Concerns, Attitudes and Intended Practices of Healthcare Workers toward COVID-19 Vaccine in Trinidad and Tobago

PAHO Pan American Health Organization
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Foreword

Trinidad and Tobago has long been a leader in the Caribbean region in the area of immunization. The country has a comprehensive and robust immunization program that starts when an infant reaches 2 months of age, when the pentavalent and trivalent vaccines are administered, and continues with vaccination against measles, mumps, and other diseases, along with routine boosters. The program is typically complete when the child is 12 years of age. This program has ensured that Trinidad and Tobago has one of the highest immunization rates in the Caribbean against many vaccine-preventable diseases and a steadily decreasing under-five mortality rate.

Paramount in this effort are the many healthcare workers, including doctors, nurses, and other allied health professionals, who work and take charge of the program by administering vaccines, educating the public on the importance of vaccination, and conducting surveillance for potential outbreaks. COVID-19 has once again highlighted the critical role that healthcare workers play in ensuring public confidence and trust in vaccination, as many people regard healthcare workers as their most trusted source of information on vaccination.

Given the current so-called infodemic surrounding the COVID-19 pandemic and the COVID-19 vaccines, the Trinidad and Tobago public must have confidence in both the vaccines and the healthcare workers that will be administering these vaccines. To this extent, it is also important that the healthcare workers tasked with COVID-19 vaccination are armed with the most relevant and up-to-date information about the COVID-19 vaccine and be able to educate the public on the importance of vaccination and alleviate any fears or concerns they may have.

For these reasons, the Pan American Health Organization (PAHO) Trinidad and Tobago Country Office set out to understand the attitudes and intentions of healthcare workers in Trinidad and Tobago about routine immunization and COVID-19 vaccination. During April and May 2021, a mixed-methods survey was carried out to capture the thoughts, opinions, and reasoning of more than 370 healthcare workers who volunteered their time to participate in the study.

The findings in this report will be beneficial for public health policymakers, as they can use this information to identify possible communication and information gaps and plan strategies for increasing uptake of the COVID-19 vaccine among both healthcare workers and the wider public in Trinidad and Tobago.

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The main investigators in this study were team leader Dr. Paul Edwards, Technical Advisor, Health Systems and Services, PAHO and Dr. Erica Wheeler, PAHO/WHO Representative, Trinidad and Tobago Country Office. Technical Support was provided by Dr. E. Benjamin Puertas, Advisor, Human Resources for Health, Subregional Program Coordinator for the Caribbean, Pan American Health Organization.

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Deepest thanks go to all the Trinidad and Tobago healthcare workers who took time out of their busy schedules to answer this survey.

Abbreviations and Acronyms

BeSD – behavioral and social domain
COVID-19 – coronavirus disease 2019
HCWs – healthcare workers
MoH – Ministry of Health
PAHO – Pan American Health Organization
RHA – Regional Health Authority
RoC – rest of the Caribbean
SARS-CoV2 – severe acute respiratory syndrome coronavirus 2
UNICEF – United Nations Children's Fund
WHO – World Health Organization
WHO SAGE – World Health Organization Strategic Group of Experts on Immunization

Introduction

On 12 March 2020, the first case of COVID-19 *(1)*, the disease caused by the virus SARS-CoV-2, was detected in Trinidad and Tobago. As of 6 March 2022, the country has experienced 185 377 cases, suffered 4267 deaths, and has administered 1 583 162 vaccine doses *(2)*. Of these, 695 895 were the first dose of a two-dose regimen, and 659 445 were the second dose. A further 58 577 doses of the Johnson & Johnson single shot vaccine have been administered, and an additional 169 245 booster shots have been administered to eligible persons *(2)*.

Trinidad and Tobago was part of a larger Caribbean-wide study surveying the attitudes, perceptions, and intended practices of healthcare workers (HCWs) in the Caribbean toward COVID-19 vaccines, conducted from April to May 2021 *(3)*. HCWs from Trinidad and Tobago constituted the single largest group of respondents in the Caribbean-wide survey, and emphasis will be placed on the results from Trinidad and Tobago, which this report will describe separately.

Vaccines represent an important measure for gaining control of the COVID-19 pandemic. In the pursuit to provide safe and effective vaccines to the global population, vaccine research and development have occurred at an accelerated rate *(4)*. HCWs were among the priority groups for receiving the first doses of vaccines within countries while supply was limited. This approach was identified by the Values Framework for the Allocation and Prioritization of COVID-19 Vaccination *(5)*, released by the World Health Organization (WHO) Strategic Advisory Group of Experts on Immunization (SAGE) on 14 September 2020. The approach also applied to older adults and adults living with chronic diseases.

An essential part of vaccine rollout is a communication campaign, targeting not only members of the public but also the specific priority groups identified by each country. As this is the first pandemic to occur in the Information Age, COVID-19 information is being disseminated through technology and social media on a massive scale to keep people safe, informed, productive, and connected. The Internet has been the main source of information on COVID-19 in the United States of America *(6)* and while it has the potential to keep people connected and informed through times of social distancing, the technology is also enabling and escalating an overabundance of information—the so-called infodemic. Significantly, COVID-19 vaccines have been the target of misinformation and disinformation on the Internet, leading to public mistrust and concerns over vaccine safety undermining the global response to the pandemic and ultimately jeopardizing measures taken by health authorities to control the pandemic. Social media is an influential channel for propagating antivaccine information, which has previously been found to have an inverse impact on the uptake of the influenza vaccine. Nevertheless, social media also has the potential to be used to spread reliable vaccine information from trusted HCWs and public health authorities and can thus foster public trust in vaccination *(7)*.

Varying degrees of COVID-19 vaccine hesitancy have previously been demonstrated in Trinidad and Tobago. A survey of 500 people conducted by De Freitas et al. in November and December 2020 found that 63% of participants would take a COVID-19 vaccine if available *(8)* implying a 37% hesitancy. Another poll of 973 members of the general public of Trinidad and Tobago conducted in April and May of 2021 found that 65% displayed some degree of COVID-19 vaccine hesitancy *(9)*. De Freitas et al. further described the two most important factors influencing vaccine decisions as being whether vaccines had been used for a long time and without adverse effect, and whether they had been used in other countries *(8)*. A study conducted in the United States of America found 27% of the public to be vaccine-hesitant, with the main reasons stated also being concern over the possible side effects of

the vaccine and the vaccine being too new, and a lack of trust in government having ensured the vaccine to be safe and effective *(10)*. The Pan American Health Organization (PAHO) has documented the extent to which the infodemic accompanying the COVID-19 pandemic has affected and influenced the knowledge and attitudes of Caribbean HCWs *(3)*.

The WHO SAGE Working Group recommends targeting HCWs as an effective strategy to address vaccine hesitancy *(11)*. The importance of this strategy is mirrored in the United States of America, where 85% of the public expressed that they trust their doctor or health care provider for reliable vaccine information *(10)*, but at least 15% of the HCWs who had been offered vaccination had refused to take it *(12, 13)*. PAHO found that 23% of Caribbean HCWs expressed some level of vaccine hesitancy and identified concerns about vaccine safety, lack of confidence in vaccine benefits, and lack of trust in new vaccines as the main reasons behind their vaccine hesitancy *(3)*. This mirrors findings from Europe and Canada, where concerns about vaccine safety were a key influencer of vaccine hesitancy among HCWs *(14, 15)*. Trust in the institutions delivering information on vaccines and vaccination is essential for vaccine acceptance among HCWs *(14)*. In France, vaccine uptake among hospital staff has increased due to vaccine information specifically targeting HCWs *(16)*, and information and being well-informed were also found to be to pivotal to vaccine uptake among Mexican HCWs *(17)*.

Among Caribbean HCWs, nurses have been found to be more vaccine hesitant than physicians, and the younger HCWs have been demonstrated to be more vaccine hesitant than older HCWs, while there was no difference between male and female HCWs *(3)*.

Nurses displaying comparably more vaccine hesitancy than other categories of HCWs is mirrored in studies from around the world *(18–20)*. In contrast to the Caribbean, studies from other parts of the world have found female gender to be a negative predictor of vaccine uptake *(19, 21–26)*. Younger age is also found globally to be inversely associated with vaccine uptake, as in the Caribbean, and so is parenthood/having children at home *(18, 24, 26, 27)*. Before the onset of COVID-19, studies from Latin America and the Caribbean found rural-dwelling, lower education, and financial insecurity to be associated with vaccine hesitancy among both HCWs and the public *(25, 28)*. These trends appear to be global, as they were mirrored in studies from other parts of the world *(24, 26, 27)*.

This report describes the results and implications of responses given by HCWs from Trinidad and Tobago, which was also a part of PAHO's Caribbean-wide survey, whose methods, results, and implications are described in a separate report *(3)*. Some of the motivation and methods description in this current report is shared with the same sections in the Caribbean report, but this report provides additional Trinidad and Tobago-specific details, where appropriate. The results section a) focuses only on Trinidad and Tobago, b) compares the demographics and opinions of Trinidad and Tobago respondents with the Caribbean report, and c) compares Trinidad and Tobago with the rest of the Caribbean excluding Trinidad and Tobago. These results can guide decisionmakers in Trinidad and Tobago in the effort to develop public policy to establish adequate measures to mitigate the impact of the infodemic through a targeted communication effort to increase uptake of the COVID-19 vaccines among HCWs.

Methods

For a detailed description of the materials and methods of the original survey, please refer to the report Concerns, Attitudes, and Intended Practices of Healthcare Workers toward COVID-19 Vaccination in the Caribbean *(3)*. The methods applied in the main study are described below, with details specific to Trinidad and Tobago added, as appropriate.

Survey instrument development

The instrument is based on a tool developed by WHO and UNICEF and presented in the interim guidance document Data for Action: Achieving High Uptake of COVID-19 Vaccines *(29)*, and a questionnaire developed by researchers from the University of California, Los Angeles *(30)*. It was adapted for use in the Caribbean and reviewed by the Caribbean Technical Advisory Group for Immunization. To ensure questions and response options were understood as intended by Caribbean HCWs, and measured what they were designed to measure, the questionnaire was piloted by the original survey team *(3)*. The instrument includes specific questions geared at HCWs, as they are a target audience for COVID-19 vaccine communications, considering their important role as trusted sources of information on vaccines and the fact that they were to be among the first group to be vaccinated in the vaccine rollout, in accordance with the WHO SAGE framework *(5)*. Questions on the influenza vaccine were added to allow for the comparison between attitudes toward COVID-19 vaccine and another vaccine given to adults in the Caribbean.

Survey implementation

Data were collected anonymously using an electronic survey in English via Qualtrics® (Qualtrics, Provo, UT) (Annex A). Qualtrics recorded the respondents' start and end date and time and used cookies and IP address tracking and geographical coordinates (latitude/longitude) to prevent multiple submissions by the same respondent. It was set to accept responses from within the Caribbean region. The project team tested the web survey before it was opened for project data collection. Due to complications with poor Internet access in some areas in Trinidad and Tobago and a preference for a paper form of the questionnaire, a paper form of the questionnaire was circulated in addition to the survey link.

Questions were grouped into several categories:

1. Country, sex, age, job title, HCW category.
2. Opinion questions 1:
    a. Attitudes to vaccines in general (7 Likert questions)
    b. Vaccine readiness (3 Likert questions).
3. Opinion questions 2: Attitudes toward COVID-19 vaccines
    a. Overall attitudes (3 Likert questions)
    b. Vaccination if a COVID-19 vaccine becomes publicly available: (4 Likert questions)
    c. Reasons for delaying or refusing a COVID-19 vaccine: (5 Likert and 1 open text).
4. Reasons contributing to opinions on COVID-19 vaccines (8 Likert questions and 1 open text).
5. Attitudes toward influenza vaccine (2 Likert questions and 2 open text).

If the respondent consented to take the survey, they were presented with all the questions. They were not required to respond to any of the opinion questions. There was no review or confirmation step at the end of the survey. All Likert questions used four response options: Strongly agree; Agree; Disagree; Strongly disagree.

Survey dissemination and advertising the survey

The Qualtrics platform created a link and Quick Response (QR) code for survey dissemination. These were distributed to the Trinidad and Tobago Ministry of Health (MoH), the five Regional Health Authorities (RHAs), and a few private medical institutions inclusive of private community HCWs through the PAHO/WHO Trinidad and Tobago Country Office. The PAHO/WHO Country Office advised some Trinidad and Tobago officials, including general managers in primary health care, to distribute the questionnaire via communications at the health facilities across the different RHAs. The questionnaire was also uploaded to PAHO/WHO Trinidad and Tobago's Facebook social media account. Several webinars with the assigned PAHO/WHO focal point were carried out to present the survey and describe its components.

The survey had the option of multiple completes per link to allow for snowballing. However, Qualtrics monitors survey activity using a browser-based cookie. This ensures that each respondent completes the survey no more than once. If someone who has already taken the survey attempted to repeat it, they were prevented from doing so. There were no payments or incentives to complete the survey. Data collection occurred between 15 March and 30 April 2021.

Paper forms were collected by the PAHO/WHO Trinidad and Tobago Country Office for 86 such respondents, and their responses were uploaded using Qualtrics at a location with stable Internet access. Each paper form was assigned a unique identification number and two staff members from the PAHO/WHO Trinidad and Tobago Country Office independently of each other typed the information from the paper survey into the Qualtrics® platform.

Sample size

The target sample size for the larger Caribbean survey was calculated using the total number of HCWs in the categories reported to the WHO National Health Workforce Accounts Portal (NHWA): nurses, physicians, midwives, dentists, and pharmacists. Fourteen countries of the Caribbean reported a total of 38 671 HCWs; this was taken to be the size of the population of eligible respondents. To calculate the sample size, a complex multilevel sample design was assumed. To be conservative, the inferential goal was to estimate Caribbean HCW vaccine hesitancy using a two-sided Wald-type margin of error no wider than ±5% if 50% of HCWs were hesitant and if complex sampling carried a design effect up to 2. The resulting sample size (n = 761) was allocated proportionally across countries. Trinidad and Tobago was calculated to have 34.5% of all HCWs in the Caribbean, and so was assigned a

TABLE 1 **Healthcare workers by country/region and category: complex multilevel sample size calculation**

COUNTRY/REGION	POPULATION*	NURSES	MIDWIVES	MEDICAL DOCTORS	DENTISTS	PHARMACISTS	SUBTOTAL	PROPORTION OF CARIBBEAN HCWS	TARGET SAMPLE SIZE
Trinidad and Tobago	1 394 969	5689	41	6244	444	923	13 341	34%	263
Caribbean	18 664 468	21 199	1395	12 392	1405	2280	38 671	100%	761

**United Nations population estimate for 2019.*

Source: WHO National Health Workforce Accounts Portal.

target of 263 respondents (Table 1). Sample size was calculated using OpenEpi v3.01 *(31)*.

Statistical analysis

Summaries were calculated using proportions, where the denominator was the number of respondents who answered the question, and the numerator was the number of persons who gave the response being analyzed. Data were summarized as if they were from a simple random sample of HCWs. Responses to each of the 32 opinion questions were summarized using all four categories—Strongly agree; Agree; Disagree; Strongly disagree—and two consolidated categories thereafter: Strongly agree combined with Agree (Agree); Disagree combined with Strongly disagree (Disagree).

Binary consolidated response categories (Agree vs. Disagree) were analyzed using Fisher's exact test to identify questions that yielded different proportions of agreement between respondent categories. The main analysis approach was to examine groups of questions and look for patterns in responses between respondent categories, and to use those patterns to inform communication strategies for HCWs. The Fisher's exact test p-values were used to confirm that the patterns in proportions were statistically significant.

The question "If a COVID-19 vaccine becomes available, I intend to get it as soon as possible" was identified as a proxy of COVID-19 vaccine acceptance; those who disagreed or strongly disagreed with this statement were considered to be COVID-19 vaccine hesitant.

Multivariable logistic regression was used to assess outcomes for every opinion question. Respondents who said "Strongly agree" or "Agree" were coded with an outcome of 1 and those who said "Disagree" or "Strongly disagree" were coded with 0. Explanatory factors included three categorical variables: job category (five levels, with physicians as the reference group); sex (with males as the reference); and age quartile (with the youngest quartile as the reference group). If a question did not have at least 15 respondents with the outcome coded 1 and at least 15 with the outcome coded 0, then the responses were considered to be too homogeneous for multivariable logistic regression, and the only hypothesis tests employed were Fisher's exact test.

Each opinion question reports the percentage of respondents in each response category, along with the number of persons in that category who answered the question. The data and Fisher's exact test and logistic regression results for Trinidad and Tobago respondents for all 32 questions and all respondent categories are listed in Annex C.

To compare patterns of responses from Trinidad and Tobago HCWs with those from HCWs in the rest of the Caribbean (RoC), results for each question were stratified into two groups—Trinidad and Tobago and RoC—and logistic regression was run separately for each group.

Data cleaning and categorization

After the survey was closed in May 2021, responses were downloaded from the Qualtrics platform. Respondents were dropped from the dataset if they a) indicated they were not an HCW, b) did not consent to answer the questions, c) were younger than 21 years of age, d) did not give a substantive response to any of the 32 opinion questions with Likert response options, or e) indicated via their job description that they were not included in the target population (e.g., veterinarians, receptionists, hospital laundry workers, orderlies, medical records officers, etc.).

Respondents were assigned to several categories for the purpose of reporting results:

1. Job categories
    a. Five broad categories: Physicians; Nurses; Public Health Professionals; Allied Health Professionals; and Other. (Persons who answered "other" entered a free text job title and a team categorized some of those

as falling in the other four categories and some as being, indeed, other. The dataset was updated with these team-corrected classifications.)

2. Age categories
    a. The age quartiles were the same as those reported in the broader Caribbean survey report: 22–32, 33–40, 41–50, and 51–81 years.[1]

Summarizing open text responses (qualitative response)

Open text responses were collected for four questions:

Q28: Other reasons for delaying or refusing COVID-19 vaccine.
Q37: Other factors that contributed to my opinion on a COVID-19 vaccine.
Q39: If you disagree with taking the flu vaccine, why?
Q41: If you disagree with recommending the flu vaccine to friends and family, why?

The qualitative response categorization team consisted of three pairs of investigators. Each pair had a member with strong quantitative skills and a member with strong qualitative skills. The pairs examined open-text responses to questions 28, 37, 39, and 41 and categorized them as reflecting one of four domains from the WHO behavioral and social drivers of COVID-19 vaccination model, which was adapted by the team to fit the survey findings *(29)*. The domains identified in this framework are: thinking and feeling; motivation; social processes; and practical issues. After the initial categorization, the pairs of investigators then collated their work and conferred to resolve discordant decisions. The responses were once again analyzed and coded by three team members. All team members participated in a further review where a consensus decision was made on all answers for which there had been doubt about the final domain and/or construct following the initial review.

