)	48 (25.1%)	54(28.2%)
Availability of the vaccines	36 (18.8%)	56 (29.3%)	99 (51.8%)
For travel purposes	47 (24.6%)	58 (30.4%)	86 (45%)

3.6 Factors Influencing Covid-19 Vaccine Uptake among the Healthcare Workers

The health workers were asked to rate the influence of some factors on a scale of 1 (no

influence) to 3 (high influence) on their decision on whether or not to get vaccinated against covid-19. The Table 3 show summarises the result of these findings. Availability of vaccines was rated by more than half of the participants as having high influence on their decision to get

vaccinated with almost similar number rating influence from family and friends and trust in the vaccines as also having same influence. Religious or cultural consideration was rated as the least influential when it comes to covid vaccine uptake.

4. DISCUSSION

From this study, 46.6% of the study participants had been vaccinated against Covid-19. Study findings are similar to a study by [12], which concludes that only 48% of the healthcare workers had gotten the vaccine against COVID-19. This was contrary to another study carried out in Ethiopia which reported a higher uptake of COVID-19 vaccines of 61.56% [13]. AstraZeneca was the most received Vaccine, According to Ahmed (2021) the popularity of the AstraZeneca vaccine was because it was the first to be approved for mass vaccination use by the Federal Republic of Somalia MOH.

From this study, data analysis leads us to the conclusion that among health workers who have received the COVID-19 vaccination, there is no statistically significant difference in age, gender, education level, or work experience. These findings were contrary to another study carried out in Ethiopia revealed that women were 5.6 more more likely to seek the uptake of COVID-19 vaccines as compared to males [14]. Another study carried out in Germany where the age of the study respondent was associated with the uptake of the COVID-19 vaccine [15]. Another study that has shown a correlation between age and vaccine uptake was carried out in Tanzania which revealed that having a young age increased the odds of COVID-19 vaccine uptake by 2 [16]. On education and vaccine uptake, while this study has shown there is no statistically significant difference, a study done in Kenya demonstrated education level status was associated with the uptake of COVID-19 vaccines, where having a tertiary level of education increased the odds of COVID-19 vaccination [17]. The findings of this study were consistent with the findings from a scoping review where education level was not associated with the uptake of COVID-19 vaccines [18]. The study, unlike the other studies cited above, could not show a statistically significant difference in the variables studied since the sample size is smaller than for the other studies.

The study found out that, though religious and cultural beliefs is a determining factor in many

other activities, it had the least impact when it came to deciding to get the covid-19 vaccine. Availability of the vaccines, influence from friends and family and trust in the protection of the vaccines were found to have the highest influence on the health workers' uptake of covid-19 vaccine. Similarly, in the multi-country study of Verger et al. [19], which also assessed health care workers' attitudes towards COVID-19 vaccination in France, Belgium, and Canada, it was found that approximately 40% of health care workers in Belgium (Wallonia and Brussels) were willing to vaccinate themselves if COVID-19 vaccines were available.

5. CONCLUSION

From this research, close to half of the study respondents had been vaccinated with COVID-19 vaccines which is way below bearing these are healthcare workers who are highly exposed to the COVID-19 virus. Several studies cited above have shown there is a significant difference in the vaccination status of different age groups, education level, gender and work experience. However, analysis of the data from this study has indicated there is no statistically significant difference. A similar study with a larger sample size needs to be conducted to bring out the effect of these variables on vaccination status.

While focus has been on use of social media and government directives, this study has shown the healthcare workers are influenced by their family and friends, creating trust and making vaccines available. Policymakers need to focus on increasing access to vaccines. The study recommends that the Federal Government of Somalia should approve more types of covid-19 vaccines. A wider choice of vaccine type will improve the vaccine uptake.

6. LIMITATIONS OF THE STUDY

First, the study focused on COVID-19 uptake and the contributing factors among healthcare staff in lower Juba region Somalia. The study was limited to the lower Juba region of Jubaland state, Somalia.

Secondly, since respondents (Healthcare workers) are self-reporting, this made independent verification difficult.

Lastly, the lack of similar studies in the country, the geographical differences in the level of

education (cities and regions) and the small sample size made generalization in the rest of the country difficult.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

CONSENT

When giving the questionnaires to the respondents, the researcher ensured to get their consent prior to answering through inclusion as the first stage in the online questionnaire, as required by the standards of medical ethics. A concise explanation of the study was provided at the very beginning of the questionnaire in order to provide the respondents with further background information. Prior to the administration of the questionnaires, permission was sought from the management of the health facilities. Efforts were made to ensure the results of the questionnaire were available for inspection by the administration of the health facilities and officials who were involved in the investigation. The outcome was not utilized for any purpose other than the one that had been indicated. The researcher ensured that they never interfered with the normal operations of the health facilities. If any respondent had questions or concerns about the questionnaire, they were given the researcher's contact information, including their telephone number for any assistance.

