

# KNOWLEDGE, ATTITUDES, AND PRACTICES OF HEALTH WORKERS REGARDING COVID-19 VACCINES IN LATIN AMERICA



In partnership with  
**Canada**



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*Knowledge, Attitudes, and Practices of Health Workers Regarding COVID-19 Vaccines in Latin America*

PAHO/FPL/IM/COVID-19/22-0056

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# Acknowledgments

This publication is the product of an interprogrammatic initiative between the Human Resources for Health Unit of the Department of Health Systems and Services, and the Comprehensive Family Immunization Unit of the Family, Health Promotion and Life Course Department, both of the Pan American Health Organization (PAHO).

The contributions and inputs of the technical team coordinated by Tamara Rivera, Martha Velandia, and Maite Vera Antelo are acknowledged.

The research team also included Jennifer Brustrom, statistician (Biostat Global Consulting, Worthington, Ohio, United States of America); Finola Crowley, PAHO intern; Ana García, PAHO consultant (Central America Subregion); Irene Melamed, PAHO consultant (Southern Cone Subregion); Angela Meza, PAHO consultant (Andean Community Subregion); Dale Rhoda, statistician (Biostat Global Consulting, Worthington, Ohio, United States) and Claudia Ortiz, information systems specialist at the Immunization Unit, who provided support with the platform.

The valuable contributions of Silvia Cassiani, Malhi Cho, and Hernán Sepúlveda (HSS/HR) in the design and dissemination of the instrument are appreciated, as well as the contribution of PAHO Representative Offices and focal points in the participating countries.

This publication would not have been possible without the strong, sustained commitment of PAHO Member States. The invaluable collaboration provided by public and private health institutions, universities, schools, ethics committees, scientific societies, and collegiate societies in the three subregions is acknowledged, with appreciation for their dissemination and follow-up of the survey in the participating countries.

PAHO works with health authorities, local governments, and communities to promote equitable access to COVID-19 vaccines throughout the Region of the Americas. With funding from the Government of Canada, PAHO supports and provides visibility for projects and interventions to facilitate access to vaccines for indigenous peoples, migrants, remote communities, and other populations in situation of vulnerability, while engaging in capacity-building with local health systems and combating the infodemic.

Finally, a deep and sincere thank you to all the health workers who took the time to respond to this survey, despite their enormous workloads.

This work has been sponsored by PAHO and the Government of Canada.

# Summary

## Introduction

Understanding how health workers think, feel, and act regarding vaccination is critical for designing evidence-based strategies for increasing the uptake and use of vaccines, especially vaccines against coronavirus disease (COVID-19). Health workers play an essential role in vaccination, by building the general population's trust in the immunization program. Indeed, health workers are often seen as the most reliable source of information on vaccination, and as those best able to inspire trust among their patients, colleagues, and community members. However, as with the general population, health workers are at risk of falling for misinformation about vaccines, especially in the context of the infodemic that complicates the response to the COVID-19 pandemic around the world.

## Methods

From February to May 2022, the Pan American Health Organization (PAHO) conducted a mixed-methods survey to assess the knowledge, attitudes, and vaccination practices of more than 6700 health workers in 16 countries in the Region of Latin America and the Caribbean.

## Results

The survey's findings indicated that 97% of health workers intended to recommend the COVID-19 vaccine to eligible individuals, and 98% had completed their own vaccination schedules. These findings confirmed other studies which reported that concerns about vaccine safety and effectiveness are important predictors of COVID-19 vaccination uptake or refusal.

## Discussion

Based on the present study's findings, it is advisable to focus on interventions that reinforce the perception of the risk of COVID-19 itself, rather than of the vaccine, and on interventions that increase health staff's understanding of the development process for vaccines, as well as their confidence in vaccines' safety, effectiveness, and benefits. Moreover, efforts should be directed at providing transparent, timely communication, with messages about COVID-19 vaccination adapted to the national context and situation. Finally, it is important that countries work to remove any access barriers to COVID-19 vaccination among health workers; for example, by adopting expanded hours and workplace vaccination.



# Introduction

The coronavirus disease (COVID-19) pandemic was not only characterized by loss of human lives, morbidity associated with the infection, and burden on health services; the pandemic also exacerbated the structural problems of the Region of Latin America and the Caribbean: low investment and productivity, labor informality, unemployment, inequality, and poverty. According to the Global Economic Prospects report published by the World Bank in January 2022, the recovery of emerging and developing countries is at risk: economic growth in Latin America is projected at 2.6% for 2022 and 2.7% for 2023, compared to 4.1% and 3.2%, respectively, for the same years worldwide (1).

The Second Round of the National Pulse Survey on Continuity of Essential Health Services during the Covid-19 Pandemic, January-March 2021, published by the World Health Organization (WHO) showed that, in 66% of the countries surveyed, disruptions in essential services could be attributed to health workforce-related factors. Regular immunization programs also detected a 37% reduction in service provision (2). To this must be added the additional requirements of human resources for health necessary to carry out immunization campaigns (in countries that have them) to combat severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which causes COVID-19.

Worldwide, as of 16 August 2022, there were 588 757 628 confirmed cases of COVID-19 and 6 433 794 deaths attributable to the disease. In Latin America, as of the same date, 79 134 119 confirmed cases and 1 618 518 deaths attributable to COVID-19 had been reported. These figures represented 13% of total confirmed cases worldwide, and 25% of total deaths (3).

The COVID-19 pandemic severely affected health workers. Between January 2020 and May 2021, surveillance data reported to WHO showed 3.45 million deaths from COVID-19, of which 6643 deaths were among health workers. This figure significantly underestimated the worldwide burden of mortality in this group (4), as the population-based estimate for mortality attributable to COVID-19 among health workers was 115 493 deaths.

In the Region of the Americas, as of 29 November 2021, based on available information from 41 countries and territories, 2 379 335 cases of COVID-19 had been reported among health workers, including 12 898<sup>1</sup> deaths. However, according to WHO estimates, the actual figure was approximately 60 000 deaths among health workers in the Region (4).

Regarding vaccination, as of 9 August 2022, a total of 12 355 390 588 doses of COVID-19 vaccines had been administered worldwide (3). As of 19 May 2022, there were 11 COVID-19 vaccines on the WHO crisis list<sup>2</sup>, all available through the COVID-19 Vaccine Global Access (COVAX) Facility<sup>3</sup>.

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1 Epidemiological Update Coronavirus disease (COVID-19) - PAHO / 2 December 2021. Available from: <https://iris.paho.org/handle/10665.2/55322?locale-attribute=en>

2 The listed COVID-19 vaccines are Pfizer-BioNTech (Comirnaty); AstraZeneca (AZ)/SK Bio (ChAdOx1-S); Serum Institute of India (ChAdOx1-S, Covishield); AZ EY approved sites (ChAdOx1-S) SK-Catalent, Wuxi and Chemo Spain; Janssen (Ad26.COV2.S); Moderna (mRNA-1273); Sinopharm/BIBP (BBIBP-CorV); and Sinovac (CoronaVac).

3 COVAX: an unprecedented global effort by CEPI, Gavi, UNICEF, PAHO, and WHO to ensure equitable Access to immunization throughout the world. The PAHO Revolving Fund is the recognized COVAX procurement entity in the Region.

The first doses provided through the COVAX mechanism in the Region of the Americas were delivered to Colombia on 1 March 2021. From that date until 4 August 2022, 33 countries and territories in Latin America and the Caribbean received approximately 149 642 250 doses through COVAX<sup>4</sup>.

Throughout the Region of the Americas, as of 12 August 2022, a total of 1 945 420 795 doses of vaccines had been administered, of which 991 599 924 were administered to the population of Latin America (41%). Of total doses in the Region, 76 719 619 (4%) were administered in Central America; 61 450 838 (3%) in the Andean Community; and 656 693 442 (34%) in the Southern Cone<sup>5</sup>.

An essential part of strategies to promote vaccination are communication campaigns aimed not only at the general public, but also at the specific priority groups designated by each country. The COVID-19 pandemic is the first in history in which technology and social media are being used on a massive scale to help people stay safe, have access to information, and stay productive and connected. Regarding information, both online and offline, it is important to highlight that the overabundance of information and the risk of unintentional access to misinformation have had a negative impact on such crucial issues as COVID-19 vaccination. One of the most serious consequences is the concern and mistrust that have been generated in the public regarding the safety of these vaccines. This negative effect on the acceptance of COVID-19 vaccines in Latin America should be evaluated, and communication and public policy strategies implemented, to ensure that the measures taken to address the COVID-19 pandemic have the desired impact on the population.

The Collective Service for Risk Communication and Community Engagement (RCCE), noted that by May 2022, the acceptance of COVID-19 vaccines in the general population worldwide was 90.2% (5). As for health workers, a study conducted in London by Abuown et al. in December 2020 indicated that 24% of health workers were reluctant to receive the COVID-19 vaccine, with an even lower intention to be vaccinated among women, younger age groups, black health workers, and nursing staff. The main reason given for vaccine refusal was safety concerns (6). In other European countries, a study conducted in Russia in January 2021 on the acceptance of COVID-19 vaccination indicated that only 35% of health workers were willing to be vaccinated (7), whereas in Italy, Papini et al. reported that 62.69% of health workers were in favor of mandatory COVID-19 vaccination, while only 6.76% had doubts about vaccines (8).

According to a PAHO study conducted in the Caribbean Subregion between April and May 2021, respondents generally agreed that vaccines are safe and efficient, and that the information provided by authorities and health care providers is reliable. When assessing the uptake of COVID-19 vaccination, 23% of respondents showed some level of reluctance; compared with medical staff, nursing staff and other health workers expressed more doubts. The findings of the Caribbean study also indicated that the youngest members of the health workforce (21 to 32 years) showed higher vaccine reluctance compared to the older group (51 to 87 years). Moreover, 48% of respondents said that the country of origin of the laboratory where the COVID-19 vaccine was manufactured influenced their opinion, while 30% of participants said they did not yet have enough information about the vaccine to make a decision, and another 30% reported that information received through social media influenced their opinions regarding COVID-19 vaccines (9).

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4 Pan American Health Organization. COVID-19 Daily Update. Available from: <https://paho-covid19-response-who.hub.arcgis.com/>.

5 Pan American Health Organization. Available from: [https://ais.paho.org/imm/IM\\_DosisAdmin-Vacunacion.asp](https://ais.paho.org/imm/IM_DosisAdmin-Vacunacion.asp)

A study conducted in the United States by Razzaghi et al. in April 2021 showed that 7.1% of health workers were not sure about getting vaccinated, and another 14.9% would definitely not be vaccinated; the main reasons given included potential side effects, the safety and effectiveness of COVID-19 vaccines, and their rapid development and approval (10). A study of 543 health workers in the state of Nuevo León, Mexico, conducted between October and December 2022, reported that 30 (5.5%) respondents would refuse COVID-19 vaccination; the most important factor related to refusal was misinformation regarding vaccination and COVID-19 (11). In South America, a study conducted among health workers at several hospitals in Trujillo, Peru in July 2021 indicated that, of a total of 269 people surveyed, 4.6% refused the vaccine, and a direct relationship was established between knowledge about COVID-19 vaccination and its acceptance or refusal (12).

In view of the growing evidence that the number of deaths from COVID-19 among health workers is much higher than officially reported, the need to protect this group through vaccination should not be underestimated (4). Health workers remain a priority group for receiving COVID-19 vaccines, not only to protect against the disease, but because they are an important group for the dissemination of evidence-based knowledge and information, and their behavior influences society's response to public health issues. Moreover, their knowledge and attitude towards other vaccines in general and especially towards some vaccines recommended for health workers, such as flu/influenza vaccines, has been associated with a higher probability of acceptance of COVID-19 vaccines (8, 13).

An assessment should be made of the extent to which misinformation may have affected the knowledge and attitudes of health workers, probably influencing their acceptance or hesitancy regarding COVID-19 vaccines. Such an assessment will help to develop messages targeting health workers to clarify their questions and concerns. The available evidence can guide the design of communication campaigns aimed at this target population and facilitate the development of public policies by decision makers to establish appropriate measures to improve their impact. Therefore, documenting health workers' attitudes towards COVID-19 vaccines is of paramount importance for the ultimate success of a set of communication activities aimed at the target population and the eventual acceptance of vaccines to control the COVID-19 pandemic.

The objective of the present research project was to document the knowledge, attitudes, and practices of health workers regarding COVID-19 vaccines in Latin America. Data were collected from 16 countries in Latin America<sup>6</sup> through an online cross-sectional survey of health workers, which collected information on attitudes and predispositions towards vaccines in general, attitudes towards COVID-19 vaccines, and attitudes towards flu/influenza and hepatitis B vaccines.

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6 Argentina, Bolivia (Plurinational State of), Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Panama, Paraguay, Peru, Uruguay and Venezuela (Bolivarian Republic).

# Materials and methods

## Development of the instrument

The survey instrument was based on a tool presented in the interim guidance report *Data for action: achieving high uptake of COVID-19 vaccines* (14), published by WHO and the United Nations Children's Fund (UNICEF), which was a questionnaire developed by the University of California, Los Angeles for its survey on vaccine acceptance by health workers (15). PAHO validated the instrument and used it in the study conducted in the Caribbean Subregion between March and April 2021 (9). This instrument was adapted for use in Latin America and presented to experts from the PAHO Department of Health Systems and Services and the Comprehensive Family Immunization Unit. A pilot study was conducted in several Latin American countries to ensure that the questions and options for answers were understood as intended and measured what they were intended to measure. The instrument included specific questions addressed to health workers, based on their role as a reliable source of information on vaccines and the fact that they are one of the priority groups to receive the vaccine. Questions were added about flu/influenza and hepatitis B vaccines to facilitate the comparison of attitudes toward COVID-19 vaccines and other vaccines given to adults in Latin America. The full survey can be found in Annex A.

The 34 survey questions were grouped into the following categories:

- Demographics and disease history: 11 questions, in which respondents confirmed whether they were health workers and whether they had consented to participate in the study, and answered questions about their country of origin, gender, age, ethnicity, work sector and workplace, profession, whether they had had COVID-19, and whether they had ever been tested for COVID-19
- Opinion questions (block 1):
  - Attitudes toward vaccines in general (eight Likert scale questions)<sup>7</sup>
  - Predisposition to get vaccinated (four Likert scale questions)
- Opinion questions (block 2): availability of COVID-19 vaccines (four yes/no questions and one open-ended question)
- Opinion questions (block 3): COVID-19 vaccination (three multiple-choice questions and one open-ended question)
- Opinion questions (block 4): attitudes towards COVID-19 vaccines
- Reasons to delay or refuse COVID-19 vaccine (five Likert scale questions and one free-answer question).

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<sup>7</sup> The Likert scale is a psychometric rating scale used to ask questions about the respondent's level of agreement or disagreement with a statement. This scale is ideal for measuring the respondent's reactions, attitudes, and behaviours.

- Reasons influencing opinions on COVID-19 vaccines (nine Likert scale questions and one free-answer question)
- Attitudes towards flu/influenza and hepatitis B vaccines (four Likert scale questions and four free-answer questions)
- Additional comment on COVID-19 vaccines (a free-answer question)

## Calculation of the target sample size

The target sample size for the study was based on the total number of health workers in the categories reported to the WHO portal of National Health Workforce Accounts (NHWA), which include nurses, physicians, midwives, and dental and pharmacy professionals. Sixteen countries in Latin America (seven in Central America, five in the Andean Community, and four in the Southern Cone)<sup>8</sup> provided data on their human resources for health to the NHWA portal, reporting a total of 1 906 703 health workers. By subregions, Central America reported 383 447 health workers, the Andean Community reported 680 695 health workers, and the Southern Cone reported 842 561 health workers.

To calculate the sample, the target sample size per country was defined, with a confidence level of 95% and a margin of error of 5%, and then a minimum number per country was defined for subregional sampling.

The minimum target sample size for each country was set at 200, with the aim of estimating the percentage of health workers having doubts about the COVID-19 vaccine, with a Wald-type confidence level of 95% on two sides of the interval and no wider than  $\pm 10\%$  in each country if the design effect was  $\leq 2$ , and no wider than  $\pm 7\%$  if the design effect was 1. This estimate assumed that 50% of health workers might have doubts about the vaccine, which would give the widest confidence intervals. If more or fewer individuals in the sample were doubtful, the confidence intervals would be even narrower.

Data from each country's non-probability sample were analyzed as if they came from a simple randomized sample. Data for each country were weighted so that the relative amounts of weights reflected the relative number of health workers estimated to work in each country.

In the aggregate analysis, the countries served as strata, and both weighting and stratification produced the possibility of a design effect not equal to 1. The width of the confidence interval when combining countries across subregions should be much smaller than that of each country.

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<sup>8</sup> Argentina, Bolivia (Plurinational State of), Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Panama, Paraguay, Uruguay, and Venezuela (Bolivarian Republic of).

## Ethics Review Committee and confidentiality

The study protocol was approved by the PAHO Ethics Review Committee. The study team obtained consent from those who agreed to participate, and the consent form was submitted online before participants were given access to the questionnaire. All study procedures were described in detail, providing participants with complete information about the requirements. During this consent process, health workers were informed that they were free to participate or not to participate in the study. The welcome statement stressed that participation was voluntary, that there would be no negative consequences, and that there were no right or wrong answers. All potential participants could consent or refuse to participate in the study. A list of participants who gave their consent was drawn up. In addition, in Panama, an exemption was obtained from the country's ethics committee.

To maintain data confidentiality and privacy, each questionnaire was tagged with a numerical identifier so that specific responses could not be linked to the data. An anonymous uniform resource locator (URL) link was provided to conduct the survey.

## Recruitment and conducting the survey

The electronic survey was conducted in Spanish on a platform from Qualtrics, a software company based in Provo, United States. The platform created a link and a quick response (QR) code for the dissemination of the survey. PAHO sent the questionnaire link and QR code to ministries of health and professional associations in the participating countries through the PAHO Representative Offices. The Representative Offices recommended national officials to distribute the survey through professional associations or societies from the public and private sectors, and advertisements in clinics. At the subregional level, the questionnaire link and QR code were sent to academic institutions, scientific societies, professional associations, private health institutions, private practices, and independent professionals. Several webinars were held with the focal points assigned by PAHO to present the survey and describe its components.

The data was collected anonymously on the Qualtrics platform. The option for multiple people to use the same link to access the survey was offered, but the survey was protected so that each person could answer it only once.

The Qualtrics platform recorded the start and end date and time of each survey, and cookies and tracking technologies using internet protocol (IP) addresses and geographic coordinates (latitude and longitude) prevented the same person from answering the survey more than once. A configuration that accepted responses from Latin America was used. The project team tested the survey online before using it to collect data for the project.

Participants who consented to respond to the survey were given access to all questions. Respondents were not required to fill in the free-answer questions. A review or confirmation step was not included at the end of the survey. All the Likert scale questions offered four options for the answer: "strongly agree", "agree", "disagree", and "strongly disagree".

In Cuba, due to restrictions regarding access to certain websites (e.g., Qualtrics), the online survey

was made available at the PAHO Representative Office, and the printed questionnaire was distributed to approximately 50 health institutions in 15 municipalities of Havana (including the Ministry of Health; School of Public Health; the Institute of Hygiene, Epidemiology, and Microbiology; medical societies; and medical schools). Ministry of Health staff were responsible for distributing the survey and compiling responses; 307 surveys were received, and a staff member at the PAHO office in Cuba was tasked with entering the data on the Qualtrics platform. The Immunization focal point at that office will be responsible for storing the surveys in a secure place to ensure the confidentiality of the data obtained.

The survey was answered by 6718 health workers, more than double the projected total (3200). There were no payments or incentives for responding to the survey. Data was collected between 21 February and 20 May 2022.

## Data cleaning and categorization

Once the survey was closed, responses were downloaded from the Qualtrics platform. Survey responses were eliminated if they met any of the following criteria: (1) respondent did not complete the questionnaire, (2) respondent indicated that they were not a health worker, (3) respondent did not consent to answer the questions, or (4) respondent was under the age of 18. Respondents were required to answer all opinion questions that appeared on their screens. Some opinion questions were shown only to respondents who indicated that they had not received the COVID-19 vaccine, had not received the full vaccination schedule, or disagreed with questions related to flu/influenza vaccines and hepatitis B vaccines.

Respondents were classified into different categories to organize the reporting of results:

1. Five broad categories of work were considered, including medical staff, nursing and midwifery staff, other health professionals, health technicians, and others (see Annex II). The category of “other health professionals” includes professions specified in the survey by the researchers (see Annex II) and the category “others” was made available to people who did not identify with any of the professions specified by the research team in the survey, such as audiologists and biomedical staff.
2. Age quartiles were calculated for each subregion and for all 16 countries. The boundaries of these categories are described in the general analysis of Latin America and in the analyses of each subregion.
3. Three categories of ethnicity were considered: white, mestizo (mixed Spanish-indigenous ancestry), and others. The latter group included people of African descent, indigenous people, and those who responded “others”.



## Results analysis

According to the WHO model of behavioral and social drivers of vaccination (BeSD) (14, four domains influence vaccine acceptance: what people think and feel about vaccines (“thinking and feeling” domain), social processes that favor or inhibit vaccination (“social processes” domain), individual motivations (or reluctance) to seek vaccination (“motivation” domain), and practical issues that affect seeking and accepting vaccination (“practical issues” domain). Assessing all the domains enabled better planning and more thorough evaluation of the results obtained.

The BeSD model was used to organize the results of the quantitative and qualitative analyses.

## Quantitative analysis

Question 14d, “I would recommend the COVID-19 vaccine to eligible people”, was identified as the only item on the questionnaire indicating acceptance of COVID-19 vaccination. People who responded that they disagreed or strongly disagreed with this statement were considered to be vaccine hesitant, and respondents who agreed or strongly agreed with this statement were considered to have accepted the COVID-19 vaccine.

The results were calculated using proportions where the denominator was the number of respondents answering the question, and the numerator was the number of respondents providing a given answer. Data were summarized as coming from a simple randomized sample of health workers in each country. By combining the results between countries to produce a subregional estimate or an estimate for the total of 16 countries, the intention was for the larger countries to have more weight than the smaller ones. Consequently, each country’s response was weighted by the total number of medical staff and nursing staff in that country, according to the WHO NHWA portal.

