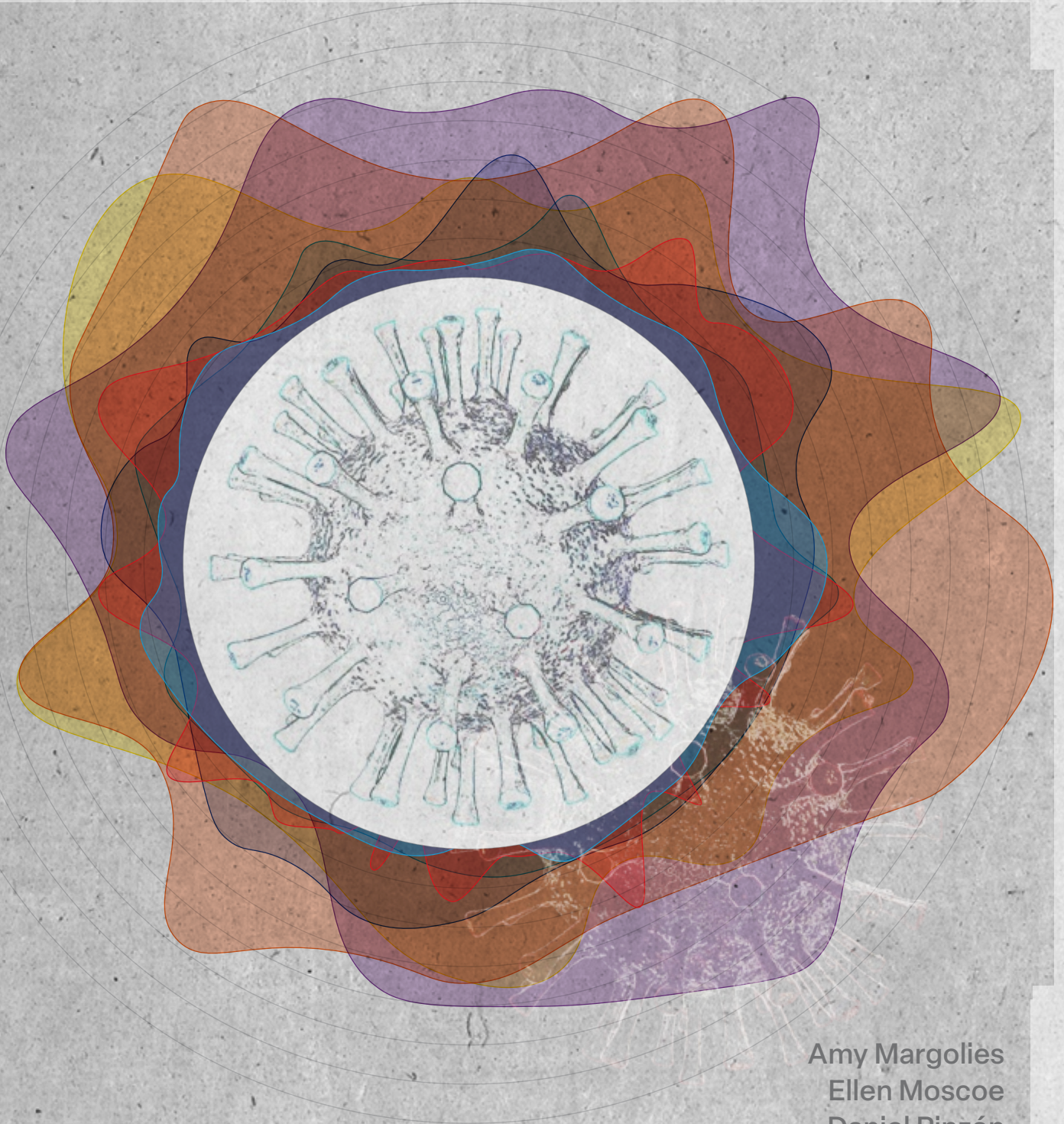