Ethics and confidentiality

The data for the report are extracted from the data collected in the study Concerns, Attitudes, and Intended Practices of Healthcare Workers toward COVID-19 Vaccine in the Caribbean. The study protocol received approval from the Trinidad and Tobago Ministry of Health Ethics Committee and the PAHO Ethics Review Committee (PAHOERC). The study team obtained consent from the participants, who agreed to participate in the survey. The consent form was available online, or in printed form for respondents filling out paper forms, before the participants had access to the questionnaire. All study procedures were described in detail such that the participants were fully informed of their requirements while in the study. During this consent process, HCWs were informed that they were free to choose to take part in the research study or not. The survey welcomed information, emphasized that participation was voluntary, that there was no negative consequence, and no expected appropriate answer to the questions. All potential participants could agree or decline to participate in the study. Those who consented to participate in the study were enrolled.

1 The age quartiles used in the overall Caribbean report were 21–32, 33–40, 41–50, and 51–87 years. However, as no respondents in Trinidad and Tobago were younger than 22 or older than 81 years, for the purpose of clarity, this report refers to AQ1 as 22–31 and AQ4 as 51–81 years, respectively.

Results

A total of 371 HCWs from Trinidad and Tobago answered the survey (Figure 1 and Table 2); 72% of respondents were females, 39% were 22–32 years old, and physicians constituted the largest group of respondents (51%). In comparison, the respondents from the Caribbean survey were made up of 75% females, 25% between the ages of 21–32, and 43% physicians. For comparability, we analyzed the results from Trinidad and Tobago using the same age brackets as in the overall Caribbean survey (AQ1: 21–32; AQ2: 33–40; AQ3: 41–50; and AQ4: 51–87 years), adjusting the endpoints to reflect the more limited Trinidad and Tobago respondent age range of 22–81 years.

Respondents were not required to answer any question. Annex B lists the number of respondents who answered each of the Likert-type opinion questions. The number of answers ranged from as few as 206 for Q24: "I am confident there will be other effective treatments soon" to as many as 360 for Q6: "Vaccines are important for my health."

Quantitative responses

Six questions had responses that were too homogeneous to support multivariable logistic regression:

Q6. Attitudes: Vaccines are important for my health.
Q7. Attitudes: Vaccines are a good way to protect myself from disease.
Q8. Attitudes: Vaccines are safe.
Q9. Attitudes: Vaccines are effective.
Q10. Attitudes: Vaccines are important for the health of others.
Q22. COVID-19 vaccine: I do not intend to ever get the vaccine.

In the paragraphs below, we describe only differences that were statistically significant. For questions that support it, the significance is assessed with multivariable logistic regression. For questions where responses were too homogeneous for logistic regression, we report results from Fisher's exact test.

FIGURE 1 **Trinidad and Tobago respondents by job category, sex, and age**

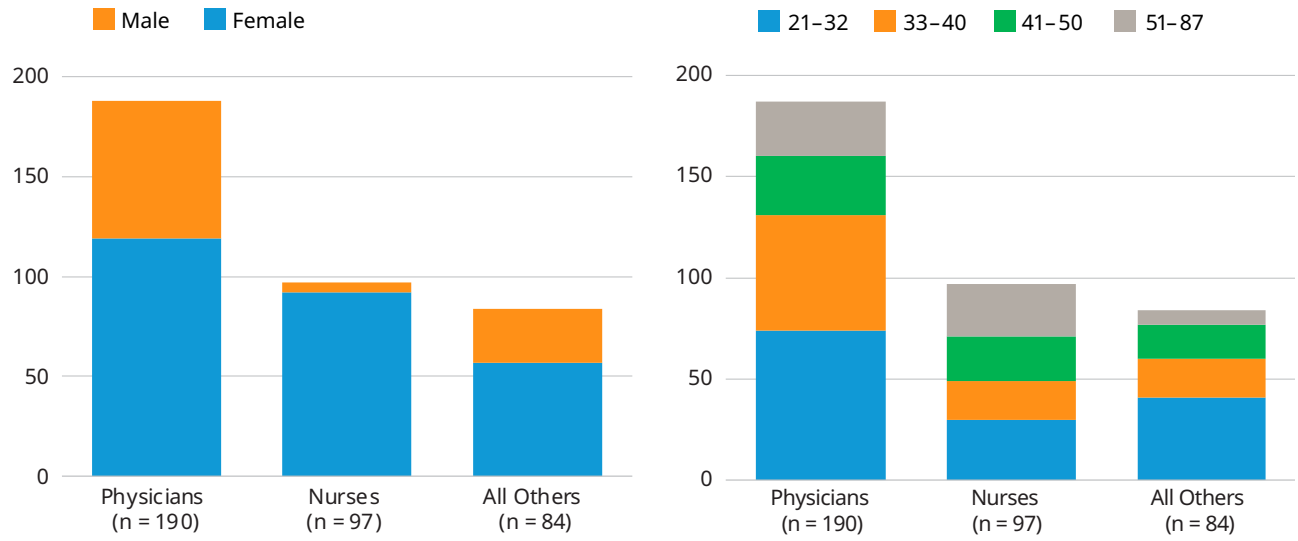

TABLE 2 **Respondent counts by age, sex, and job category**

FEMALE

	PHYSICIAN	NURSES	OTHER	TOTAL
22-32 y	52	28	28	108
33-40 y	41	19	12	72
41-50 y	14	20	11	45
51-81 y	11	25	6	42
Missing	1	0	0	1
Total	119	92	57	268

MALE

	PHYSICIAN	NURSES	OTHER	TOTAL
22-32 y	22	2	13	37
33-40 y	16	0	7	23
41-50 y	14	2	6	22
51-81 y	16	1	1	18
Missing	1	0	0	1
Total	69	5	27	101

Notes: Green bars are scaled so that if the cell is filled, the count is n = 52. One respondent did not identify as male or female, and one respondent did not provide any gender information.

Full details are available in Annex C. The sentences below include p-values of specific statistically significant differences.

Attitudes to routine vaccines

Regarding attitudes to routine vaccines, respondents displayed widespread agreement that vaccines in general are important for their health (99%) and a good way to protect oneself from disease (99%). Whereas we found an overall agreement that vaccines are safe (97%) and effective (98%), we observed some differences between comparison groups: 87% of nurses ($p < 0.001$) agreed that vaccines are safe and 92% ($p = 0.003$) agreed that vaccines are effective, compared to 100% and 99% of physicians, respectively.

The same pattern was repeated, as, overall, respondents agreed that vaccine information is reliable and trustworthy (94%) and that they do what their health care provider recommends about vaccines (94%), while among nurses ($p < 0.001$) only 87% agreed that vaccine information is reliable and trustworthy, and 87% of nurses ($p = 0.003$) do what their health care provider recommends, compared to 98% and 97% of physicians, respectively.

When looking across age groups and between sexes, respondents uniformly displayed positive attitudes to routine vaccines.

Vaccine readiness

When asking about vaccine readiness, there were significant differences between HCW categories. Overall, 54% of respondents agreed that new vaccines carry more risk than older vaccines, as did 38% of physicians vs. 70% of nurses ($p < 0.001$) and 77% of

TABLE 3 Summary of responses by HCW category, age, and gender

RESPONDENTS WHO AGREE OR STRONGLY AGREE WITH:	ALL (%)	PHYSICIANS (%)*	NURSES (%)	OTHER (%)	PHYSICIANS–GENERAL AND FAMILY (%)	PHYSICIANS – SPECIALISTS (%)	NURSES – INPATIENT (%)	NURSES – OUTPATIENT (%)	MALE (%)*	FEMALE (%)	AGE 22–32 (%)*	AGE 33–40 (%)	AGE 41–50 (%)	AGE 51–81 (%)
6. Attitudes: Vaccines are important for my health	99	100	97	99	100	100	97	96	99	99	99	98	100	98
7. Attitudes: Vaccines are a good way to protect myself from disease	99	100	97	99	100	100	97	96	100	98	100	99	99	96
8. Attitudes: Vaccines are safe	97	100	87	98	100	100	84	95	98	96	98	95	95	96
9. Attitudes: Vaccines are effective	98	99	92	100	99	100	89	100	97	98	98	98	100	96
10. Attitudes: Vaccines are important for the health of others	99	100	97	97	100	100	97	96	98	99	99	99	98	97
11. Attitudes: Vaccine information is reliable and trustworthy	94	98	87	92	98	100	84	95	94	94	94	95	93	96
12. Attitudes: I do what my care provider recommends about vaccines	94	97	87	94	96	100	85	91	98	92	96	90	92	96
13. Readiness: New vaccines carry more risk than older vaccines	54	38	70	77	39	32	82	35	50	56	54	55	55	51
14. Readiness: I would recommend a COVID-19 vaccine to friends and family	86	95	70	73	94	100	67	78	86	85	85	84	83	92
15. Readiness: I am concerned about serious adverse effects of vaccines	79	74	79	89	74	73	81	74	77	79	79	81	80	73
16. COVID-19: A COVID-19 vaccine will protect me from severe COVID disease	88	98	67	80	98	100	64	75	94	86	85	92	87	89
17. COVID-19: I am confident in the COVID-19 vaccine scientific approval process	78	92	54	62	91	97	48	71	88	74	75	78	75	92

Continues next page

TABLE 3 (CONTINUED) **Summary of responses by HCW category, age, and gender**

RESPONDENTS WHO AGREE OR STRONGLY AGREE WITH:	ALL (%)	PHYSICIANS (%)*	NURSES (%)	OTHER (%)	PHYSICIANS– GENERAL AND FAMILY (%)	PHYSICIANS – SPECIALISTS (%)	NURSES – INPATIENT (%)	NURSES – OUTPATIENT (%)	MALE (%)*	FEMALE (%)	AGE 22–32 (%)*	AGE 33–40 (%)	AGE 41–50 (%)	AGE 51–81 (%)
18. COVID-19: I would be willing to participate in a COVID-19 vaccine trial	42	58	19	31	58	57	13	45	53	38	41	45	43	43
19. COVID-19 vaccine: I intend to get it as soon as possible	74	88	48	60	86	100	39	73	82	70	63	81	77	82
20. COVID-19 vaccine: I intend to wait to see how it affects others before I get it	52	33	71	71	36	21	74	58	48	54	61	43	51	45
21. COVID-19 vaccine: I do not intend to get it soon, but might in the future	42	24	62	61	27	10	66	50	30	47	47	35	48	30
22. COVID-19 vaccine: I do not intend to ever get the vaccine	3	2	8	0	2	0	6	13	2	3	1	4	2	7
23. Reasons: I am confident there will be other effective treatments soon	82	75	87	95	76	71	90	75	83	82	84	80	78	84
24. Reasons: I do not yet know enough about the vaccine to make a decision	34	14	61	53	16	6	70	35	28	37	36	29	43	31
25. Reasons: I want to gain natural immunity to the virus that causes COVID-19	24	12	43	39	14	6	42	44	22	25	21	19	31	32
26. Reasons: Development may be rushed/vaccine may not be thoroughly tested	50	30	76	71	31	25	80	63	46	52	50	43	58	53
27. Reasons: I believe vaccines may give you the disease	17	10	29	24	11	3	36	11	17	17	16	15	19	17
29. Opinion shapers: The pace at which the vaccine was researched and developed	59	49	70	72	48	55	71	68	54	61	60	59	58	57

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TABLE 3 (CONTINUED) **Summary of responses by HCW category, age, and gender**

RESPONDENTS WHO AGREE OR STRONGLY AGREE WITH:	ALL (%)	PHYSICIANS (%)*	NURSES (%)	OTHER (%)	PHYSICIANS– GENERAL AND FAMILY (%)	PHYSICIANS – SPECIALISTS (%)	NURSES – INPATIENT (%)	NURSES – OUTPATIENT (%)	MALE (%)*	FEMALE (%)	AGE 22–32 (%)*	AGE 33–40 (%)	AGE 41–50 (%)	AGE 51–81 (%)
30. Opinion shapers: The unfolding and frequently evolving science of SARS-CoV-2	89	89	87	92	89	91	88	82	83	91	89	92	93	81
31. Opinion shapers: Actions and opinions of friends and family	28	23	37	34	22	24	38	33	35	25	29	17	37	34
32. Opinion shapers: Relationship between coverage rates and community transmission	78	76	84	77	76	76	85	80	74	80	70	79	87	87
33. Opinion shapers: My own research on COVID-19 vaccines	89	92	90	79	91	97	89	94	88	89	83	93	93	90
34. Opinion shapers: The country in which a vaccine is manufactured	49	46	59	48	46	47	60	59	48	50	47	44	60	52
35. Opinion shapers: The potential cost of a COVID-19 vaccine	26	28	28	19	29	23	26	33	25	27	22	28	39	22
36. Opinion shapers: Information I've seen on social media.	30	18	45	42	22	3	44	47	26	30	34	18	36	29
38. Influenza: I would take the flu vaccine if offered	85	93	66	85	92	97	62	79	90	83	84	90	84	82
40. Influenza: I would recommend the flu vaccine to friends and family	95	99	89	90	99	100	85	100	96	94	96	95	91	94

Notes: Shaded cells mean logistic regression p-value is < 0.05.

*Logistic regression reference category

others ($p < 0.001$) (Table 4). We found a statistically significant difference between subcategories of nurses, as 82% of inpatient nurses agreed with the statement vs. 35% of outpatient nurses ($p < 0.001$).

Some 95% of physicians agreed they would recommend a COVID-19 vaccine to friends and family vs. 70% of nurses ($p < 0.001$) and 73% of others ($p < 0.001$); whereas 74% of physicians are concerned about serious adverse effects of vaccines vs. 89% of other HCWs ($p = 0.012$) (Table 5).

Attitudes toward COVID-19 vaccines

Concerning attitudes specifically pertaining to COVID-19 vaccines, the pattern of differences among HCW categories was repeated. Overall, 88% of respondents believe that a COVID-19 vaccine would protect against severe COVID-19 and 78% are confident in the scientific approval process for a COVID-19 vaccine; 42% would be willing to participate in a COVID-19 vaccine trial.

Comparing across HCW categories, 98% of physicians vs. 67% nurses ($p < 0.001$) and 80% of other workers ($p < 0.001$) agreed to the ability of COVID-19 vaccines to protect against severe COVID-19.

Some 92% of physicians are confident in the scientific approval process, compared to 54% of nurses ($p < 0.001$) and 62% of other HCWs ($p < 0.001$).

Some 58% of physicians agree they would be willing to participate in a COVID-19 vaccine trial,

TABLE 4 **New vaccines carry more risk than older vaccines**

	AGREE OR STRONGLY AGREE (%)	DISAGREE OR STRONGLY DISAGREE (%)	N	FISHER'S EXACT TEST P-VALUE	LOGISTIC REGRESSION ADJUSTED ODDS RATIO	P-VALUE	LOWER BOUND	UPPER BOUND
All	54	46	264					
HCW: Physicians	38	62	145		1.00			
HCW: Nurses	70	30	66	**<0.001**	4.11	**<0.001**	2.08	8.12
HCW: All Others	77	23	53	**<0.001**	5.52	**<0.001**	2.65	11.53
Doctor (general & family)	39	61	120					
Doctor (specialist)	32	68	25	0.651				
Nurse (inpatient)	82	18	49					
Nurse (outpatient)	35	65	17	**<0.001**				
Sex: Male	50	50	70		1.00			
Sex: Female	56	44	192	0.484	0.85	0.606	0.45	1.58
Age Q1: 22-32	54	46	103		1.00			
Age Q2: 33-40	55	45	75		1.19	0.601	0.62	2.26
Age Q3: 41-50	55	45	47		0.91	0.812	0.43	1.95
Age Q4: 51-81	51	49	37	0.985	0.78	0.554	0.34	1.78

Note: In every row, those who agree plus those who disagree sum to 100%. Bars are scaled so that if the percentage were 100%, the entire width of the table cell would be filled with color.

compared to 19% of nurses ($p < 0.001$) and 31% of other HCWs ($p < 0.001$). Differences appear to be significant between subcategories of nurses, but only 11 outpatient nurses answered the question, and so those results are based on a sample too small to interpret. After adjusting for job category, there were no significant differences between sex or age groups.

Vaccine hesitancy

Figures 2, 3, and 4 summarize the proportion of HCWs who do not plan to receive a COVID-19 vaccine as soon as possible. Overall, 26% of HCWs expressed some degree of COVID-19 vaccine hesitancy: 12% of physicians did not intend to get a COVID-19 vaccine as soon as possible, compared with 52% of nurses ($p < 0.001$) and 40% of all others ($p < 0.001$); 14% of general and family physicians exhibited hesitancy vs. 0% of specialists ($p = 0.045$); 61% of inpatient nurses exhibited hesitancy vs. 27% of outpatient nurses, but only 15 outpatient nurses answered the question, and so this difference is based on a small number of respondents.

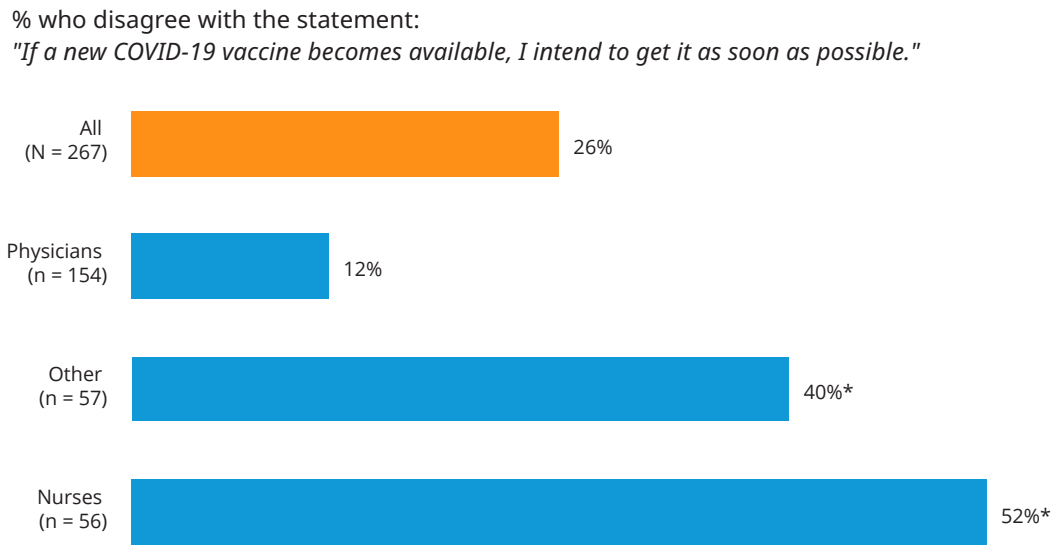
When comparing across age quartiles, vaccine hesitancy was most prevalent among the youngest HCWs, as 37% of those aged 22–32 compared to 19% of those aged 33–40 ($p = 0.042$), 23% of those aged 41–50 ($p = 0.034$), and 18% of those aged 51–81 ($p = 0.005$) did not intend to get a COVID-19 vaccine as soon as possible.