The answers to each of the opinion questions that contained a four-point Likert scale were classified into two consolidated categories: agree (“strongly agree” combined with “agree”) and disagree (“strongly disagree” combined with “disagree”).

Consolidated binary response categories (agree versus disagree) were analyzed with chi-square tests to identify questions that produced different proportions of agreement among the categories of people surveyed. The main analysis approach was to examine groups of questions and to look for patterns in responses among the categories of respondents, using those patterns to inform communication strategies for health workers. Chi-square test values were used to confirm whether the patterns were statistically significant.



Multivariate logistic regression was used to assess the results of each opinion question. Respondents who answered “agree” or “strongly agree” were coded with a score of 1, and respondents who answered “disagree” or “strongly disagree” were coded as 0. Explanatory factors included six categorical variables, each with its reference group:

1. Gender (with “female” as the reference group)
2. Age quartile (with the youngest quartile as the reference group)
3. Job category (included five levels, with “physicians” as the reference group)
4. Ethnicity (included three levels, with “white” as the reference group)
5. Workplace (included four levels, with “public sector” as the reference group)
6. History of previous diagnosis of COVID-19 (included two levels, with “yes” as the reference group)

For each opinion question, the percentage of respondents in each answer category was reported, along with the number of people in that category who answered the question.

Tables were drawn up to identify patterns in logistic regression outcomes. They summarized the percentage of respondents who selected “agree” or “strongly agree” within different demographic subgroups. Cells with statistically significant logistic regression levels and in which the percentage of respondents in that category who agreed with the statement was at least 10 points higher or lower than the percentage in the reference category were highlighted. For example, if the odds ratio for nursing staff was statistically significant (with a value of  $P < 0.05$ ) and if the percentage of nurses who answered “agree” was at least 10% higher or at least 10% lower than the percentage of medical staff who answered “agree”, then the cell summarizing the nursing staff’s agreement would be highlighted on the chart to flag it for the analysis team. Guidelines were reviewed for each subregion and for the 16 countries in total.

Likewise, to highlight differences between subregions, each opinion question was summarized with the percentage of respondents who answered “agree” or “strongly agree” to each question, and the cells on the table were flagged if the difference between subregions was statistically significant (P value <0.05) by sex, age, job category, or ethnicity of the respondents, and if the percentage who answered “agree” was at least 10 points higher or lower than the percentage in the subregion of reference. The purpose of these Tables was also to highlight the views of respondents across subregions.

## Coding and qualitative analysis

The survey contained a total of nine free-answer questions.

As recommended by the WHO publication on the collection and use of data on behavioral and social drivers of vaccination – BeSD (14), the domains suggested by BeSD were used and thematic codes were developed to organize concepts in the free-answer questions instead of the constructs predetermined by the BeSD model. This approach made it possible to access more detailed and specific information on the factors influencing the opinions and decisions about vaccination of the people surveyed, and to increase the number of codes to formally organize the variables found.

### Thematic coding

A member of the study team presented a coding scheme based on the objectives of the study and the important issues that had emerged from a preliminary review of the answers to each of the nine free-answer questions.

Members of the coding team worked in pairs and in two phases. Each team coded three items (questions) on similar topics. During the first coding phase, each team member read each of the answers to the assigned questions and coded each answer with up to two corresponding thematic codes. The teams coded responses that did not address the study question (e.g., “I have nothing to say”) as “non-substantive/non-applicable answer”. During the second phase, the coding teams met to discuss and reconcile disagreements over the codes that were initially proposed. During the coding process, the coding scheme was reviewed to detect other emerging issues and to facilitate consistent coding.

## Coding domains of behavioral and social drivers (BeSD)

Each coding team categorized each of the thematic codes of their assigned free-answer questions by BeSD domain. The coding teams used the BeSD categorization schemes (14), as well as Puertas et al., as references (16). The coding team leader then reviewed all the assigned BeSD codes and made adjustments to ensure that the coding scheme was applied uniformly across all responses.

## Coding barriers and facilitators to vaccination

To interpret the open-ended questions, the coding teams collaboratively classified each of the thematic codes according to whether it represented a facilitating factor (e.g., scientific evidence, medical literature, publications and statistics), a barrier (e.g. lack of confidence in the vaccine), or a neutral factor (which could be a facilitator or barrier) in the context of behavioral and social drivers of vaccination (e.g. pregnancy, lactation, and the postpartum period). In cases where the classification of a particular thematic code as a facilitator, barrier, or neutral factor was not intuitive, the coding team leaders reviewed open-text responses with that code to decide how to classify the thematic code.

## Analysis

The weighted percentages of people surveyed were calculated separately for each of the nine free-answer questions classified according to each subject code. Thematic codes were organized by BeSD domain and according to whether they constituted a facilitating factor (+), a barrier (-), or a neutral factor (+/-) in the context of vaccination. Answers coded as “not a substantive response/not applicable” were excluded from the analysis.

# Results

The regional results are presented below, and some relevant differences by subregion are noted. Each of the 16 participating Latin American countries and territories met its quota regarding sample size.

**Table 1. Shows the number of persons surveyed by subregion, country, and job category.**

SUBREGION	COUNTRY	MEDICAL STAFF		NURSING AND MIDWIFERY STAFF <sup>a</sup>		OTHER HEALTH WORKERS		HEALTH TECHNICIANS		OTHERS		UNWEIGHTED TOTAL <sup>c</sup>	WEIGHTED TOTAL <sup>d</sup>
		n	%	n	%	n	%	n	%	n	%		
Central America	Costa Rica	226	22	212	20	256	25	210	20	134	13	1038	36,179
	Cuba	75	24	96	31	93	30	11	4	32	10	307	181,198
	Dominican Republic	105	51	11	5	74	36	6	3	11	5	207	31,264
	El Salvador	121	46	65	25	36	14	29	11	13	5	264	30,205
	Guatemala	132	42	36	11	34	11	89	28	27	9	318	62,293
	Honduras	130	31	69	17	118	29	58	14	39	9	414	11,939
	Panama	140	46	9	3	137	45	9	3	12	4	307	20,544
Andean Community	Bolivia (Plurinational State of Bolivia)	68	23	131	45	33	11	56	19	5	2	293	28,977
	Colombia	113	11	630	60	242	23	21	2	50	5	1056	192,488
	Ecuador	173	34	159	31	130	25	27	5	28	5	517	80,074
	Peru	64	29	96	44	35	16	17	8	7	3	219	121,853
	Venezuela (Bolivarian Republic of Venezuela)	98	32	80	26	78	26	23	8	26	9	305	110,556
Southern Cone	Argentina	133	41	71	22	68	21	23	7	29	9	324	297,694
	Chile	240	52	103	23	80	18	16	4	19	4	458	121,716
	Paraguay	89	34	81	31	57	22	6	2	26	10	259	17,899
	Uruguay	204	47	53	12	56	13	92	21	27	6	432	41,405
<b>Total</b>		2111	31.4	1902	28	1527	23	693	10	485	7	6718	1,386,284

## Notes:

a In some rows, owing to rounding, column percentages do not add up to exactly 100%.

b "Nursing staff" includes respondents with a bachelor's degree in nursing.

c Unweighted figures are the actual number of respondents from all occupations.

d Weighted figures are the total estimated numbers of medical and nursing staff in the country used to weight national results in the subregional summaries.

## Source:

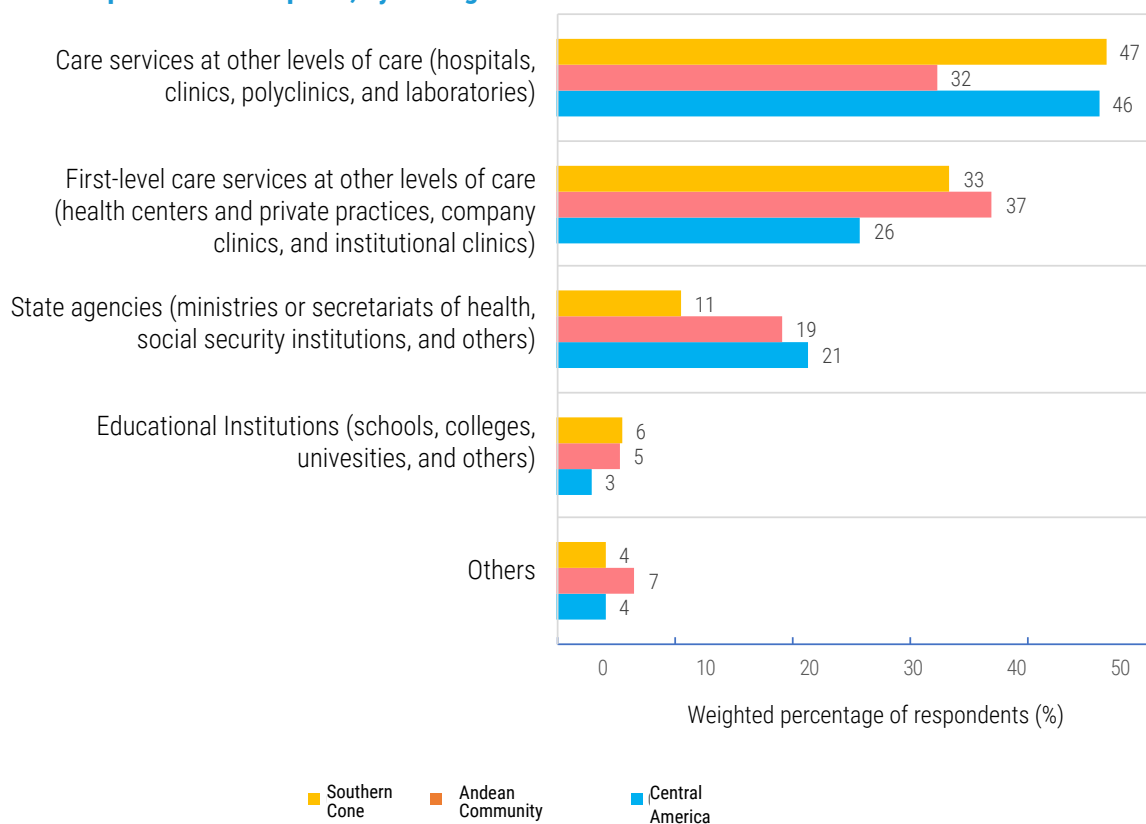
World Health Organization. WHO Health Workforce National Accounts Portal, online (accessed 13 May 2022). Geneva: WHO. Available from: <https://apps.who.int/nhwportal/>

**Table 2. Demographic data on survey respondents, by job category, gender, age, ethnicity, and work sector**

PARAMETERS	MEDICAL STAFF				NURSING AND MIDWIFERY STAFF					OTHER HEALTH PROFESSIONALS					HEALTH TECHNICIANS					OTHERS					ALL						TOTAL		
	Female		Male		Female		Male		Other	Female		Male		Other	Female		Male		Other	Female		Male		Other	Female		Male		Other				
	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	(n)				
Age quartile (years)																																	
1 (19-34)	360	16.2	237	10.7	696	31.4	106	4.8	1	<0,1	259	11.7	94	4.2	1	<0,1	239	10.8	63	2.8	112	5.0	49	2.2	2	0.1	1666	75.1	549	24.7	4	0.2	2219
2 (35-44)	376	19.5	222	11.5	435	22.6	69	3.6			341	17.7	123	6.4	1	0.1	167	8.7	57	3.0	98	5.1	38	2.0			1417	73.5	509	26.4	1	0.1	1927
3 (45-55)	261	18.0	169	11.6	354	24.3	54	3.76			279	19.2	105	7.2			96	6.6	25	1.7	89	6.1	21	1.4	1	0.1	1079	74.2	374	25.7	1	0.1	1454
4 (56-83)	236	21.1	250	22.4	164	14.7	23	2.1			224	20.0	100	8.9			37	3.3	9	0.8	57	5.1	18	1.6			718	64.2	400	35.8			1118
Work sector																																	
Public	777	17.8	544	12.5	1099	25.2	170	3.9	1	<0,1	641	14.7	261	6.0	2	<0,1	408	9.3	121	2.8	247	5.7	90	2.1	3	0.1	3172	72.7	1186	27.2	6	0.1	4364
Private	315	21.3	205	13.8	396	26.7	62	4.2			251	16.9	72	4.9			96	6.5	16	1.1	56	3.8	13	0.9			1114	75.2	368	24.8			1482
Social Security	102	19.2	98	18.4	74	13.9	10	1.9			105	19.7	48	9.0			32	6.0	16	3.0	32	6.0	15	2.8			345	64.8	187	35.2			532
Academy	32	13.2	23	9.5	64	26.4	4	1.7			66	27.3	34	14.0			3	1.2	1	0.4	11	4.5	4	1.7			176	72.7	66	27.3			242
Other	7	7.1	8	8.2	16	16.3	6	6.1			40	40.8	7	7.1						10	10.2	4	4.1			73	74.5	25	25.5			98	
Ethnic group																																	
Afro descendant	39	13.0	23	7.7	103	34.3	10	3.3			61	20.3	24	8.0	1	0.3	15	5.0	4	1.3	15	5.0	4	1.3	1	0.3	233	77.7	65	21.7	2	0.7	300
White	542	21.9	331	13.4	514	20.7	87	3.5			417	16.8	145	5.8			211	8.5	36	1.5	151	6.1	45	1.8			1835	74.0	644	26.0			2479
Indigenous	15	11.5	21	16.0	37	28.2	10	7.6			8	6.1	5	3.8			19	14.5	8	6.1	6	4.6	1	0.8	1	0.8	85	64.9	45	34.4	1	0.8	131
Mestizo	612	17.1	481	13.5	922	25.8	136	3.8	1	<0,1	580	16.2	234	6.5	1	0	282	7.9	98	2.7	160	4.5	68	1.9	1	0.0	2556	71.5	1017	28.4	3	0.1	3576
Others	25	10.8	22	9.5	73	31.5	9	3.9			37	15.9	14	6.0			12	5.2	8	3.4	24	10.3	8	3.4			171	73.7	61	26.3			232
Total	1233	18	878	13	1649	24.5	252	3.8	1	<0,1	1103	16.4	422	6.3	2	<0,1	539	8	154	2.3	356	5.3	126	1.9	3	<0,1	4880	72.6	1832	27.3	6	0.1	6718

Regarding their workplace, 41% of respondents reported that they worked in services at other than the first level of care (hospitals, clinics, polyclinics, and laboratories), 33% indicated first-level care services (health centers, private practices, company clinics, and academic institutions), 17% in government agencies, 5% in educational institutions, and another 5% in other workplaces. Variations between subregions were detected (Figure 1).

**Figure 1. Respondents' workplace, by subregion**



Source: The authors, based on their survey data.

## Quantitative analysis

Regarding attitudes and predispositions towards vaccines in general, 99% of health workers surveyed said that vaccines are reliable, safe, effective, and an important tool to protect their health and that of their communities. More than 90% were willing to recommend new vaccines, mentioning that they did what their health care provider or primary care provider recommended, and that the information provided by their health care provider (public or private) was reliable.

It was found that 75% were concerned about serious adverse effects, and that 52% were concerned about mild adverse effects related to vaccines in general. Significant variations were observed between categories of health workers, with 41% of medical staff being concerned about mild adverse effects compared to 59% of nursing staff ( $P < 0.001$ ), 68% of health technicians ( $P < 0.001$ ), 52% of other health professionals ( $P < 0.001$ ) and 59% of "others" ( $P < 0.001$ ). Approximately 59% of respondents in the quartile aged 19–34 years reported concerns about mild adverse effects, compared to 43% of respondents in the 56–83 quartile range ( $P < 0.001$ ) (Table 3).

Despite these reservations, 97% of participants said they would get the flu/influenza vaccine, and 99% would get the hepatitis B vaccine, and similar numbers of health workers said they would recommend both vaccines to their patients (98% for flu/influenza, and 100% for hepatitis B).

**Table 3. Data on health workers' concerns about mild adverse effects that vaccines can generally cause (survey question 13b)**

VARIABLES	N	AGREE OR STRONGLY AGREE (%)	DISAGREE OR STRONGLY DISAGREE (%)	VALUE OF P (CHI-SQUARE TEST)	ADJUSTED ODDS RATIO	LOWER LIMIT	UPPER LIMIT	VALUE OF P (LOGISTIC REGRESSION)
All	6718	52	48					
Sex								
Female	4880	53	47	<b>0.033</b>	1			
Male	1832	49	51		1	0.8	1.2	0.787
Age quartile (years)								
19-34	2219	59	41	<b>&lt;0,001</b>	1			
35-44	1927	53	47		0.9	0.7	1	0.097
45-55	1454	52	48		0.9	0.7	1.1	0.259
56-83	1118	43	57		0.8	0.6	1	<b>0.016</b>
Job category								
Medical staff	2111	41	59	<b>&lt;0,001</b>	1			
Nursing and midwifery staff	1902	59	41		1.8	1.5	2.2	<b>&lt;0,001</b>
Other health professionals	1527	52	48		1.5	1.2	1.8	<b>&lt;0,001</b>
Health technicians	693	68	32		2.6	1.9	3.4	<b>&lt;0,001</b>
Others	485	59	41		2	1.4	2.7	<b>&lt;0,001</b>
Ethnic group								
White	2479	43	57	<b>&lt;0,001</b>	1			
Mestizo	3576	58	42		1.6	1.3	18	<b>&lt;0,001</b>
Others	663	64	36		1.9	1.5	2.4	<b>&lt;0,001</b>
Work sector								
Public	4364	54	46	<b>&lt;0,004</b>	1			
Private	1482	47	53		0.9	0.7	1	0.152
Social security	532	49	51		1	0.7	1.3	0.856
Others	340	48	52		0.9	0.7	1.3	0.597
Personal history of COVID-19								
Yes	3378	55	45	<b>&lt;0,001</b>	1			
No or doesn't know	3340	49	51		0.8	0.7	1	<b>0.008</b>

Note:  
Figures in boldface indicate that the difference is statistically significant (P value <0.05).

Regarding acceptance of COVID-19 vaccines, health workers were asked whether they would recommend these vaccines to eligible persons based on criteria set by each country's ministry of health, such as essential frontline personnel, the elderly, people with comorbidities that increase their risk of severe disease, and pregnant people (question 14d). The results from the 16 countries that participated in the survey (Table 4) show that 97% of health workers would recommend COVID-19 vaccination.

**Table 4. Data on acceptance of COVID-19 vaccines by health workers in Latin America (survey question 14d)**

BREAKDOWN BY REGION AND COUNTRY	ALL RESPONDENTS (N)	AGREE OR STRONGLY AGREE (%)	DISAGREE OR STRONGLY DISAGREE (%)
<i>Central America</i>	2855	97	3
Costa Rica	1038	94	6
Cuba	307	97	3
El Salvador	264	98	3
Guatemala	318	98	3
Honduras	414	99	1
Panama	307	98	2
Dominican Republic	207	94	6
<i>Andean Community</i>	2390	97	3
Bolivia (Plurinational State of Bolivia)	293	98	2
Colombia	1056	97	3
Ecuador	517	98	2
Peru	219	97	3
Venezuela (Bolivarian Republic of Venezuela)	305	95	5
<i>Southern Cone</i>	1473	98	2
Argentina	324	97	3
Chile	458	98	2
Paraguay	259	98	2
Uruguay	432	97	3
<b>Total</b>	<b>6718</b>	<b>97</b>	<b>3</b>



When studying attitudes and biases specifically related to COVID-19 vaccines, 99% of health workers who responded to the survey indicated that they had received at least one dose of COVID-19 vaccine, knew where to be vaccinated, and had or had had access to COVID-19 vaccination services. Of the health workers surveyed, 90% of participants reported that they had received the full vaccination schedule with a booster (single dose plus booster or additional dose, or first and second dose plus booster or additional dose), or two booster doses or additional doses in any vaccination schedule (single-dose or double-dose), while 8% reported having the complete schedule but without any booster or additional dose, 1% reported not having the complete vaccination schedule, and 1% reported that they had not received any dose of a COVID-19 vaccine (Figure 2).

