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Public Health
Agency

CARPHA

Preventing disease,
promoting and protecting health

COVID-19 VACCINE ACCEPTANCE

Among Active Social Media Users in the Caribbean

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COVID-19 VACCINE ACCEPTANCE

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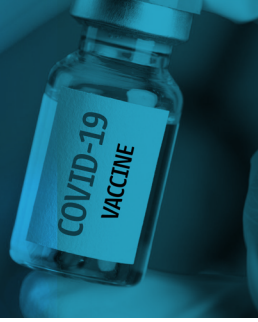

Introduction

The COVID-19 pandemic has resulted in devasting impact on global, social, and economic structures including the Caribbean. Public health measures and actions including innovation on existing systems have been required, along with the rapid development of therapies and vaccines to control and end the Pandemic. The World Health Organization (WHO) identified vaccine hesitancy as one of the ten global health threats the world faces in 2019 and beyond, in its five-year strategic plan. (Guzman-Holst et al., 2019) Barriers to vaccination in Latin America: A systematic literature review, Vaccine, https://doi.org/10.1016/j.vaccine.2019.10.088).

A survey conducted by Johns Hopkins Centre for Communication Programs reported that 72% of Jamaicans and 59% of persons living in Trinidad and Tobago would not accept a COVID-19 vaccine, if it were made available to them (Babalola et al., 2020). More recently, a survey conducted among healthcare workers in the Cayman Islands, reported 48% unwilling to take the vaccine (Cayman Islands Health Services Authority, 2020). In addition, a Jamaica newspaper article entitled COVID Jab Fear – Resistance from Frontline Staff could Hurt Vaccine Campaign, reported "Scepticism was rife among a variety of workers at The University Hospital of the West Indies (UHWI) and the Kingston Public Hospital (KPH)" (Cross, 2020).

The article cited healthcare workers expressing fears of possible side effects and wanting to know more about the COVID-19 vaccine. Therefore, it is important to identify and address the potential barriers affecting vaccine uptake. Although there is some data regarding vaccine hesitancy from a few countries in the Caribbean Community, each country has different socio-economic, political, and cultural circumstances which may lead to different factors affecting vaccination uptake and coverage.

This study aims to assess the beliefs and opinions among Caribbean residents about COVID-19 vaccines and the potential barriers to acceptance of these vaccines, trusted sources and persons for information and best messaging tools to allow development of CARPHA's campaign.

COVID-19 VACCINE ACCEPTANCE

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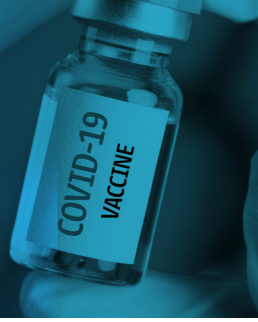

Objectives

To describe the attitudes of active social media users in the Caribbean towards immunization with a COVID-19 vaccine; to determine if geographical location, gender, age group, or education are associated with vaccine acceptance; and to identify trusted sources of information and existing information gaps on COVID-19 and related vaccines

Brief Description of the study

A cross-sectional study was conducted among active social media users aged 18 years and older in twenty-six (26) Caribbean Public Health Agency (CARPHA) Member States (CMS) between 17th February to 18th June 2021. Although all Member States participated in the survey, only six (6) CMS achieved the target sample size, namely, Barbados, Curacao, Guyana, Jamaica, Saint Lucia, and Trinidad and Tobago. The questionnaire was administered via an online survey administration tool (Survey Monkey), and launched on the CARPHA Facebook page, and CARPHA WhatsApp groups. Member States and partners were also invited to share the advertisement on their Facebook and other social media platforms. The proposal was submitted to the CARPHA Research Ethics Committee for review and approval of research involving human participants. Ethical approval was received on January 29, 2021.

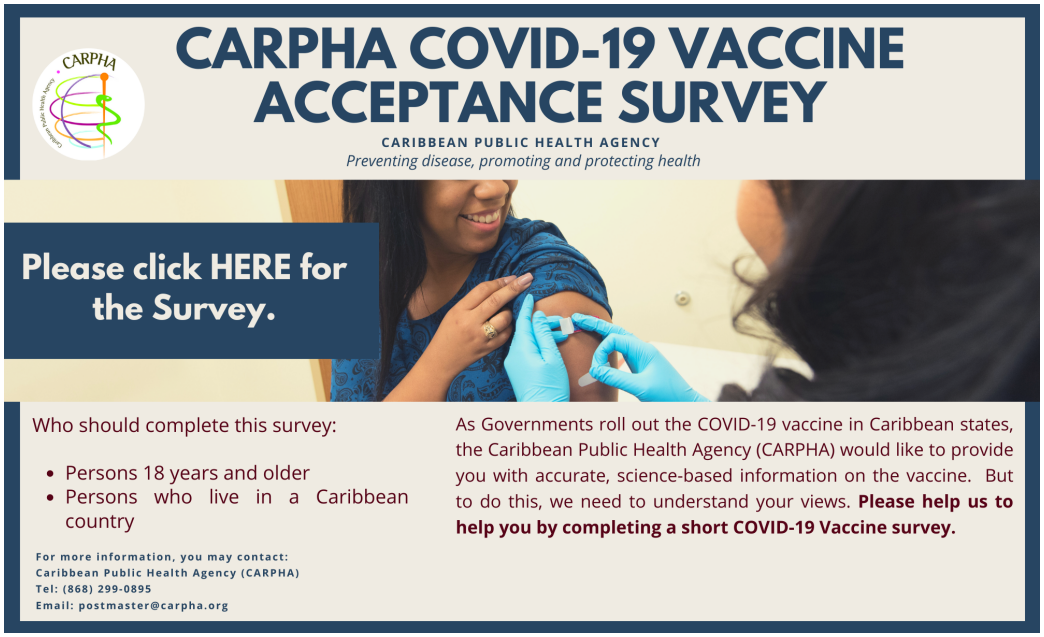

Figure 1. CARPHA COVID-19 Vaccine Acceptance Survey Flyer

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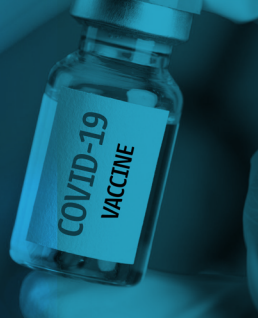


Results

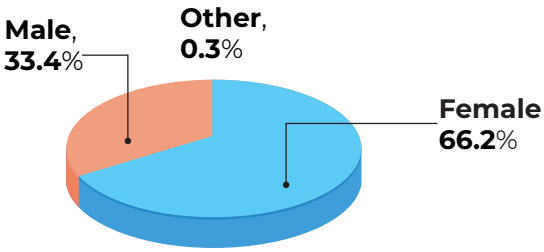
Socio-Demographic Profile:

A total of 2,302 individuals from six CARPHA Member States (Barbados, Curacao, Guyana, Jamaica, Saint Lucia, and Trinidad and Tobago) with the minimum number of required participants from the survey are included in this study. The survey participants are mostly females (66%) and between the ages of 31 and 60 years (68%); 63% of the participants are from urban areas; 40% are undergraduates.