TABLE 5 **I am concerned about serious adverse effects of vaccines**

	AGREE OR STRONGLY AGREE (%)	DISAGREE OR STRONGLY DISAGREE (%)	N	FISHER'S EXACT TEST P-VALUE	LOGISTIC REGRESSION ADJUSTED ODDS RATIO	P-VALUE	LOWER BOUND	UPPER BOUND
All	79	21	350					
HCW: Physicians	74	26	180		1.00			
HCW: Nurses	79	21	91	0.372	1.38	0.338	0.72	2.65
HCW: All Others	89	11	79	**0.025**	2.72	**0.012**	1.25	5.91
Doctor (general & family)	74	26	147					
Doctor (specialist)	73	27	33	0.830				
Nurse (inpatient)	81	19	68					
Nurse (outpatient)	74	26	23	0.555				
Sex: Male	77	23	95		1.00			
Sex: Female	79	21	253	0.659	1.09	0.776	0.59	2.01
Age Q1: 22-32	79	21	139		1.00			
Age Q2: 33-40	81	19	85		1.22	0.579	0.61	2.42
Age Q3: 41-50	80	20	64		1.00	0.992	0.47	2.11
Age Q4: 51-81	73	27	59	0.677	0.76	0.471	0.37	1.59

Note: In every row, those who agree plus those who disagree sum to 100%. Bars are scaled so that if the percentage were 100%, the entire width of the table cell would be filled with color.

FIGURE 2 **Vaccine hesitancy by HCW job category**



Note: Asterisk (*) indicates a statistically significant difference compared with physicians, having adjusted for age and gender.

Some 33% of physicians wanted to wait and see how a COVID-19 vaccine affected others before getting it themselves, compared to 71% of nurses ($p < 0.001$) and 71% of others ($p < 0.001$). So did 61% of the youngest age group (22–32) vs. 45% of the eldest (51–81) ($p = 0.024$). Similarly, 24% of physicians agreed that they did not intend to get the vaccine soon, but they might in the future, compared to 62% of nurses ($p < 0.001$) and 61% ($p < 0.001$) of others. So did 47% of those aged 22–32, compared to 30% of respondents aged 51–81 ($p = 0.017$).

We observed no significant differences between subcategories of physicians, subcategories of nurses, or between sexes.

Only 3% of respondents stated an intent to refuse a COVID-19 vaccine altogether: 2% of physicians vs. 8% of nurses ($p = 0.034$).

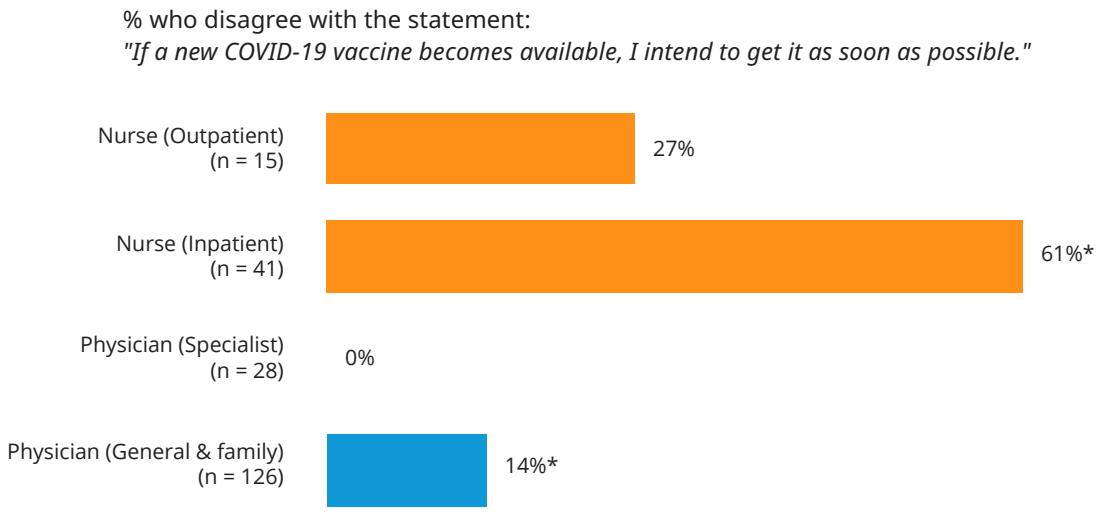
Factors that contributed to the opinions on COVID-19 vaccines

When asked the reasons behind their intention to receive or not receive COVID-19 vaccines, 82% of participants were confident that there would be other effective treatments soon, with significant differences between other HCWs (95%) and physicians (75%) ($p = 0.011$).

Some 34% of HCWs replied they did not yet know enough about COVID-19 vaccines to make a decision; 14% of physicians agreed with this statement, compared to 61% of nurses ($p < 0.001$) and 53% of others ($p < 0.001$). Differences in subcategories were significant for nurses ($p = 0.008$), where 70% of inpatient nurses lacked knowledge, compared to only 35% of outpatient nurses.

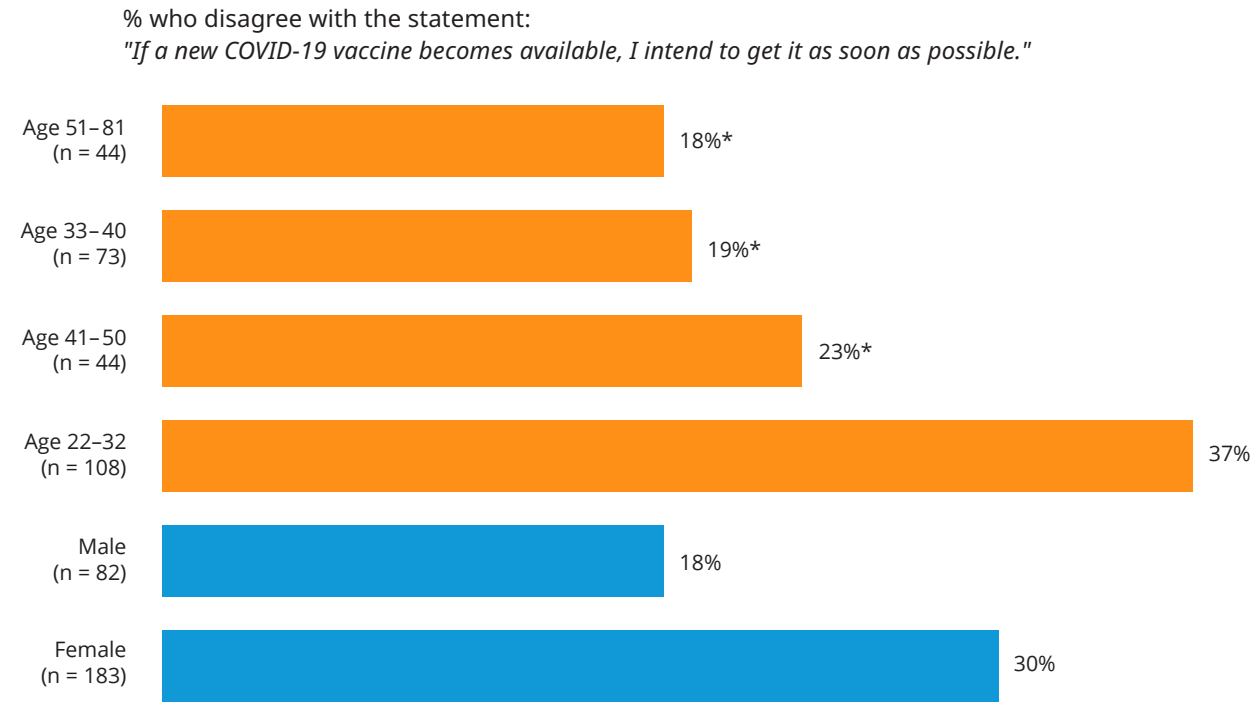
Further, 24% wanted to gain natural immunity to COVID-19, mostly nurses (43%, $p < 0.001$) and other HCWs (39%, $p < 0.001$), compared with physicians (12%).

FIGURE 3 Vaccine hesitancy by subgroups of physicians and nurses



Note: Asterisk (*) indicates a statistically significant difference compared with physicians, having adjusted for age and gender.

FIGURE 4 Vaccine hesitancy by age and gender



Note: Asterisk (*) indicates a statistically significant difference compared with physicians, having adjusted for age and gender.

Half of the HCWs agreed that vaccine development might have been rushed, or the vaccines not thoroughly tested. We observed differences between HCW categories, where 76% of nurses ($p < 0.001$) and 71% of other HCWs ($p < 0.001$) agreed, compared to 30% of physicians (Table 6).

Some 29% of nurses ($p < 0.001$) and 24% of other HCWs ($p = 0.003$) agreed the COVID-19 vaccine might cause the disease, compared to 10% of physicians.

When surveyed on reasons behind their attitudes and perceptions toward COVID-19 vaccines, 59% of respondents answered that their opinion was shaped by the pace with which the vaccine had been developed. This was true for 40% of physicians, compared to 70% of nurses ($p = 0.005$) and 72% of other HCWs ($p = 0.002$).

The unfolding and frequently evolving science on SARS-CoV-2 shaped the opinions of 89% of respondents: 83% of male respondents agreed with this compared to 91% of female respondents ($p = 0.029$).

The actions and opinions of friends and family shaped the opinion of 28% of respondents, and of 37% of nurses compared to 23% of physicians ($p = 0.011$), and 35% of males compared to 25% of females ($p = 0.027$).

The relationship between coverage rates and community transmission was an opinion shaper for 78% of respondents; 70% of the youngest HCWs, aged 22–32, agreed with this, compared to 87% of those aged 41–50 ($p = 0.035$) and also 87% of those aged 51–81 ($p = 0.045$).

TABLE 6 Development may be rushed; vaccine may not be thoroughly tested

	AGREE OR STRONGLY AGREE (%)	DISAGREE OR STRONGLY DISAGREE (%)	N	FISHER'S EXACT TEST P-VALUE	LOGISTIC REGRESSION ADJUSTED ODDS RATIO	P-VALUE	LOWER BOUND	UPPER BOUND
All	50	50	292					
HCW: Physicians	30	70	155		1.00			
HCW: Nurses	76	24	75	**<0.001**	8.65	**<0.001**	4.34	17.22
HCW: All Others	71	29	62	**<0.001**	6.33	**<0.001**	3.25	12.32
Doctor (general & family)	31	69	123					
Doctor (specialist)	25	75	32	0.665				
Nurse (inpatient)	80	20	56					
Nurse (outpatient)	63	37	19	0.212				
Sex: Male	46	54	83		1.00			
Sex: Female	52	48	207	0.364	0.75	0.35	0.41	1.37
Age Q1: 22-32	50	50	109		1.00			
Age Q2: 33-40	43	57	76		1.04	0.908	0.53	2.03
Age Q3: 41-50	58	42	55		1.22	0.604	0.58	2.55
Age Q4: 51-81	53	47	49	0.401	1.16	0.706	0.54	2.50

Note: In every row, those who agree plus those who disagree sum to 100%. Bars are scaled so that if the percentage were 100%, the entire width of the table cell would be filled with color.

Their own research on COVID-19 vaccines was an influencer for 89% of respondents, and for 92% of physicians vs. 79% of other HCWs (p = 0.015).

The country in which a vaccine was manufactured shaped the opinion of 49% of respondents, with no significant differences between groups.

The potential cost of a COVID-19 vaccine shaped the opinion of 26% of all respondents; it did so for 39% of respondents aged 41–50, compared to 22% of those aged 22–32 years (p = 0.046).

Information seen on social media influenced the opinion of 30% of respondents; 18% of physicians agreed with this, compared to 45% of nurses (p < 0.001) and 40% of other HCWs (p < 0.001). General and family physicians were more likely to be influenced by social media (22%) than specialists (3%) (p = 0.018).

Attitudes toward influenza vaccine

When asked about their attitudes on the influenza vaccine, 85% of participants agreed that they would take an influenza vaccine if offered; 93% of physicians agreed with this, compared to 66% of nurses (p < 0.001). Similarly, 95% of respondents would recommend an influenza vaccine to friends and family, as did 99% of physicians vs. 89% of nurses (p = 0.006) and 90% of other HCWs (p = 0.005) (Table 7).

There were no significant differences between the age groups or sexes.

TABLE 7. I would take the flu vaccine if offered

	AGREE OR STRONGLY AGREE (%)	DISAGREE OR STRONGLY DISAGREE (%)	N	FISHER'S EXACT TEST P-VALUE	LOGISTIC REGRESSION ADJUSTED ODDS RATIO	P-VALUE	LOWER BOUND	UPPER BOUND
All	85	15	316					
HCW: Physicians	93	7	178		1.00			
HCW: Nurses	66	34	71	**<0.001**	0.14	**<0.001**	0.06	0.32
HCW: All Others	85	15	67	**<0.001**	0.41	0.054	0.16	1.02
Doctor (general & family)	92	8	144					
Doctor (specialist)	97	3	34	0.467				
Nurse (inpatient)	62	38	52					
Nurse (outpatient)	79	21	19	0.258				
Sex: Male	90	10	91		1.00			
Sex: Female	83	17	223	0.16	0.92	0.851	0.37	2.26
Age Q1: 22-32	84	16	121		1.00			
Age Q2: 33-40	90	10	83		1.70	0.261	0.67	4.27
Age Q3: 41-50	84	16	58		1.18	0.729	0.47	2.95
Age Q4: 51-81	82	18	51	0.519	1.19	0.717	0.46	3.08

Note: In every row, those who agree plus those who disagree sum to 100%. Bars are scaled so that if the percentage were 100%, the entire width of the table cell would be filled with color.

Trinidad and Tobago apart from the Caribbean

When comparing the data from Trinidad and Tobago with that from other Caribbean countries, we observe some noticeable differences. Broadly speaking, there are more significant differences between physicians and nurses in Trinidad and Tobago than in the rest of the Caribbean. Conversely, the rest of the Caribbean revealed more differences between age quartiles and between sexes than were observed in Trinidad and Tobago.

Table 8 shows the proportion of respondents who selected "Agree" or "Strongly agree" for each question, with separate rows for Trinidad and Tobago (TT) and the rest of the Caribbean (RoC). In cases where the multivariable logistic regression indicates a significant difference between one group and its reference group, the table cell is shaded. Blue shading indicates situations where there was a significant difference in the RoC countries, and orange shading indicates a significant difference in Trinidad and Tobago. The p-values for each of these logistic regression outcomes may be found in Annex C.

Many questions show a significant difference between physicians (who are the HCW reference group) and nurses. In every instance where that difference is statistically significant, the nurses display more hesitancy than physicians. In Trinidad and Tobago, nurses were more hesitant than physicians in 22 out of 32 opinion questions; in RoC, nurses were more hesitant than physicians in 15 out of 32 questions.

In both Trinidad and Tobago and RoC, of the 32 opinion questions, there were significant differences between the percentage of physicians and nurses who agreed with the statement (after controlling for differences in sex and age) in 12 questions (#13, 18, 19, 20, 21, 24, 25, 26, 27, 29, 36, and 38). Respondents in Trinidad and Tobago showed a significant difference between physicians and nurses in an additional 10 questions where the difference for RoC countries was not significant (#8, 9, 11, 12, 14, 16, 17, 22, 31, and 40). Conversely, the RoC nurses differed from physicians in three questions where the Trinidad and Tobago difference was not significant (#15, 34, and 35).

Statistically significant differences by sex were less common in Trinidad and Tobago than elsewhere. In Trinidad and Tobago there were differences in three questions (#9, 30, and 31), two of which are notable: women report being more influenced by the unfolding and frequently evolving science of SARS-CoV-2 than men (91% vs. 83%), while men report being more influenced by the actions and opinions of friends and family than women (35% vs. 25%, respectively). In RoC, there were sex-based differences in nine questions (#6, 8, 9, 11, 12, 14, 18, 22, and 24), with women showing more pro-vaccine attitudes and more likelihood to recommend a COVID-19 vaccine than men, and men being substantially more willing to participate in a COVID-19 vaccine trial than women—but also being more likely to say they would never take the vaccine.

Finally, in RoC, Table 8 indicates that there were significant differences in the responses provided by the older vs. the youngest HCWs for 19 of 32 questions, with younger respondents showing consistently more hesitancy than older ones. In Trinidad and Tobago there were significant differences between age groups for only 7 of 32 questions. The differences were significant in both Trinidad and Tobago and RoC for questions #17, 19, 20, 21, and 35. They were significant in Trinidad and Tobago but not elsewhere for questions #25 and 32. They were not significant in Trinidad and Tobago but were significant elsewhere for questions #8, 9, 11, 13, 14, 16, 18, 22, 24, 26, 29, 30, 31, and 36.