**Figure 2. Compliance with the COVID-19 vaccination schedule in health workers in Latin America**

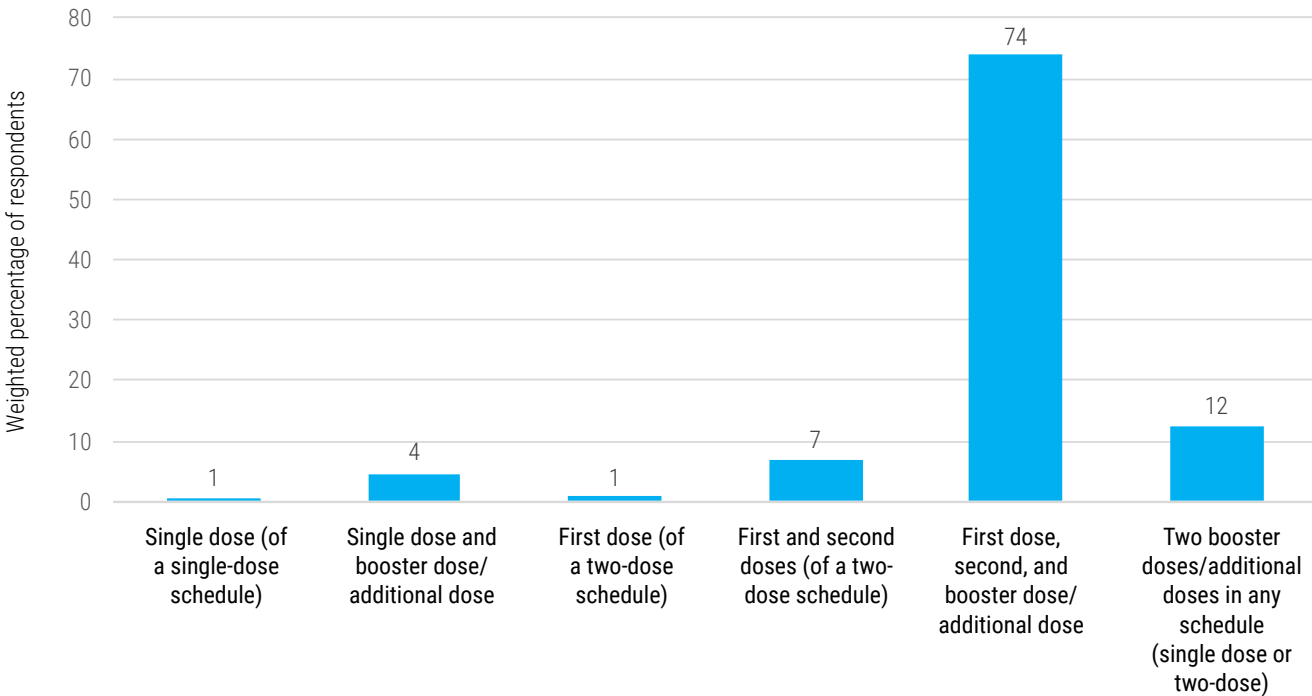
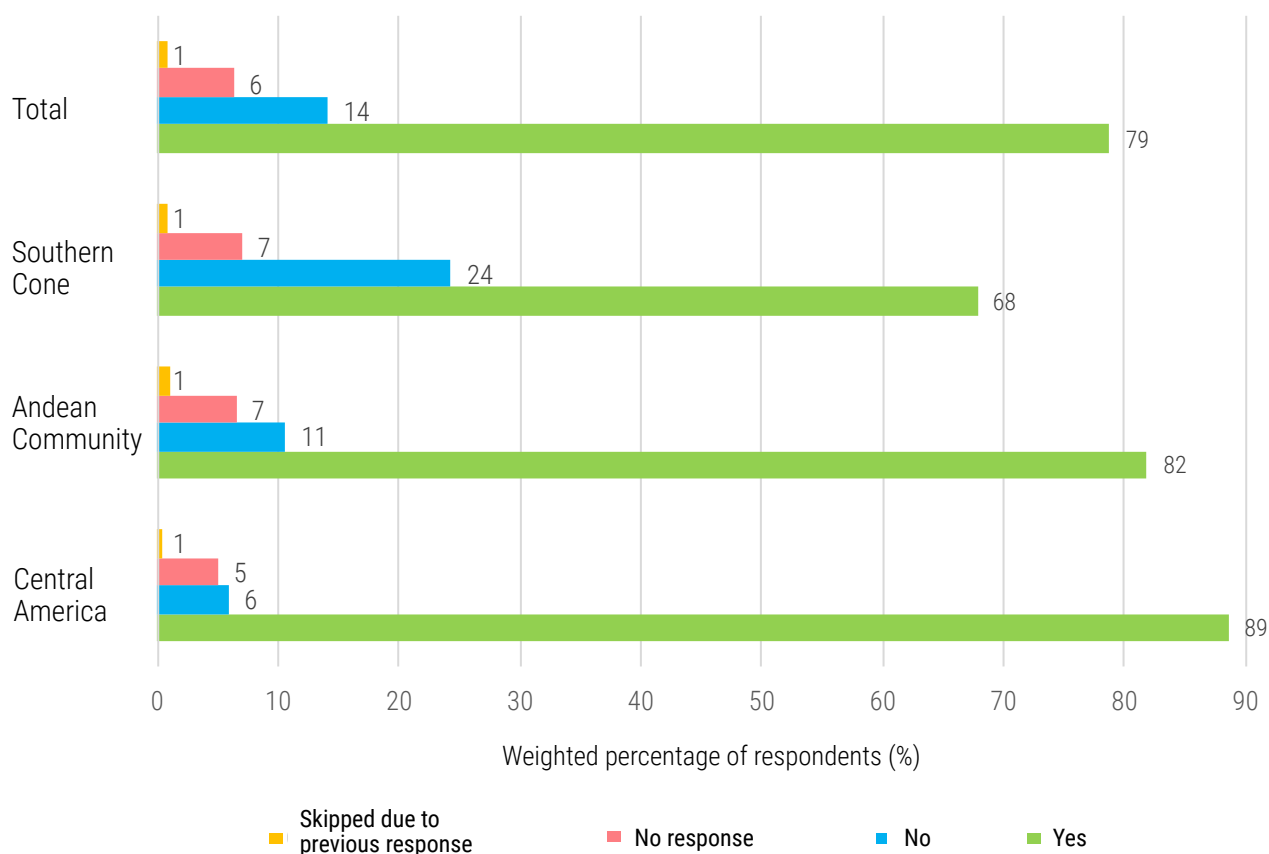


Figure 3 shows that 79% of respondents said that they could be vaccinated in their workplace, with differences between the three subregions: the Southern Cone was the subregion with the lowest rate of health workers vaccinated in the workplace (68%).

**Figure 3. Percentage of workplace vaccination by subregion**



## Quantitative analysis according to behavioral and social drivers BeSD

When analyzing the results of the quantitative questions based on the BeSD, only answers related to the domains “thinking and feeling” and “social processes” were identified.

### “Thinking and feeling” domain

When studying what respondents think and feel about COVID-19 vaccines, few differences were found when comparing job categories, age quartiles, and ethnicity. Overall, 97% of respondents said that COVID-19 vaccines are good for their health and will protect them from severe forms of the disease. Among the main factors that contributed to shaping their opinion on COVID-19 vaccines were scientific publications on topics related to SARS-CoV-2, which are constantly changing (97%); how quickly vaccines were researched and developed (87%); and the relationship between the proportion of vaccinated people and hospitalization and mortality rates (87%) (Table 5).

**Table 5. Percentage of responses on the thinking and feeling domain by sex, age, category of health care worker, ethnicity, and work sector**

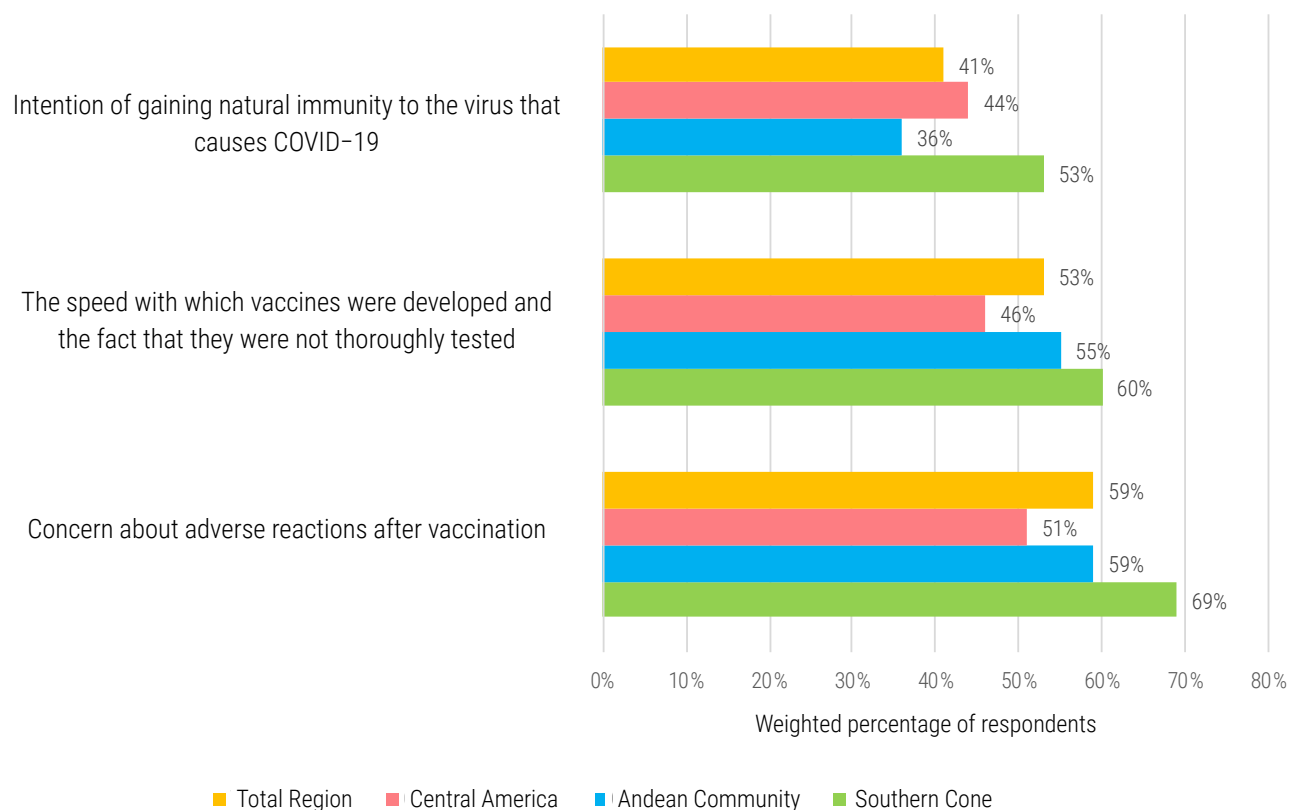
Statements with which respondents agreed or strongly agreed (question number)	Total (%)	Sex		Age quartile				Health care worker category					Ethnic group			Work sector				Personal History of COVID-19	
		Female	Male	19-34 <sup>a</sup>	35-44	45-55	56-83	Medical staff <sup>a</sup>	Nursing and midwifery staff	Other health professionals	Health technicians	Others	White <sup>a</sup>	Mestizo	Others	Public <sup>a</sup>	Private	Social security	Others	Yes <sup>a</sup>	No or doesn't know
The COVID-19 vaccine will protect me from severe forms of COVID-19. (14a)	97	97	99	96	97	99	98	98	97	98	94	98	98	97	96	97	98	99	97	97	98
Getting vaccinated against COVID-19 is or will be good for my health (14c)	98	98	98	97	98	98	98	99	97	98	97	98	99	98	96	98	97	99	98	97	98
I still don't know enough about the vaccines available to make a decision. (Q23a)	34	32	36	36	31	29	38	34	30	34	47	30	29	33	43	35	32	22	17	32	35
I want to gain natural immunity to the virus that causes COVID-19. (Q23b)	41	41	41	41	41	38	44	40	44	34	52	37	34	43	42	44	38	22	18	40	41
The available vaccines may have been developed too quickly or not thoroughly tested before approval. (Q23c)	53	52	58	50	55	55	59	59	49	55	50	54	56	50	60	56	49	37	47	54	53
I believe that vaccines can cause the disease they were designed to prevent. (Q23d)	30	30	28	33	28	28	28	32	30	21	45	31	25	31	35	33	24	16	15	27	35
I am concerned about the adverse reactions that have been seen when people get vaccinated. (Q23e)	59	61	50	58	59	60	57	64	55	53	72	58	53	59	67	62	54	35	43	57	62
The speed with which vaccines were researched and developed. (Q25a)	87	87	88	85	87	88	88	86	90	85	87	85	87	88	86	88	85	85	84	88	87
The scientific topics of SARS-CoV-2 that are constantly being discovered and evolving (Q25b)	97	97	98	97	97	98	98	99	97	97	94	96	98	97	94	97	97	97	97	97	97
The relationship between the proportion of vaccinated people and hospitalization and mortality rates. (Q25f)	87	86	89	88	85	84	90	91	84	86	85	84	88	87	83	85	92	93	85	86	88
My own research on COVID-19 vaccines. (Q25g)	83	83	82	85	82	84	81	83	85	81	82	80	81	85	81	83	82	84	81	83	83
The country in which the available vaccines were developed/ manufactured. (Q25h)	77	76	79	78	74	80	76	74	82	73	83	74	72	81	82	79	71	78	68	79	75

**Notes:**

<sup>a</sup> Reference category. The cells highlighted in blue represent a statistically significant difference that exceeds the distance threshold of 10 points between the reference category and the other categories.

Of those surveyed, 10% said they did not complete the vaccination schedule or did not receive booster doses or additional doses (9%) or were not vaccinated (1%). When asked why they had refused or delayed COVID-19 vaccination, 59% indicated concerns about adverse reactions following vaccination, with significant variations between ethnicity categories, ranging from 53% among those who self-identified as white, to 59% for mestizos, and 67% for others. Other factors mentioned were the speed with which vaccines had been developed, the fact that not enough testing had been done (53%), and the intention to gain natural immunity to the virus that causes COVID-19 (41%). There were significant variations by the work sector: 44% ( $P = 0.013$ ) worked in the public sector, 38% in the private sector, 22% in social security and 18% in other sectors. When comparing these three factors for refusal or delay of COVID-19 vaccination between subregions, greater concern was detected in participants in the Southern Cone (Figure 4).

**Figure 4. Main reasons for refusing or delaying vaccination, by subregion (survey question 23)**



Three factors were found to influence the thinking and feeling of respondents in the three subregions (by sex, age quartile, job category, and ethnicity). These factors were as follows:

- Country in which COVID-19 vaccines were developed or manufactured (question 25h): 87% in Central America, 81% in the Andean Community, and 64% in the Southern Cone
- Adverse reactions to COVID-19 vaccines (question 23e): 69% in the Southern Cone, 56% in the Andean Community, and 51% in Central America
- Hospitalization and mortality rates of people who had received COVID-19 vaccines (question 25f): 93% in the Southern Cone, 88% in the Andean Community, and 77% in Central America

### **“Social processes” domain**

Analyzing factors influencing health workers’ views on COVID-19 vaccines, differences were found in comparisons between health workforce categories, age quartiles, and ethnicity. Of the respondents, 93% said that they trusted the scientific approval processes for COVID-19 vaccines available in their country, and that the main factors that had contributed to forming their opinion on COVID-19 vaccines were the recommendations issued by scientists or international organizations (96%).

Of the health workers surveyed, 57% said that the actions and opinions of their friends, family, and colleagues had influenced their opinions on COVID-19 vaccines (Table 6). Variations were observed between job categories: 52% of physicians, compared to 72% of health technicians ( $P < 0.001$ ), 60% of nurses, 52% of other health professionals, and 60% of “others”, agreed that this factor influenced their opinions on COVID-19 vaccines. Respondents who self-identified as white reported that this factor influenced them less (53%;  $P < 0.001$ ) compared to those who self-identified as mestizo (59%) or other ethnicities (63%) (Table 6).

**Table 6. Factors influencing health workers' views on COVID-19 vaccines (survey question 25d about the actions and opinions of friends, family, and colleagues)**

VARIABLES	N	AGREE OR STRONGLY AGREE (%)	DISAGREE OR STRONGLY DISAGREE (%)	VALUE OF P (CHI-SQUARE TEST)	ADJUSTED ODDS RATIO	LOWER LIMIT	UPPER LIMIT	LOGISTIC REGRESSION P VALUE
All	6718	57	43					
Sex								
Female	4880	56	44		1			
Male	1832	58	43	<b>0,363</b>	1.2	1	1.4	0,074
Age quartile (years)								
19-34	2219	61	39		1			
35-44	1927	55	45		0.8	0.7	1	<b>0,027</b>
45-55	1454	57	43		1	0.8	1.2	0,708
56-83	1118	54	46	<b>0,028</b>	0.9	0.8	1.2	0,588
Job category								
Medical staff	2111	52	48		1			
Nursing and midwifery staff	1902	60	40		1.4	1.1	1.7	<b>&lt;0,001</b>
Other health professionals	1527	52	48		1	0.8	1,2	0,976
Health technicians	693	72	28		2.3	1.7	3.1	<b>&lt;0,001</b>
Others	485	60	40	<b>&lt;0,001</b>	1.4	1	1.9	<b>0,044</b>
Ethnic group								
White	2479	53	47		1			
Mestizo	3576	59	41		1.2	1	1.4	<b>0,020</b>
Others	663	63	37	<b>&lt;0,001</b>	1.4	1.1	1.8	<b>0,006</b>
Work sector								
Public	4364	58	42		1			
Private	1482	54	46		0.9	0.8	1.1	0,257
Social security	532	64	36		1.4	1	1.9	0,073
Others	340	45	55	<b>&lt;0,001</b>	0.7	0.5	0.9	<b>0,016</b>
Personal history of COVID-19								
Yes	3378	59	41		1			<b>0,079</b>
No or doesn't know	3340	55	45	<b>0,020</b>	0.9	0.8	1	

Note: Figures in boldface indicate that the difference is statistically significant (P value <0.05).

Of those surveyed, 39% agreed that information received through social media (e.g., Facebook®, Instagram®, Twitter®, TikTok®, YouTube®, and WhatsApp®) had influenced their views on COVID-19 vaccines. Here, there were also variations between age quartiles: in people aged 19 to 34 years, those reporting such influence was greater (47%) than in the 56–83 age group (32%;  $P < 0.001$ ). Nurses (46%) and health technicians (56%) were more influenced by social media compared to physicians (31%;  $P < 0.001$ ). Respondents who self-identified as mestizo (44%) or as belonging to “other ethnicities” (47%) reported being more influenced by social media compared to those who self-identified as white (32%;  $P < 0.001$ ). Similarly, health workers in the public sector reported higher levels of social media influence compared to those working in the private sector and other sectors (42%, 31%, and 26%, respectively) (Table 7).

**Table 7. Influence of social media on health workers' views on COVID-19 vaccines (survey question 25i)**

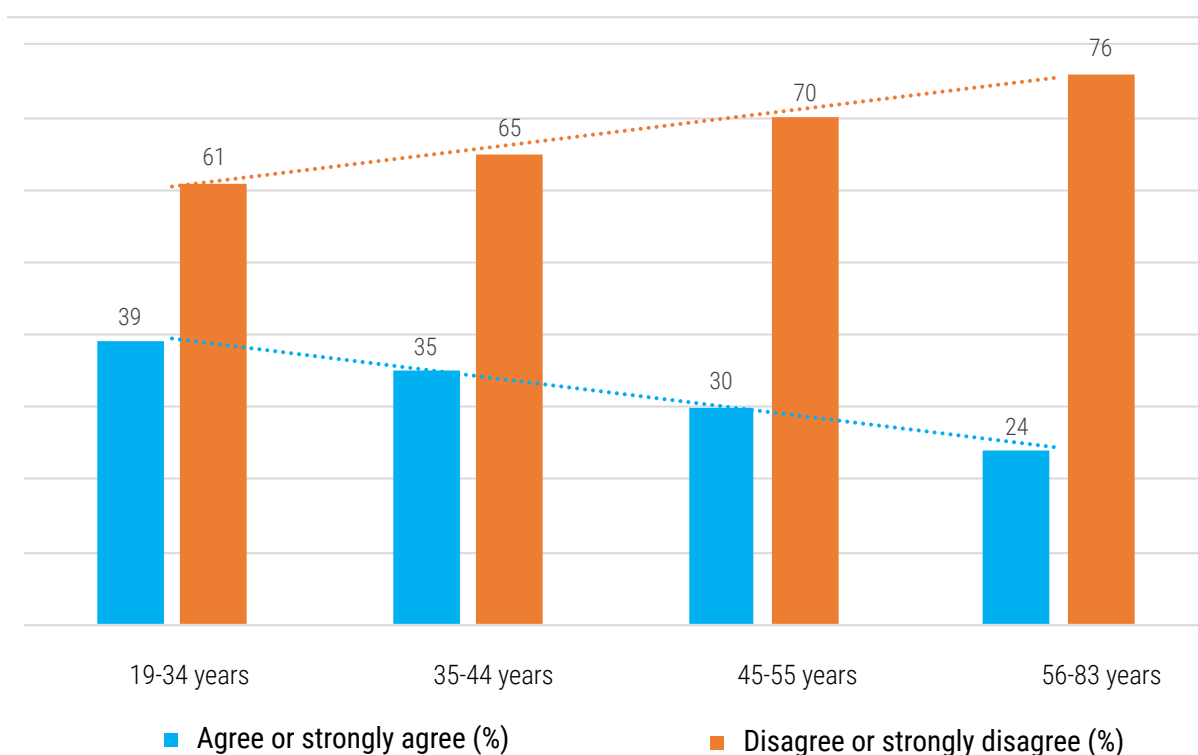
VARIABLES	AGREE OR STRONGLY AGREE (%)	DISAGREE OR STRONGLY DISAGREE (%)	N	VALUE OF P (CHI-SQUARE TEST)	ADJUSTED ODDS RATIO	LOWER LIMIT	UPPER LIMIT	LOGISTIC REGRESSION P VALUE
All	39	61	6718					
Sex								
Female	38	62	4880		1			
Male	40	60	1832	0.343	1.3	1.1	1.5	<b>0,007</b>
Age quartile (years)								
19-34	47	53	2219		1			
35-44	39	61	1927		0.7	0.6	0.9	<b>0,001</b>
45-55	37	63	1454		0.7	0.6	0.9	<b>0,002</b>
56-83	32	68	1118	<b>&lt;0,001</b>	0.7	0.6	0.9	<b>0,006</b>
Job category								
Medical staff	31	69	2111		1			
Nursing and midwifery staff	46	54	1902		1.8	1.5	2.2	<b>&lt;0,001</b>
Other health professionals	35	65	1527		1.3	1	1.6	<b>0,019</b>
Health technicians	56	44	693		2.5	1.8	3.3	<b>&lt;0,001</b>
Others	39	61	485	<b>&lt;0,001</b>	1.4	1	1.9	<b>0,040</b>
Ethnic group								
White	32	68	2479		1			
Mestizo	44	56	3576		1.4	1.2	1.7	<b>&lt;0,001</b>
Others	47	53	663	<b>&lt;0,001</b>	1.6	1.2	2	<b>&lt;0,001</b>
Work sector								
Public	42	58	4364		1			
Private	31	69	1482		0.7	0.6	0.8	
Social security	35	65	532		0.8	1	1.1	
Others	26	74	340	<b>&lt;0,001</b>	0.6	0.5	0.8	
Personal history of COVID-19								
Yes	42	58	3378		1	0.7	1	
No or doesn't know	36	64	3340	<b>&lt;0,001</b>	0.8	0.7	1	<b>0,019</b>

Note: Figures in boldface indicate that the difference is statistically significant (P value <0.05).



For 32% of the health workers surveyed, the actions and opinions of their religious leaders influenced their opinions on COVID-19 vaccines. In the group of physicians, 26% agreed that these leaders influenced them, compared to 37% of nurses and 54% ( $P < 0.001$ ) of health technicians. Differences were also observed when comparing by age quartiles: 39% of those aged 19–34 agreed that the opinions and actions of religious leaders had influenced their views on COVID-19 vaccines, compared to 24% of the 56–83 quartile ( $P < 0.001$ ). As for ethnicity, 37% ( $P < 0.001$ ) of respondents who self-identified as mestizo and 41% ( $P < 0.001$ ) of those who self-identified as belonging to “other ethnicities” reported being influenced by their religious leaders, compared to 25% of those who self-identified as white (Figure 5).