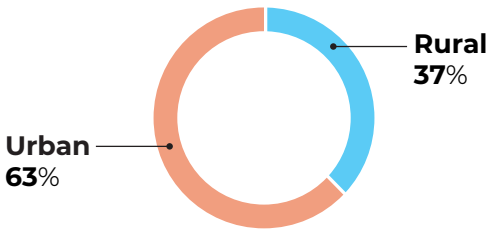
SAMPLE SIZE BY COUNTRY

COUNTRY	FREQUENCY
Barbados	384
Curacao	383
Guyana	384
Jamaica	384
Saint Lucia	383
Trinidad and Tobago	384
Total	**2302**

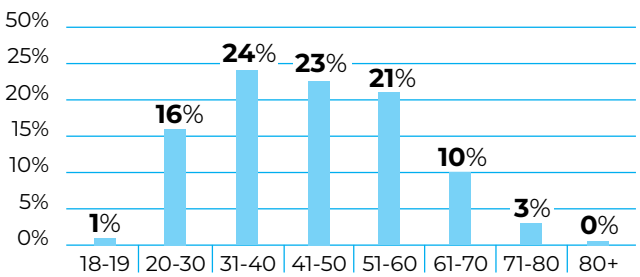
GENDER DISTRIBUTION



AREA DISTRIBUTION



AGE DISTRIBUTION



LEVEL OF EDUCATION DISTRIBUTION

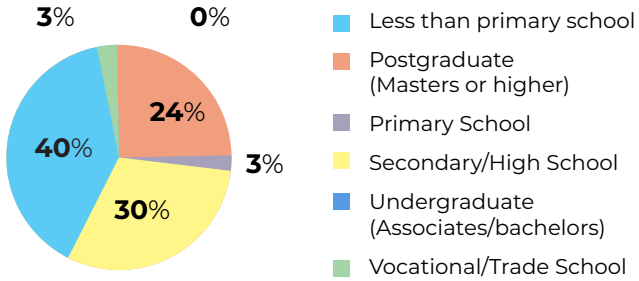


Figure 2. Socio-Demographic Profile

Healthcare Worker Status

A total of 312 (14%) of respondents were healthcare workers. A higher percentage of healthcare workers were vaccinated compared to non-healthcare workers (64.4% vs 49.2%). Of the number of healthcare workers that were not vaccinated, vaccine non-acceptance was 22.5%, and undecided was 36.9%.