TABLE 8. Summary of responses by HCW category, age, and gender, for Trinidad and Tobago (TT) and from the rest of the Caribbean (RoC)

RESPONDENTS WHO AGREE OR STRONGLY AGREE WITH:	GROUP	ALL (%)	PHYSICIANS (%) *	NURSES (%)	OTHER (%)	PHYSICIANS – GENERAL AND FAMILY (%)	PHYSICIANS – SPECIALISTS (%)	NURSES – INPATIENT (%)	NURSES – OUT-PATIENT (%)	MALE (%)*	FEMALE (%)	AGE 22–32 (%)*	AGE 33–40 (%)	AGE 41–50 (%)	AGE 51–81 (%)
6. Attitudes: Vaccines are important for my health	RoC	97	97	98	97	97	98	97	98	94	98	99	99	96	97
	TT	99	100	97	99	100	100	97	96	99	99	99	98	100	98
7. Attitudes: Vaccines are a good way to protect myself from disease	RoC	97	98	96	97	97	98	93	97	95	97	96	99	97	97
	TT	99	100	97	99	100	100	97	96	100	98	100	99	99	96
8. Attitudes: Vaccines are safe	RoC	94	93	96	90	94	92	95	97	87	96	90	92	95	97
	TT	97	100	87	98	100	100	84	95	98	96	98	95	95	96
9. Attitudes: Vaccines are effective	RoC	96	95	98	97	94	98	98	97	93	97	95	95	98	99
	TT	98	99	92	100	99	100	89	100	97	98	98	98	100	96
10. Attitudes: Vaccines are important for the health of others	RoC	98	98	98	97	98	98	99	98	96	98	98	99	99	98
	TT	99	100	97	97	100	100	97	96	98	99	99	99	98	97
11. Attitudes: Vaccine information is reliable and trustworthy	RoC	94	93	95	94	93	92	99	93	87	96	91	94	95	97
	TT	94	98	87	92	98	100	84	95	94	94	94	95	93	96
12. Attitudes: I do what my care provider recommends about vaccines	RoC	91	93	92	88	93	92	91	93	88	93	92	90	91	94
	TT	94	97	87	94	96	100	85	91	98	92	96	90	92	96
13. Readiness: New vaccines carry more risk than older vaccines	RoC	57	52	62	57	51	52	61	63	53	58	64	56	51	56
	TT	54	38	70	77	39	32	82	35	50	56	54	55	55	51
14. Readiness: I would recommend a COVID-19 vaccine to friends and family	RoC	90	91	92	85	91	92	94	91	85	92	85	89	92	94
	TT	86	95	70	73	94	100	67	78	86	85	85	84	83	92
15. Readiness: I am concerned about serious adverse effects of vaccines	RoC	77	70	81	82	67	74	76	83	76	77	82	74	75	75
	TT	79	74	79	89	74	73	81	74	77	79	79	81	80	73
16. COVID-19: A COVID-19 vaccine will protect me from severe COVID-19 disease	RoC	93	96	93	90	94	98	90	94	92	94	88	94	94	97
	TT	88	98	67	80	98	100	64	75	94	86	85	92	87	89

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TABLE 8 (CONTINUED) **Summary of responses by HCW category, age, and gender, for Trinidad and Tobago (TT) and from the rest of the Caribbean (RoC)**

RESPONDENTS WHO AGREE OR STRONGLY AGREE WITH:	GROUP	ALL (%)	PHYSICIANS (%) *	NURSES (%)	OTHER (%)	PHYSICIANS – GENERAL AND FAMILY (%)	PHYSICIANS – SPECIALISTS (%)	NURSES – INPATIENT (%)	NURSES – OUT-PATIENT (%)	MALE (%)*	FEMALE (%)	AGE 22–32 (%)*	AGE 33–40 (%)	AGE 41–50 (%)	AGE 51–81 (%)
17. COVID-19: I am confident in the COVID-19 vaccine scientific approval process	RoC	85	87	85	80	86	89	81	86	83	85	81	80	84	92
	TT	78	92	54	62	91	97	48	71	88	74	75	78	75	92
18. COVID-19: I would be willing to participate in a COVID-19 vaccine trial	RoC	41	52	28	38	54	49	40	22	65	33	30	44	46	42
	TT	42	58	19	31	58	57	13	45	53	38	41	45	43	43
19. COVID-19 vaccine: I intend to get it as soon as possible	RoC	78	85	73	71	82	90	72	73	81	77	65	74	83	86
	TT	74	88	48	60	86	100	39	73	82	70	63	81	77	82
20. COVID-19 vaccine: I intend to wait to see how it affects others before I get it	RoC	44	36	56	45	38	32	53	57	35	47	60	51	39	33
	TT	52	33	71	71	36	21	74	58	48	54	61	43	51	45
21. COVID-19 vaccine: I do not intend to get it soon, but might in the future	RoC	37	28	50	37	28	29	52	50	32	39	47	38	37	31
	TT	42	24	62	61	27	10	66	50	30	47	47	35	48	30
22. COVID-19 vaccine: I do not intend to ever get the vaccine	RoC	4	6	3	4	7	4	4	3	11	2	7	3	4	3
	TT	3	2	8	0	2	0	6	13	2	3	1	4	2	7
23. Reasons: I am confident there will be other effective treatments soon	RoC	87	85	88	89	83	89	76	92	90	86	86	91	85	85
	TT	82	75	87	95	76	71	90	75	83	82	84	80	78	84
24. Reasons: I do not yet know enough about the vaccine to make a decision	RoC	28	20	38	30	22	17	39	37	28	28	41	30	25	20
	TT	34	14	61	53	16	6	70	35	28	37	36	29	43	31
25. Reasons: I want to gain natural immunity to the virus that causes COVID-19	RoC	32	21	41	39	23	20	42	41	32	31	39	31	32	24
	TT	24	12	43	39	14	6	42	44	22	25	21	19	31	32
26. Reasons: Development may be rushed/vaccine may not be thoroughly tested	RoC	46	39	52	50	41	36	60	50	41	47	62	46	43	36
	TT	50	30	76	71	31	25	80	63	46	52	50	43	58	53
27. Reasons: I believe vaccines may give you the disease	RoC	23	18	31	21	18	17	36	30	24	22	25	20	21	23
	TT	17	10	29	24	11	3	36	11	17	17	16	15	19	17

Continues next page

TABLE 8 (CONTINUED) **Summary of responses by HCW category, age, and gender, for Trinidad and Tobago (TT) and from the rest of the Caribbean (RoC)**

RESPONDENTS WHO AGREE OR STRONGLY AGREE WITH:	GROUP	ALL (%)	PHYSICIANS (%) *	NURSES (%)	OTHER (%)	PHYSICIANS – GENERAL AND FAMILY (%)	PHYSICIANS – SPECIALISTS (%)	NURSES – INPATIENT (%)	NURSES – OUT-PATIENT (%)	MALE (%)*	FEMALE (%)	AGE 22–32 (%)*	AGE 33–40 (%)	AGE 41–50 (%)	AGE 51–81 (%)
29. Opinion shapers: The pace at which the vaccine was researched and developed	RoC	63	55	70	67	55	55	69	71	59	64	79	68	57	53
	TT	59	49	70	72	48	55	71	68	54	61	60	59	58	57
30. Opinion shapers: The unfolding and frequently evolving science of SARS-CoV-2	RoC	83	85	82	81	80	91	87	81	79	84	91	87	81	77
	TT	89	89	87	92	89	91	88	82	83	91	89	92	93	81
31. Opinion shapers: Actions and opinions of friends and family	RoC	29	26	34	29	27	23	33	34	29	29	37	35	30	19
	TT	28	23	37	34	22	24	38	33	35	25	29	17	37	34
32. Opinion shapers: Relationship between coverage rates and community transmission	RoC	73	74	72	73	73	76	73	72	66	76	79	80	70	69
	TT	78	76	84	77	76	76	85	80	74	80	70	79	87	87
33. Opinion shapers: My own research on COVID-19 vaccines	RoC	88	88	89	87	87	89	85	91	84	89	90	86	85	90
	TT	89	92	90	79	91	97	89	94	88	89	83	93	93	90
34. Opinion shapers: The country in which a vaccine is manufactured	RoC	48	44	58	41	43	46	67	55	42	49	49	55	40	48
	TT	49	46	59	48	46	47	60	59	48	50	47	44	60	52
35. Opinion shapers: The potential cost of a COVID-19 vaccine	RoC	35	31	44	30	36	24	55	41	33	35	45	44	30	26
	TT	26	28	28	19	29	23	26	33	25	27	22	28	39	22
36. Opinion shapers: Information I've seen on social media.	RoC	30	21	44	30	22	19	47	42	22	33	41	35	28	22
	TT	30	18	45	42	22	3	44	47	26	30	34	18	36	29
38. Influenza: I would take the flu vaccine if offered	RoC	73	79	67	68	83	72	69	66	76	71	74	73	74	73
	TT	85	93	66	85	92	97	62	79	90	83	84	90	84	82
40. Influenza: I would recommend the flu vaccine to friends and family	RoC	83	88	82	75	90	85	78	84	84	83	83	83	86	84
	TT	95	99	89	90	99	100	85	100	96	94	96	95	91	94

Notes: Shaded cells mean logistic regression p-value is < 0.05 (blue cells in RoC rows and orange cells in TT rows).

* Logistic regression reference category

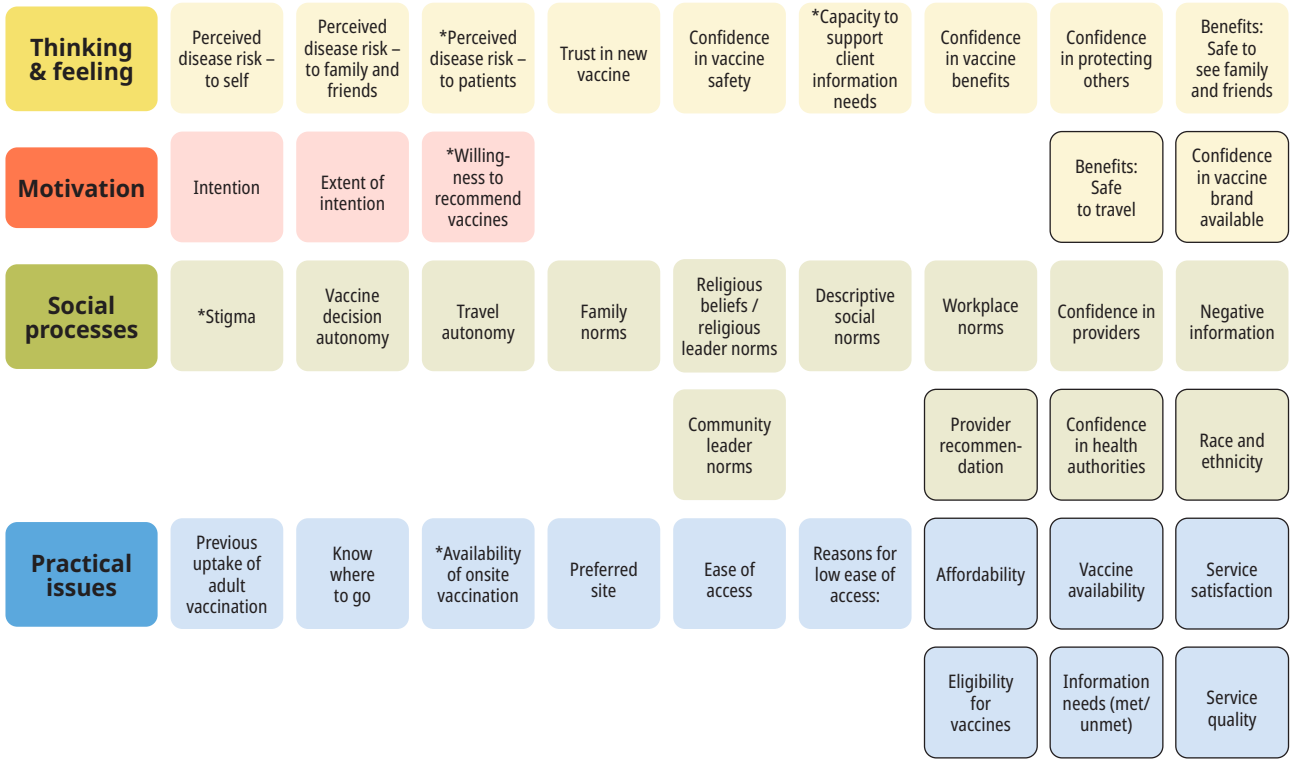
Qualitative responses categorized by behavioral and social domain (BeSD) and construct and by HCW job category

In Trinidad and Tobago, 94 respondents (of the total 371) responded to at least one of the four qualitative questions.

We identified 18 different constructs under the four WHO BeSD domains (14 pertaining to COVID-19 vaccine, 9 pertaining to influenza vaccine).2 Some answers contained information that fell under two separate constructs and sometimes within two different domains. In these cases, the answer was coded as belonging to both constructs and domains.

Figure 5 summarizes the WHO behavioral and social domains (BeSD) and constructs that were used to categorize the opinions expressed in four free-text responses (questions 28, 37, 39, and 41). Note that respondents may express an opinion in the same direction as the construct name wording (i.e., express confidence in vaccine safety), or they may express an opinion in the opposite direction (i.e., lack of confidence in vaccine safety). In both cases, the opinion would be tagged as relating to the construct named "Confidence in vaccine safety."

FIGURE 5 **WHO behavioral and social determinants domains and constructs for COVID-19 vaccines – Caribbean HCWs survey iteration**



Constructs with borders are new suggestions (not currently in published framework).

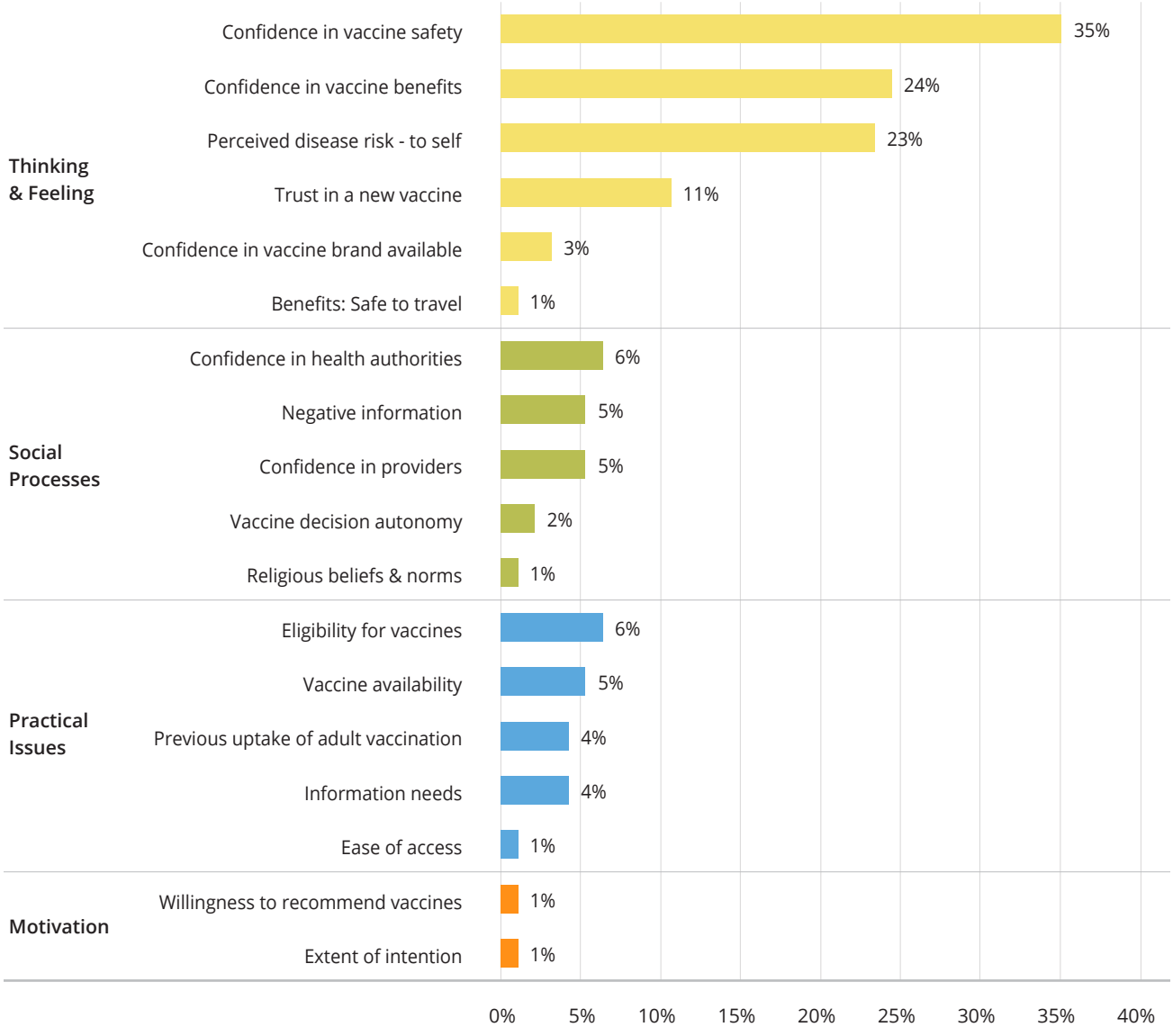
*Applies to HCWs only.

2 Some of the constructs were identified twice under factors contributing to opinions on COVID-19 vaccines and on influenza vaccines.

Figure 6 summarizes all the qualitative responses across all four of these free-text questions, showing both domains and constructs. Each bar is annotated with the proportion of respondents whose comments were classified into that category. The domain-based color schemes adhere to those used in the WHO BeSD manual.

An overall analysis of the answers submitted for the four free-text questions showed that respondents' answers fit mostly within the thinking and feeling domain. Specifically, most answers were classified as being related to their confidence (or lack of) in the vaccines' safety (35%) and benefits (24%); as well as their perceived low risk of the disease compared to the perceived risks associated with the vaccines (23%) and their trust (or lack thereof) in a new vaccine (11%) (Figure 6).

FIGURE 6 **Qualitative response domains classified using the WHO behavioral and social drivers (BeSD) rubric – all four qualitative questions together**



Attitude toward COVID-19 vaccines

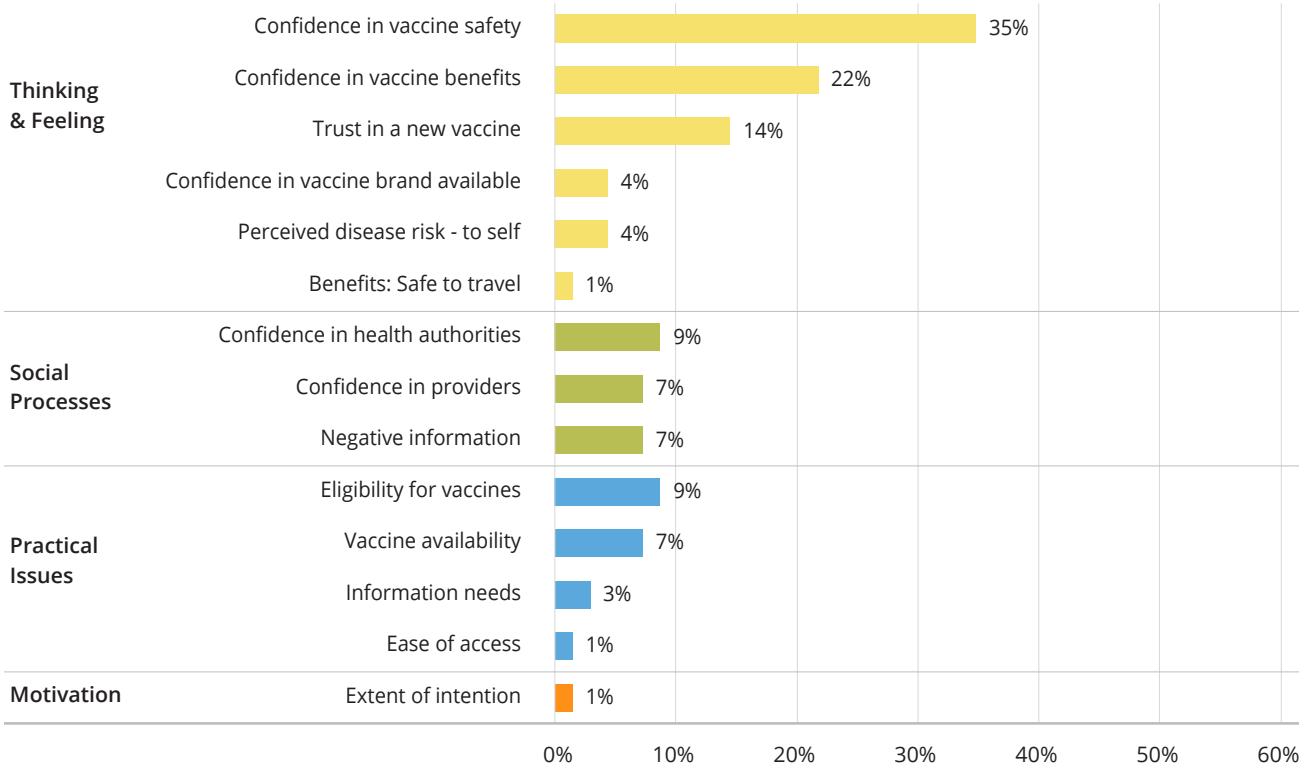
For the two questions related to HCWs' perceived barriers to COVID-19 vaccination (Q28 "Other reasons for delaying or refusing a COVID-19 vaccine" and Q37 "Other factors in my COVID-19 vaccine opinion"), the 69 respondents' answers overwhelmingly corresponded to the thinking and feeling domain (Figure 7).