**Figure 5. Factors influencing opinions on COVID-19 vaccines (actions and opinions of religious leaders) by age**



When the results are analyzed by subregion, it is observed that they presented significant variations when compared by the variables of sex, age, job category, and ethnicity. The following three factors influencing this domain were detected:

- Actions and opinions of friends, family, and colleagues on COVID-19 vaccines: had less influence over respondents in the Southern Cone (47%) compared to respondents from Central America (60%) and the Andean Community (63%).
- Information from social media: had influence on more health workers in the Andean Community (48%) and Central America (44%) compared to respondents in the Southern Cone (25%).
- Opinions of religious leaders: fewer health workers in the Southern Cone considered themselves influenced by these leaders (20%) compared to respondents surveyed in Central America (36%) and the Andean Community (40%).

## Qualitative analysis

Qualitative responses were classified according to BeSD. We identified 48 thematic codes in the four domains: thinking and feeling (18 codes), social processes (14), motivation (4), and practical issues (12). For each figure of the qualitative analysis, the number of people who answered each survey question is presented together with the number of the question, and the percentage of answers for each thematic code represents the number of answers to each of these codes, which in some cases contained information corresponding to two different thematic codes and, sometimes, to two different domains. Therefore, for some questions, the percentages of a row add up to more than 100.<sup>9</sup>

Table 8 summarizes the WHO BeSD, the subject codes, and which factors are facilitating factors (+), barriers (-), or neutral factors (+/-). The BeSD are used to classify the opinions expressed in nine free-answer questions (questions 16, 21, 24, 26, 28, 30, 32, 34 and 35), which were optional. The domain-based color system follows the one used in the WHO manual on BeSD.

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<sup>9</sup> This information will be displayed on each chart in the qualitative analysis.

**Table 8. World Health Organization domains of behavioral and social and drivers and thematic codes regarding COVID-19 vaccines and vaccines in general**

THINKING AND FEELING	SOCIAL PROCESSES	MOTIVATION	PRACTICAL ISSUES
FACILITATING FACTORS (+)			
<ul style="list-style-type: none"> <li>Vaccines are beneficial, effective, save lives and protect health</li> <li>Vaccines are important and essential</li> </ul>	<ul style="list-style-type: none"> <li>Scientific evidence, medical literature, publications, and statistics</li> <li>Experiences of friends or family</li> <li>Recommendations from health workers regarding the obligation to be vaccinated</li> <li>Educational materials, trainings, webinars, and podcasts</li> <li>Opinions of health experts and recommendations from health organizations</li> </ul>	<ul style="list-style-type: none"> <li>"We should encourage people to get vaccinated"</li> <li>"All health workers should be vaccinated"</li> <li>Programmatic recommendation<sup>a</sup></li> </ul>	

## BARRIERS (-)

<ul style="list-style-type: none"> <li>• Allergy to flu shots</li> <li>• Illness or other health reason (other than COVID-19)</li> <li>• Lack of confidence in the vaccine</li> <li>• Lack of information or misinformation</li> <li>• Vaccine brand (availability, confidence, and adverse effects)</li> <li>• Not effective</li> <li>• Not necessary</li> <li>• "I don't know enough to recommend vaccines"</li> <li>• "I've never been told that I need it"</li> <li>• "I had adverse reactions to previous doses"</li> <li>• Concerns about side effects, adverse reactions, and vaccine safety</li> <li>• "More information is needed about the vaccine"</li> <li>• Speed with which vaccines were researched and developed</li> </ul>	<ul style="list-style-type: none"> <li>• Unreliable scientific evidence</li> <li>• Staff recommendations on the non-compulsory nature of vaccination</li> <li>• Political reasons</li> </ul>	<ul style="list-style-type: none"> <li>• "I don't want/need to get vaccinated"</li> <li>• Lack of motivation</li> <li>• "I don't need a booster"</li> </ul>	<ul style="list-style-type: none"> <li>• The vaccination schedule is inconvenient</li> <li>• Difficulty in accessing vaccination</li> <li>• Difficulty in transportation for accessing vaccination</li> <li>• The vaccination site is inconvenient</li> <li>• Lack of information on the vaccination calendar and on when the vaccine is available</li> <li>• Lack of information on the vaccination site</li> <li>• Lack of time</li> <li>• "I don't have enough information"</li> <li>• Vaccine not available (lack of supply or insufficient supply)</li> </ul>
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## NEUTRAL FACTORS (+/-)

<ul style="list-style-type: none"> <li>• Pregnancy, lactation, and postpartum period</li> <li>• Personal experience<sup>b</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Opinions of colleagues</li> <li>• “It’s a personal decision, people should be free to make their own choices</li> <li>• Work experience<sup>c</sup></li> <li>• Media, social networks, news channels, Internet</li> <li>• Observations<sup>d</sup></li> <li>• Recommend only on a case-by-case basis</li> </ul>		<ul style="list-style-type: none"> <li>• “I’m not eligible for the next dose yet”</li> <li>• Positive personal history of COVID-19<sup>a</sup></li> <li>• “I already got the vaccine”.</li> </ul>
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### Notes:

<sup>a</sup> Programmatic recommendation: respondent suggested how vaccination-related policies and procedures could be improved (e.g., improving the immunization registration system in the country).

<sup>b</sup> Personal experience: respondents described their own experience with COVID-19 vaccination (e.g., “In Uruguay we were among the first groups to be vaccinated, I received four doses of the Pfizer vaccine”).

<sup>c</sup> Work experience: respondents described their work experiences with COVID-19 vaccination (e.g., “Morbidity and mortality decreased in those who chose to be vaccinated, evidenced in our emergency rooms”).

<sup>d</sup> Observations: respondents described their personal observations on COVID-19 vaccination in particular and COVID-19 in general (e.g. “I think it’s a privilege to be in the health sector, as you learn a lot about vaccines and have the possibility of getting vaccinated quickly”).

## Attitudes towards COVID-19 vaccines

The qualitative responses to the free-answer questions related to COVID-19 vaccines (questions 16, 21, 24, 26, and 35) are summarized below, a domain-by-domain analysis of the BeSDs is shown, and the main results of the responses to the five questions are presented.

### Opinions regarding the delay or rejection of COVID-19 vaccines

Of the total survey group, approximately 6% who did not have access to COVID-19 vaccination or had not been vaccinated or who had not received the full vaccination schedule or booster doses or additional doses of COVID-19 vaccine answered questions about the main reasons why it was difficult to access COVID-19 vaccination (question 16, n = 24), reasons for not having a full vaccination schedule or booster dose or additional dose of COVID-19 vaccine (question 21, n = 474), and reasons for delaying or refusing a COVID-19 vaccine (question 24, n = 318).<sup>10</sup>

The respondents who answered these questions were, for the most part, women (84%), between 19 and 34 years old (39%), and nurses and midwives (32%).

<sup>10</sup> The vaccination schedule is considered complete when a person has received the first and second doses of COVID-19 vaccine. The health care workers who answered this question had received a single dose (in a one-dose schedule) without a booster dose, or the first dose (in a two-dose schedule) without a booster dose, or the first and second doses (in a two-dose schedule) without a booster dose.

### **“Thinking and feeling” domain**

Among the 6% of respondents who answered questions related to COVID-19 vaccination, 9% said that concerns about possible side effects, adverse reactions, and vaccine safety influenced them not having received a full vaccination schedule or booster doses or additional doses, and 21% said it was a factor in delaying and refusing these vaccines.

***“I haven’t gotten the booster dose yet, because I’m worried about mixing the doses” (question 24).***

Of the 6% of respondents who answered these questions, 21% reported that they had not yet received their second dose or booster dose or extra dose, because they had had an illness or some health-related issue (other than COVID-19), and this also influenced 14% to delay or refuse a COVID-19 vaccine (Figure 6).

***“I’ve been sick, and to receive the extra dose they tell me I need to be in good health” (question 21).***

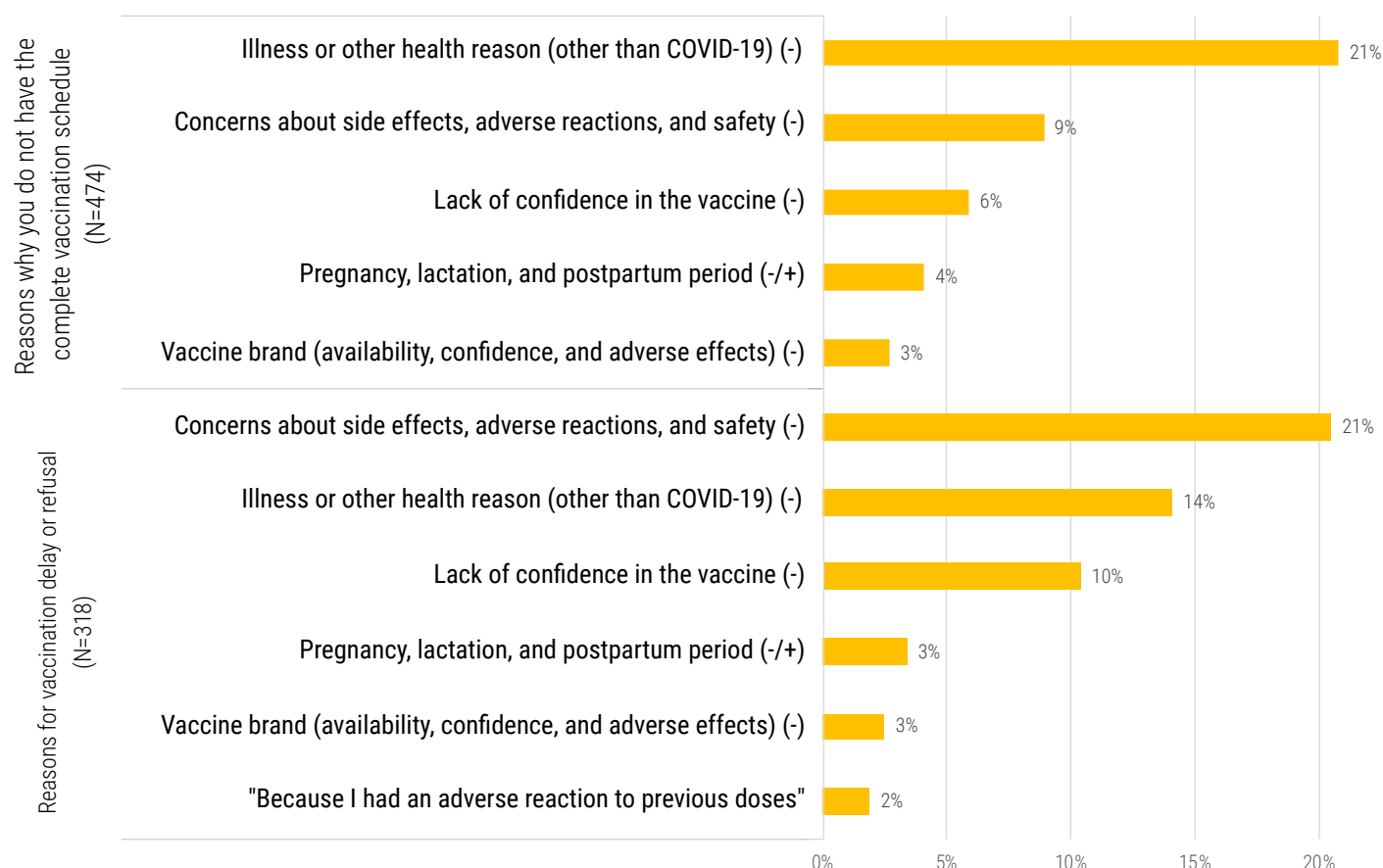
Likewise, in this domain, the responses fit into the thematic code related to confidence in the vaccine: 6% of those who answered these questions said that lack of confidence was one of the reasons why they did not have a full vaccination schedule or booster doses or additional doses, and 10% used it as a reason to delay or refuse vaccination. These responses revealed feelings of uncertainty regarding the effectiveness of COVID-19 vaccines:

***“I’ve been sick, and to receive the extra dose they tell me I need to be in good health” (question 21).***

The brand of vaccine had influenced 3% of the people who answered these questions to not have a full vaccination schedule or booster doses or additional doses, or to delay or refuse COVID-19 vaccination::

***“I don’t want to get the Moderna vaccine® because of side effects it caused in health workers” (question 24).***

**Figure 6. Qualitative responses ranked according to World Health Organization behavioral and social drivers (“thinking and feeling” domain) regarding opinions on coronavirus disease (COVID-19) vaccines**



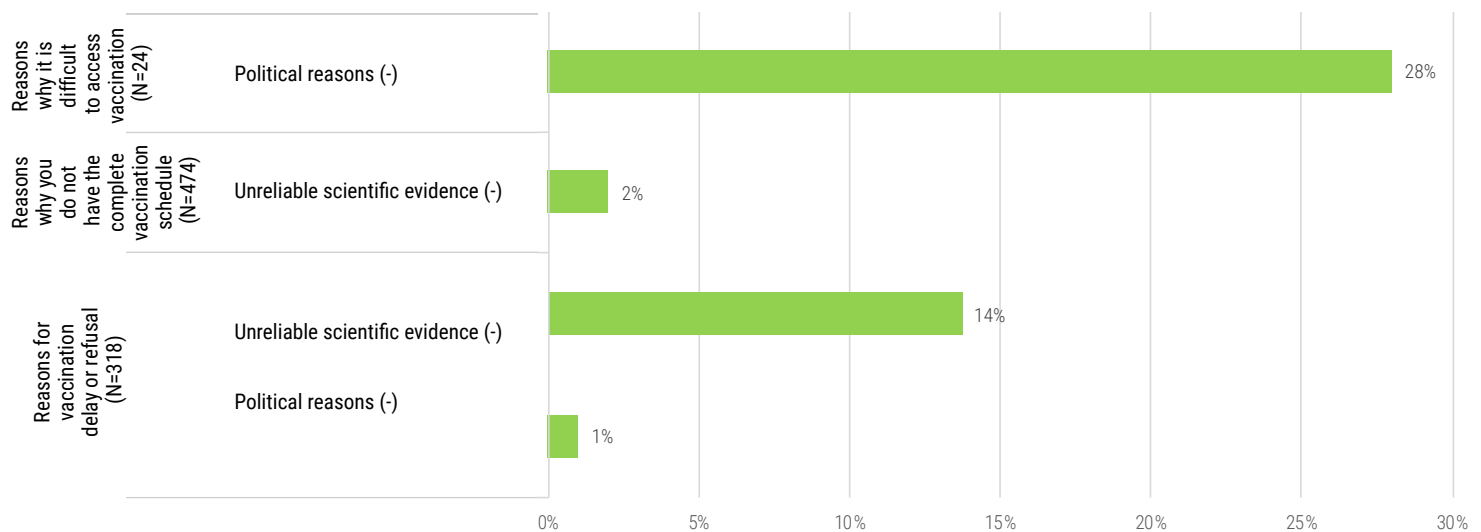
**Note:**  
 Values are weighted percentages of response categories.  
 Percentages can add up to more than 100 because responses can be assigned to more than one thematic category.  
 (+): facilitating factor, (-): barrier, (-/+): neutral factor.

### “Social processes” domain

Of the 6% of health workers who answered questions related to COVID-19 vaccination, 28% indicated that it was difficult to access these vaccines for political reasons, and 14% indicated that one of the reasons for delaying or refusing COVID-19 vaccination was unreliable scientific evidence, because the vaccines were still in trial or experimental periods (Figure 7):

***They're not vaccines, they're serums in the trial period; moreover, I don't see benefits that outweigh the after-effects of vaccines” (question 24).***

**Figure 7. Qualitative responses classified according to World Health Organization behavioral and social drivers (“social processes” domain) regarding opinions on coronavirus disease (COVID-19) vaccines**



**Note:**  
 Values are weighted percentages of response categories.  
 Percentages can add up to more than 100 because responses can be assigned to more than one thematic category.  
 (+): facilitating factor, (-): barrier, (-/+): neutral factor.

## “Motivation” domain

Of the 6% of health workers who answered open-ended questions related to COVID-19 vaccination, 9% indicated that the main reason for not receiving a COVID-19 vaccine was not wanting to be vaccinated, not needing the vaccine, lack of motivation, or not needing a booster because it does not guarantee greater protection against COVID-19. This factor also influenced 13% in their decision to not receive the full vaccination schedule or to not receive booster doses or additional doses, and it influenced 9% to delay or refuse COVID-19 vaccination (Figure 8), as mentioned by some of the respondents:

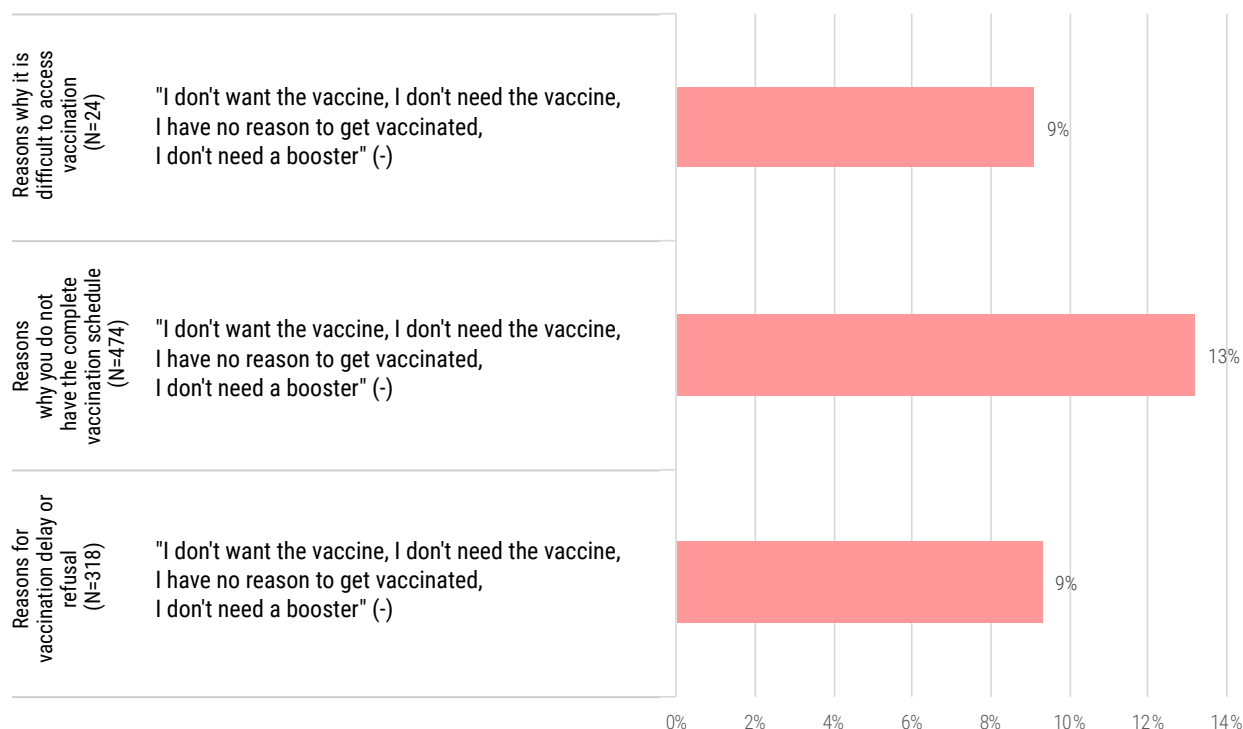
***“Two doses are enough” (question 24).***

***“I don’t think I need it; we took the necessary preventive measures” (question 21).***

***“The booster dose can’t guarantee that you have more protection against COVID-19, so I don’t think it’s necessary to get it” (question 24).***



**Figure 8. Qualitative responses ranked according to World Health Organization behavioral and social drivers (“motivation” domain) regarding opinions on coronavirus disease (COVID-19) vaccines (“thinking and feeling” domain) regarding opinions on coronavirus disease (COVID-19) vaccines**



**Note:**  
Values are weighted percentages of response categories.  
Percentages can add up to more than 100 because responses can be assigned to more than one thematic category.  
(+): facilitating factor, (-): barrier, (+/-): neutral factor.