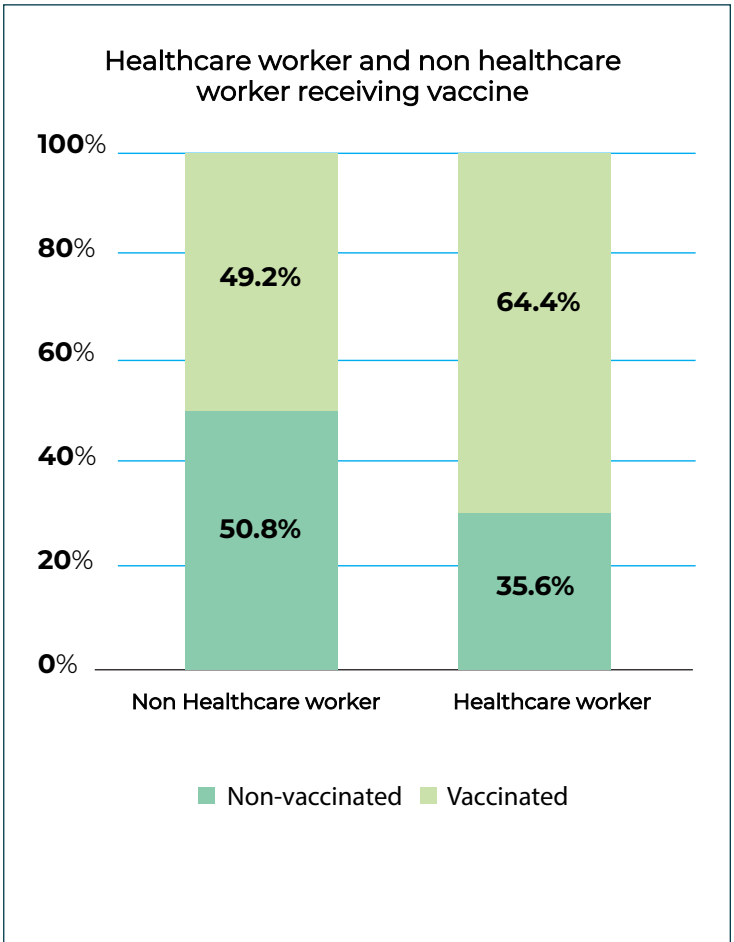


Figure 3. Healthcare worker and non-healthcare receiving vaccine

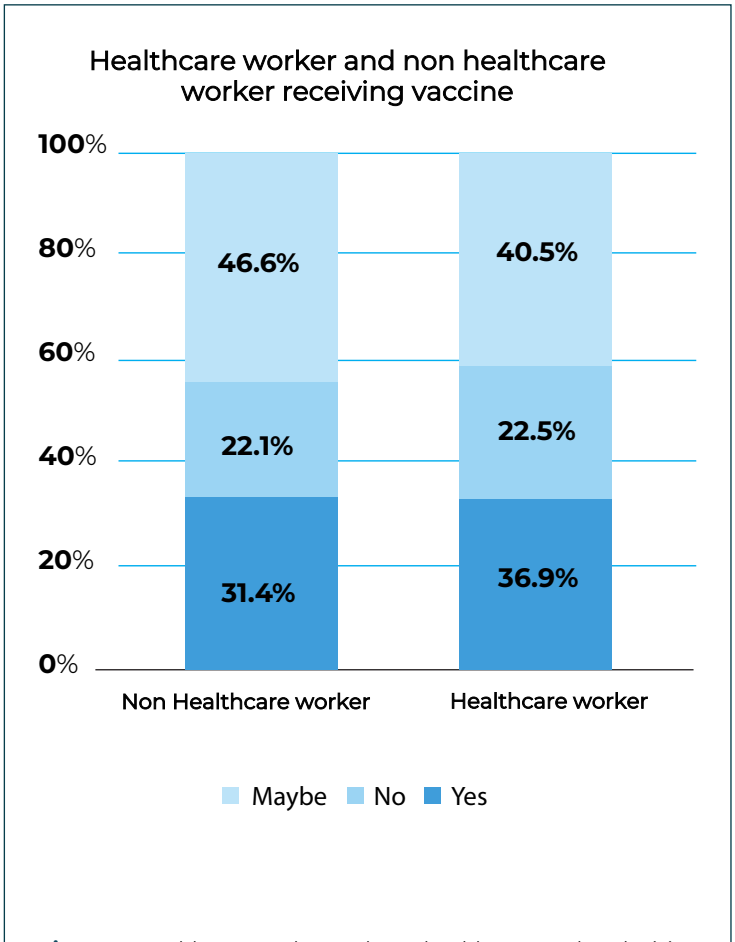


Figure 4. Healthcare worker and non-healthcare worker decision

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Acceptance of a COVID-19 Vaccine

In total 51% (1181/2302) of the study participants had received a vaccine for COVID-19, whereas 49% (1121/2302) did not receive a vaccine for COVID-19. Among those who are unvaccinated, 46% (515/2302) reported that they "would get the vaccine if available", whereas 32% (358/2302) reported that they "may get the vaccine if available" and the remaining 22% (248/2302) reported that they "will not get the COVID-19 vaccine if available". Hence overall COVID-19 vaccine acceptance (i.e., have taken a vaccine and willing to take a vaccine) accounted for 74% (1696/2302): 15% (358/2302) of the participants were hesitant, and 11% (248/2302) reported that would not accept a COVID-19 vaccine when it became available.

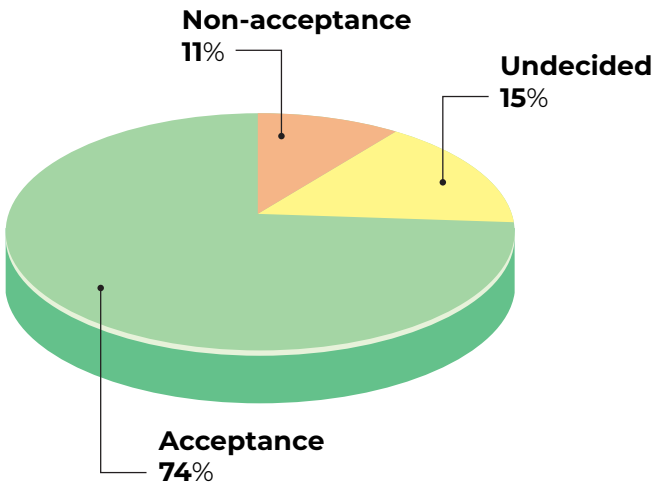
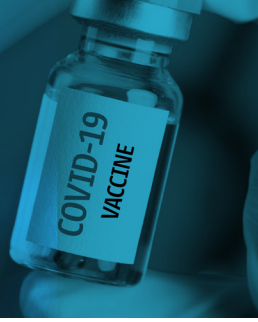


Figure 5. Acceptance of a COVID-19 Vaccine



Acceptance of a COVID-19 Vaccine for your child or children and elderly parents

Participants were asked whether they would vaccinate their children and elderly parents with the COVID-19 vaccine. The percentage of participants who reported that they would vaccinate their elderly parents was higher than those who reported that they would vaccinate their children (53% vs. 38%).

Table 1. Acceptance of a COVID-19 Vaccine for your child or children and elderly parents

Questionnaire items	N	%
Decision to vaccinate Children		
Yes	876	38.1
No	307	13.3
Maybe	395	17.2
Not applicable	724	31.5
Decision to vaccinate Elderly Parents		
Yes	1222	53.1
No	248	10.8
Maybe	306	13.3
Not applicable	526	22.8

Concerns about receiving a COVID-19 vaccine

52.9% of participants indicated that they had no concerns about the COVID-19 vaccine, while 47.1% indicated that they had concerns (**Figure 6**).

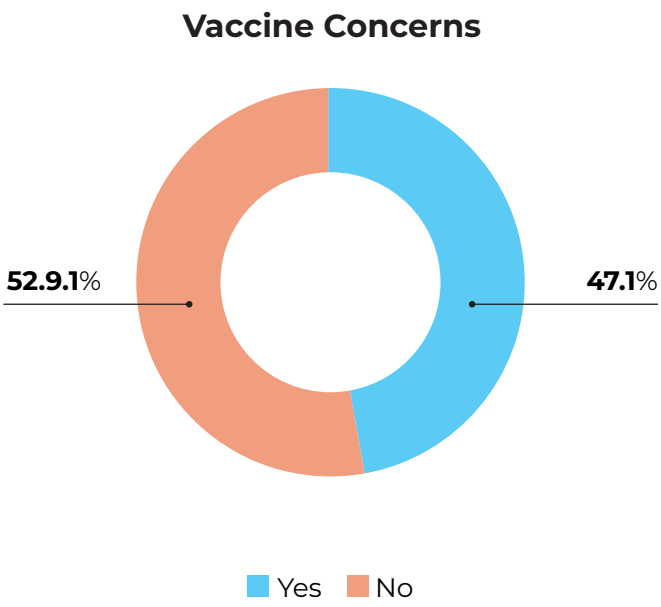
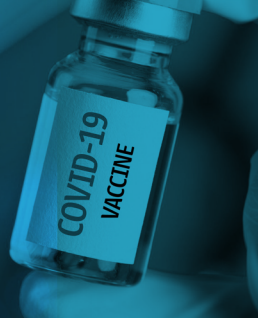


Figure 6. Concerns about COVID-19 Vaccine

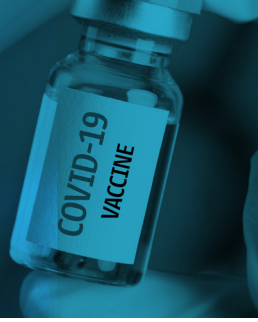


Reasons for Concern about the COVID-19 Vaccine

Of those participants who indicated that they had concerns about the COVID-19 vaccine "I am concerned about the possible side effects of the vaccine" (38.0%) was the major concern selected by participants (**Table 2**).