The primary construct identified as part of the qualitative analysis was related to lack of confidence regarding vaccine safety (35%), as several respondents described fear of adverse effects. Another important construct identified related to a (lack of) confidence in vaccine benefits (22%), particularly as it pertained to the ability of the vaccine to prevent disease. Responses describing (low levels of) trust in new vaccines were also frequently identified (14%). Respondents especially expressed concern that the vaccines had not been adequately tested. Importantly, 4% of responses related to a low perceived disease risk to oneself from COVID-19. Some responses centered around the brand of the COVID-19 vaccine available to them as reason for delaying or refusing to get vaccinated (4%), which prompted the survey team to define a new construct of confidence in brand availability under the thinking and feeling domain:

> *"The brand I would like is not yet available here."*

The most important construct identified under the social processes domain was confidence (or lack thereof) in health authorities (9%), where respondents highlighted the importance of information from national and international health authorities; however, it is not clear whether the respondents making these mentions were hesitant or not, and thus, whether they were critiquing a lack of information or referring to the information already provided as being instrumental for their positive vaccine attitude.

FIGURE 7 **Qualitative response domains classified using the WHO behavioral and social drivers (BeSD) rubric – open text questions about COVID-19 vaccines (Q28 and Q37)**



Among the constructs identified within the practical issues domain, the most influential related to lack of eligibility for vaccine (9%). Some respondents stated pregnancy as a reason for not getting vaccinated, in line with official Trinidad and Tobago guidelines at that time.

Attitude toward influenza vaccines

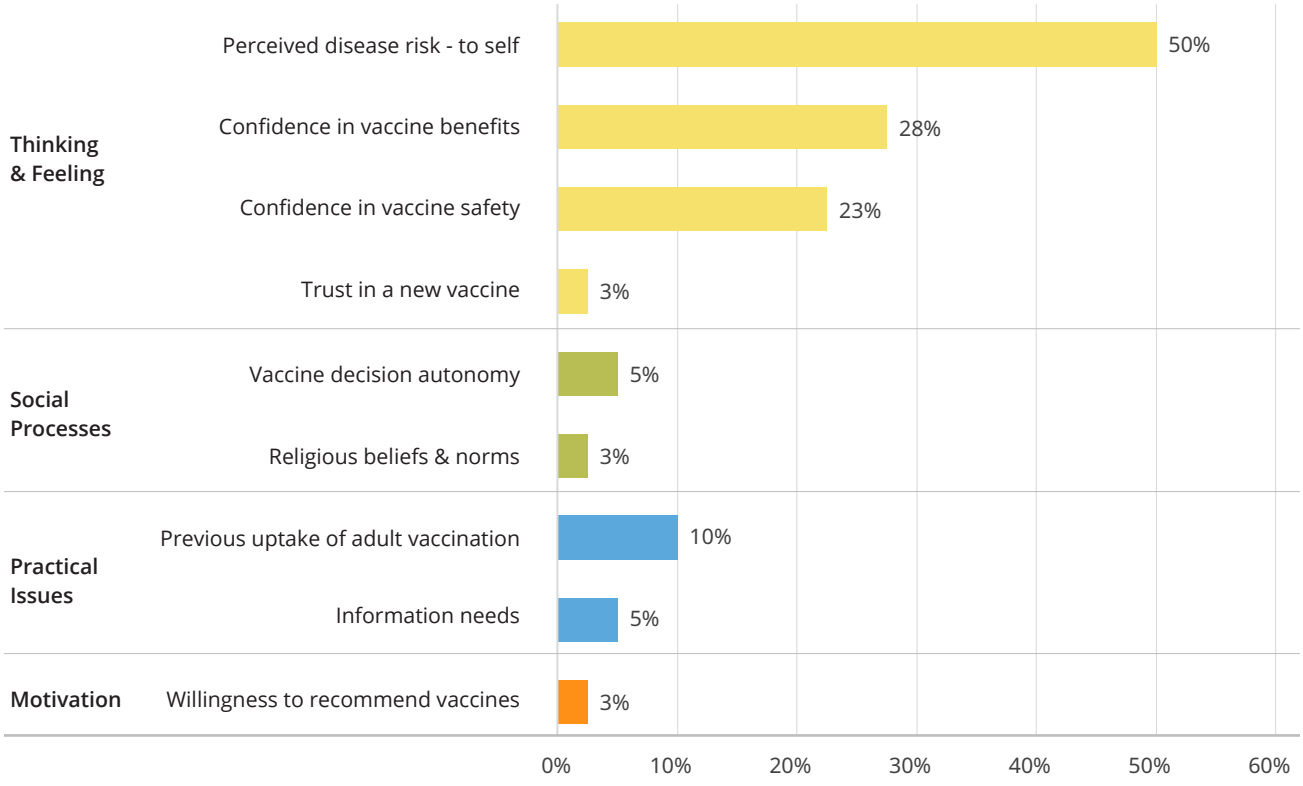
Regarding the two questions relating to HCWs' attitudes toward influenza vaccines (Q39, "If you disagree with getting the flu vaccine for yourself, why?" and Q41, "If you disagree with recommending the flu vaccine, why?"), most answers followed the same pattern as the questions about COVID-19 vaccines, by corresponding mostly to the thinking and feeling domain (Figure 8).

The dominant concerns were related to the perceived disease risk to oneself (50%). Many respondents alluded to not getting the flu or not being at risk as reasons for refusing the influenza vaccine. Another important construct was (lack of) confidence in vaccine benefits (28%), where many respondents expressed doubts in the influenza vaccines' ability to prevent them from getting the flu. Many responses related to a (lack of) confidence in vaccine safety (23%), where many respondents were concerned about adverse effects of the vaccine.

Among the responses classified under the social processes domain, the most prominent was vaccine decision autonomy (5%), stating that it should be a personal choice.

For the responses classified as practical issues, the most identified construct was previous uptake of adult vaccination (10%), where respondents described previous experiences of adverse event after getting the influenza vaccine as their reason for not wanting to get it in the future.

FIGURE 8 **Qualitative response domains classified using the WHO behavioral and social drivers (BeSD) rubric – open text questions about influenza vaccine**



Discussion

Vaccination is one of the most important and effective tools in protecting populations from infectious diseases of public health concern. This includes using vaccines to prevent the spread of COVID-19, but some HCWs are hesitant toward the effectiveness and safety of these vaccines and may delay or even refuse to get vaccinated when offered because of the above *(32)*. The SAGE road map for prioritizing uses of COVID-19 vaccines in the context of limited supply defined HCWs as the first priority population for vaccination against COVID-19 *(5)*. Furthermore, HCWs play an important role in encouraging the public to get vaccinated *(33)*.

Assessing the intention of HCWs in Trinidad and Tobago to get the COVID-19 vaccine, we found that 74% of the respondents wanted to get the vaccine as soon as possible, whereas 26% expressed vaccine hesitancy. The intention to get a COVID-19 vaccine as soon as possible was used as a proxy for vaccine hesitancy. This is comparable to other studies assessing vaccine hesitancy *(14, 20, 23, 24, 26, 34)*. A very small portion—only 3%—stated that they did not intend ever to get the vaccine. We found nurses to be hesitant at more than four times the rate of physicians. The youngest age group was twice as hesitant as the oldest, and females were more than 1.5 times more hesitant than their male colleagues. When comparing the findings from Trinidad and Tobago to those from the entire Caribbean survey, there are similar findings in the data for the entire Caribbean, including Trinidad and Tobago. It was observed that nurses were twice as hesitant as compared to physicians, and the younger HCWs were more hesitant than the older ones, although the difference between sexes is not as big for the Caribbean as a whole. Comparing the data from Trinidad and Tobago to the data for the rest of the Caribbean (without Trinidad and Tobago), it is noted that that while nurses are still more vaccine hesitant than physicians, it is at a rate of only 1.5 times. The pattern of the youngest HCWs being the most hesitant is repeated, while there is no difference in vaccine hesitancy between the sexes when looking at the rest of the Caribbean without Trinidad and Tobago.

The discrepancy in vaccine hesitancy rates between nurses and doctors when comparing Trinidad and Tobago, separately, to the Caribbean, suggests that the high levels of vaccine hesitancy among nurses found in the overall survey may be largely driven by vaccine hesitancy among Trinidad and Tobago nurses. When comparing to findings from other countries, there appears to be a consistent global pattern of high level of COVID-19 vaccine hesitancy among nurses. In Hong Kong, Kwok et al. found that only 63% of nurses intended to get a COVID-19 vaccine *(20)*. Findings from Trinidad and Tobago are comparable to findings from the United States of America, where Gadoth et al. found nurses to be four times as vaccine hesitant as physicians *(30)*. Similarly, in France, nurses expressed a lower COVID-19 vaccine acceptance compared to physicians *(19)*, while in Spain nurses were vaccine hesitant at twice the rate of physicians *(15)*.

When comparing across subcategories of HCWs, namely physicians and nurses, we found significant differences between specialties. Emergency and general and family physicians were more vaccine hesitant than physicians working in medical or surgical specialties. These findings are consistent with findings from the overall Caribbean survey *(3)*. A general tendency in Trinidad and Tobago was found for critical care, ward, and to some degree also outpatient nurses to be more hesitant than community and public health nurses. This finding is contradictory to findings from elsewhere, as critical care nurses have previously been found to be less vaccine hesitant than other nurses *(35)*, and being directly involved in the care of COVID-19 patients, as critical care nurses are, has previously been demonstrated to increase acceptance of the vaccine among HCWs *(19)*. When comparing these results with the findings from the whole of the Caribbean, the same pattern that critical care and ward nurses are

more hesitant than their colleagues is noted. However, when comparing with the data from the rest of the Caribbean, except Trinidad and Tobago, there was no evidence to suggest that the pattern of critical care and ward nurses being particularly vaccine hesitant compared to their nursing colleagues repeated. Thus, it appears that the high level of vaccine hesitancy among critical care and ward nurses is particular to Trinidad and Tobago and occurs to such a degree that it has influenced the results for nurses in the overall Caribbean survey.

When discussing the subcategory analyses, it is important to note that only three of the responding nurses identified as outpatient nurses, and that some questions were answered by even just one or two of them. Therefore, we cannot reject the possibility that this small number of outpatient nurses contributed to the detection of what may be artificial significant differences between subcategories of nurses.

In Trinidad and Tobago, as in the whole of the Caribbean and the rest of the Caribbean excluding Trinidad and Tobago, it was found that the younger HCWs do display more hesitancy than older HCWs. Apart from that crucial finding, fewer differences were observed between age groups in Trinidad and Tobago compared to the whole of the Caribbean including Trinidad and Tobago, and also to the rest of the Caribbean excluding Trinidad and Tobago. This suggests that the difference between age quartiles observed in the subregional study may largely be driven by countries other than Trinidad and Tobago. However, it is important to note that, for comparability, the analysis of the Trinidad and Tobago data used the same age quartiles as in the Caribbean study, but as the age distribution of respondents differed somewhat for Trinidad and Tobago compared to the whole of the Caribbean, the pattern of differences between age groups may have been slightly different. This potentially would have, to a greater degree, mirrored that of the whole Caribbean and other countries had we analyzed the Trinidad and Tobago data using Trinidad and Tobago age quartiles.

We found fewer differences between the sexes in Trinidad and Tobago compared to the whole of the Caribbean *(3)* and the rest of the Caribbean (Table 8), and we observed no difference in vaccine hesitancy between males and females in Trinidad and Tobago. However, this differs from findings of other studies, where female gender has been shown to be negatively associated with vaccine hesitancy *(19, 30, 34)*.

When it comes to the influenza vaccine, HCWs of Trinidad and Tobago express more willingness to get vaccinated, as only 15% do not want to take an influenza vaccine. This is a notably smaller fraction than for the whole of the Caribbean (23%) and for the rest of the Caribbean excluding Trinidad and Tobago (27%). Interestingly, while for the whole of the Caribbean the percentage of vaccine hesitancy toward influenza vaccine is the same as toward COVID-19 vaccines, it was observed that there were opposite trends in HCWs vs. the rest of the Caribbean excluding Trinidad and Tobago. While in the rest of the Caribbean a higher percentage of HCWs are hesitant toward influenza vaccine than toward COVID-19 vaccines, in Trinidad and Tobago HCWs are notably more hesitant toward COVID-19 vaccines than toward influenza vaccine. This suggests that HCWs in Trinidad and Tobago are not hesitant to adult vaccinations in general but to the COVID-19 vaccine in particular, and that communication and initiatives to increase vaccine acceptance among HCWs should focus specifically on COVID-19 vaccines rather than on general adult vaccine uptake. This tendency somewhat differs from previous findings by Wang et al., where nurses willing to get the influenza vaccine displayed willingness toward COVID-19 vaccines *(36)*.

Factors that contributed to the opinion on COVID-19 vaccines

Equipping HCWs with the knowledge they need to make informed decisions on COVID-19 is important: 34% of respondents reported that they did not yet know enough about the vaccine to decide, and this number was especially driven by nurses (61%) and other HCWs (53%) compared with physicians (14%). Verger et al. previously described the importance of recognizing that the different HCW professions do

not have the same prerequisite knowledge about immunization and also have different levels of knowledge about COVID-19 vaccines, and stressed the importance of developing vaccine information targeting the different HCW groups *(14)*. The proportion of HCWs who do not feel they possess enough information to make a decision about COVID-19 vaccine is slightly higher in Trinidad and Tobago than in the Caribbean as a whole (30%) and also than in the rest of the Caribbean excluding Trinidad and Tobago (28%). This is possibly suggesting that health authorities in Trinidad and Tobago may have to intensify their communication to HCWs about COVID-19 vaccines even more than in other Caribbean countries.

The need for more information about the research and development of the COVID-19 vaccines is also mirrored in the fact that 50% of HCWs of Trinidad and Tobago believe vaccine development to have been rushed and that the vaccines may not have been tested thoroughly; a belief that is also found outside the Caribbean *(37)*. Once more, this proportion is slightly higher than for the whole of the Caribbean, including Trinidad and Tobago (47%), and higher also than for the rest of the Caribbean, excluding Trinidad and Tobago (46%).

Misconceptions about COVID-19 vaccines are mirrored in one out of four HCWs preferring to gain natural immunity against the disease and 17% believing the vaccine may cause the disease. Notably, 10% of physicians and 29% of nurses share this belief. Front-line HCWs have shown to be pivotal in encouraging public acceptance of the COVID-19 vaccine *(33)*, including in Trinidad and Tobago, where HCWs are perceived as the most trusted source of information regarding COVID-19 *(8)*. Misconceptions may, thus, endanger adherence to the public vaccination scheme and so should be addressed. These misconceptions, however, are less prevalent in Trinidad and Tobago compared to other Caribbean countries, as in the overall survey 29% of HCWs preferred to gain natural immunity, and 21% believed the vaccine may cause COVID-19. For the rest of the countries in the survey, excepting Trinidad and Tobago, almost one-third preferred to gain natural immunity, while 23% believed the vaccine to cause COVID-19.

Qualitative analyses of the open text questions confirmed doubts about the efficacy and safety of the COVID-19 vaccine as being the main drivers of vaccine hesitancy. This corresponds to the findings from the survey of the general population of Trinidad and Tobago by La Freitas et al. *(8)*, and has also been reported in similar studies around the world *(14, 34)*. To the contrary, in a study from France, Luévano et al. found that messaging emphasizing the collective benefits of being vaccinated, such as being able to meet older people and contributing to controlling the epidemic, carried the strongest positive impacts on HCWs' COVID-19 vaccine attitudes and preferences, rather than messaging about factors related to lowering one's own risk of contracting the disease *(38)*. Moreover, the 9% of respondents agreeing that confidence (or lack thereof) in health authorities is influencing their vaccine decisions is consistent with previous reporting from Europe *(14)* on the importance of establishing trust in the public health authorities. Some 9% reported (lack of) eligibility for vaccines due to pregnancy and breastfeeding as influencing their vaccine decisions. This is in line with official Trinidad and Tobago guidelines, at that time, of not offering the vaccine to pregnant or breastfeeding women. Some 7% of participants expressed that they did not wish to receive the brand of vaccine available to them. Maharaj et al. expressed concern about the global COVID-19 vaccine inequities rendering Trinidad and Tobago with less desirable vaccine options, causing stigmatization of citizens of Trinidad and Tobago, as they could not enter some countries due to the vaccine they received not being recognized by some governments *(39)*.

Interpretation of the results

Efforts need to be made to increase risk perception of COVID-19 disease versus all approved vaccines, so that HCWs feel more confident not only in getting vaccinated themselves but also in recommending that their patients, family, and friends get vaccinated as well. Messaging also needs to emphasize the importance of taking the first vaccine that is available and not delaying vaccination in hope of receiving a vaccine of personal preference. Trusted technical spokespersons should be used to empathetically communicate critical messages about vaccine safety and efficacy and the

importance of getting vaccinated with the first vaccine that is offered. This is especially important in situations where health authorities and government figures are not trusted sources of information for all audiences, and political spokesmanship has to be separated from scientific, technical spokesmanship.

Given the answers to open-ended questions that allergies were reason for not immediately being vaccinated against COVID-19, messaging should also seek to clarify that allergies in general are not a contraindication for vaccination.

Likewise, in response to participants' responses about not having enough information or not enough research having been carried out to make sound decisions about COVID-19 vaccination, results of studies should be clearly and transparently communicated and explained to HCWs, so they are continuously informed about new findings on vaccine effectiveness and safety.

Considering the statistically significant hesitancy among respondents in the youngest age group, a variety of channels should be employed to reach this audience with key messages in favor of vaccination. For example, authorities should explore social media platforms like Instagram and TikTok in addition to traditional communications channels.