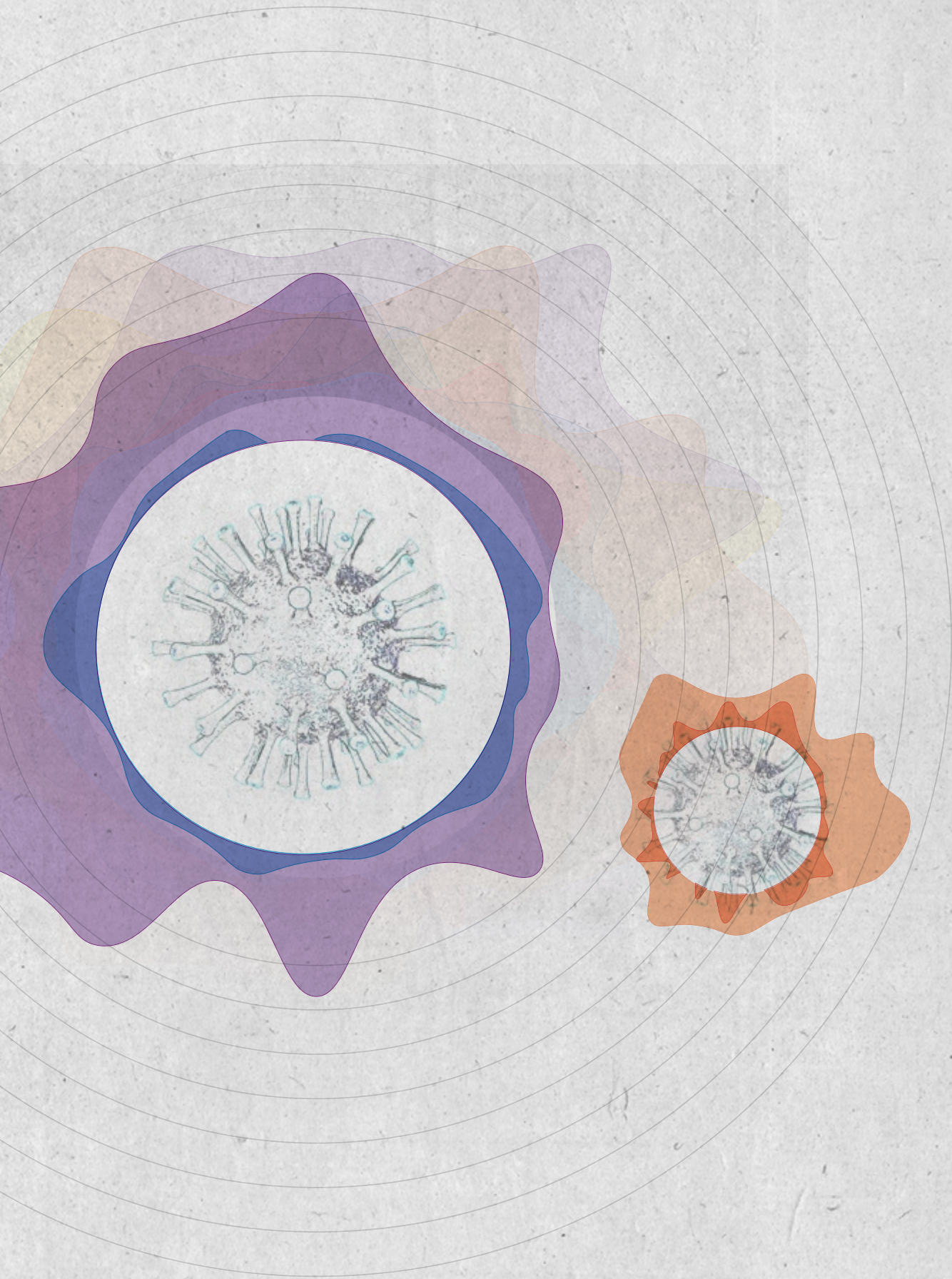