### “Practical issues” domain

Of the 6% of respondents who answered questions related to COVID-19 vaccination, 36% indicated that one of the main reasons why it was difficult to access vaccination was that vaccines were not available, either due to lack of supply or because the supply was insufficient. This was given as a reason for not having the full vaccination schedule or booster doses or additional doses (4%) or for delaying or refusing vaccination (4%) (Figure 9), as noted by some respondents:

***“The biological version isn’t available for people” (question 16).***

***“I didn’t get the second dose of the vaccine, because I went to several vaccination sites and the corresponding vaccine wasn’t available” (question 16).***

Other important access barriers to vaccination were lack of information on the place of vaccination (23%) and lack of information on vaccination schedules (20%); lack of information was also a reason given for delaying or refusing a COVID-19 vaccine (4%). As several people noted:

***"I don't have information on areas and hours of operation, or on the available vaccines" (question 24).***

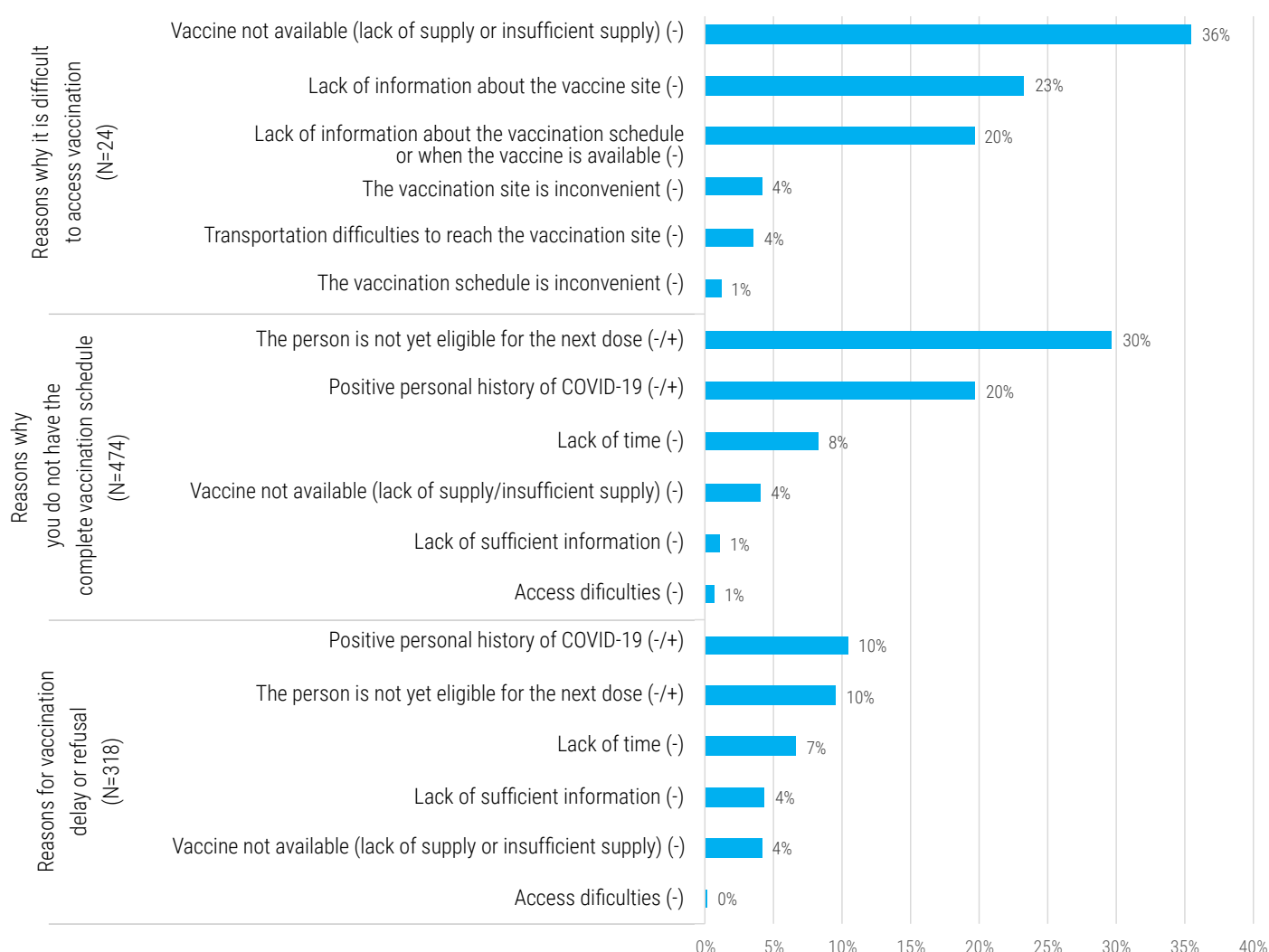
***"They change venues all the time, and they don't provide information on the new vaccination sites" (question 16).***

Other barriers mentioned by the 6% of health workers who answered these questions, and which are linked to the reasons for not having a full vaccination schedule or booster doses or additional doses, were that they were not yet eligible for the next dose of vaccine (30%), or that they had COVID-19 at the time or had had the disease (20%), and therefore they had to wait the required time before getting a booster dose. These factors had also influenced delaying or refusing vaccination (10%).

The health workers who answered these questions also reported that lack of time (8%) was another reason which had influenced them not having the complete vaccination schedule or the booster doses or additional doses, because their work schedule made it impossible to go to the vaccination sites. As some of the respondents said:

***"Having to go from the workplace to a vaccination site hinders vaccination, because it is more difficult to match work schedules with the available vaccination times" (question 21).***

**Figure 9. Qualitative responses ranked according to World Health Organization behavioral and social drivers (“practical issues” domain) regarding opinions on coronavirus disease (COVID-19) vaccines**



**Note:**

Values are weighted percentages of response categories.

Percentages can add up to more than 100 because responses can be assigned to more than one thematic category.

(+): facilitating factor, (-): barrier, (-/+): neutral factor.

## Other factors influencing opinions on coronavirus disease (COVID-19) vaccines

Approximately one third of respondents (30%) answered open-ended questions related to general COVID-19 vaccine comments or opinions (question 26, “Other factors that contributed to my opinion on COVID-19 vaccines” [n=2843], and question 35, “Additional comments on COVID-19 vaccines for health workers” [n = 1290]), which they had no obligation to answer. Following is the analysis of the answers to these questions, detailed based on the three BeSD domains found (thinking and feeling, social processes, and motivation); regarding these questions, there were no answers related to the domain of practical issues.

## “Thinking and feeling” domain

Of respondents who answered these questions, 18% said that vaccines are beneficial, effective, lifesaving, and protect health; 7% said that vaccines are important and essential; and 3% said that vaccines are safe.

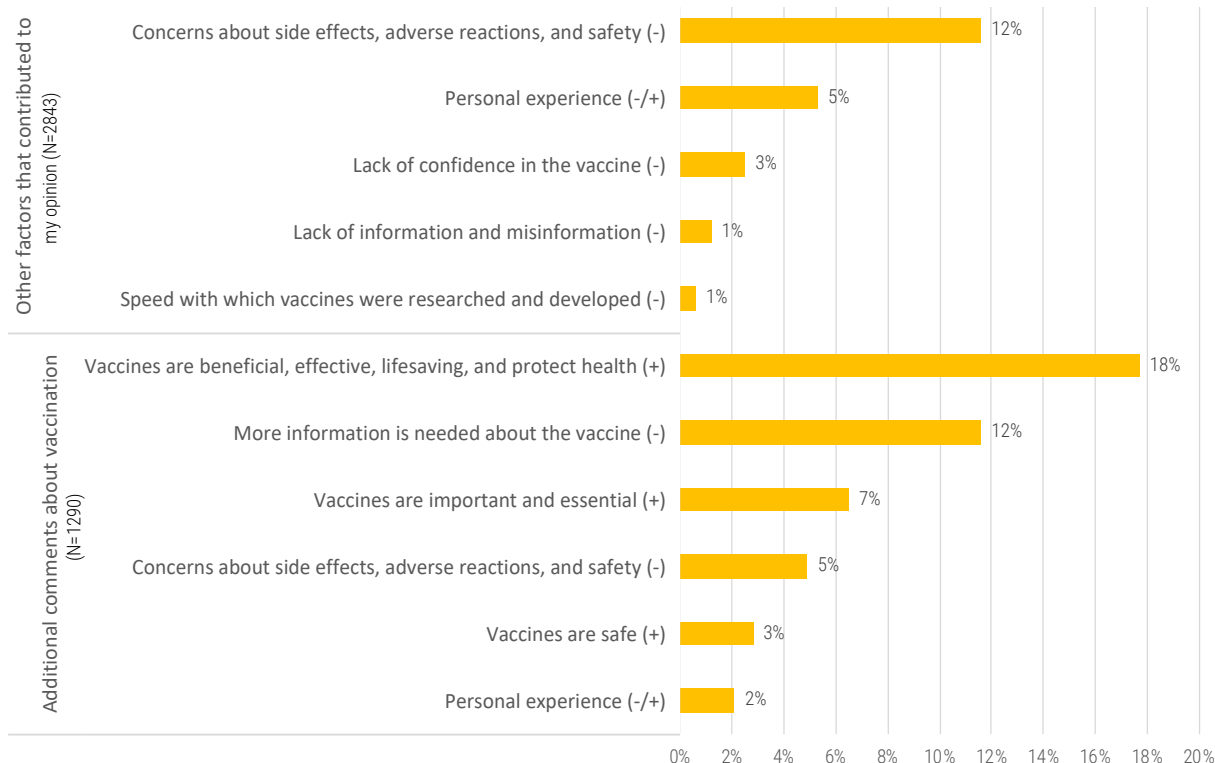
Of the people who answered these questions, 12% indicated that concern about possible side effects, adverse reactions and safety of vaccines, and lack of confidence (3%) and lack of information or the presence of misinformation (1%) were factors that had influenced their views on COVID-19 vaccines. Some of the people surveyed made comments like the following:

***“Studies are still lacking to learn more about the side effects of the vaccine” (question 26).***

Moreover, 12% of the health workers who answered these questions indicated that they needed more information about COVID-19 vaccines (Figure 10):

***“Lack of sufficient information about booster vaccines” (question 35).***

**Figure 10. Qualitative responses classified according to World Health Organization behavioral and social drivers (“thinking and feeling” domain) regarding other factors affecting opinions on coronavirus disease (COVID-19) vaccines**



**Note:**  
 Values are weighted percentages of response categories.  
 Percentages can add up to more than 100 because responses can be assigned to more than one thematic category.  
 (+): facilitating factor, (-): barrier, (-/+): neutral factor.

## “Social processes” domain

Of the one third of health workers who answered the two questions in the “social processes” domain, 38% reported that scientific evidence, medical literature, scientific publications, and statistics that they had read had influenced their opinions about COVID-19 vaccines, while 9% said that the opinions of health experts and international agencies had influenced them. The experience of friends or family had influenced only 2% of those surveyed. Moreover, 6% of the people who answered these questions said that COVID-19 vaccines should be mandatory (Figure 11).

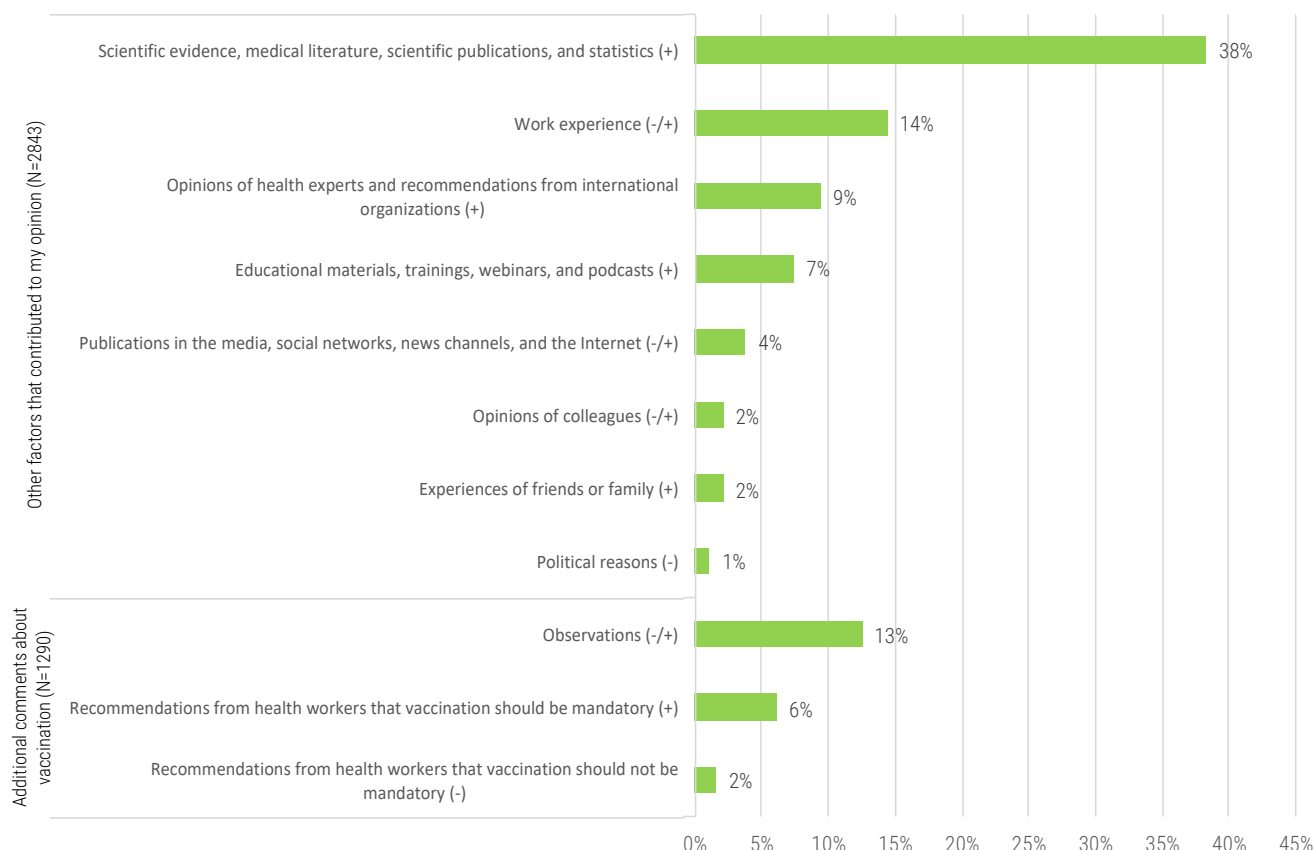
Other factors were found that could positively or negatively influence opinions on COVID-19 vaccines: 14% of respondents who answered these questions mentioned work experience; 13% described their personal observations on COVID-19 vaccination; 4% pointed to content posted on social media, other media, news, and the Internet; and 2% mentioned that what their colleagues say influenced their opinions on COVID-19 vaccines. The following are some of the verbatim comments from health workers who responded to the survey:

***“The reading I’ve done online has helped me to further clarify my concerns about COVID-19 vaccination” (question 35).***

***“Some tutorials, personal research, and social media information” (question 26).***

In the “social processes” domain, of the people who answered these questions, 1% indicated that political reasons had contributed to shaping their opinions on COVID-19 vaccines, and 2% said that these vaccines should not be mandatory.

**Figure 11. Qualitative responses classified according to World Health Organization behavioral and social drivers (“social processes” domain) regarding other factors affecting opinions on coronavirus disease (COVID-19) vaccines**



**Note:**

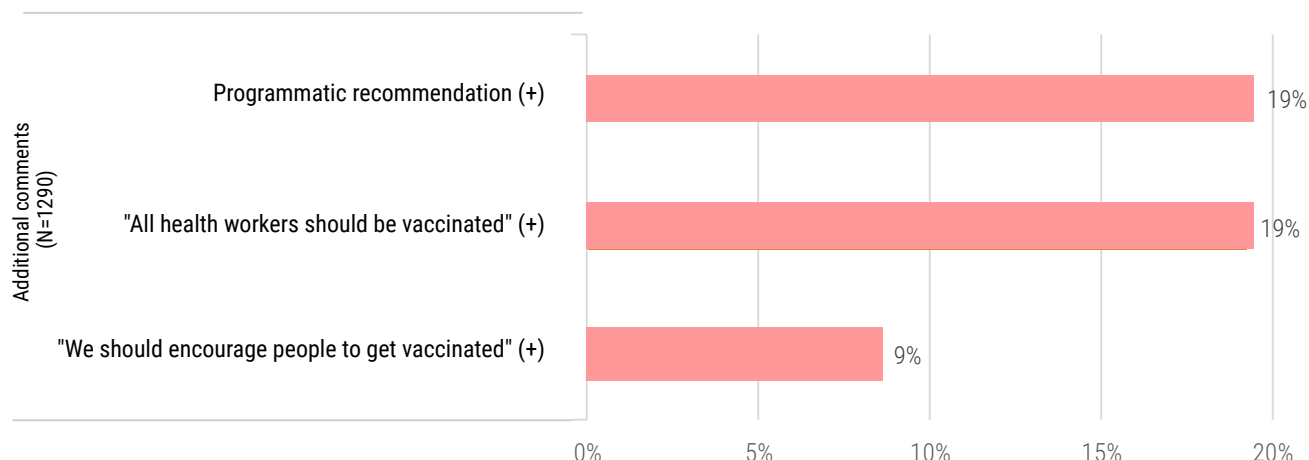
Values are weighted percentages of response categories. Percentages can add up to more than 100 because responses can be assigned to more than one thematic category.  
 (+): facilitating factor, (-): barrier, (-/+): neutral factor.

## “Motivation” domain

The main facilitating factors for vaccination found in this domain had to do with respondents’ intention to recommend the vaccine: 19% of respondents answering these questions said that all health workers should be vaccinated, 19% would be motivated to give a programmatic recommendation to health authorities on how to improve the vaccination process, and 9% said that the general population should be encouraged to get vaccinated (9%) (Figure 12). In the words of some of the respondents:

***“If we all get vaccinated, we will better serve our population while incentivizing vaccination” (question 35).***

**Figure 12. Qualitative responses ranked according to World Health Organization social and behavioral determinants (“motivation” domain) regarding other factors affecting opinions on coronavirus disease (COVID-19) vaccines**



**Note:**  
 Values are weighted percentages of response categories.  
 Percentages can add up to more than 100 because responses can be assigned to more than one thematic category.  
 (+): facilitating factor, (-): barrier, (+/-): neutral factor.

### Attitudes towards flu/influenza and hepatitis B vaccines

Four questions were asked related to health workers' attitudes towards flu/influenza vaccines (and hepatitis B vaccines) question 28: reasons for not receiving the flu/influenza vaccine<sup>11</sup> (n = 246), question 30: reasons why you would not recommend the flu/influenza vaccine (n = 131), question 32: reasons for not receiving the hepatitis B vaccine (n = 54), and question 34: reasons for not recommending the hepatitis B vaccine (n = 44). Respondents who had given negative responses to questions related to such vaccines (questions 27, 29, 31, and 33) answered these four questions optionally; those who did represented approximately 2% of the total number of people surveyed. Most responses followed the same pattern as questions about COVID-19 vaccines, and the analysis based on WHO BeSD domains is presented.

Of the respondents who answered questions related to flu/influenza and hepatitis B vaccines, 73% were women, 56% were between 45 and 83 years old, and 31% were in the category of "other health professionals".

### "Thinking and feeling" domain

Among the 2% of respondents who said that they did not want to receive or recommend the flu/influenza vaccine, 20% expressed concerns about side effects or adverse reactions to the vaccine. In this regard, participants referred to negative experiences with vaccines, both their own and those of people they knew, saying that this was why did not want to recommend them (24%). Some respondents made comments like the following:

<sup>11</sup> In the instrument used to conduct the survey, the terms "flu" and "influenza" were used. This publication uses the term "flu/influenza" in discussing the results of the study.

***“I got it once and I had severe symptoms afterwards” (question 28).***

Other important barriers reported by those who answered these questions to not receive the vaccine included the opinion that the flu/influenza vaccine was not effective (16%) and factors related to lack of confidence in the vaccine (10%), in addition, these factors influenced in their decision not to recommend this vaccine (17% and 13%, respectively). As noted by several respondents:

***“I don’t believe in the influenza vaccine because this virus has such a high mutation rate” (question 30).***

***“I think everyone should build natural defenses to these flu variants” (question 30).***

For the 1% of respondents who answered questions related to the hepatitis B vaccine, the barriers that predominated in participants’ decision to not receive or recommend it were related to lack of confidence in the vaccine (9%), and therefore not recommending it (24%) (Figure 13). As several of the participants said:

***““I won’t recommend something I don’t trust” (question 34).***

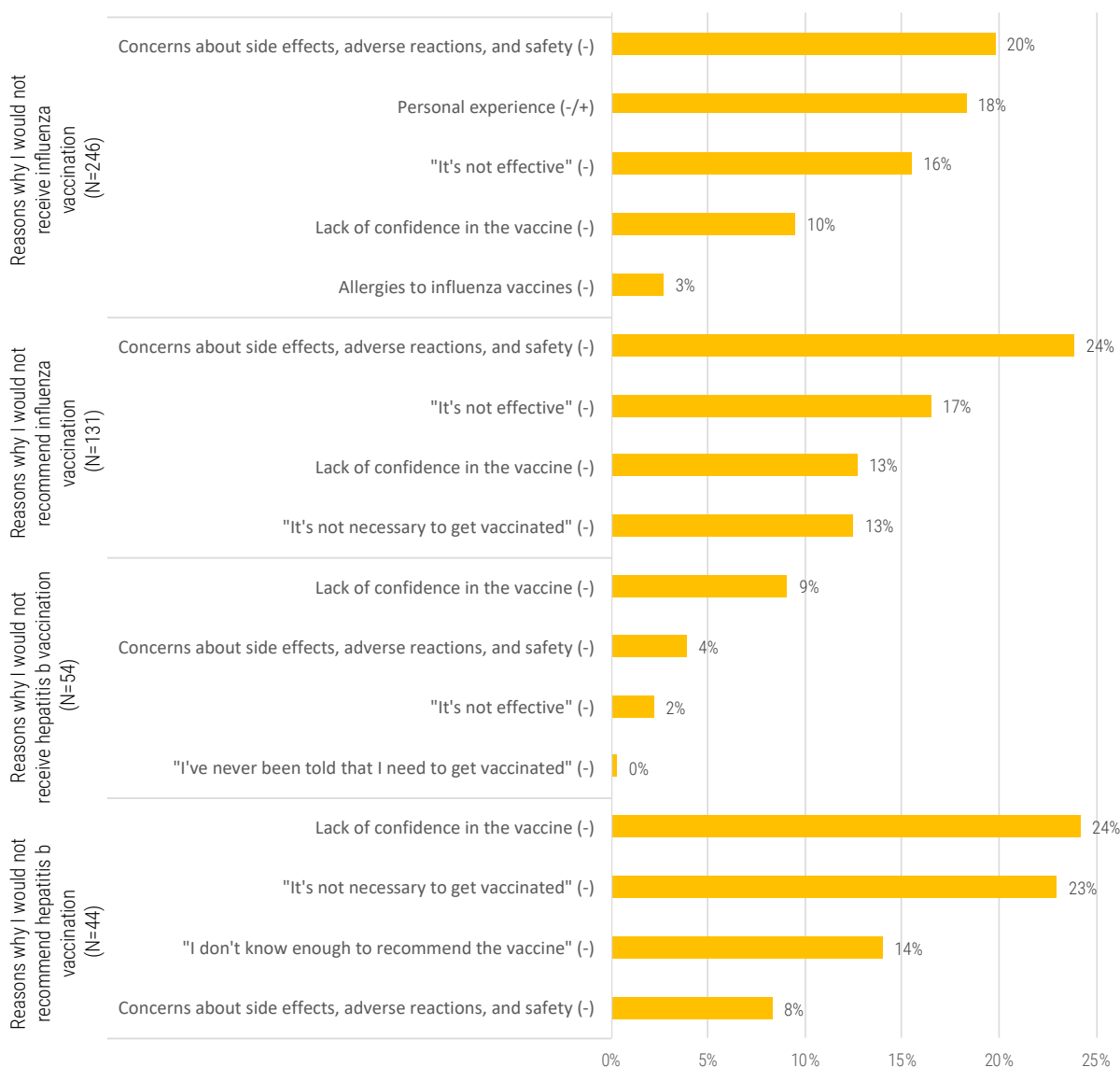
Concern about side effects or adverse reactions was another reason given for not receiving the hepatitis B vaccine (4%) and not recommending it (8%). Moreover, in this domain, 23% of health workers who answered these questions said that this vaccine is not necessary, and 14% indicated that they did not have enough information to recommend the hepatitis B vaccine. As some participants said:

***“For fear of adverse symptoms” (question 32).***

***“I don’t know enough” (question 34).***



**Figure 13. Qualitative responses classified according to World Health Organization behavioral and social drivers ("thinking and feeling" domain) regarding flu/influenza and Hepatitis B vaccines**



**Note:**

Values are weighted percentages of response categories.