Reasons for vaccine hesitancy listed in the qualitative answers that can be classified as misinformation, as well as the indication that social media is a source of information for HCWs about COVID-19 vaccines, show that HCWs would benefit from targeted training on identifying misinformation and trusted sources of information related to vaccines and vaccination. This will provide the tools to identify misinformation and thus be better informed and able to correct rumors they hear from colleagues, patients, and community members.

Relevance of our findings

Our results could be used to tailor communication strategies by age group, professional category, and specialty of HCWs, focusing efforts on those groups that show more hesitancy toward COVID-19 vaccines. Training and continuing education of HCWs—in particular, physicians and nurses—must continue so these groups can identify and address misinformation with their peers, patients, and community members, and have less anxiety related to the vaccines. Other groups of HCWs should be empowered as well. Specific interventions for primary care physicians and nurses can be implemented, considering that these professionals have close contact with the public on health-related matters, including related to vaccination.

Vaccine hesitancy among HCWs follows similar characteristics to the general population. Social listening activities and studies have also shown concerns about the process of COVID-19 vaccine development (regarding the speed at which they were developed and the testing and approval processes); the perceived risks of taking the vaccine, including in the long term; and mistrust of authorities. Dispelling doubts among physicians and nurses could have a positive effect among the population, who are highly influenced by the opinion of their health care providers.

Inaccurate information spread on social networks influenced participating HCWs on COVID-19 vaccines. However, social media can be a powerful tool to provide accurate information, debunk myths and rumors, facilitate the exchange of ideas, understand different population groups' concerns and doubts, and target different generations of HCWs in the Caribbean. A variety of platforms should be considered to ensure that younger HCWs, who in our study showed more hesitancy, are reached and engaged as well.

Younger age groups were more hesitant about COVID-19 vaccination than older age groups of HCWs. The perception of lower risk to COVID-19 disease among generally healthy individuals could explain this phenomenon, as well as the fact that these groups widely use social media and could be more exposed to fake news. Similarly, responses to open-ended questions that referenced concerns about side effects could reflect concerns of respondents in younger age groups, where more cases of thrombosis with thrombocytopenia syndrome (TTS) have been reported. It is important to note that cases of TTS are extremely

rare, and the WHO Strategic Advisory Group of Experts on Immunization (SAGE) and the Global Advisory Committee on Vaccine Safety (GACVS) have both stated that the benefits of these vaccines far outweigh any potential risks *(40)*.

Nurses were almost four times more hesitant and less informed than physicians. Hesitancy among nurses is a major concern since the nature of their work puts them in more and longer contact with patients. Efforts in the short, medium, and long term should emphasize capacity building and training of nurses in communicating about vaccination, especially related to vaccine safety, with users of health services, their families, and members of their communities. In addition to education, policy-level interventions must be considered by national and subnational governments where vaccine hesitancy among HCWs is affecting the vaccination of the general public as well.

Strengths and limitations

This study has several strengths:

- The survey was widely publicized, and the online survey was available for 50 days, casting a wide net for HCWs of Trinidad and Tobago to respond.
- The survey was available in paper form, in addition to the website interface.
- Pilot interviews conducted by the survey team resulted in confusing phrases being identified and adjusted for clarity within the survey tool.
- Free text responses were independently categorized by several teams. Disagreements were resolved after consultation with the Behavioral and Social Drivers (BeSD) team from WHO Headquarters and further internal survey team review.
- Some consistently contrasting patterns in responses are evident between physicians and nurses and between the youngest and oldest respondents.
- Even without underlying differences, we expect 5% of hypothesis tests to yield p-values below 0.05. In this work, we report 188 Fisher's exact tests, so we would expect 9 or 10 to have p-values below 0.05 even if there were no underlying differences. In this analysis, 62 of the 188 comparisons yielded a p-value below 0.05, so it seems likely that there are very real differences of opinion between subgroups in these data.

It also has several limitations:

- The sample is not likely to be perfectly representative of HCWs of Trinidad and Tobago.
- The open invitation to participate was circulated through numerous professional networks, but it is not possible to know what portion of HCWs of Trinidad and Tobago heard about the survey in time to participate, or whether those who heard are similar in demographics and attitude to those who did not hear.
- Similarly, it is not possible to know what portion of those who learned of the survey decided to participate, and why; likewise, we do not know the reasons why those who did not participate did not.
- Because the sample is likely to be clustered by profession and by location of health facilities, the responses to questions are likely to be correlated with each other—persons in the same professional organization or the same health facility are subject to similar sources of information and are more likely to give responses similar to their colleagues than to those given by people from other job categories or locations. It is not possible to know the locations of the respondents, so it is not possible to account for spatial clustering in the analysis. Analyses of correlated data that cannot account for correlation are likely to yield smaller p-values than those that are able to account for the correlation, so there is a possibility that some of the statistically significant p-values here do not reflect true significant differences.
- Due to the nature of the survey, answers received for the four free-text questions were limited to the information provided by the respondents. Some of these included one-word responses. There was no way of following up with respondents to obtain further explanation or information on what was entered in the survey. This meant that the analysis of these questions required some interpretation from the team on the intent and meaning behind the entries, inserting assumptions into the analysis.
- Understanding that the survey took place between March and April 2021 and given the rapidly changing

epidemiological situation in Trinidad and Tobago, it is important to note that some of the attitudes and perceptions regarding perceived severity of COVID-19 disease described here could have changed as well.

- When the survey instrument was initially developed, COVID-19 vaccines were not yet available; however, by the time the instrument was implemented, vaccines were available in Trinidad and Tobago. Some respondents indicated the survey questions were confusing because they posed COVID-19 vaccination as a hypothetical, while they themselves had already been vaccinated.
- The survey was rolled out during an incredibly busy time for HCWs, as they were involved with vaccination campaigns and general pandemic response. This may have impacted the survey response rate.
- The survey carries an inherent risk of social desirability bias, where participants may respond to a question in a manner that is viewed as favorably by others. The survey team was not able to check if the participants' responses were true.

Recommendations

Based on the WHO BeSD framework as well as the results of the survey, Table 9 outlines possible interventions to be implemented at country level to improve vaccine acceptance among HCWs.

As discussed in the "Interpretation of the results" section above, considering the majority of responses fall under the "think and feel" domain and constructs related to low confidence in vaccine safety, efficacy, and benefits, PAHO/WHO suggests focusing on interventions that increase risk perception of COVID-19 as a disease in relation to COVID-19 vaccination. At the same time, interventions should seek to increase HCWs' understanding and acceptance of the safety, efficacy, and benefits of vaccination. Educational campaigns and provider and institutional recommendations can be employed to facilitate these objectives.

Additionally, because trust is such a critical issue for the immunization program, further interventions may be considered to address study findings under the "social processes" domain related to lack of confidence in health authorities. Such efforts might include transparent, timely communication from authorities on COVID-19 vaccination, or collaboration with trusted leaders in HCW communities who can advocate for vaccination.

For additional information on Table 9, including likely impact on vaccine uptake and strength of evidence, please see the WHO interim guidance Data for Action: Achieving High Uptake of COVID-19 Vaccines *(29)*.

TABLE 9 Recommendations by domains, indicator, intervention category, and description

Domain	Indicator (problem areas)	Intervention category and description
What people think and feel	% of HCWs who would trust the new COVID-19 vaccine "very much" or "moderately" (item 10) % of HCWs who think a COVID-19 vaccine is "very" or "moderately" important for their health (item 11)	**1. Educational campaign:** a. Educational campaign consisting of informational posters with disease risk, letters, educational materials, group educational session highlighting disease salience and importance of vaccine b. Educational campaign consisting of posters encouraging vaccination to protect yourself and patients. c. 15-minute in-service educational seminar; personalized education on vaccines. d. Lectures/posters, employee education. e. Health education with all relevant personnel in a health facility/hospital. f. Educational program for health care providers using a train-the-trainer model. g. Decision aid that guides HCW through the decision-making process for vaccination. **2. Institutional recommendation:** a. Institutions, such as hospitals, encourage vaccination, and vaccination stickers. **3. Provider recommendation:** a. Provider recommends COVID-19 vaccine. **4. Not categorized:** a. HCW vaccination campaign consisting of a *mandatory declination policy* where HCW sign a form saying they are declining the vaccine and understand the risks of non-vaccination to themselves and others.
Social processes	% of HCWs who think most of the people they work with will get a COVID-19 vaccine (item 25) % of HCWs who think most of their close family and friends would want them to get a COVID-19 vaccine (item 22)	**1. On-site vaccination:** a. Increase convenient access and affordability of vaccine by providing vaccination on site or at work. **2. Institutional recommendation:** a. Healthcare facility recommends vaccine and encourages vaccinated by providing "I vaccinated" stickers. **3. Not categorized:** a. System to disclose vaccination status to managers.
Motivation	% of HCWs who would recommend a COVID-19 vaccine to eligible individuals (item 17) % of HCWs who would get a COVID-19 vaccine if it was available to them (item 15)	**1. Educational campaign:** a. 15-minute in-service educational seminar; personalized education of vaccine and building interpersonal communication skills of HCW. b. Decision aids that guide HCW through decision-making process for vaccination. **2. Reminders and recall:** a. Letter and telephone reminders. b. E-mail reminders. **3. Incentives:** a. Incentives for vaccination including free lunches, raffles, lottery tickets, and cash prizes. b. Monetary incentives for vaccination. **4. Institutional recommendation:** a. Institutional recommendation. **5. Vaccine champions:** a. Vaccine champions. **6. Not categorized:** a. Training for providers to reinforce provider recommendation with health risk appraisal (an assessment of a patient's health risks and preventive behaviors). b. Process for considering noncompliance with vaccination as part of routine employee performance reviews.

Note: HCW, healthcare worker.

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Annexes

Annex A. Questionnaire

PAHO

Pan American Health Organization — World Health Organization Americas

CONCERNS, ATTITUDES, AND INTENDED PRACTICES OF HEALTHCARE WORKERS TO COVID-19 VACCINE IN THE CARIBBEAN

Thank you very much for participating in this survey for healthcare workers. The questionnaire has a duration of no more than eight (8) minutes.
No. _____

1 **Country where you work: _____**

2 **Sex: Male** ☐ **Female** ☐ **Other** 3. **Age: _____**

4 **Job title/post: _____** 5. **HCW category:**

Please choose the box with the response that best fits your personal concerns, attitudes and intended practices:

		Strongly Agree	Agree	Disagree	Strongly Disagree
	Attitudes to vaccines				
6	Vaccines are important for my health				
7	Getting vaccines is a good way to protect myself from disease				
8	Overall, vaccines are safe				
9	Overall, vaccines are effective				
10	Getting vaccinated is important for the health of others in my community				
11	The information I receive about vaccines from public health authorities/my health care provider is reliable and trustworthy				
12	Generally, I do what my doctor or health care provider recommends about vaccines for myself and my family				

	Vaccine readiness	Strongly Agree	Agree	Disagree	Strongly Disagree
13	New vaccines carry more risk than older vaccines				
14	I would recommend a COVID-19 vaccine to friends and family				
15	I am concerned about serious adverse effects of vaccines				

	Attitudes towards COVID-19 vaccine	Strongly Agree	Agree	Disagree	Strongly Disagree
16	A coronavirus (COVID-19) vaccine will protect me from severe COVID disease				
17	I am confident in the scientific approval process for a new coronavirus (COVID-19) vaccine				
18	I would be willing to participate in a vaccine trial for a coronavirus (COVID-19) vaccine				
	If a new coronavirus (COVID-19) vaccine becomes publicly available:				
19	I intend to get it as soon as possible				
20	I intend to wait to see how it affects others before I get it				
21	I do not intend on getting it soon, but might sometime in the future				
22	I do not intend to ever get the vaccine				
	Please indicate how you feel about the statements below	**Strongly Agree**	**Agree**	**Disagree**	**Strongly Disagree**
23	I am confident there will be other effective treatments soon				
24	I do not yet know enough about the vaccine to make a decision				
25	I want to gain natural immunity to the virus that causes COVID-19				
26	Development of the vaccine may be rushed/the vaccine may not be thoroughly tested prior to approval				
27	I believe vaccines may give you the disease they are designed to protect against				
28	Other reasons for delaying or refusing COVID-19 vaccine:				

	Attitudes towards COVID-19 vaccine				
	The following factors contributed to my opinion on a COVID-19 vaccine:	**Strongly Agree**	**Agree**	**Disagree**	**Strongly Disagree**
29	The pace at which the vaccine was researched and developed				
30	The unfolding and frequently evolving science of SARS-CoV-2				
31	Actions and opinions of my friends and family regarding the vaccine				
32	The relationship between coverage rates and community transmission				
33	My own research on COVID-19 vaccines				
34	The country in which a vaccine is manufactured				
35	The potential cost of a COVID-19 vaccine				
36	Information I've seen on social media				
37	Other factors:				

	Attitudes towards influenza vaccine	**Strongly Agree**	**Agree**	**Disagree**	**Strongly Disagree**
38	I would take the flu vaccine if offered				
39	If you disagree, what are the reasons why? _____				
		Strongly Agree	**Agree**	**Disagree**	**Strongly Disagree**
40	I would recommend the flu vaccine to friends and family				
41	If you disagree, what are the reasons why? _____				

Thanks again for your participation!

Please, feel free to share this survey with other healthcare workers who may be interested in participating.

Annex B. Number of responses, by question

Question	Number of Responses
6. Attitudes: Vaccines are important for my health	360
7. Attitudes: Vaccines are a good way to protect myself from disease	359
8. Attitudes: Vaccines are safe	333
9. Attitudes: Vaccines are effective	335
10. Attitudes: Vaccines are important for the health of others	355
11. Attitudes: Vaccine information is reliable and trustworthy	314
12. Attitudes: I do what my care provider recommends about vaccines	355
13. Readiness: New vaccines carry more risk than older vaccines	264
14. Readiness: I would recommend a COVID-19 vaccine to friends and family	304
15. Readiness: I am concerned about serious adverse effects of vaccines	350
16. COVID-19: A COVID-19 vaccine will protect me from severe COVID disease	277
17. COVID-19: I am confident in the COVID-19 vaccine scientific approval process	270
18. COVID-19: I would be willing to participate in a COVID-19 vaccine trial	262
19. COVID-19 vaccine: I intend to get it as soon as possible	267
20. COVID-19 vaccine: I intend to wait to see how it affects others before I get it	315
21. COVID-19 vaccine: I do not intend to get it soon, but might in the future	312
22. COVID-19 vaccine: I do not intend to ever get the vaccine	304
23. Reasons: I am confident there will be other effective treatments soon	206
24. Reasons: I do not yet know enough about the vaccine to make a decision	331
25. Reasons: I want to gain natural immunity to the virus that causes COVID-19	308
26. Reasons: Development may be rushed/vaccine may not be thoroughly tested	292
27. Reasons: I believe vaccines may give you the disease	303
29. Opinion shapers: The pace at which the vaccine was researched and developed	302
30. Opinion shapers: The unfolding & frequently evolving science of SARS-CoV-2	295
31. Opinion shapers: Actions and opinions of friends and family	297
32. Opinion shapers: Relationship between coverage rates and community transmission	224
33. Opinion shapers: My own research on COVID-19 vaccines	311
34. Opinion shapers: The country in which a vaccine is manufactured	289
35. Opinion shapers: The potential cost of a COVID-19 vaccine	267
36. Opinion shapers: Information I´ve seen on social media.	298
38. Influenza: I would take the flu vaccine if offered	316
40. Influenza: I would recommend the flu vaccine to friends and family	309

Annex C. Summary of responses including colored bars and Fisher's exact test and logistic regression p-values, by question

Each table in this annex summarizes responses to a single survey question. The rows represent subgroups of respondents. The first four columns summarize the proportion who answered Strongly agree, Agree, Disagree, and Strongly disagree. The next two columns consolidate the responses into two categories: Strongly agree and Agree versus Disagree and Strongly disagree. The next column indicates the number of persons in each subgroup who responded to the question. The next column lists Fisher's exact test p-values that test the hypothesis that the percentage who Strongly agree or Agree is the same:

a. Between nurses and physicians;
a. Across all categories of healthcare workers;
a. Among categories of physicians;
a. Among categories of nurses;
a. Between men and women;
a. Among age groups.

P-values smaller than 0.05 are listed in a bold font and indicate a statistically significant difference.

The final four columns show results from multivariable logistic regression, where the outcome is 1 if the respondent selected Strongly agree or Agree and is 0 if they selected Disagree or Strongly disagree. The regression uses three categorical predictors: healthcare worker category (physician is the reference group); sex (male is the reference); and age quartile (youngest is the reference group). Each table lists odds ratios, *p*-values, and 95% confidence intervals for the odds ratios. *P*-values smaller than 0.05 are listed in a bold font and indicate a statistically significant result when simultaneously adjusting for differences in job category, sex, and age.