Table 2. Reasons for concern about the COVID-19 vaccine

Reasons	N	%
I am concerned about the possible side effects of the vaccine	**875**	**38.0**
I think the vaccine was developed too quickly	**476**	**20.7**
I do not know enough about the vaccine	**438**	**19.0**
I do not think the vaccine will protect me from getting COVID-19	370	16.1
I do not trust vaccine manufacturers	223	9.7
I prefer to use local remedies or natural alternatives	198	8.6
I think that I can get COVID-19 from taking the vaccine	94	4.1
I do not think that COVID-19 is real	47	2.0
I do not believe in vaccination	42	1.8
I may not be able to afford the vaccine	36	1.6
I have no concern	31	1.3
I do not think I can get COVID-19	11	0.5
Other	168	7.3



Concerns about receiving a COVID-19 vaccine by Demographic Characteristics (age, gender, area, education)

The top three concerns reported were relatively the same by area, gender, and healthcare worker status.

"I am concerned about the possible side effects of the vaccine" was reported as the number one concern by participants in all age groups. The concern, **"I think the vaccine was developed too quickly"** was reported as the second highest by participants aged 18 to 40 years and the 51 to 60 and 71 to 80 age groups.

"I do not know enough about the vaccine" was the second highest concern reported by participants in the 41 to 50 and 61 to 70 age groups. **"I do not think the vaccine will protect me from getting COVID-19"** was reported as the third highest concern by participants aged 18 to 40 and 51 to 60.

Across all age groups, **"I do not trust vaccine manufacturers"** was in the top three only for participants in the 71 to 80 and over 80 age groups. Notably, **"I do not think that COVID-19 is real"** was one of the top three concerns for participants in the over 80 age group.

"I am concerned about the possible side effects of the vaccine" was reported as the number one concern by participants in all education level except for primary school. **"I do not think the vaccine will protect me from getting COVID-19"** was the highest concern for persons in the primary school education group.

COVID-19 VACCINE ACCEPTANCE

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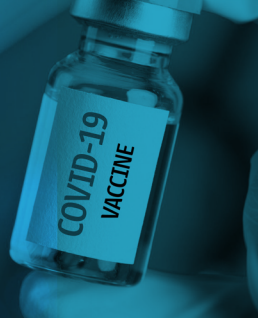


Participants top 3 reasons for concerns about COVID-19 vaccine by age, education, area, gender and healthcare worker status

Age

18-19	20-30	31-40	41-50	51-60	61-70	71-80	Over 80
1. I am concerned about the possible side effects of the vaccine	**1.** I am concerned about the possible side effects of the vaccine	**1.** I am concerned about the possible side effects of the vaccine	**1.** I am concerned about the possible side effects of the vaccine	**1.** I am concerned about the possible side effects of the vaccine	**1.** I am concerned about the possible side effects of the vaccine	**1.** I am concerned about the possible side effects of the vaccine	**1.** I am concerned about the possible side effects of the vaccine
2. I think the vaccine was developed too quickly	**2.** I think the vaccine was developed too quickly	**2.** I think the vaccine was developed too quickly	**2.** I do not know enough about the vaccine	**2.** I think the vaccine was developed too quickly	**2.** I do not know enough about the vaccine	**2.** I think the vaccine was developed too quickly	**1.** I do not think that COVID-19 is real
3. I do not think the vaccine will protect me from getting COVID-19	**3.** I do not think the vaccine will protect me from getting COVID-19	**3.** I do not think the vaccine will protect me from getting COVID-19	**3.** I think the vaccine was developed too quickly	**3.** I do not think the vaccine will protect me from getting COVID-19	**3.** I think the vaccine was developed too quickly	**2.** I do not trust vaccine manufacturers	**1.** I think the vaccine was developed too quickly
3. I do not know enough about the vaccine						**2.** I do not know enough about the vaccine	**1.** I do not trust vaccine manufacturers

Education

Less than Primary School	Primary School	Vocational/ Trade School	Secondary/ High School	Undergraduate	Postgraduate
1. I do not think the vaccine will protect me from getting COVID-19	**1.** I am concerned about the possible side effects of the vaccine	**1.** I am concerned about the possible side effects of the vaccine	**1.** I am concerned about the possible side effects of the vaccine	**1.** I am concerned about the possible side effects of the vaccine	**1.** I am concerned about the possible side effects of the vaccine
2. I am concerned about the possible side effects of the vaccine	**2.** I do not know enough about the vaccine	**2.** I do not know enough about the vaccine	**2.** I think the vaccine was developed too quickly	**2.** I think the vaccine was developed too quickly	**2.** I think the vaccine was developed too quickly
2. I think the vaccine was developed too quickly	**3.** I think the vaccine was developed too quickly	**3.** I think the vaccine was developed too quickly	**3.** I do not know enough about the vaccine	**3.** I do not know enough about the vaccine	**3.** I do not know enough about the vaccine
2. I do not know enough about the vaccine					

Figure 7. Participants top 3 reasons for concerns about COVID-19 vaccine by age and education

Participants top 3 reasons for concerns about COVID-19 vaccine by age, education, area, gender and healthcare worker status