Percentages can add up to more than 100 because responses can be assigned to more than one thematic category.

(+): facilitating factor, (-): barrier, (-/+): neutral factor.

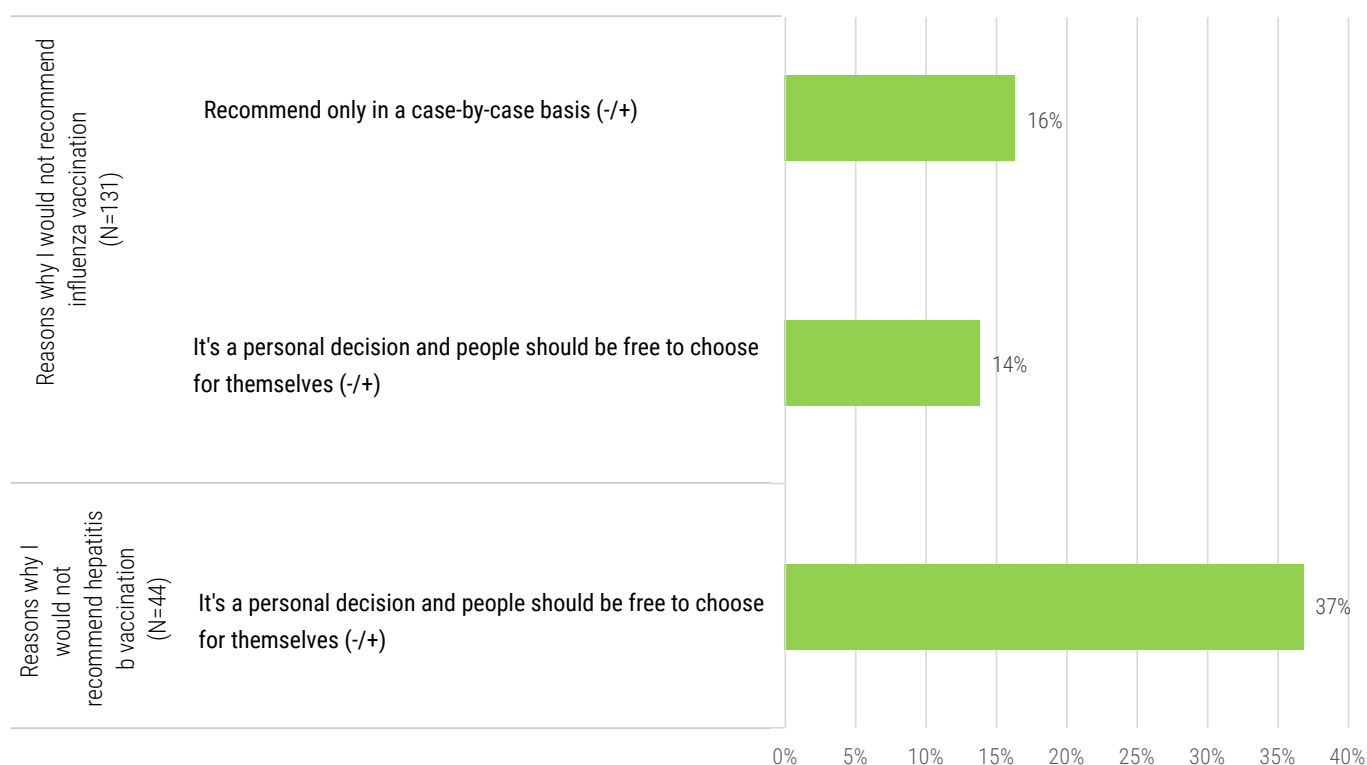
## "Social processes" domain

Some health workers who answered these questions said that receiving the flu/influenza vaccine and the Hepatitis B vaccine was a personal decision (14% and 37%, respectively), and therefore each person should be free to choose on their own (Figure 14). Moreover, 16% said that the flu/influenza vaccine should be recommended only on a case-by-case basis; in the words of some of the interviewees:

***"Not everyone. Just some. For example: I've been giving it every year to my 84-year-old mother, since she was 65" (question 30).***

***"I would recommend it based on the risk profile, but not in a general way" (question 34).***

**Figure 14. Qualitative responses classified according to World Health Organization behavioral and social drivers ("social processes" domain) regarding flu/influenza and Hepatitis B vaccines**



**Note:** Values are weighted percentages of response categories.

Percentages can add up to more than 100 because responses can be assigned to more than one thematic category.

(+): facilitating factor, (-): barrier, (-/+): neutral factor.

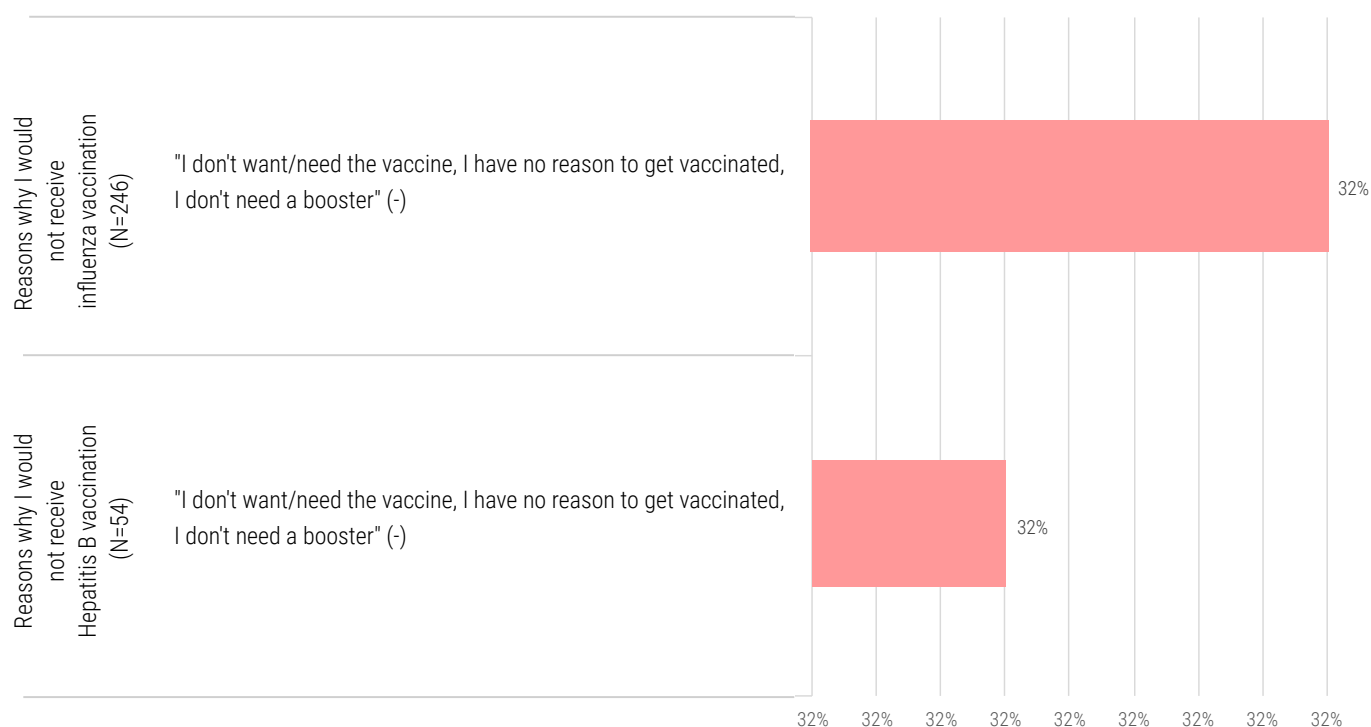
## "Motivation" domain

In this domain, the only barrier found was that, of the 1% of health workers who answered these questions, 32% did not want or thought they did not need the flu/influenza or Hepatitis B vaccine or booster (32%) (Figure 15). As two of the participants wrote:

***"Artificial immunity leads us to evolve naturally weaker, versus infectious organisms that evolve stronger" (question 28).***

***"I'm not interested, and I don't know the benefits of that hepatitis vaccine" (question 32).***

**Figure 15. Qualitative responses according to the World Health Organization behavioral and social drivers ("motivation" domain) regarding the flu/influenza and Hepatitis B vaccines**



### Note:

Values are weighted percentages of response categories.

Percentages can add up to more than 100 because responses can be assigned to more than one thematic category.

(+): facilitating factor, (-): barrier, (-/+): neutral factor.

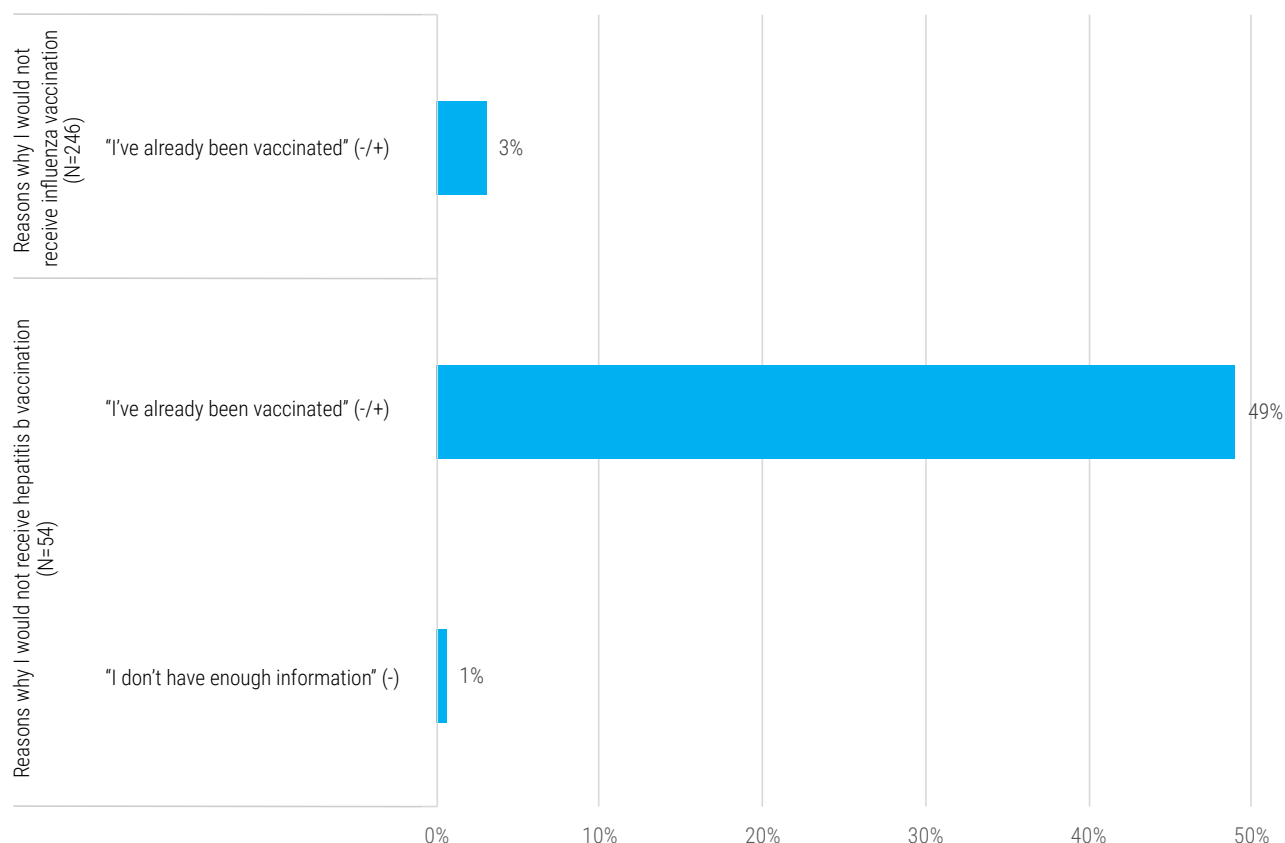
## "Practical issues" domain

Of the 1% of respondents who answered these questions, 49% indicated that they had already received the hepatitis B vaccine, while 3% indicated that they did not have sufficient information about the flu/influenza vaccine and 1% did not have sufficient information about the hepatitis B vaccine (Figure 16). As noted by some respondents:

***"I don't have enough information" (question 28).***

***"I can't recommend something that I know nothing about" (question 32).***

**Figure 16. Qualitative responses according to the World Health Organization behavioral and social drivers ("practical issues" domain) regarding the flu/influenza and hepatitis B vaccines**



### Note:

Values are weighted percentages of response categories.

Percentages can add up to more than 100 because responses can be assigned to more than one thematic category.

(+): facilitating factor, (-): barrier, (-/+): neutral factor.

# Discussion

This study found that 97% of health workers in 16 Latin American countries intended to recommend COVID-19 vaccines to eligible individuals, and that 98% had completed their vaccination schedules.

The WHO BeSD model was used to identify factors affecting the acceptance or non-acceptance of COVID-19 vaccines, and the study found that the most common reasons for vaccine hesitancy were concerns about vaccine safety and side effects. Moreover, nursing staff and the youngest age quartile (19–34 years) were found to be less likely to be vaccinated against COVID-19, compared to physicians and other health professionals and older people; however, these differences were not statistically significant.

Vaccination is the most cost-effective public health intervention to save lives, prevent disabilities, and ensure greater health equity (17, 18). However, it has been found that the development and introduction of vaccines against COVID-19 has generated uncertainties and controversies, in addition to making visible the effect of actions by anti-vaccination movements, especially against this type of vaccine (19). Furthermore, it has been observed that some health workers remain unconvinced regarding the effectiveness and safety of these vaccines. This may be a reason why these workers have delayed or refused vaccination when offered the opportunity (9, 20), or have expressed this reluctance to their patients or relatives. The commitment to vaccination of health workers is of the utmost importance, because these workers are considered the most reliable source of vaccine-related information and are in the best position to engage with undecided patients, respond to their concerns, and find ways to explain the benefits of vaccination to them (21).

In the 16 Latin American countries that participated in this study, 97% of health workers would recommend COVID-19 vaccination. This figure is much higher compared to studies in other parts of the world: for example, a 2021 study in Ethiopia showed that 74.5% of health workers accepted COVID-19 vaccines, and 79.8% were willing to recommend it (22). Other studies conducted the same year in the United Arab Emirates (23), Saudi Arabia (24), China (25), and Italy (26) showed acceptance for COVID-19 vaccination ranging between 82% and 89%.

Specifically for the Americas region, a study conducted in Canada in 2020 showed that 72.4% accepted COVID-19 vaccination, and 79.6% accepted recommending these vaccines (27). In 2021, a publication on a study conducted in the Caribbean subregion (16) showed a 77% acceptance rate for vaccination. However, it has been shown that acceptance is greater in Latin America: for example, a study conducted in Mexico in 2020 reported 94.5% acceptance for COVID-19 vaccination (11), and another conducted in Peru the same year reported 96.4% acceptance (12).

In the Region of the Americas, the Expanded Program on Immunization (EPI) has shown great progress and is the best-performing program worldwide for the elimination and control of several vaccine-preventable diseases. The factors that have favored this success in the Region include the enactment of vaccination laws, coordinated management of the EPI, self-sustainability of the EPI at the country level, the efforts of the PAHO Revolving Fund for Vaccine Procurement, and the formulation of regional policies in the meetings of the PAHO Technical Advisory Group and governing

bodies (28). For more than 40 years, the adoption of the EPI by Latin American countries has played a crucial role in generating a culture of vaccination; public policies have been created in different countries (29), and governments and health workers are committed to implementing vaccination programs (30–33).

In our study, the intention to recommend COVID-19 vaccines to eligible people was 97%, and this is reflected in the fact that 98% of health workers themselves had received the complete vaccination schedule. Other studies have found that health workers who recommended COVID-19 vaccination to colleagues, patients, and family members were 17 times more likely to agree to receive a COVID-19 vaccine, and 88% less likely to refuse vaccination (8, 23, 34–36). This is also reinforced by the comments collected in our qualitative analysis, in which respondents said that vaccination should be encouraged among the general population and health workers, and that they would be motivated to give recommendations to health authorities on how to improve vaccination in their countries.

A high percentage of respondents (79%) reported that they were able to receive vaccination in their workplace, suggesting that better health worker access to vaccination centers, and timelier and more effective service, means higher vaccination rates. This is consistent with studies by Betsch et al. (37) and by Fisk (38).

Although 1% of those surveyed said that, at the time of survey, they had not been vaccinated, 74% of these respondents indicated they would do so as soon as they were eligible or perhaps some other time in the future. It was found that the rate of COVID-19 vaccine delay or refusal was higher in the youngest group (19–34 years) and among nursing staff. These findings were consistent with similar studies conducted elsewhere (16, 39, 40). In Spain, twice as many nurses as physicians showed vaccine hesitancy (35% and 17.5%, respectively) (41). Similarly, Gagneux-Brunon et al. (42) reported lower vaccine uptake among nurses and those younger than 30 years. On the other hand, sex was not found to be a determining factor, an association that had been observed in other studies (34, 42, 43).

The percentage of people surveyed in this study who said that they would not get a flu/influenza vaccine was slightly higher (3%) than those who were unsure about COVID-19 vaccines (1%), and the percentage of respondents who said that they would not be vaccinated against hepatitis B was similar to those who were hesitant about COVID-19 vaccines (1%). Several studies have shown that behavior related to influenza vaccination was associated with increased likelihood of uptake of COVID-19 vaccines (8, 13, 44–46). While we found no similar studies comparing the uptake of hepatitis B vaccines and COVID-19 vaccines, people who participated in our study could be said to have a similar level of uptake with respect to COVID-19 vaccines and to the vaccines generally given to health workers.

## Willingness to get vaccinated and attitudes towards vaccines in general

The findings presented in this report show that there was widespread agreement that vaccines are reliable, safe, and effective, and that the vaccine information provided to health workers by their own health care providers (public or private) was reliable; this was consistent with the findings of the study previously conducted among Caribbean health workers (16). Nine out of ten people surveyed were willing to recommend new vaccines to family and friends, although concern was found regarding these vaccines, particularly about the perceived risk of serious adverse effects. Other studies have reported similar results (16, 45).

Nurses and younger respondents were more concerned than physicians--and also more concerned than all health workers from older age groups--about the mild adverse effects of vaccines in general. Furthermore, statistically significant differences were detected regarding concern about this type of adverse effects, which was greater in health workers from the Andean Community (63%), followed by Central America (57%) and the Southern Cone (36%).

## Factors influencing opinions on COVID-19 vaccines

Our study confirmed what Puertas et al. (16) and Zürcher et al. (47) considered the main factors that have contributed to shaping public opinion on COVID-19 vaccines. We found that in nine out of ten people surveyed, these factors were the scientific issues regarding SARS-CoV-2 that were constantly evolving and being discovered, the speed with which the vaccines were researched and developed, and the relationship between the proportion of people vaccinated and hospitalization and mortality rates.

Furthermore, it was observed that the country in which the available COVID-19 vaccines were developed and manufactured mainly influenced health workers in Central America (87%) and the Andean Community (81%), compared to the Southern Cone (64%). In addition, it was found that other factors that influenced the opinion of nine out of ten people surveyed were the recommendations and opinions of health experts, international organizations, and publications on scientific evidence, medical literature, and statistics: data consistent with those of a study by Papini et al. (8). However, there were also unfavorable factors that influenced opinions about COVID-19 vaccines, such as concerns about possible side effects, adverse reactions and safety of vaccines, lack of confidence, and lack of information and misinformation; these factors have also been described in several studies (11, 12, 22, 23).

The actions and opinions of friends, family and colleagues, social media, and the actions and opinions of religious leaders influenced about half of the health workers surveyed when forming an opinion about COVID-19 vaccines. This was more frequent in health technicians and nursing staff and in those who defined themselves as ethnic groups other than white (Afrodescendants and indigenous). In addition, a statistically significant difference was observed in the influence of these factors on health workers in the Andean Community and Central America, compared to the Southern Cone. A systematic review conducted in 2022 in the general population showed that these factors are relevant predictors for not getting a COVID-19 vaccine (46), and other studies have shown that these factors can influence the decision regarding whether to get vaccinated (36, 48).

## Factors influencing COVID-19 vaccination delay or refusal

The 8% of respondents who had completed the full vaccination schedule but with no boosters or additional doses, the 1% who had not completed a full vaccination schedule, and the 1% who had not received any COVID-19 vaccine said that the main reasons they had delayed or refused vaccination was concern about possible side effects, adverse reactions and vaccine safety, and the speed with which vaccines had been developed. Razzaghi et al. (10) and Puertas et al. (16) reported, in their respective studies, that these factors had influenced vaccine delay or refusal. There was a tendency to express greater concern about adverse reactions to COVID-19 vaccines among respondents in the Southern Cone (69%), compared to those in Central America (51%) and in the Andean Community (59%).

In our qualitative analysis, other reasons for delaying or refusing COVID-19 vaccination were detected to a lesser extent and were described for the first time in this study. Access barriers were reported relating to lack of availability of vaccines, either owing to lack of supply or insufficient supply, lack of information on vaccination sites and vaccination schedules, and lack of time due to workload. Although these factors were infrequent, they should be considered, since they occurred when there was a higher level of acceptance of vaccines, as noted in several other studies (37, 49–51). Other reasons infrequently given by respondents who wanted to get the vaccine but were unable to do so owing to some country-specific barrier included having a previous illness or comorbidity not related to COVID-19 or having COVID-19 (in the past or present) and therefore not yet being eligible for the booster dose. To date, such reasons have not been reported in other studies as causes for COVID-19 vaccination delay or refusal.