TABLE Q-6 Attitudes: Vaccines are important for my health

	Strongly agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	69	30	1	0	99	1	360					
HCW: Physicians	87	13	0	0	100	0	189					
HCW: Nurses	44	53	3	0	97	3	93	**0.035**				
HCW: All Others	55	44	1	0	99	1	78	**0.031**				
Doctor (general & family)	85	15	0	0	100	0	155					
Doctor (specialist)	97	3	0	0	100	0	34					
Nurse (inpatient)	39	59	3	0	97	3	70					
Nurse (outpatient)	61	35	4	0	96	4	23	1.000				
Sex: Male	78	21	1	0	99	1	97					
Sex: Female	66	33	1	0	99	1	261	1.000				
Age Q1: 22-32	65	34	1	0	99	1	141					
Age Q2: 33-40	75	23	2	0	98	2	91					
Age Q3: 41-50	70	30	0	0	100	0	67					
Age Q4: 51-81	69	29	2	0	98	2	58	0.517				

TABLE Q-7 Attitudes: Vaccines are a good way to protect myself from disease

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	71	28	1	0	99	1	359					
HCW: Physicians	86	14	0	0	100	0	188					
HCW: Nurses	52	45	3	0	97	3	92	**0.035**				
HCW: All Others	58	41	1	0	99	1	79	**0.032**				
Doctor (general & family)	85	15	0	0	100	0	154					
Doctor (specialist)	91	9	0	0	100	0	34					
Nurse (inpatient)	46	51	3	0	97	3	69					
Nurse (outpatient)	70	26	4	0	96	4	23	1.000				
Sex: Male	76	24	0	0	100	0	97					
Sex: Female	69	29	2	0	98	2	260	0.578				
Age Q1: 22-32	69	31	0	0	100	0	141					
Age Q2: 33-40	74	25	1	0	99	1	92					
Age Q3: 41-50	69	29	1	0	99	1	68					
Age Q4: 51-81	76	20	4	0	96	4	55	0.092				

TABLE Q-8 Attitudes: Vaccines are safe

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	43	54	3	0	97	3	333					
HCW: Physicians	53	47	0	0	100	0	188					
HCW: Nurses	32	56	13	0	87	13	79	**<0.001**				
HCW: All Others	29	70	0	2	98	2	66	**<0.001**				
Doctor (general & family)	51	49	0	0	100	0	154					
Doctor (specialist)	59	41	0	0	100	0	34					
Nurse (inpatient)	24	60	16	0	84	16	58					
Nurse (outpatient)	52	43	5	0	95	5	21	0.275				
Sex: Male	45	53	2	0	98	2	93					
Sex: Female	42	55	3	0	96	4	238	0.734				
Age Q1: 22-32	40	58	2	0	98	2	130					
Age Q2: 33-40	48	48	5	0	95	5	84					
Age Q3: 41-50	38	57	3	2	95	5	63					
Age Q4: 51-81	47	49	4	0	96	4	53	0.432				

TABLE Q-9 Attitudes: Vaccines are effective

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	54	44	2	0	98	2	335					
HCW: Physicians	66	34	1	0	99	1	187					
HCW: Nurses	41	51	6	1	92	8	78	**0.003**				
HCW: All Others	39	61	0	0	100	0	70	**0.002**				
Doctor (general & family)	67	32	1	0	99	1	153					
Doctor (specialist)	59	41	0	0	100	0	34	1.000				
Nurse (inpatient)	36	54	9	2	89	11	56					
Nurse (outpatient)	55	45	0	0	100	0	22	0.176				
Sex: Male	53	43	2	1	97	3	92					
Sex: Female	54	44	2	0	98	2	241	0.400				
Age Q1: 22-32	50	48	2	0	98	2	136					
Age Q2: 33-40	60	37	2	0	98	2	86					
Age Q3: 41-50	53	47	0	0	100	0	59					
Age Q4: 51-81	59	37	2	2	96	4	51	0.556				

TABLE Q-10 Attitudes: Vaccines are important for the health of others

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	65	34	1	0	99	1	355					
HCW: Physicians	83	17	0	0	100	0	190					
HCW: Nurses	46	51	3	0	97	3	89	**0.032**				
HCW: All Others	43	54	3	0	97	3	76	**0.026**				
Doctor (general & family)	80	20	0	0	100	0	156					
Doctor (specialist)	94	6	0	0	100	0	34					
Nurse (inpatient)	38	59	3	0	97	3	66					
Nurse (outpatient)	70	26	4	0	96	4	23	1.000				
Sex: Male	68	30	2	0	98	2	98					
Sex: Female	64	35	1	0	99	1	255	0.620				
Age Q1: 22-32	64	35	1	0	99	1	141					
Age Q2: 33-40	70	29	1	0	99	1	89					
Age Q3: 41-50	61	38	2	0	98	2	64					
Age Q4: 51-81	64	33	3	0	97	3	58	0.439				

TABLE Q-11 Attitudes: Vaccine information is reliable and trustworthy

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	42	53	4	1	94	6	314					
HCW: Physicians	54	44	1	1	98	2	176		1.00			
HCW: Nurses	27	60	9	4	87	13	77	**<0.001**	0.06	**<0.001**	0.01	0.32
HCW: All Others	25	67	8	0	92	8	61	**<0.001**	0.13	**0.019**	0.03	0.72
Doctor (general & family)	56	42	1	1	98	2	143					
Doctor (specialist)	45	55	0	0	100	0	33	1.000				
Nurse (inpatient)	18	65	11	5	84	16	55					
Nurse (outpatient)	50	45	5	0	95	5	22	0.265				
Sex: Male	51	43	3	2	94	6	88		1.00			
Sex: Female	38	57	5	1	94	6	224	1.000	1.62	0.468	0.44	5.93
Age Q1: 22-32	41	53	5	1	94	6	124		1.00			
Age Q2: 33-40	45	50	3	3	95	5	80		0.98	0.976	0.27	3.62
Age Q3: 41-50	36	57	7	0	93	7	58		1.02	0.979	0.27	3.81
Age Q4: 51-81	45	51	2	2	96	4	49	0.940	1.88	0.461	0.35	10.12

TABLE Q-12 Attitudes: I do what my care provider recommends about vaccines

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	37	57	5	1	94	6	355					
HCW: Physicians	49	47	2	1	97	3	186		1.00			
HCW: Nurses	22	64	12	1	87	13	89	**0.003**	0.19	**0.005**	0.06	0.60
HCW: All Others	24	70	5	1	94	6	80	**0.007**	0.40	0.164	0.11	1.46
Doctor (general & family)	48	48	3	1	96	4	152					
Doctor (specialist)	56	44	0	0	100	0	34	0.594				
Nurse (inpatient)	14	71	14	2	85	15	66					
Nurse (outpatient)	48	43	9	0	91	9	23	0.724				
Sex: Male	39	59	0	2	98	2	98		1.00			
Sex: Female	36	56	7	1	92	8	255	0.051	0.18	0.100	0.02	1.39
Age Q1: 22-32	37	59	4	0	96	4	140		1.00			
Age Q2: 33-40	34	56	8	2	90	10	89		0.33	0.053	0.11	1.02
Age Q3: 41-50	32	61	8	0	92	8	66		0.59	0.413	0.17	2.09
Age Q4: 51-81	46	51	2	2	96	4	57	0.273	1.69	0.539	0.31	9.13

TABLE Q-13 Readiness: New vaccines carry more risk than older vaccines

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	17	37	40	6	54	46	264					
HCW: Physicians	7	31	51	11	38	62	145		1.00			
HCW: Nurses	33	36	29	2	70	30	66	**<0.001**	4.11	**<0.001**	2.08	8.12
HCW: All Others	23	55	23	0	77	23	53	**<0.001**	5.52	**<0.001**	2.65	11.53
Doctor (general & family)	8	31	51	10	39	61	120					
Doctor (specialist)	0	32	52	16	32	68	25	0.651				
Nurse (inpatient)	39	43	18	0	82	18	49					
Nurse (outpatient)	18	18	59	6	35	65	17	**<0.001**				
Sex: Male	17	33	40	10	50	50	70		1.00			
Sex: Female	17	39	40	5	56	44	192	0.484	0.85	0.606	0.45	1.58
Age Q1: 22-32	16	39	40	6	54	46	103		1.00			
Age Q2: 33-40	12	43	40	5	55	45	75		1.19	0.601	0.62	2.26
Age Q3: 41-50	26	30	36	9	55	45	47		0.91	0.812	0.43	1.95
Age Q4: 51-81	19	32	43	5	51	49	37	0.985	0.78	0.554	0.34	1.78

TABLE Q-14 Readiness: I would recommend a COVID-19 vaccine to friends and family

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	44	41	11	4	86	14	304					
HCW: Physicians	60	36	3	1	95	5	177		1.00			
HCW: Nurses	22	48	21	9	70	30	67	**<0.001**	0.07	**<0.001**	0.03	0.20
HCW: All Others	23	50	22	5	73	27	60	**<0.001**	0.11	**<0.001**	0.04	0.29
Doctor (general & family)	56	38	4	1	94	6	143					
Doctor (specialist)	76	24	0	0	100	0	34	0.356				
Nurse (inpatient)	16	51	20	12	67	33	49					
Nurse (outpatient)	39	39	22	0	78	22	18	0.551				
Sex: Male	45	41	9	5	86	14	88		1.00			
Sex: Female	43	42	12	3	85	15	214	0.859	1.35	0.489	0.57	3.18
Age Q1: 22-32	43	42	9	5	85	15	116		1.00			
Age Q2: 33-40	44	40	13	4	84	16	80		0.66	0.359	0.28	1.59
Age Q3: 41-50	43	40	13	4	83	17	53		1.03	0.955	0.39	2.71
Age Q4: 51-81	50	42	8	0	92	8	52	0.475	2.89	0.090	0.85	9.83

TABLE Q-15 Readiness: I am concerned about serious adverse effects of vaccines

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	21	57	18	4	79	21	350					
HCW: Physicians	11	63	22	4	74	26	180		1.00			
HCW: Nurses	38	41	16	4	79	21	91	0.372	1.38	0.338	0.72	2.65
HCW: All Others	27	62	10	1	89	11	79	**0.025**	2.72	**0.012**	1.25	5.91
Doctor (general & family)	10	64	22	3	74	26	147					
Doctor (specialist)	12	61	18	9	73	27	33	0.830				
Nurse (inpatient)	43	38	16	3	81	19	68					
Nurse (outpatient)	26	48	17	9	74	26	23	0.555				
Sex: Male	12	65	17	6	77	23	95		1.00			
Sex: Female	25	54	18	3	79	21	253	0.659	1.09	0.776	0.59	2.01
Age Q1: 22-32	22	58	17	4	79	21	139		1.00			
Age Q2: 33-40	16	65	15	4	81	19	85		1.22	0.579	0.61	2.42
Age Q3: 41-50	28	52	17	3	80	20	64		1.00	0.992	0.47	2.11
Age Q4: 51-81	22	51	24	3	73	27	59	0.677	0.76	0.471	0.37	1.59

TABLE Q-16 COVID-19: A COVID-19 vaccine will protect me from severe COVID disease

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	43	45	10	2	88	12	277					
HCW: Physicians	57	42	2	0	98	2	168		1.00			
HCW: Nurses	16	51	24	10	67	33	63	**<0.001**	0.03	**<0.001**	0.01	0.12
HCW: All Others	33	48	20	0	80	20	46	**<0.001**	0.08	**<0.001**	0.02	0.33
Doctor (general & family)	55	43	2	0	98	2	134					
Doctor (specialist)	62	38	0	0	100	0	34	1.000				
Nurse (inpatient)	9	55	23	13	64	36	47					
Nurse (outpatient)	38	38	25	0	75	25	16	0.544				
Sex: Male	47	46	5	1	94	6	78		1.00			
Sex: Female	42	44	12	3	86	14	197	0.098	0.98	0.976	0.31	3.08
Age Q1: 22-32	41	45	14	1	85	15	101		1.00			
Age Q2: 33-40	49	42	4	4	92	8	73		1.89	0.264	0.62	5.78
Age Q3: 41-50	38	49	9	4	87	13	53		1.92	0.246	0.64	5.75
Age Q4: 51-81	47	43	11	0	89	11	47	0.589	2.69	0.118	0.78	9.31

TABLE Q-17 COVID-19: I am confident in the COVID-19 vaccine scientific approval process

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	30	49	18	4	78	22	270					
HCW: Physicians	40	53	7	1	92	8	159		1.00			
HCW: Nurses	13	41	32	14	54	46	56	**<0.001**	0.09	**<0.001**	0.04	0.21
HCW: All Others	18	44	36	2	62	38	55	**<0.001**	0.14	**<0.001**	0.06	0.31
Doctor (general & family)	36	55	8	1	91	9	127					
Doctor (specialist)	53	44	3	0	97	3	32	0.462				
Nurse (inpatient)	5	43	33	19	48	52	42					
Nurse (outpatient)	36	36	29	0	71	29	14	0.215				
Sex: Male	38	50	11	1	88	13	80		1.00			
Sex: Female	26	48	21	5	74	26	189	**0.016**	0.61	0.240	0.26	1.40
Age Q1: 22-32	24	51	21	5	75	25	102		1.00			
Age Q2: 33-40	29	49	19	4	78	23	80		0.98	0.956	0.45	2.13
Age Q3: 41-50	31	44	23	2	75	25	48		1.37	0.494	0.56	3.35
Age Q4: 51-81	44	49	5	3	92	8	39	0.101	4.94	**0.022**	1.25	19.47

TABLE Q-18 COVID-19: I would be willing to participate in a COVID-19 vaccine trial

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	16	27	38	20	42	58	262					
HCW: Physicians	23	35	35	7	58	42	139		1.00			
HCW: Nurses	9	10	41	40	19	81	58	**<0.001**	0.18	**<0.001**	0.08	0.39
HCW: All Others	6	25	40	29	31	69	65	**<0.001**	0.33	**<0.001**	0.17	0.62
Doctor (general & family)	21	37	34	8	58	42	111					
Doctor (specialist)	32	25	39	4	57	43	28	1.000				
Nurse (inpatient)	9	4	47	40	13	87	47					
Nurse (outpatient)	9	36	18	36	45	55	11	**0.025**				
Sex: Male	21	32	32	16	53	47	76		1.00			
Sex: Female	13	24	41	22	38	63	184	**0.028**	0.75	0.351	0.42	1.37
Age Q1: 22-32	14	26	40	20	41	59	106		1.00			
Age Q2: 33-40	13	31	34	21	45	55	67		1.09	0.789	0.57	2.11
Age Q3: 41-50	17	26	39	17	43	57	46		1.26	0.552	0.59	2.70
Age Q4: 51-81	20	23	35	23	43	58	40	0.950	1.26	0.587	0.55	2.89

TABLE Q-19 COVID-19 vaccine: I intend to get it as soon as possible

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	40	34	18	8	74	26	267					
HCW: Physicians	52	36	11	1	88	12	154		1.00			
HCW: Nurses	25	23	27	25	48	52	56	**<0.001**	0.10	**<0.001**	0.05	0.23
HCW: All Others	23	37	28	12	60	40	57	**<0.001**	0.21	**<0.001**	0.10	0.43
Doctor (general & family)	49	37	13	1	86	14	126					
Doctor (specialist)	64	36	0	0	100	0	28	**0.045**				
Nurse (inpatient)	17	22	32	29	39	61	41					
Nurse (outpatient)	47	27	13	13	73	27	15	**0.034**				
Sex: Male	50	32	12	6	82	18	82		1.00			
Sex: Female	36	34	21	9	70	30	183	0.050	0.83	0.619	0.40	1.73
Age Q1: 22-32	37	27	27	10	63	37	104		1.00			
Age Q2: 33-40	40	40	13	7	81	19	72		2.25	**0.042**	1.03	4.90
Age Q3: 41-50	39	39	16	7	77	23	44		2.67	**0.034**	1.08	6.65
Age Q4: 51-81	50	32	9	9	82	18	44	**0.033**	4.10	**0.005**	1.54	10.91

TABLE Q-20 COVID-19 vaccine: I intend to wait to see how it affects others before I get it

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	15	37	35	13	52	48	315					
HCW: Physicians	7	26	49	18	33	67	157		1.00			
HCW: Nurses	21	49	18	12	71	29	85	**<0.001**	6.13	**<0.001**	3.21	11.71
HCW: All Others	26	45	25	4	71	29	73	**<0.001**	5.03	**<0.001**	2.69	9.40
Doctor (general & family)	9	27	52	13	36	64	128					
Doctor (specialist)	0	21	38	41	21	79	29	0.131				
Nurse (inpatient)	26	48	15	11	74	26	66					
Nurse (outpatient)	5	53	26	16	58	42	19	0.252				
Sex: Male	13	35	37	14	48	52	91		1.00			
Sex: Female	16	38	33	13	54	46	222	0.385	0.74	0.304	0.42	1.32
Age Q1: 22-32	19	42	32	8	61	39	120		1.00			
Age Q2: 33-40	13	30	37	20	43	57	76		0.57	0.081	0.30	1.07
Age Q3: 41-50	16	35	38	11	51	49	63		0.54	0.075	0.27	1.07
Age Q4: 51-81	9	36	36	19	45	55	53	0.071	0.43	**0.024**	0.21	0.90

TABLE Q-21 COVID-19 vaccine: I do not intend to get it soon, but might in the future

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	7	35	33	26	42	58	312					
HCW: Physicians	4	20	41	35	24	76	165		1.00			
HCW: Nurses	11	51	20	18	62	38	76	**<0.001**	4.95	**<0.001**	2.60	9.43
HCW: All Others	10	51	28	11	61	39	71	**<0.001**	4.59	**<0.001**	2.50	8.44
Doctor (general & family)	4	23	43	30	27	73	135					
Doctor (specialist)	3	7	30	60	10	90	30	0.058				
Nurse (inpatient)	12	53	16	19	66	34	58					
Nurse (outpatient)	6	44	33	17	50	50	18	0.274				
Sex: Male	6	24	40	30	30	70	87		1.00			
Sex: Female	8	39	30	24	47	53	223	**0.007**	1.63	0.113	0.89	3.00
Age Q1: 22-32	7	40	32	21	47	53	121		1.00			
Age Q2: 33-40	6	29	38	27	35	65	79		0.69	0.258	0.37	1.31
Age Q3: 41-50	10	39	31	21	48	52	62		0.91	0.793	0.46	1.81
Age Q4: 51-81	4	26	30	40	30	70	47	0.086	0.37	**0.017**	0.17	0.84

TABLE Q-22 COVID-19 vaccine: I do not intend to ever get the vaccine

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	1	2	38	59	3	97	304					
HCW: Physicians	0	2	28	70	2	98	178					
HCW: Nurses	5	3	54	38	8	92	65	**0.034**				
HCW: All Others	0	0	51	49	0	100	61	**0.023**				
Doctor (general & family)	0	2	32	66	2	98	145					
Doctor (specialist)	0	0	12	88	0	100	33	1.000				
Nurse (inpatient)	4	2	56	38	6	94	50					
Nurse (outpatient)	7	7	47	40	13	87	15	0.325				
Sex: Male	0	2	30	68	2	98	87					
Sex: Female	1	1	41	56	3	97	215	1.000				
Age Q1: 22-32	0	1	34	65	1	99	116					
Age Q2: 33-40	1	2	41	55	4	96	82					
Age Q3: 41-50	2	0	52	47	2	98	58					
Age Q4: 51-81	2	4	24	69	7	93	45	0.148				

TABLE Q-23 Reasons: I am confident there will be other effective treatments soon

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	13	69	14	4	82	18	206					
HCW: Physicians	13	62	19	6	75	25	112		1.00			
HCW: Nurses	13	73	10	4	87	13	52	0.105	2.34	0.096	0.86	6.36
HCW: All Others	12	83	5	0	95	5	42	**0.007**	7.00	**0.011**	1.56	31.37
Doctor (general & family)	13	64	18	6	76	24	88					
Doctor (specialist)	17	54	21	8	71	29	24	0.602				
Nurse (inpatient)	18	73	8	3	90	10	40					
Nurse (outpatient)	0	75	17	8	75	25	12	0.331				
Sex: Male	17	66	14	3	83	17	65		1.00			
Sex: Female	11	71	13	5	82	18	140	1.000	0.79	0.593	0.32	1.91
Age Q1: 22-32	15	68	14	3	84	16	79		1.00			
Age Q2: 33-40	8	73	10	10	80	20	51		0.95	0.915	0.37	2.43
Age Q3: 41-50	14	64	19	3	78	22	36		0.69	0.500	0.23	2.04
Age Q4: 51-81	16	68	13	3	84	16	38	0.845	1.21	0.738	0.40	3.64

TABLE Q-24 Reasons: I do not yet know enough about the vaccine to make a decision