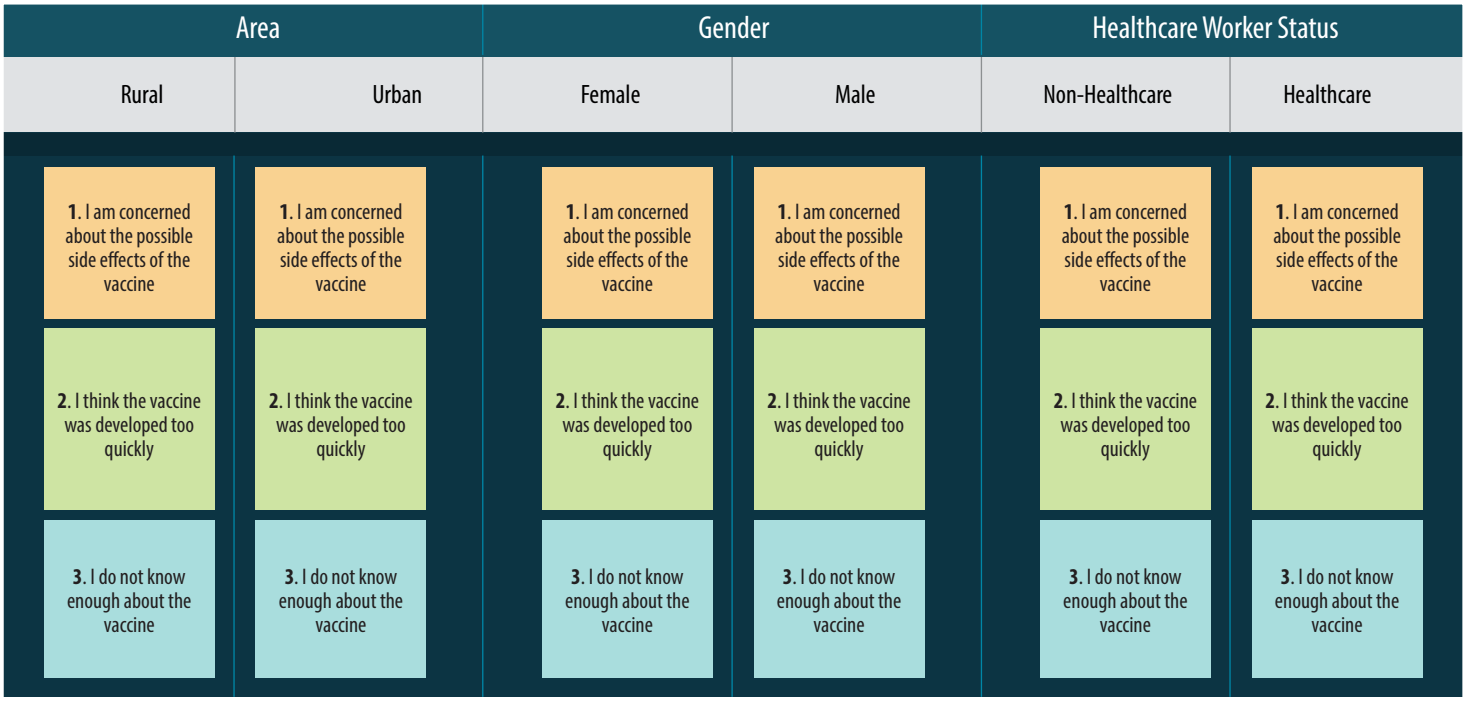
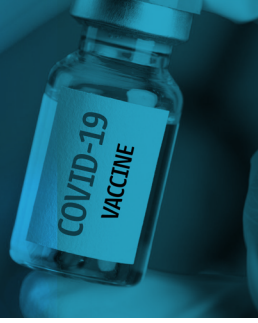


Figure 8. Participants top 3 reasons for concerns about COVID-19 vaccine by area, gender and healthcare worker status

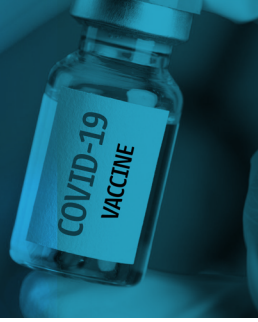


Trusted sources of information on COVID-19

The participants identified the most trusted sources of COVID-19 information as: **Scientists, Doctors**, and **Health experts** (76.8%), **Public Health Organisations** (64.2%), and **Ministry of Health** (59.6%).

Table 3. Trusted sources of COVID-19 information

Source	N	%
Scientists, doctors, and health experts	**1768**	**76.8**
Public Health Organisations (WHO, PAHO, CARPHA)	**1477**	**64.2**
Ministry of Health	**1371**	**59.6**
Websites	559	24.3
Television	523	22.7
Local health workers, clinics, and community Organisations	513	22.3
Government Agencies other than the Ministry of Health	468	20.3
Newspapers or newspaper websites	432	18.8
Social Media and Apps	344	14.9
Radio	318	13.8
Family	266	11.6
Friends/acquaintances	240	10.4
Journalists	167	7.3
Faith-Based Organisations (religious institutions)	122	5.3
Spiritual/Natural Healers	72	3.1
Other	110	4.8



Trusted sources of COVID-19 information by Demographic Characteristics (age, gender, area, education)

The top three trusted sources of COVID-19 information were the same across all countries, age, area, gender, and healthcare worker status groups.

"Scientists, Doctors, and Health experts" was reported as the number one trusted source by participants at all education levels except for less than primary school. **"Television"** was the highest ranked trusted source for persons in the less than primary school education group. As a trusted source,

"Ministry of Health" was reported as the second highest for primary school, vocational/ trade school, and secondary/high school, while **"Public Health Organisations (WHO, PAHO, CARPHA"** was reported as the second highest for undergraduate and postgraduate.

The third highest trusted source for the less than primary school group **"Friends/ acquaintances", "Radio", "Journalists" and "Family"**.

Participants top 3 trusted sources by age, education, area, gender, and healthcare worker status