ETHICAL APPROVAL

It is not applicable.

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The authors comprehend the willingness of the study respondents for participating in this study.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Chen N et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: A descriptive study. *Lancet*. 2020;395(10223):507–513.
DOI: 10.1016/S0140-6736(20)30211-7

2. Tabbakh TA et al. Clinical characteristics, complications, and predictors of poor outcome among hospitalized adult COVID-19 patients: A retrospective cohort study. *Cureus*. 2022;14(9):e28953.
DOI: 10.7759/cureus.28953.
3. Williamson EJ et al. Factors associated with COVID-19-related death using OpenSAFELY. *Nature*. 2020;584(7821):430–436.
DOI: 10.1038/S41586-020-2521-4.
4. Saade EA, Hojat LS, Gundelly P, Salata RA. Prevention and treatment of COVID-19 in patients with benign and malignant blood disorders. *Best Pract. Res. Clin. Haematol*. 2022;35(3).
DOI: 10.1016/j.beha.2022.101375.
5. Rahbar M et al. Evaluation of SARS-CoV-2 serum level in patients vaccinated with sinopharm/BBIBP-CorV with kidney transplantation. *Transplant. Proc*. 2022;54(10):2663–2667.
DOI: 10.1016/j.transproceed.2022.08.012.
6. Al Mutair A et al. Clinical, epidemiological, and laboratory characteristics of mild-to-moderate COVID-19 patients in Saudi Arabia: An observational cohort study. *Eur. J. Med. Res*. 2020;25(1).
DOI: 10.1186/s40001-020-00462-x.
7. Karijo E et al. Knowledge, attitudes, practices, and the effects of COVID-19 among the youth in Kenya. *BMC Public Health*. 2021;21(1):1–13.
DOI:10.1186/S12889-021-11067-2/TABLES/5.
8. Shah J et al. Perceptions and knowledge towards COVID-19 vaccine hesitancy among a subpopulation of adults in Kenya: An english survey at six healthcare facilities. *Vaccines*. 2022;10(5):705.
DOI: 10.3390/VACCINES10050705.
9. Albatineh AN, Dalvand P, Aslani M, Saritas S, Baghi V, Ghanei Gheshlagh R. Prevalence and factors associated with COVID-19 vaccine acceptance among the general population in Asadabad, Iran: A cross-sectional study. *Trop. Med. Health*. 2022;50(10).
DOI: 10.1186/S41182-022-00453-0
10. Ackah BBB et al. COVID-19 vaccine hesitancy in Africa: a scoping review,” *Glob. Heal. Res. Policy*. 2022;7(1):1–20.
DOI:10.1186/S41256-022-00255-1/TABLES/2.

11. MOH Komesha Corona. Repub. Kenya; 2022.
12. Sarah Maria N, Olwit C, Kaggwa MM, Nabirye RC, Ngabirano TD. Cervical cancer screening among HIV-positive women in urban Uganda: A cross sectional study. BMC Womens. Health. 2022; 22(1):1–9.
DOI:10.1186/S12905-022-01743-9/TABLES/2.
13. Belay M, Tsega TD, Molla M, Teshome M. Factors associated with COVID-19 vaccine uptake among health professionals in Debre Markos town public health facilities, Northwest Ethiopia. PLOS Glob. public Heal. 2024;4(4):e0002893.
DOI: 10.1371/JOURNAL.PGPH.0002893.
14. Worede DT, Kassahun M, Endalew B. COVID-19 vaccine acceptance and predictors among pregnant women in Ethiopia: Systematic Review and Meta-Analysis. Public Heal. Pract. 2023;5.
DOI: 10.1016/J.PUHIP.2023.100386.
15. Klee B et al. Regional differences in uptake of vaccination against COVID-19 and Influenza in Germany: Results from the DigiHero Cohort. Vaccines. 2023;11.
DOI: 10.3390/VACCINES11111640.
16. Amour MA et al. Determinants of COVID-19 Vaccine Uptake and Hesitancy among Healthcare Workers in Tanzania: A Mixed-Methods Study. COVID. 2023;3(5):777–791.
DOI: 10.3390/COVID3050058
17. Otieno C et al. Determinants of Covid-19 vaccine uptake among the elderly aged 58 years and above in Kericho County, Kenya: Institution based cross sectional survey,” PLOS Glob. Public Heal. 2023;3(9):p. e0001562.
DOI: 10.1371/JOURNAL.PGPH.0001562.
18. Naidoo D, Meyer-Weitz A, Govender K. Factors influencing the intention and uptake of COVID-19 vaccines on the African continent: A scoping review. Vaccines. 2023;11(4).
DOI: 10.3390/VACCINES11040873
19. Verger P, Scronias D, Dauby N. et al. Attitudes of healthcare workers towards COVID-19 vaccination: A survey in France and French-speaking parts of Belgium and Canada. 2020, Eurosurveillance. 2021;26(3).

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