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	8	26	45	20	34	66	331					
HCW: Physicians	3	11	58	27	14	86	175		1.00			
HCW: Nurses	19	43	25	14	61	39	80	**<0.001**	10.42	**<0.001**	5.30	20.49
HCW: All Others	11	42	37	11	53	47	76	**<0.001**	6.60	**<0.001**	3.52	12.39
Doctor (general & family)	3	13	59	25	16	84	142					
Doctor (specialist)	3	3	55	39	6	94	33	0.172				
Nurse (inpatient)	23	47	20	10	70	30	60					
Nurse (outpatient)	5	30	40	25	35	65	20	**0.008**				
Sex: Male	5	24	51	20	28	72	88		1.00			
Sex: Female	10	27	43	20	37	63	241	0.190	0.91	0.769	0.48	1.72
Age Q1: 22-32	6	29	47	17	36	64	126		1.00			
Age Q2: 33-40	9	20	51	21	29	71	87		0.92	0.806	0.47	1.79
Age Q3: 41-50	14	29	40	17	43	57	63		1.30	0.463	0.64	2.63
Age Q4: 51-81	6	25	42	27	31	69	52	0.313	0.65	0.284	0.29	1.43

TABLE Q-25 Reasons: I want to gain natural immunity to the virus that causes COVID-19

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	4	20	38	37	24	76	308					
HCW: Physicians	3	9	37	51	12	88	179		1.00			
HCW: Nurses	6	37	44	13	43	57	70	**<0.001**	5.57	**<0.001**	2.69	11.53
HCW: All Others	5	34	36	25	39	61	59	**<0.001**	4.94	**<0.001**	2.42	10.11
Doctor (general & family)	3	11	38	48	14	86	145					
Doctor (specialist)	3	3	32	62	6	94	34	0.259				
Nurse (inpatient)	6	37	44	13	42	58	52					
Nurse (outpatient)	6	39	44	11	44	56	18	1.000				
Sex: Male	3	19	37	41	22	78	90		1.00			
Sex: Female	4	21	39	35	25	75	216	0.662	0.77	0.441	0.39	1.51
Age Q1: 22-32	4	17	39	40	21	79	118		1.00			
Age Q2: 33-40	1	17	39	43	19	81	75		1.05	0.894	0.48	2.31
Age Q3: 41-50	3	27	40	29	31	69	62		1.37	0.409	0.65	2.92
Age Q4: 51-81	6	26	34	34	32	68	50	0.180	1.70	0.203	0.75	3.85

TABLE Q-26 Reasons: Development may be rushed/vaccine may not be thoroughly tested

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	15	35	37	13	50	50	292					
HCW: Physicians	6	23	51	19	30	70	155		1.00			
HCW: Nurses	32	44	16	8	76	24	75	**<0.001**	8.65	**<0.001**	4.34	17.22
HCW: All Others	16	55	27	2	71	29	62	**<0.001**	6.33	**<0.001**	3.25	12.32
Doctor (general & family)	7	24	53	16	31	69	123					
Doctor (specialist)	3	22	44	31	25	75	32	0.665				
Nurse (inpatient)	38	43	13	7	80	20	56					
Nurse (outpatient)	16	47	26	11	63	37	19	0.212				
Sex: Male	11	35	42	12	46	54	83		1.00			
Sex: Female	17	35	35	13	52	48	207	0.364	0.75	0.350	0.41	1.37
Age Q1: 22-32	13	37	41	9	50	50	109		1.00			
Age Q2: 33-40	9	34	39	17	43	57	76		1.04	0.908	0.53	2.03
Age Q3: 41-50	24	35	29	13	58	42	55		1.22	0.604	0.58	2.55
Age Q4: 51-81	18	35	35	12	53	47	49	0.401	1.16	0.706	0.54	2.50

TABLE Q-27 Reasons: I believe vaccines may give you the disease

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	5	12	46	37	17	83	303					
HCW: Physicians	2	7	43	47	10	90	177		1.00			
HCW: Nurses	10	19	47	24	29	71	68	**<0.001**	4.94	**<0.001**	2.20	11.08
HCW: All Others	7	17	55	21	24	76	58	**<0.001**	3.42	**0.003**	1.51	7.75
Doctor (general & family)	3	8	43	46	11	89	145					
Doctor (specialist)	0	3	44	53	3	97	32	0.316				
Nurse (inpatient)	12	24	46	18	36	64	50					
Nurse (outpatient)	6	6	50	39	11	89	18	0.070				
Sex: Male	3	14	42	41	17	83	86		1.00			
Sex: Female	6	11	48	35	17	83	215	0.866	0.63	0.230	0.29	1.34
Age Q1: 22-32	6	11	45	39	16	84	122		1.00			
Age Q2: 33-40	1	14	43	42	15	85	79		1.20	0.657	0.53	2.74
Age Q3: 41-50	4	15	52	29	19	81	52		1.23	0.647	0.51	2.97
Age Q4: 51-81	10	6	50	33	17	83	48	0.936	0.97	0.948	0.38	2.49

TABLE Q-29 Opinion shapers: The pace at which the vaccine was researched and developed

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	17	42	35	6	59	41	302					
HCW: Physicians	8	41	44	7	49	51	167		1.00			
HCW: Nurses	37	33	21	9	70	30	70	**0.004**	2.49	**0.005**	1.32	4.72
HCW: All Others	20	52	28	0	72	28	65	**<0.001**	2.70	**0.002**	1.44	5.07
Doctor (general & family)	7	41	46	6	48	52	138					
Doctor (specialist)	10	45	34	10	55	45	29	0.542				
Nurse (inpatient)	39	31	24	6	71	29	51					
Nurse (outpatient)	32	37	16	16	68	32	19	1.000				
Sex: Male	12	41	44	2	54	46	82		1.00			
Sex: Female	19	42	32	7	61	39	219	0.240	1.11	0.707	0.64	1.92
Age Q1: 22-32	15	45	36	4	60	40	118		1.00			
Age Q2: 33-40	13	45	35	7	59	41	75		1.05	0.885	0.57	1.92
Age Q3: 41-50	22	36	35	7	58	42	55		0.88	0.713	0.45	1.73
Age Q4: 51-81	22	35	37	6	57	43	51	0.978	0.82	0.588	0.41	1.67

TABLE Q-30 Opinion shapers: The unfolding & frequently evolving science of SARS-CoV-2

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	21	68	8	2	89	11	295					
HCW: Physicians	16	73	8	2	89	11	166		1.00			
HCW: Nurses	32	55	10	3	87	13	69	0.656	0.64	0.370	0.24	1.69
HCW: All Others	23	68	7	2	92	8	60	0.715	1.19	0.748	0.41	3.44
Doctor (general & family)	13	76	10	1	89	11	134					
Doctor (specialist)	28	63	3	6	91	9	32	1.000				
Nurse (inpatient)	31	58	8	4	88	12	52					
Nurse (outpatient)	35	47	18	0	82	18	17	0.679				
Sex: Male	17	66	12	5	83	17	83		1.00			
Sex: Female	23	69	7	1	91	9	211	0.059	2.54	**0.029**	1.10	5.86
Age Q1: 22-32	19	70	10	1	89	11	110		1.00			
Age Q2: 33-40	16	76	5	3	92	8	76		1.37	0.551	0.48	3.89
Age Q3: 41-50	26	67	2	6	93	7	54		1.73	0.372	0.52	5.71
Age Q4: 51-81	27	54	17	2	81	19	52	0.203	0.60	0.294	0.23	1.55

TABLE Q-31 Opinion shapers: Actions and opinions of friends and family

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	3	26	51	21	28	72	297					
HCW: Physicians	1	22	48	29	23	77	167		1.00			
HCW: Nurses	4	32	55	8	37	63	71	**0.037**	2.39	**0.011**	1.22	4.68
HCW: All Others	5	29	54	12	34	66	59	0.052	1.90	0.062	0.97	3.73
Doctor (general & family)	1	22	50	28	22	78	134					
Doctor (specialist)	3	21	39	36	24	76	33	0.819				
Nurse (inpatient)	4	34	57	6	38	62	53					
Nurse (outpatient)	6	28	50	17	33	67	18	0.785				
Sex: Male	5	30	38	27	35	65	81		1.00			
Sex: Female	2	23	56	19	25	75	214	0.112	0.50	**0.027**	0.27	0.93
Age Q1: 22-32	1	28	50	21	29	71	114		1.00			
Age Q2: 33-40	0	17	61	21	17	83	75		0.55	0.111	0.26	1.15
Age Q3: 41-50	8	29	42	21	37	63	52		1.21	0.599	0.59	2.49
Age Q4: 51-81	6	28	47	19	34	66	53	0.061	1.13	0.735	0.55	2.34

TABLE Q-32 Opinion shapers: Relationship between coverage rates and community transmission

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	11	67	19	3	78	22	224					
HCW: Physicians	11	65	22	2	76	24	124		1.00			
HCW: Nurses	11	72	15	2	84	16	61	0.259	1.27	0.593	0.53	3.00
HCW: All Others	10	67	18	5	77	23	39	0.479	1.09	0.843	0.45	2.63
Doctor (general & family)	8	68	21	3	76	24	99					
Doctor (specialist)	24	52	24	0	76	24	25	1.000				
Nurse (inpatient)	11	74	13	2	85	15	46					
Nurse (outpatient)	13	67	20	0	80	20	15	0.696				
Sex: Male	9	65	24	3	74	26	68		1.00			
Sex: Female	12	68	17	3	80	20	155	0.296	1.42	0.352	0.68	2.95
Age Q1: 22-32	4	66	27	4	70	30	82		1.00			
Age Q2: 33-40	14	64	16	5	79	21	56		1.65	0.218	0.74	3.69
Age Q3: 41-50	16	71	13	0	87	13	45		2.90	**0.035**	1.08	7.83
Age Q4: 51-81	18	69	13	0	87	13	39	0.068	3.02	**0.045**	1.03	8.89

TABLE Q-33 Opinion shapers: My own research on COVID-19 vaccines

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	28	60	9	2	89	11	311					
HCW: Physicians	32	59	6	2	92	8	170		1.00			
HCW: Nurses	27	63	8	1	90	10	73	0.804	0.83	0.723	0.31	2.28
HCW: All Others	19	60	18	3	79	21	68	**0.031**	0.36	**0.015**	0.16	0.82
Doctor (general & family)	32	59	7	2	91	9	140					
Doctor (specialist)	33	63	0	3	97	3	30	0.468				
Nurse (inpatient)	27	62	9	2	89	11	55					
Nurse (outpatient)	28	67	6	0	94	6	18	0.673				
Sex: Male	27	61	7	5	88	12	85		1.00			
Sex: Female	28	60	10	1	89	11	225	0.843	1.14	0.750	0.50	2.62
Age Q1: 22-32	24	59	13	3	83	17	120		1.00			
Age Q2: 33-40	30	62	6	1	93	7	82		2.34	0.087	0.88	6.19
Age Q3: 41-50	27	66	4	4	93	7	56		2.72	0.085	0.87	8.51
Age Q4: 51-81	32	58	10	0	90	10	50	0.150	1.58	0.401	0.54	4.61

TABLE Q-34 Opinion shapers: The country in which a vaccine is manufactured

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	10	39	39	11	49	51	289					
HCW: Physicians	12	35	39	15	46	54	165		1.00			
HCW: Nurses	11	48	34	6	59	41	64	0.078	1.63	0.123	0.88	3.03
HCW: All Others	7	42	45	7	48	52	60	0.195	1.08	0.803	0.59	1.97
Doctor (general & family)	13	33	41	13	46	54	135					
Doctor (specialist)	7	40	30	23	47	53	30	1.000				
Nurse (inpatient)	9	51	32	9	60	40	47					
Nurse (outpatient)	18	41	41	0	59	41	17	1.000				
Sex: Male	14	34	39	14	48	53	80		1.00			
Sex: Female	9	41	40	10	50	50	207	0.793	1.01	0.967	0.59	1.75
Age Q1: 22-32	9	38	45	8	47	53	110		1.00			
Age Q2: 33-40	10	34	42	14	44	56	79		0.92	0.790	0.51	1.66
Age Q3: 41-50	9	51	26	13	60	40	53		1.61	0.165	0.82	3.17
Age Q4: 51-81	16	36	39	9	52	48	44	0.298	1.15	0.703	0.56	2.35

TABLE Q-35 Opinion shapers: The potential cost of a COVID-19 vaccine

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	4	22	55	19	26	74	267					
HCW: Physicians	4	23	51	22	28	72	162		1.00			
HCW: Nurses	3	24	59	14	28	72	58	1.000	0.94	0.869	0.46	1.94
HCW: All Others	2	17	66	15	19	81	47	0.495	0.61	0.233	0.27	1.38
Doctor (general & family)	5	23	51	20	29	71	132					
Doctor (specialist)	0	23	50	27	23	77	30	0.655				
Nurse (inpatient)	2	23	60	14	26	74	43					
Nurse (outpatient)	7	27	53	13	33	67	15	0.738				
Sex: Male	4	21	58	18	25	75	73		1.00			
Sex: Female	4	23	55	19	27	73	192	0.876	1.16	0.655	0.60	2.25
Age Q1: 22-32	2	20	61	17	22	78	105		1.00			
Age Q2: 33-40	6	22	55	17	28	72	69		1.29	0.485	0.63	2.62
Age Q3: 41-50	6	33	43	18	39	61	49		2.15	**0.046**	1.01	4.58
Age Q4: 51-81	2	20	56	22	22	78	41	0.159	0.98	0.957	0.40	2.37

TABLE Q-36 Opinion shapers: Information I've seen on social media

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	3	27	43	27	30	70	298					
HCW: Physicians	2	16	45	36	18	82	165		1.00			
HCW: Nurses	7	38	39	16	45	55	74	**<0.001**	3.74	**<0.001**	1.93	7.26
HCW: All Others	2	41	42	15	42	58	59	**<0.001**	3.28	**<0.001**	1.68	6.41
Doctor (general & family)	2	19	43	36	22	78	134					
Doctor (specialist)	0	3	58	39	3	97	31	**0.018**				
Nurse (inpatient)	9	35	42	15	44	56	55					
Nurse (outpatient)	0	47	32	21	47	53	19	0.795				
Sex: Male	1	25	39	35	26	74	80		1.00			
Sex: Female	4	26	45	25	30	70	216	0.566	0.85	0.630	0.45	1.62
Age Q1: 22-32	3	31	40	26	34	66	118		1.00			
Age Q2: 33-40	3	15	54	28	18	82	74		0.50	0.066	0.24	1.05
Age Q3: 41-50	4	33	35	29	36	64	55		0.95	0.887	0.47	1.93
Age Q4: 51-81	4	25	46	25	29	71	48	0.051	0.75	0.462	0.35	1.62

TABLE Q-38 Influenza: I would take the flu vaccine if offered

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	47	39	11	3	85	15	316					
HCW: Physicians	60	33	6	1	93	7	178		1.00			
HCW: Nurses	25	41	23	11	66	34	71	**<0.001**	0.14	**<0.001**	0.06	0.32
HCW: All Others	33	52	13	1	85	15	67	**<0.001**	0.41	0.054	0.16	1.02
Doctor (general & family)	56	37	7	1	92	8	144					
Doctor (specialist)	79	18	3	0	97	3	34	0.467				
Nurse (inpatient)	17	44	25	13	62	38	52					
Nurse (outpatient)	47	32	16	5	79	21	19	0.258				
Sex: Male	52	38	8	2	90	10	91		1.00			
Sex: Female	44	39	13	4	83	17	223	0.160	0.92	0.851	0.37	2.26
Age Q1: 22-32	44	40	12	3	84	16	121		1.00			
Age Q2: 33-40	40	51	8	1	90	10	83		1.70	0.261	0.67	4.27
Age Q3: 41-50	50	34	10	5	84	16	58		1.18	0.729	0.47	2.95
Age Q4: 51-81	61	22	14	4	82	18	51	0.519	1.19	0.717	0.46	3.08

TABLE Q-40 Influenza: I would recommend the flu vaccine to friends and family

	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Agree or Strongly Agree (%)	Disagree or Strongly Disagree (%)	n	Fisher's Exact Test P-value	Logistic Regression Adjusted Odds Ratio	P-value	Lower Bound	Upper Bound
All	52	43	5	0	95	5	309					
HCW: Physicians	63	35	1	0	99	1	178		1.00			
HCW: Nurses	34	55	11	0	89	11	64	**0.002**	0.09	**0.006**	0.02	0.50
HCW: All Others	37	52	9	1	90	10	67	**<0.001**	0.10	**0.005**	0.02	0.48
Doctor (general & family)	60	39	1	0	99	1	144					
Doctor (specialist)	79	21	0	0	100	0	34	1.000				
Nurse (inpatient)	28	57	15	0	85	15	46					
Nurse (outpatient)	50	50	0	0	100	0	18	0.177				
Sex: Male	54	41	3	1	96	4	90		1.00			
Sex: Female	51	44	6	0	94	6	217	0.786	1.20	0.789	0.32	4.45
Age Q1: 22-32	52	44	4	0	96	4	113		1.00			
Age Q2: 33-40	44	52	5	0	95	5	85		0.59	0.482	0.14	2.55
Age Q3: 41-50	53	38	7	2	91	9	55		0.40	0.199	0.10	1.62
Age Q4: 51-81	62	32	6	0	94	6	53	0.475	0.70	0.662	0.14	3.53

Vaccination is one of the most important and effective tools in protecting populations from infectious diseases of public health concern. This includes using vaccines to prevent the spread of COVID-19, but some Health Care Workers (HCWs) are hesitant toward the effectiveness and safety of these vaccines and may delay or even refuse to get vaccinated when offered.

In this survey, the intention of the HCWs in Trinidad and Tobago to get the COVID-19 vaccine was demonstrated by 74% of the respondents wanted to get the vaccine as soon as possible, whereas 26% expressed vaccine hesitancy. Nurses were hesitant at more than four times the rate of physicians. The youngest age group (22–31 years) was twice as hesitant as the oldest (51–81 years), and females were more than 1.5 times as hesitant than their male colleagues. When comparing the findings from Trinidad and Tobago to those from the entire Caribbean survey, there are similar findings in the data for the entire Caribbean, including Trinidad and Tobago, whereby it was observed that nurses were twice as hesitant as compared to physicians, and the younger HCWs were more hesitant than the older ones, although the difference between sexes is not as big for the Caribbean.

Efforts need to be made to increase risk perception of COVID-19 disease versus all approved vaccines, so that HCWs feel more confident not only getting vaccinated themselves but also in recommending that their patients, family, and friends get vaccinated as well. Messaging also needs to emphasize the importance of taking the first vaccine that is available and not delaying vaccination in the hope of receiving a vaccine of personal preference. Trusted technical spokespersons should be used to empathetically communicate critical messages about vaccine safety and efficacy and the importance of getting vaccinated with the first vaccine that is offered.

PAHO Pan American Health Organization World Health Organization Regional Office for the Americas

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