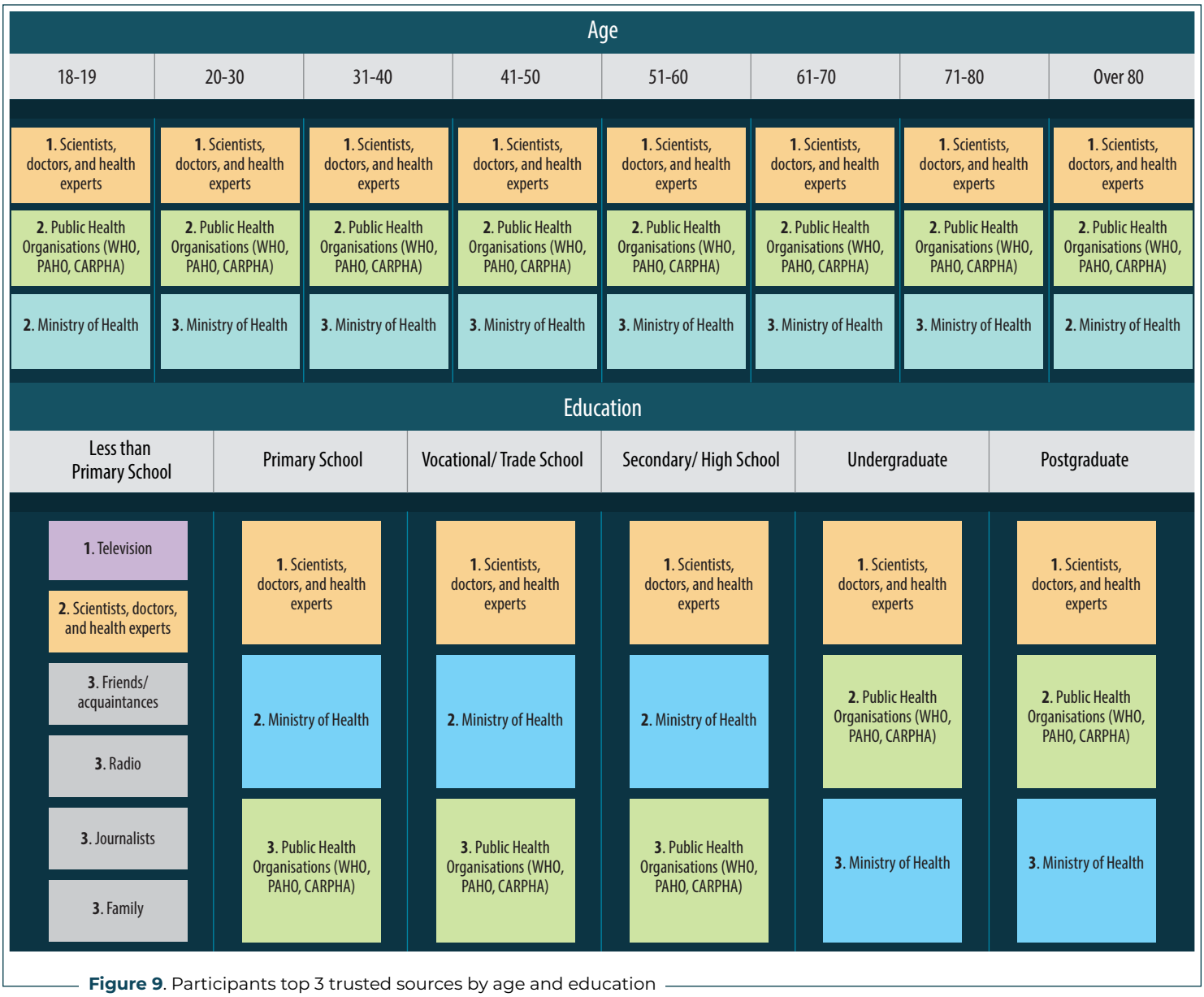


Figure 9. Participants top 3 trusted sources by age and education

Participants top 3 trusted sources by age, education, area, gender, and healthcare worker status

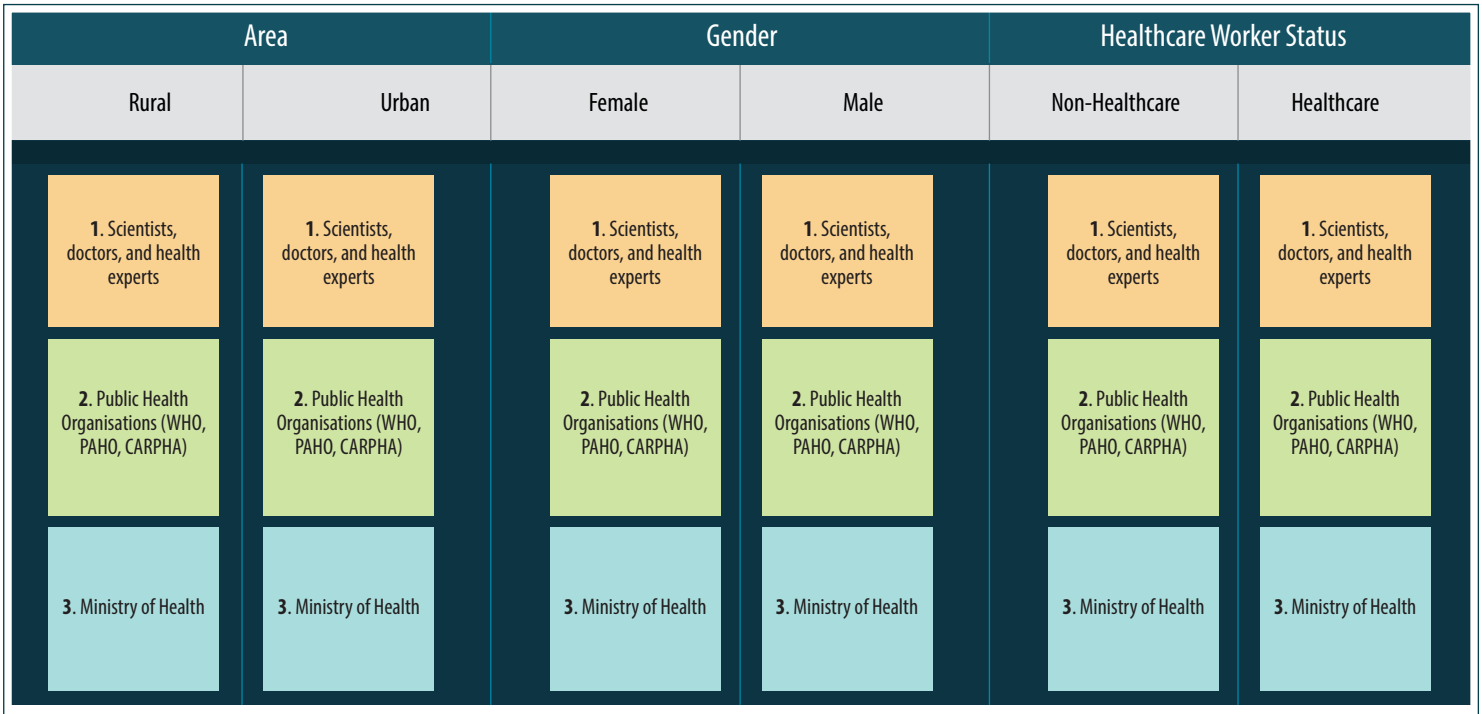


Figure 10. Participants top 3 trusted sources by area, gender, and healthcare worker status

Participants COVID-19 information needs

Participants' knowledge about COVID-19 was generally high, with over 50% of participants indicating that they were either moderately or extremely knowledgeable about the areas included in the survey (Table 4).