## Conclusions

Our study found high uptake of COVID-19 vaccines among health workers in 16 Latin American countries. Findings reported by other studies regarding concerns about vaccine safety and effectiveness were confirmed as important predictors of COVID-19 vaccination uptake or refusal.

Information about vaccines is one of the cornerstones of vaccination compliance; therefore, communication on the safety of COVID-19 vaccines must be strengthened to raise the confidence levels of health workers. Moreover, it is clear that social media play an important role in spreading messages, true and false, about vaccination, both in the general population and among health workers. The pandemic increased the communication engagement of authorities, experts, and opinion leaders through social networks and, therefore, the searches for information in these media by health workers. Therefore, it is crucial to provide up-to-date, clear, concise, focused, and transparent scientific information to all health workers on a regular basis, based on the evolution of knowledge about COVID-19 vaccines and the workload of health workers during the pandemic. Moreover, health authorities and other national and international stakeholders in the health sector should provide appropriate information to health workers, according to their language, age group, ethnicity, and job category.

Likewise, it is very important to consider the channels of distribution of information and the different tools adapted to the local contexts of health workers. This will help health workers provide appropriate



information, answer questions, communicate about the benefits of vaccines, and recommend them to patients, family, friends, and colleagues.

Training for health workers, particularly nurses, on vaccination-related issues and interpersonal communication should be continuous so that they can detect and address misinformation more effectively. Moreover, the activities programmed for the medium and long term should highlight the professional training of nursing staff and evaluate whether the curricula are based on conceptual, procedural, and attitudinal competencies that enable nurses to carry out reflective and practical processes and to gain a comprehensive vision of vaccination.

Strategies to expand vaccination with boosters or additional doses in health workers should include identifying individuals considered influential in these groups, such as peers, renowned experts, religious leaders, or prominent people in their communities, who can act as communication channels for specific information on the safety and efficacy of COVID-19 vaccines. The possibility of training health workers on topics related to interpersonal communication skills should be evaluated; such training could help them to approach conversations with colleagues, because undecided health workers often turn to their peers for information before making a decision. However, while health workers may be the most effective promoters of vaccination among their colleagues, this source of information is often overlooked.

Finally, increasing and ensuring access to workplace vaccination for health workers and removing any other scheduling barriers will make it possible to maintain high COVID-19 vaccination coverage among health workers as a priority group.

## Limitations

The limitations detected in our study are:

- Since a cross-sectional survey is a snapshot taken at a specific time, it is difficult to explain the concerns, attitudes, and possible decisions of health workers at different times or stages.
- The data from this survey cannot be considered representative of health workers in Spanish-speaking Latin America, because it is impossible to know what proportion of health workers knew about the survey, or why some of those who did learn about the survey chose not to participate.
- There was a risk that people with strong opinions for and against vaccines wanted to make sure that their opinions were taken into account, and that people with less interest in answering surveys were less likely to participate.
- At both the country and subregional levels, although the results are indicative of the attitudes of all health workers, they are not representative.
- Because the sample is likely to be grouped by profession and by location of health facilities, the answers to the questions could be intrinsically correlated.

## Strengths

The strengths detected in our study are:

- The study was widely publicized, and the online survey was available for 90 days, so health workers in Latin America had ample opportunity to answer it.
- In Cuba, due to barriers to access to the Qualtrics platform of the study population, the survey was made available in a printed format and distributed at approximately 50 health institutions in 15 municipalities of Havana.
- In the present survey, unlike the previous survey conducted in the Caribbean Subregion (13), respondents were encouraged to provide one or two sentences to put their answer in context for its proper classification, based on the WHO BeSD model.
- Thanks to the pilot study, confusing phrases were detected, and adjustments were made to clarify survey questions.
- Several teams classified the responses independently of the qualitative analysis. Disagreements were resolved with the expanded research team.

## Recommendations

Based on the WHO BeSD framework and survey results, Table 9 outlines some interventions that could be undertaken in Latin American countries to increase the vaccination rate with boosters or additional doses among health workers.

As noted in the Results section, given that most responses fall under the “thinking and feeling” domain and factors related to low confidence in the safety, effectiveness, and benefits of vaccines, PAHO suggests focusing on interventions to raise awareness of the risk of COVID-19 as a disease compared to the risk of COVID-19 vaccination, and on improving health workers’ understanding of the vaccine development process, as well as their confidence in the safety, effectiveness, and benefits of vaccines. Educational campaigns and recommendations from health providers and institutions can be designed to facilitate the achievement of these objectives.

Moreover, because trust is so crucial to the immunization program, other interventions should be considered, in order to address the present study’s findings in the “social processes” domain, related to information given by authorities, experts, and opinion leaders. Such efforts should include transparent, timely, and message-appropriate communication tailored to the national context and the reality of COVID-19 vaccination on the ground. Finally, it is important that countries strive to remove all barriers that prevent health workers from accessing COVID-19 vaccines. This includes offering extended hours and workplace vaccination.

**Table 9. Recommendations to expand COVID-19 vaccination among health workers in Latin America, by domain and type of intervention**

DOMAIN IN WHICH THE PROBLEM WAS DETECTED	INTERVENTIONS TO INCREASE VACCINATION RATES
<b>THINKING AND FEELING</b>	<ul style="list-style-type: none"> <li>• Campaigns to inform or educate health workers about vaccination, including health center- or community-based approaches: <ul style="list-style-type: none"> <li>○ Educational campaigns: <ul style="list-style-type: none"> <li>• Posters on the risk of the disease, educational materials, educational group sessions in which the relevance of the disease and the importance of the vaccine are highlighted</li> <li>• Posters encouraging vaccination to protect oneself and one's patients</li> <li>• 15-minute in-service educational seminar for health workers, and personalized education about COVID-19 vaccines</li> <li>• Presentations and posters, training for staff working in health centers</li> <li>• Health education for all relevant staff in a health facility</li> <li>• Educational program for health care providers based on the trainer-of-trainers model</li> <li>• Guidelines on the vaccination decision-making process for health workers</li> <li>• Professional training of nursing staff, with competency-based curricula</li> </ul> </li> <li>○ Uncategorized: <ul style="list-style-type: none"> <li>• Vaccination campaigns for health workers, including a mandatory opt-out policy whereby health workers sign a declaration refusing vaccination and indicating that they understand the risks of non-vaccination for themselves and others</li> </ul> </li> </ul> </li> <li>• Dialogue-based interventions, including individual counselling to promote vaccination</li> </ul>

## **SOCIAL PROCESSES**

- Community involvement
  - Educational campaigns:
    - 15-minute in-service educational seminar, personalized vaccine education, and interpersonal communication training for influential health workers, renowned experts, religious leaders, or influencers in their communities, so that they can serve as communication channels providing specific information on the safety and effectiveness of COVID-19 vaccines
- Recommendations to get vaccinated from health workers
  - Educational campaigns:
    - 15-minute in-service educational seminar for health workers, personalized education about the vaccine and training in interpersonal communication for health workers
    - Guidelines on the vaccination decision-making process for health workers
    - Support for communication to raise awareness of the risks of contracting COVID-19 versus the risks of vaccination
  - Virtual courses to support the needs of health workers

## MOTIVATION

- Incentives for vaccination and recommendation of vaccines
  - Educational campaigns:
    - 15-minute in-service educational seminar for health workers, personalized education about the vaccine and training in interpersonal communication for health workers
    - Guidelines on the vaccination decision-making process for health workers
  - Incentives
    - Incentives for vaccination, including free lunches and raffles, and others to be determined by each country
    - Monetary incentives for vaccination.
  - Institutional recommendations:
    - Institutions, such as hospitals, should encourage vaccination and the use of vaccination stickers
  - Vaccine champions
  - Uncategorized:
    - Training for health workers to strengthen their recommendations regarding the evaluation of health risks (risk evaluation and preventive actions for patients)
    - Process for considering non-compliance with vaccination in the periodic performance evaluations of staff working at health facilities

## PRACTICAL ISSUES

- Increase and ensure access to workplace vaccination
  - Reduced out-of-pocket costs
    - Free vaccines
    - Workplace vaccination (avoiding travel to get vaccinated)
  - Workplace vaccination
    - Offer vaccination near the entrances to health facilities, with mandatory use of masks for unvaccinated people
    - Increase access to workplace vaccination, especially in well-trafficked areas.
    - Vaccination in all settings where health workers are found
    - Enhance accessibility (vaccination at mobile stations and during night or weekend shifts)
  - Default appointments for administering boosters or additional doses
  - Improvements in quality of service
  - Timely reminder for the next dose and regarding missed doses
    - Reminders by letter, telephone, and email.
  - Incentives:
    - Vaccination incentives, including free food, raffles, lotteries, and cash prizes
    - Monetary incentives for vaccination
  - Institutional recommendations
  - Vaccine champions

**Source:**

The authors, based on the results of the present study and World Health Organization recommendations (Data for action: achieving high uptake of COVID-19 vaccines. Geneva: WHO; 2021. Available at <https://apps.who.int/iris/handle/10665/339452>).

# References

1. World Bank Group. Global Economic Prospects. Washington, D.C.: World Bank; 2022. Available at: <https://openknowledge.worldbank.org/bitstream/handle/10986/36519/9781464817601.pdf>.
2. World Health Organization. Second round of the national pulse survey on continuity of essential health services during the COVID-19 pandemic: January – March 2021. Geneva: WHO; 2021. Available at: <https://www.who.int/publications/i/item/WHO-2019-nCoV-EHS-continuity-survey-2021.1>.
3. World Health Organization. WHO Coronavirus (COVID-19) Dashboard. Geneva: WHO; 2022. Available at: <https://covid19.who.int/>.
4. World Health Organization. The impact of COVID-19 on health and care workers: a closer look at deaths. Geneva: WHO, 2021. Available at: <https://apps.who.int/iris/bitstream/handle/10665/345300/WHO-HWF-WorkingPaper-2021.1-eng.pdf?sequence=1&isAllowed=y>.
5. International Federation of Red Cross and Red Crescent Societies, United Nations Children's Fund, World Health Organization, and Global Outbreak Alert and Response Network. COVID-19 behaviour change framework. Collective Service. 2021. Available at: <https://www.rcce-collective.net/resource/covid-19-behaviour-change-framework/>.
6. Abuown A, Ellis T, Miller J, Davidson R, Kachwala Q, Medeiros M, et al. COVID-19 vaccination intent among London healthcare workers. *Occup Med*. 2021;71(4–5):211–4.
7. Briko N, Korshunov V, Mindlina A, Polibin R, Antipov M, Brazhnikov A, et al. Healthcare workers' acceptance of COVID-19 vaccination in Russia. *Int J Environmental Res Public Health*. 2022;19:4136.
8. Papini F, Mazzilli S, Paganini D, Rago L, Arzilli G, Pan A, et al. Healthcare workers' attitudes, practices and sources of information for COVID-19 vaccination: an Italian national survey. *Int J Environmental Res Public Health*. 2022;19(2):733.
9. Pan American Health Organization, Puertas EB, Velandia M, Vulcanovic L, Bayley L, Broome L, et al. Concerns, Attitudes, and Intended Practices of Healthcare Workers toward COVID-19 Vaccination in the Caribbean. Pan American Health Organization; 2021 sep. Report No.: Forthcoming by 2021-10-07.
10. Razzagi H, Masalovich S, Sivrastav A, Black K, Nguyen K, de Perio M, et al. COVID-19 Vaccination and Intent Among Healthcare Personnel, U.S. *Am J Prev Med*. May, 2022;62(5):705-15.
11. Castañeda-Vasquez DE, Ruiz-Padilla JP, Botello-Hernandez E. Vaccine Hesitancy against SARS-CoV-2 in Health Personnel of Northeastern Mexico and its Determinants. *J Occup Environ Med* [Internet]. agosto de 2021 [quoted April 19, 2021];63(8). Available at: [https://journals.lww.com/joem/Abstract/9000/Vaccine\\_Hesitancy\\_against\\_SARS\\_CoV\\_2\\_in\\_Health.97927.aspx](https://journals.lww.com/joem/Abstract/9000/Vaccine_Hesitancy_against_SARS_CoV_2_in_Health.97927.aspx).
12. Aranda Chiclayo LL. Conocimiento y aceptación frente a la vacuna Covid-19 en el personal de salud de

Hospitales nivel II-1 Red Trujillo, 2021 (Knowledge and acceptance against the Covid-19 vaccine in the health personnel of Level II-1 Hospitals Red Trujillo, 2021). Dissertation. César Trujillo University, 2021. Available at: <https://hdl.handle.net/20.500.12692/73839>.

13. Costantino C, Graziano G, Bonaccorso N, Conforto A, Cimino L, Sciortino M, et al. Knowledge, Attitudes, Perceptions and Vaccination Acceptance/Hesitancy among the Community Pharmacists of Palermo's Province, Italy: From Influenza to COVID-19. *Vaccines*. March 18, 2022;10(3):475.
14. WHO, UNICEF. Data for action: achieving high uptake of COVID-19 vaccines: gathering and using data on the behavioural and social drivers of vaccination: a guidebook for immunization programmes and implementing partners: interim guidance [Internet]. 2021 [quoted January 18, 2022]. Available at: <https://apps.who.int/iris/handle/10665/339452>.
15. Gadoth A, Halbrook M, Martin-Blais R, Gray A, Tobin NH, Ferbas KG, et al. Cross-sectional Assessment of COVID-19 Vaccine Acceptance Among Health Care Workers in Los Angeles. *Ann Intern Med*. June 15, 2021;174(6):882-5.
16. Puertas EB, Velandia-Gonzalez M, Vulcanovic L, Bayley L, Broome K, Ortiz C, et al. Concerns, attitudes, and intended practices of Caribbean healthcare workers concerning COVID-19 vaccination: A cross-sectional study. *Lancet Reg Health - Am*. May, 2022;9:100193.
17. Ehreth J. The value of vaccination: a global perspective. *Vaccine*. October, 2003;21(27-30):4105-17.
18. Bloom DE. The Value of Vaccination. En: Curtis N, Finn A, Pollard AJ, editores. *Hot Topics in Infection and Immunity in Children VII* [Internet]. New York, NY: Springer New York; 2011 [quoted september 5, 2022]. p. 1-8. (Advances in Experimental Medicine and Biology; vol. 697). Available at: [http://link.springer.com/10.1007/978-1-4419-7185-2\\_1](http://link.springer.com/10.1007/978-1-4419-7185-2_1).
19. Lin C, Tu P, Beitsch LM. Confidence and Receptivity for COVID-19 Vaccines: A Rapid Systematic Review. *Vaccines*. December 30, 2020;9(1):16.
20. European Centre for Disease Prevention and Control. Vaccine hesitancy among healthcare workers and their patients in Europe [Internet]. European Centre for Disease Prevention and Control. 2015 [quoted August 14, 2021]. Available at: <https://www.ecdc.europa.eu/en/publications-data/vaccine-hesitancy-among-healthcare-workers-and-their-patients-europe>
21. Dzieciolowska S, Hamel D, Gadio S, Dionne M, Gagnon D, Robitaille L, et al. Covid-19 vaccine acceptance, hesitancy, and refusal among Canadian healthcare workers: A multicenter survey. *Am J Infect Control*. september, 2021;49(9):1152-7.
22. Yilma D, Mohammed R, Abdela S, Enviale W, Seifu F, Pareyn M, et al. COVID-19 vaccine acceptability among healthcare workers in Ethiopia: Do we practice what we preach? *Trop Med Intern Health*. 2022;27:27-418.
23. AlKetbi LMB, Elharake JA, Memari SA, Mazrouei SA, Shehhi BA, Malik AA, et al. COVID-19 vaccine acceptance among healthcare workers in the United Arab Emirates. *IJID Reg*. December, 2021;1:20-6.
24. Qabool H, Hamid F, Sukhia R. Acceptance of SARS-CoV-2 vaccination and the associated factors among



- dental health care professionals: A cross-sectional survey. *Dent Med Probl.* January 3, 2022;59(1):21-6.
25. Zhang J, Dean J, Yin Y, Wang D, Sun Y, Zhao Z, et al. Determinants of COVID-19 Vaccine Acceptance and Hesitancy: A Health Care Student-Based Online Survey in Northwest China. *Front Public Health.* January 6, 2022;9:777565.
  26. Belingheri M, Roncalli M, Riva MA, Paladino ME, Teruzzi CM. COVID-19 vaccine hesitancy and reasons for or against adherence among dentists. *J Am Dent Assoc.* September, 2021;152(9):740-6.
  27. Verger P, Scronias D, Dauby N, Adedzi KA, Gobert C, Bergeat M, et al. Attitudes of healthcare workers towards COVID-19 vaccination: a survey in France and French-speaking parts of Belgium and Canada, 2020. *Eurosurveillance.* January 21, 2021;26(3):2002047.
  28. Andrus JK, Bandyopadhyay A, DanovaroHolliday MC, Dietz V, Domingues C, Figueroa JP, et al. The past, present, and future of immunization in the Americas. *Rev Panam Salud Pública.* 2017;1-4.
  29. de Quadros CA, Epstein D. Health as a bridge for peace: PAHO's experience. *The Lancet.* December, 2002;360:s25-6.
  30. CEPAL, OPS. Salud y economía: una convergencia necesaria para enfrentar el COVID-19 y retomar la senda hacia el desarrollo sostenible en América Latina y el Caribe [Internet]. 2020 jul [quoted september 14, 2022] p. 26. Report No.: Informe COVID-19. CEPAL-OPS. Available at: [https://repositorio.cepal.org/bitstream/handle/11362/45840/4/S2000462\\_es.pdf](https://repositorio.cepal.org/bitstream/handle/11362/45840/4/S2000462_es.pdf).
  31. OPS, OMS. CD59/INF/16 - A. Plan de acción sobre recursos humanos para el acceso universal a la salud y la cobertura universal de salud 2018-2023: Informe de progreso - OPS/OMS | Organización Panamericana de la Salud [Internet]. 2021 august [quoted september 15, 2022]. Available at: <https://www.paho.org/es/documentos/cd59inf16-plan-accion-sobre-recursos-humanos-para-acceso-universal-salud-cobertura>.
  32. OPS, OMS. CD59/INF/1 - Actualización sobre la COVID-19 en la Región de las Américas - OPS/OMS | Organización Panamericana de la Salud [Internet]. 2021 august [quoted september 15, 2022]. Available at: <https://www.paho.org/es/documentos/cd59inf1-actualizacion-sobre-covid-19-region-americas>.
  33. OPS, OMS. CD59/3 - Informe anual del Director de la Oficina Sanitaria Panamericana - OPS/OMS | Organización Panamericana de la Salud. Seguir trabajando para superar la pandemia de COVID-19 [Internet]. 2021 ago [quoted september 15, 2022]. Available at: <https://www.paho.org/es/documentos/cd593-informe-anual-director-oficina-sanitaria-panamericana>.
  34. Fares S, Elmnyer MM, Mohamed SS, Elsayed R. COVID-19 Vaccination Perception and Attitude among Healthcare Workers in Egypt. *J Prim Care Community Health.* January 1, 2021;12:21501327211013304.
  35. Shekhar R, Sheikh AB, Upadhyay S, Singh M, Kottewar S, Mir H, et al. COVID-19 Vaccine Acceptance among Health Care Workers in the United States. *Vaccines.* February 3, 2021;9(2):119.
  36. Wiysonge C, Alobwede S, de Marie P, Kidzeru E, Lumngwena E, Cooper S, et al. COVID-19 vaccine acceptance

- and hesitancy among healthcare workers in South Africa. *Expert Rev Vaccine*. 2022;21(4):549-59.
37. Betsch C, Schmid P, Heinemeier D, Korn L, Holtmann C, Böhm R. Beyond confidence: Development of a measure assessing the 5C psychological antecedents of vaccination. Angelillo IF, editor. *PLOS ONE*. December 7, 2018;13(12):e0208601.
  38. Fisk Rebeca. Barriers to vaccination for coronavirus disease 2019 (COVID-19) control:experience from the United States. *Glob Health Netw [Internet]*. 2021 [quoted september 21, 2022];5. Available at: <https://www.sciencedirect.com/science/article/pii/S2414644721000051#bib0008>.
  39. Khubchandani J, Bustos E, Chowdhury S, Biswas N, Keller T. COVID-19 Vaccine Refusal among Nurses Worldwide: Review of Trends and Predictors. *Vaccines*. February 2, 2022;10(2):230.
  40. Fakonti G, Kyprianidou M, Toumbis G, Giannakou K. Attitudes and Acceptance of COVID-19 Vaccination Among Nurses and Midwives in Cyprus: A Cross-Sectional Survey. *Front Public Health*. 2021;9:481.
  41. Eguia H, Vinciarelli F, Bosque-Prous M, Kristensen T, Saigí-Rubió F. Spain's Hesitation at the Gates of a COVID-19 Vaccine. *Vaccines* 2021. February 18, 2021;9:170.
  42. Gagneux-Brunon A, Detoc M, Bruel S, Tardy B, Rozaire O, Frappe P, et al. Intention to get vaccinations against COVID-19 in French healthcare workers during the first pandemic wave: a cross-sectional survey. *J Hosp Infect*. February 1,2021;108:168-73.
  43. Gadoth A, Halbrook M, Martin-Blais R, Gray A, Tobin NH, Ferbas KG, et al. Assessment of COVID-19 vaccine acceptance among healthcare workers in Los Angeles. *medRxiv*. November 19, 2020;2020.11.18.20234468.
  44. Wang K, Wong ELY, Ho KF, Cheung AWL, Chan EYY, Yeoh EK, et al. Intention of nurses to accept coronavirus disease 2019 vaccination and change of intention to accept seasonal influenza vaccination during the coronavirus disease 2019 pandemic: A cross-sectional survey. *Vaccine [Internet]*. October 21, 2020 [quoted august 14, 2021];38(45). Available at: <https://www.sciencedirect.com/science/article/pii/S0264410X20311750>.
  45. Sherman SM, Smith LE, Sim J, Amlôt R, Cutts M, Dasch H, et al. COVID-19 vaccination intention in the UK: results from the COVID-19 vaccination acceptability study (CoVAccS), a nationally representative cross-sectional survey. *Hum Vaccines Immunother*. June 3, 2021;17(6):1612-21.
  46. Pires C. Global Predictors of COVID-19 Vaccine Hesitancy: A Systematic Review. *Vaccines*. August 18, 2022;10(8):1349.
  47. Vaccination willingness for COVID-19 among healthcare workers: a cross-sectional survey in a Swiss canton. *Swiss Med Wkly [Internet]*. 13 de septiembre de 2021 [quoted april 12, 2022];151(37-38). Available at: <https://smw.ch/index.php/smw/article/view/3075>
  48. Kabamba Nzaji M, Kabamba Ngombe L, Ngoie Mwamba G, Banza Ndala DB, Mbidi Miema J, Luhata Lungoyo C, et al. Acceptability of Vaccination Against COVID-19 Among Healthcare Workers in the Democratic Republic of the Congo. *Pragmatic Obs Res*. October, 2020;Volume 11:103-9.