The most knowledgeable areas (moderately and extremely knowledgeable) are 'How to protect myself from getting COVID-19' (87.6%), were 'How the COVID-19 virus is spread' (82.2%) and 'The symptoms of COVID-19 infection' (76.5%).

Participants were less knowledgeable about how "The COVID-19 Vaccine being developed" and "The systems in place to ensure COVID-19 Vaccine safety".

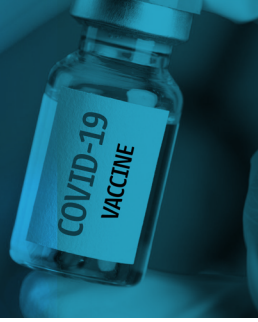


Table 4. Level of Knowledge about COVID-19

	Not at all Knowledgeable	Slightly Knowledgeable	Somewhat Knowledgeable	Moderately Knowledgeable	Extremely Knowledgeable	Mean
The COVID-19 Vaccine being developed	8.9	15.4	26.4	37.8	11.4	3.3
How the COVID-19 virus is spread	2.5	4.9	10.4	37.1	45.1	4.2
How the COVID-19 virus is detected	4.6	7.8	21.3	39.3	27.0	3.8
How the COVID-19 virus affects the body	3.3	7.7	19.1	41.9	28.0	3.8
The symptoms of COVID-19 infection	2.5	6.5	14.4	40.1	36.4	4.0
How to protect myself from getting COVID-19	1.6	3.0	7.8	28.3	59.3	4.4
How COVID-19 is treated	6.7	11.9	27.5	34.8	19.2	3.5
How to cope with the 'new normal'	4.6	6.0	17.9	39.8	31.7	3.9
The systems in place to ensure COVID-19 Vaccine safety	10.4	12.9	24.9	32.1	19.8	3.4

Participants preferred communication channel to get information on COVID-19 vaccines

Participants were asked to rank their preferred communication type/channel to get information on COVID-19 vaccines, with 1 being most preferred to 6 being least preferred. **"Infographics"** was the most preferred information type while **"Cartoon videos" and "Live social media"** were the least preferred (Figure 11). **"Fact sheets"** and **"Conversations with healthcare providers"** were preferred communication channels.

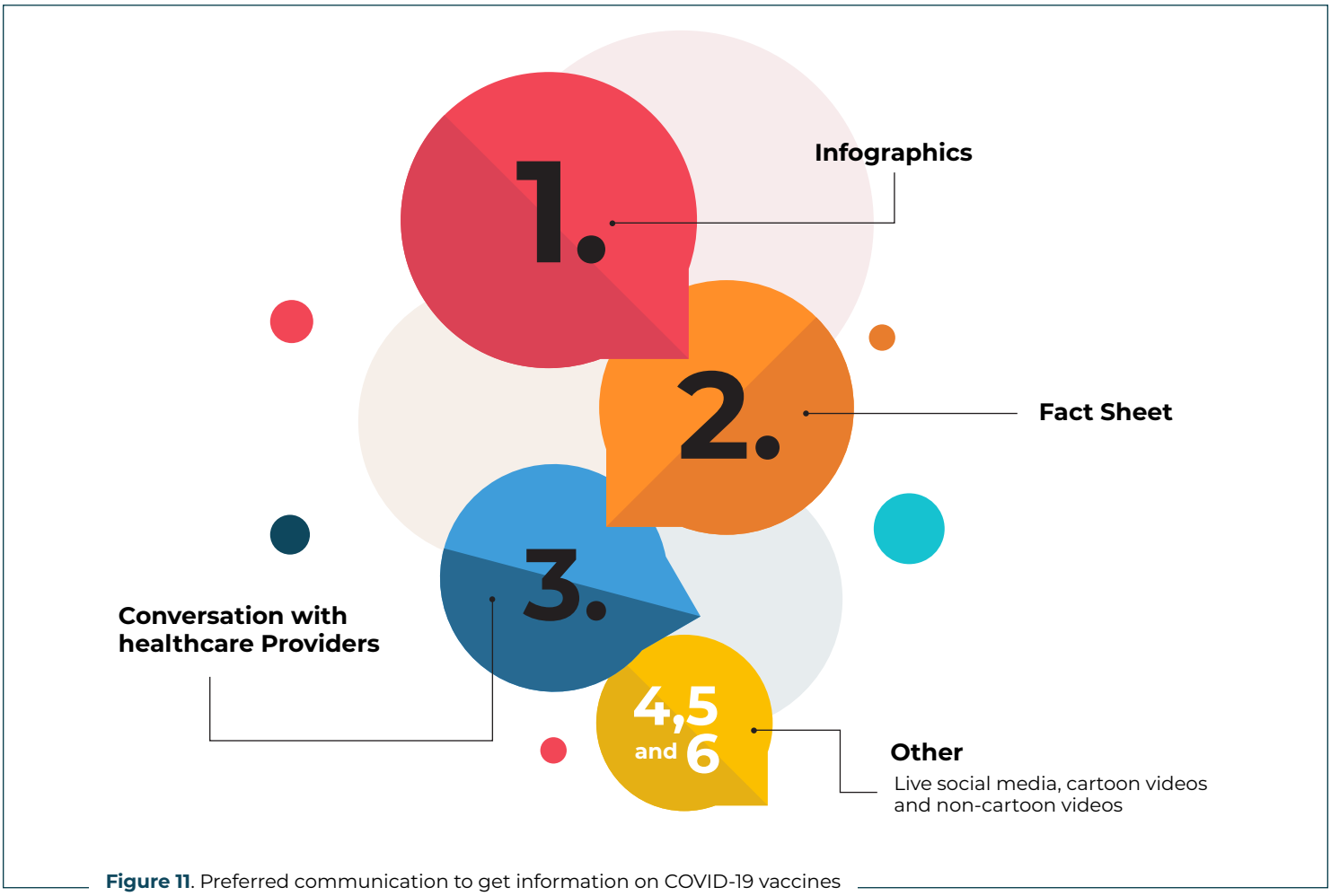
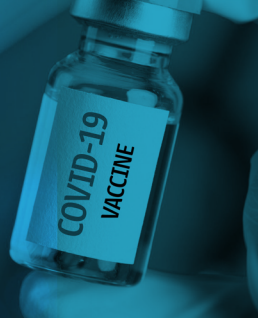


Figure 11. Preferred communication to get information on COVID-19 vaccines



Demographic Characteristics (age, gender, area, education) association with levels of vaccine acceptance and trusted sources of information on COVID-19 vaccine

Significant statistical associations were found between vaccine acceptance and **country, age, education,** and **gender**. However, the strength of the associations was small.

Demographic Characteristics (age, gender, area, education) association with trusted sources of information on COVID-19 vaccine

The top three trusted sources of COVID-19 information were **"Scientists, Doctors, and Health experts"** (77%), **"Public Health Organisations"** (64%) and **"Ministry of Health"** (60%).

"Public Health Organisations" as a trusted source of information was significantly associated with all the demographic variables, except healthcare worker status. There was a moderately strong association between **"Public Health Organisations"** as a trusted source and country ($\varphi = 0.254$) and education ($\varphi = 0.250$). The associations between Public Health Organisations as a trusted source and age ($\varphi = 0.084$), gender ($\varphi = 0.059$) and area ($\varphi = 0.047$) were small.

"Scientists, Doctors, and Health experts" as a trusted source of information was significantly associated with country, age, area and education. There was a moderately strong association between **"Scientists, Doctors, and Health experts"** and country ($\varphi = 0.231$) and education ($\varphi = 0.207$). The associations between Scientists, Doctors, and Health experts as a trusted source and age ($\varphi = 0.123$) and area ($\varphi = 0.091$) were small.

"Ministry of Health" as a trusted source of information was only significantly associated with country and education. There was a moderately strong association between **"Ministry of Health"** and country, ($\varphi = 0.219$) while the association with education was small ($\varphi = 0.133$).

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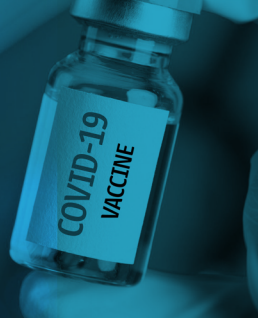


Vaccine acceptance associations with concerns about the COVID-19 vaccine and knowledge about COVID-19

1. Is vaccine acceptance associated with participants' concerns about receiving the COVID-19 vaccine?

A significant statistical association was found between the levels of vaccine acceptance and **presence of concerns** ($\chi 2(2) = 672.38$, $p < .001$. The strength association was strong with $\Phi = 0.540$.

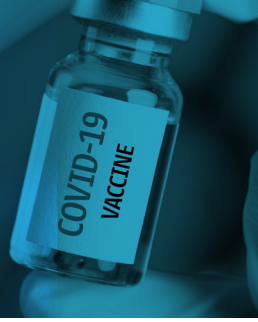
2. Is vaccine acceptance associated with participants' knowledge about COVID-19?

A higher level of knowledge was associated with participants being in the vaccine acceptance group. Thus, participants in the acceptance group reported a higher level of knowledge in the areas below except for the "The symptoms of COVID-19 infection" knowledge area.

- The COVID-19 Vaccine being developed
- How the COVID-19 virus is spread
- How the COVID-19 virus is detected
- The symptoms of COVID-19 infection
- How COVID-19 is treated
- The systems in place to ensure COVID-19 Vaccine safety

3. Is presence of concerns and number of concerns about vaccination associated with participants' knowledge about COVID-19?

Participant's knowledge of all the COVID-19 information areas assessed by the survey differed significantly with the presence of concerns about COVID-19 vaccine. However, participants having no concerns reported a higher level of knowledge about COVID-19. There was a statistically significant, negative correlation between knowledge of COVID-19 information and number of concerns about COVID-19 vaccine. The indicates, the more knowledge participants were about COVID-19, the fewer their concerns were about COVID-19 vaccinations.



Limitations of the Study

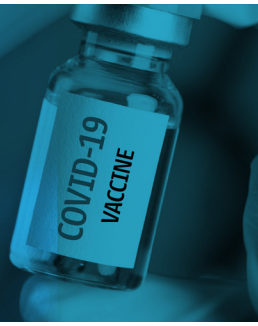
The limitations of the study include difficulty defining the population size, marginalized populations may be under represented, limited access to subscribers of social media platforms, the inability to validate self-reported information, difficult to capture feelings and emotions and COVID-19 related survey fatigue.

Conclusion

Responses from a total of 2,302 individuals from six countries of the Caribbean with the minimum number of required participants from the survey are included in this study. The survey participants were mostly females (66%) and between the ages of 31 and 60 years (68%); 63% of the participants are from urban areas; 40% are undergraduates; and 14% of them are healthcare workers. The results showed the vaccination status of the participants: 51% have taken the COVID-19 vaccine whereas among those who did not, 46% agreed to take the vaccine if given the vaccine, resulting in an overall vaccination acceptance rate of 74%.

The overall vaccination acceptance rates differed significantly with participants' Country, Age, Education, Healthcare worker status, and Concerns about vaccination (having more concerns is associated with significantly less vaccination rates. The vaccination acceptance rates for elderly parents of the participants were higher compared to their children (53% vs. 38%), while concerns about vaccination against COVID-19 among the participants themselves, was 47%.

The participants got most of the trusted COVID-19 information from Scientists, Doctors, and Health experts (77%), Ministry of Health (60%) and Public Health Organisations (64%), which significantly differed by participants' geographical regions, and levels of education. Of the nine categories of Knowledge about COVID-19, "The systems in place to ensure COVID-19 vaccine safety" was found to be the category most significantly associated with both vaccination acceptance rates and concerns. The findings from these Tables indicate that having prior information about COVID-19 is associated with vaccine acceptance especially among health care workers. On the other hand, the more knowledge about COVID-19 expressed by the participants, the less likely the concerns about COVID-19 vaccinations.



Supplementary Information

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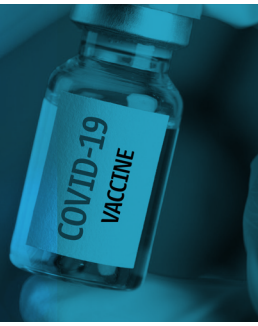
Availability of data and materials:
The datasets for this study are not publicly available.

Declarations

Statement of Ethics:
The study was approved by the Research Ethics Committee of the Caribbean Public Health Agency (approval reference: No. 1)

Informed Consent Statement:
Every participant gave informed consent before they attempted the questionnaire.

Conflict of Interest Statement:
The authors have no conflict of interest to declare.



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