49. Paterson P, Meurice F, Stanberry LR, Glismann S, Rosenthal SL, Larson HJ. Vaccine hesitancy and healthcare providers. *Vaccine*. December, 2016;34(52):6700-6.
50. Betsch C, Bach Habersaat K, Deshevoi S, Heinemeier D, Briko N, Kostenko N, et al. Sample study protocol for adapting and translating the 5C scale to assess the psychological antecedents of vaccination. *BMJ Open*. March, 2020;10(3):e034869.
51. Al-Sanafi M, Sallam M. Psychological Determinants of COVID-19 Vaccine Acceptance among Healthcare Workers in Kuwait: A Cross-Sectional Study Using the 5C and Vaccine Conspiracy Beliefs Scales. *Vaccines*. June 25, 2021;9(7).

# Annexes

## ANNEX 1. Survey instrument for conducting the study



Survey on the knowledge, attitudes, and practices of health workers regarding COVID-19 vaccines in Latin America

Thank you very much for your interest in this survey. The purpose of the study is to document the knowledge, attitudes, and practices of health workers regarding coronavirus disease (COVID-19) vaccines in Latin American countries. A health worker is someone who performs activities whose primary purpose is to improve health in their respective communities. Only health workers will participate in this survey. We estimate that the questionnaire will not take more than eight (8) minutes to answer. Please read the consent form and, if you agree to participate, click Yes and continue with the survey.

**1. I confirm that I am a health worker [Yes/ No]**

☐ Yes      ☐ No

**IF YOU ANSWERED YES, PLEASE CONTINUE WITH THE SURVEY.  
IF YOU ANSWERED NO, THANK YOU VERY MUCH FOR YOUR INTEREST IN PARTICIPATING AND WE ASK YOU  
NOT TO CONTINUE FILLING THE SURVEY**

## **Informed consent**

**Study title:** Knowledge, attitudes, and practices of health workers regarding COVID-19 vaccines in Latin America.

**Researchers:** Pan American Health Organization (PAHO) - Comprehensive Family Immunization Unit - Department of Family, Health Promotion and Life Course: Tamara Rivera, Martha Velandia, Maite Vera, Dale Rhoda. Health Systems and Services Unit / Human Resources Unit for Health - Department of Health Systems and Services: Silvia Cassiani, Malhi Cho, Hernan Sepúlveda.

**Purpose:** To document the knowledge, attitudes, and practices of health workers regarding COVID-19 vaccines in Latin American countries, which will support the development and improvement of communication strategies and approaches for COVID-19 vaccines aimed at this priority group, with the objective of increasing vaccine uptake and improving confidence.

**Potential benefits:** the study aims to achieve better understanding of health workers' acceptance of COVID-19 vaccines, which will enable PAHO to support the development and improvement of communication strategies for COVID-19 vaccines and the development of public policies to increase the rate of vaccine acceptance, improve confidence and thus enable effective promotion of COVID-19 vaccination among the general population.

**Potential risks:** There are no known or expected risks from participating in this study. PAHO will share the results with ministries of health and professional associations using information consolidated at the regional level, so there is no possibility of tracing responses back to individual participants.

**Privacy protection:** The researchers listed on the first page of this form are the only people who will have access to the information that could link individual participants to their survey responses.

## **Consent**

I understand that I am being asked to participate in a PAHO/WHO study to answer questions about the knowledge, attitudes, and practices of health workers regarding COVID-19 vaccines in Latin America. I understand that it is my voluntary decision to participate in this study and/or withdraw from the study at any time. I will be provided with a summary of the survey results at the end of the study, should I request a copy. I understand what this study entails and freely agree to participate.

## **2. Country where you work**

---

**3. I have read the description of the study and consent to participate:**

**[Yes / No]**

- ☐ Yes ☐ No

*IF YOU ANSWERED YES, PLEASE CONTINUE WITH THE SURVEY.*

*IF YOU ANSWERED NO, THANK YOU VERY MUCH FOR YOUR INTEREST IN PARTICIPATING AND WE ASK YOU NOT TO CONTINUE FILLING THE SURVEY.*

**4. Sex**

- ☐ Female
- ☐ Male
- ☐ Other

**5. Age (years)**

---

**6. Ethnicity/race (choose only one option)**

- ☐ Afrodescendant
  - ☐ White
  - ☐ Indigenous
  - ☐ Mestizo (mixed Spanish-indigenous ancestry)
  - ☐ Other (please specify)
- 

**7. Sector where you work (sector to which you dedicate the most working hours; if you have several jobs with the same workload, please choose one)**

- ☐ Public
  - ☐ Private
  - ☐ Social security
  - ☐ Academia
  - ☐ Other (please specify)
-

**8. Workplace (according to your answer above, please select the place where you spend the most working hours; if you have several jobs with the same workload, please choose only one)**

- ☐ First-level care services (health centers, private clinics, company clinics, institutional clinics)
  - ☐ Care services at other levels of care (hospitals, clinics, polyclinics, laboratories)
  - ☐ State institutions (e.g., ministries or secretariats of health, social security)
  - ☐ Educational institutions (e.g., schools, colleges, universities)
  - ☐ Other (please specify)
-



**9. Profession (choose only one option)**

<ul style="list-style-type: none"><li><input type="radio"/> General practitioner</li><li><input type="radio"/> Specialist physician (clinical, surgical, emergency)</li><li><input type="radio"/> Nurse (University Degree)</li><li><input type="radio"/> Specialized licensed nurse (clinical, surgical, emergency)</li><li><input type="radio"/> Midwifery professional</li><li><input type="radio"/> Dentist /odontologist</li><li><input type="radio"/> Psychologist</li><li><input type="radio"/> Pharmacist</li></ul>	<ul style="list-style-type: none"><li><input type="radio"/> Professional in charge of environmental and workplace health and Hygiene</li><li><input type="radio"/> Public health professional</li><li><input type="radio"/> Public health professional</li><li><input type="radio"/> Physiotherapist</li><li><input type="radio"/> Dietician, nutritionist</li><li><input type="radio"/> Biologist, microbiologist, bacteriologist</li><li><input type="radio"/> Nurse technician</li><li><input type="radio"/> Nursing assistant</li><li><input type="radio"/> Other health technician</li></ul>
---	---

☐ Other (please specify)

---

**10. Do you have, or have you had, COVID-19?**

☐ Yes      ☐ No      ☐ Don't know

**11. Have you been tested to find out whether you have had COVID 19?**

☐ Yes      ☐ No      ☐ Don't know

**PLEASE SHARE WITH US HOW MUCH YOU AGREE OR DISAGREE WITH THE STATEMENTS BELOW.**

## 12. Attitudes towards vaccines

	Strongly agree	Agree	Disagree	Strongly disagree
a. Vaccines are important for my health.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Vaccination is a good way to protect myself from diseases.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. In general, vaccines are safe.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. In general, vaccines are effective.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Getting vaccinated is important for the health of others in my community.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. The information given to me by the health authorities (ministry or secretariat of health) is reliable and trustworthy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. The information my health care provider gives me is reliable and trustworthy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. In general, I do what my doctor or health care provider recommends regarding vaccines for me and my family.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### 13. Predisposition regarding vaccines

	Strongly agree	Agree	Disagree	Strongly disagree
a. Newer vaccines pose more risks than older vaccines.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I would recommend a new vaccine to my friends and family.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. I am concerned about the <b>mild adverse effects</b> that vaccines could cause me ( <i>symptoms that are easily tolerated and do not require medical treatment or intervention</i> ).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. I am concerned about the <b>serious adverse effects</b> that vaccines could cause me ( <i>signs or symptoms that make me unable to carry out my usual activities</i> ).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

#### 14. Health workers' attitudes towards COVID-19 vaccines

	Strongly agree	Agree	Disagree	Strongly disagree
a. The COVID-19 vaccine will protect me from severe forms of COVID-19.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I trust the scientific approval process for the COVID-19 vaccines available in my country.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Getting vaccinated against COVID-19 is or will be good for my health.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. I would recommend the COVID-19 vaccine to <b>eligible people</b> ( <i>criteria established by the Ministry of Health of each country, which may include, but is not limited to, essential frontline employees, seniors, people with an underlying medical condition that increases their risk of serious illness, pregnant women</i> ).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

#### 15. COVID-19 vaccine availability

	Yes	No
a. I know where to go to be vaccinated.	<input type="radio"/>	<input type="radio"/>
b. I have access to COVID-19 vaccination services.	<input type="radio"/>	<input type="radio"/>

**IF YOU ANSWERED "NO" TO THE QUESTION "I HAVE ACCESS TO COVID-19 VACCINATION SERVICES", PLEASE ANSWER THE FOLLOWING QUESTION:**

**16. It is difficult for me to access the vaccine against COVID-19 due to: (Please, leave a comment to answer with a complete sentence):**

---

**17. COVID-19 vaccine availability**

	Yes	No
I have received a COVID-19 vaccine.	<input type="radio"/>	<input type="radio"/>

**IF YOU ANSWERED "YES" TO THE QUESTION "I HAVE RECEIVED A COVID-19 VACCINE", ANSWER QUESTIONS 18 AND 19 .**

**IF YOU ANSWERED "NO", ANSWER QUESTION 20.**

**18. COVID-19 vaccine availability**

	Yes	No
<b>I have been able to receive COVID-19 vaccination in my workplace.</b>	<input type="radio"/>	<input type="radio"/>

**19. Which of the following doses of COVID-19 vaccine have you received? (Choose only one option)**

- ☐ Single dose (of a single-dose schedule)
- ☐ Single dose and booster dose/additional dose
- ☐ First dose (of a two-dose schedule)
- ☐ First and second doses (of a two-dose schedule)
- ☐ First dose, second dose, and booster/extra dose
- ☐ Two booster doses/additional doses in any schedule (single-dose or two-dose)

**20. When do you intend to get vaccinated against COVID-19? (Choose only one option)**

- ☐ As soon as I am eligible
- ☐ Not very soon, but maybe one day
- ☐ Never

**21. I do not have the complete vaccination schedule or the booster doses/additional doses against COVID-19 disease due to: (please, answer your reasons with a complete sentence, if applicable).**

---

**22. When do you intend to receive the next dose of COVID-19 vaccine? (please give your reasons as a full sentence, if applicable):**

- ☐ As soon as I am eligible
- ☐ Not soon, but maybe someday
- ☐ Never

**PLEASE ANSWER QUESTIONS 23 AND 24 IF YOU ANSWERED:  
 THAT YOU HAVE NOT RECEIVED ANY COVID-19 VACCINES  
 THAT YOU HAVE RECEIVED A SINGLE DOSE (OF A SINGLE-DOSE SCHEDULE)  
 THAT YOU HAVE RECEIVED A FIRST DOSE (OF A TWO-DOSE SCHEDULE)  
 THAT YOU HAVE RECEIVED THE FIRST AND SECOND DOSES (OF A TWO-DOSE SCHEDULE)**

**23. Please indicate your reasons for delaying or refusing COVID-19 vaccinations**

	Strongly Agree	Agree	Disagree	Strongly disagree
a. I still don't know enough about the vaccines available to make a decision.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I want to gain natural immunity to the virus that causes COVID-19.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. The available vaccines may have been developed too quickly or not thoroughly tested before approval.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. I believe that vaccines can cause the disease they were designed to prevent.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. I am concerned about the adverse reactions that have been seen when people get vaccinated.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**24. . Other reasons for delaying or refusing COVID-19 vaccination (please give your reasons as a full sentence):**

---

**25. The following factors contributed to my opinions on COVID-19 vaccines:**

	Strongly agree	Agree	Disagree	Strongly disagree
a. The speed with which vaccines were researched and developed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. The evolving scientific issues regarding SARS-CoV-2 that are constantly being discovered.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. The recommendations issued by scientists and international organizations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. The actions and opinions of my friends, family, and colleagues regarding vaccines.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. The actions and opinions of my religious leaders.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. The relationship between the proportion of vaccinated people with hospitalization and mortality rates.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. My own research on COVID-19 vaccines.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. The country in which the available vaccines were developed/manufactured.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. The information that I've seen on social networks (e.g., Facebook, Instagram, Twitter, TikTok, YouTube, WhatsApp).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



**26. Other factors that contributed to my opinions on COVID-19 vaccines (please describe/specify in the space below):**

---

**27. Health workers' attitudes towards the influenza vaccine**

	Strongly agree	Agree	Disagree	Strongly disagree
I would get the influenza vaccine if it were offered to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**28. If you disagree, what are the reasons? (Please give your reasons as a full sentence):**

---

**29. Health workers' attitudes towards the influenza vaccine**

	Strongly agree	Agree	Disagree	Strongly disagree
I would recommend the influenza vaccine to my friends and family.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**30. If you disagree, what are the reasons? (Please give your reasons as a full sentence):**

---

**31. Health workers' attitudes towards the hepatitis B vaccine**

	Strongly agree	Agree	Disagree	Strongly disagree
I would get the Hepatitis B vaccine if it were offered to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**32. If you disagree, what are the reasons? (Please give your reasons as a full sentence):**

---

**33. Health workers' attitudes towards the Hepatitis B vaccine**

	Strongly agree	Agree	Disagree	Strongly disagree
I would recommend the Hepatitis B vaccine to my colleagues.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**34. If you disagree, what are the reasons? (*Please give your reasons as a full sentence*):**

---

**35. If you have any additional comments about COVID-19 vaccines for health workers, please write them here:**

---

**Thank you for participating in this survey. Have a nice day.**

**For any questions or concerns, either before or after your participation, please feel free to contact:**

**Dra. Martha Velandia at +1 202-733-8269 or by at email [velandiam@paho.org](mailto:velandiam@paho.org)**

**Dra. Tamara Rivera at +1 246- 851-1802 or by email at [riveratam@paho.org](mailto:riveratam@paho.org)**

## ANNEX II. JOB CATEGORIES OF HEALTH WORKERS.

Classification of health professionals <sup>a</sup>	
<b>MEDICAL STAFF</b>	<p>General practitioner (1)</p> <p>Specialist (medicine, surgery, and emergency) (2)</p>
<b>NURSES AND MIDWIFERY PROFESSIONALS</b>	<ul style="list-style-type: none"> <li>○ Nurses (with university degree) (3)</li> <li>○ Specialized licensed nurse (clinical, surgical and emergency) (4)</li> <li>○ Midwifery professional (5)</li> </ul>
<b>OTHER HEALTH PROFESSIONALS</b>	<ul style="list-style-type: none"> <li>○ Dentist/odontologist (6)</li> <li>○ Pharmacist (8)</li> <li>○ Professional in charge of environmental and workplace health and hygiene (9)</li> <li>○ Physical therapist</li> <li>○ Dietician, nutritionist (13)</li> <li>○ Biologist, microbiologist, bacteriologist (14)</li> <li>○ Psychologist (7)</li> <li>○ Public health professional (10)</li> <li>○ Health administration management professional (11)</li> </ul>
<b>HEALTH TECHNICIANS</b>	<ul style="list-style-type: none"> <li>○ Nurse technician (15)</li> <li>○ Nursing assistant (15)</li> <li>○ Other health technician (17)</li> </ul>
<b>OTHERS</b>	

# ANNEX III. Overview of responses to Likert scale questions by sex, age, job category, ethnicity, work sector, and history of coronavirus disease (COVID-19)

## Respondents who agree or strongly agree with:

### Social Processes

The information given to me by the Health authorities (Ministry or Secretary of Health) is reliable and trustworthy. (Q12f)	93	93	92	92	93	93	94	92	94	93	95	92	94	92	91	95	88	94	87	93	93
The information my health care provider gives me is reliable and trustworthy (Q12g)	95	95	96	95	96	93	97	96	95	95	96	97	96	95	94	97	93	93	89	95	96
In general, I do what my doctor or health care provider recommends regarding vaccinations for me and my family. (Q12h)	97	97	98	97	98	97	98	99	97	97	97	95	98	98	96	98	97	97	97	97	98
I trust the scientific approval process of the available vaccines against coronavirus (COVID-19) in my country. (Q14b)	93	93	94	96	95	94	92	92	95	93	94	95	94	93	93	95	90	96	89	93	94
The recommendations issued by scientists and international organizations. (Q25c)	96	96	97	95	96	97	98	97	96	96	93	96	97	96	95	97	96	98	95	97	96
The actions and opinions of my friends, family, and colleagues about vaccines. (Q25d)	57	56	58	61	55	57	54	52	60	52	72	60	53	59	63	58	54	64	45	59	55
The information I have seen on social networks (Facebook, Instagram, Twitter, Tiktok , Youtube , WhatsApp, others). (Q25i)	39	38	40	47	39	37	32	31	46	35	56	39	32	44	47	42	31	35	26	42	36

### Thinking and Feeling

Vaccines are important to my health. (Q12a)	99	100	100	100	100	99	99	100	99	100	100	98	100	100	98	100	99	100	99	99	99
Vaccination is a good way to protect myself from diseases. (Q12b)	99	99	100	100	100	99	100	100	99	100	99	99	100	99	99	99	99	100	99	99	99
In general, vaccines are safe. (Q12c)	98	98	98	98	98	97	99	99	98	98	98	97	99	98	97	98	98	99	97	98	99
In general, vaccines are effective. (Q12d)	98	98	99	98	99	98	99	99	98	99	97	98	99	99	94	99	98	84	81	83	83
Getting vaccinated is important to the health of others in my community. (Q12e)	99	99	99	100	100	99	99	100	99	100	99	99	100	99	98	100	99	99	99	99	99
Newer vaccines pose more risks than older vaccines. (Q13a)	33	32	34	36	35	31	30	33	32	35	37	31	29	36	36	32	35	36	33	33	33
I am concerned about the minor adverse effects that the vaccines may cause in me. (Q13c)	52	53	49	59	53	52	43	41	59	52	68	59	43	58	64	54	47	49	48	55	49
I am concerned about the serious adverse effects that vaccines can cause in me. (Q13d)	75	76	72	78	75	72	74	77	72	73	74	80	71	78	73	73	78	81	72	75	74
The coronavirus (COVID-19) vaccine will protect me from severe forms of the COVID-19 disease. (Q14a)	97	97	99	96	97	99	98	98	97	98	94	98	98	97	96	97	98	99	97	97	98
Getting vaccinated against the coronavirus (COVID-19), is or will be good for my health. (Q14c)	98	98	98	97	98	98	98	99	97	98	97	98	99	98	96	98	97	99	98	97	98
I still don't know enough about the available vaccines to make a decision. (Q23a)	34	32	36	36	31	29	38	34	30	34	47	30	29	33	43	35	32	22	17	32	35
I want to gain natural immunity to the virus that causes COVID-19. (Q23b)	41	41	41	41	41	38	44	40	44	34	52	37	34	43	42	44	38	22	18	40	41
Available vaccines may have been developed too quickly or not thoroughly tested before approval. (Q23c)	53	52	58	50	55	55	59	59	49	55	50	54	56	50	60	56	49	37	47	54	53
I believe that vaccines can cause the disease they were designed to prevent. (Q23d)	30	30	28	33	28	28	28	32	30	21	45	31	25	31	35	33	24	16	15	37	35
I am concerned about the adverse reactions that have been seen when the vaccine is given. (Q23e)	59	61	50	58	59	60	57	64	55	53	72	58	53	59	67	62	54	35	43	57	62
The speed with which vaccines were researched and developed. (Q25a)	87	87	88	85	87	88	88	86	90	85	87	85	87	88	86	88	85	85	84	88	87
The scientific topics of SARS-CoV-2 that are constantly being discovered and evolving. (Q25b)	97	97	98	97	97	98	98	99	97	97	94	96	98	97	94	97	97	97	97	97	97
The relationship between the proportion of vaccinated with hospitalization and mortality. (Q25f)	87	86	89	88	85	84	90	91	84	86	85	84	88	87	83	85	92	93	85	86	88
My own research on COVID-19 vaccines. (Q25g)	83	83	82	85	82	84	81	83	85	81	82	80	81	85	81	83	82	84	81	83	83
The country in which the available vaccines were developed/manufactured. (Q25h)	77	76	79	78	74	80	76	74	82	73	83	74	72	81	82	79	71	78	68	79	75

### Motivation

I would recommend a new vaccine to my friends and family. (Q13b)	90	89	94	89	91	89	92	93	90	88	87	86	90	90	88	90	90	94	93	90	90
I would recommend the COVID-19 vaccine to eligible people. (Q14d)	97	97	98	97	96	97	98	98	97	97	93	98	98	97	95	97	97	97	98	96	98
I would get the influenza shot if it was offered to me. (Q27)	97	96	97	97	97	96	97	97	97	96	97	95	97	96	96	97	95	95	93	97	96
I would recommend the influenza vaccine to my friends and family. (Q29)	98	97	99	98	97	98	98	98	98	97	98	96	98	98	98	98	96	98	96	98	98
I would get the Hepatitis B vaccine if it was offered to me. (Q31)	99	99	99	99	99	99	98	99	99	99	99	97	99	99	96	99	99	100	99	99	99
I would recommend the Hepatitis B vaccine to my colleagues. (Q33)	100	100	100	99	100	99	100	100	100	99	99	98	100	100	99	100	99	99	99	100	99

#### Notes:

\*Cells marked in blue represent a statistically significant difference and whether the difference exceeds the 10-point distance threshold between the categories and the reference category.



























# KNOWLEDGE, ATTITUDES, AND PRACTICES OF HEALTH WORKERS REGARDING COVID-19 VACCINES IN LATIN AMERICA



In partnership with  
**Canada**