Behavioral insights for COVID-19 vaccine uptake in the Caribbean: rapid surveys from Belize, Haiti, and Jamaica



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Abstract

In the wake of the pandemic, the greatest obstacle to COVID-19 vaccination in the Caribbean is vaccine acceptance and uptake rather than supply. Social media surveys were conducted in three Caribbean countries to better understand the socio-behavioral drivers of vaccine acceptance and uptake to address ongoing vaccination challenges to prevent morbidity and mortality. Behavioral science made critical contributions to global COVID-19 vaccination campaigns. We wanted to understand vaccine intentions, behavioral biases and barriers limiting vaccine uptake to better target vaccination efforts and inform health communication campaigns. Surveys were administered via Facebook messenger chatbot, with data drawn from a non-probability sample of both vaccinated and unvaccinated respondents. Surveys were conducted in April-May 2022, with respondents from Belize (n=2,657), Jamaica (n=4,096), and Haiti (n=10,419). We focused on the 'movable middle', i.e., people who are still undecided about whether they wanted the

COVID-19 vaccine. Further, surveys tested the impact of different behaviorally informed messages on vaccine intention. Each country presented unique vaccination uptake challenges which required specific interventions or outreach strategies to change vaccination attitudes and behaviors. The responses of the movable middle provide insights into how this group could be targeted for improving uptake. Knowledge of this group can aid in targeting messaging, selection of trusted messengers and channels.

Introduction

Early in the pandemic the greatest challenge with COVID-19 vaccination was creating, producing, and distributing vaccines. Across the Latin American and Caribbean region, vaccine availability is no longer a primary constraint. Two years later, the greatest obstacle is vaccine acceptance and uptake rather than supply. This challenge is particularly acute in the Caribbean. National governments, the Pan-American Health Organization (PAHO) and the COVID-19 Vaccines Global Access initiative (COVAX) aided in the distribution of vaccines in Latin America and the Caribbean (LAC) region. Jamaica was the first country in the Caribbean to receive donations of COVID-19 vaccines from COVAX¹ for primary vaccinations². Booster doses first became available in many countries in LAC by August of 2021. By July 15, 2022, COVAX distributed 149 million doses in the Americas³. Despite these efforts, the variation in vaccination coverage in the region is breathtaking - over 90 percent of Chileans are fully vaccinated with the primary series as compared to barely two percent of Haitians⁴. Further, most Caribbean countries fall well below the World Health

Organization's (WHO) initial COVID-19 vaccination target of 70 percent coverage, and many are still below 50 percent coverage⁵. The WHO's revised COVID-19 vaccination strategy redoubled efforts to reach populations most at risk (WHO 2022). The new target aims for 100 percent coverage of health care workers and 100 percent coverage of the highest-risk populations with both the primary series and booster doses. Despite the new strategy, the challenge of vaccine acceptance and uptake persists in the Caribbean, testing national capacities to protect populations against the virus.

The World Bank undertook social media surveys to better understand the socio-behavioral drivers of vaccine acceptance and uptake to address ongoing vaccination challenges to prevent morbidity and mortality from COVID-19 in the region. Due to the global nature of the problem, concerns about vaccination must be addressed at scale. Social and behavior change communication (SBCC) interventions and campaigns are a strategy employed by governments, non-profit

1 <https://www.paho.org/en/news/15-3-2021-jamaica-becomes-first-country-caribbean-receive-covid-19-vaccines-through-covax>.

2 Primary vaccination refers to the full vaccination series for one vaccine type (i.e., two vaccinations for Pfizer, one for Johnson & Johnson, etc.). The primary vaccination series is completed prior to receiving a booster dose.

3 <https://www.as-coa.org/articles/timeline-tracking-latin-americas-road-vaccination>.

4 Our World in Data, October 20, 2022.

5 Trinidad and Tobago, Dominica, Bahamas, Saint Lucia, Grenada, Saint Vincent and the Grenadines, Jamaica, Haiti (Our World in Data, October 20, 2022).



organizations, and others to help shift attitudes on vaccination. During the pandemic, SBCC campaigns were deployed via social media to reach audiences while avoiding the risk of transmitting the virus through in-person events. More than 4.1 billion adults use social media and instant messaging services across the globe, and participation is rapidly growing in low and middle-income countries which provides an opportunity for communication-based strategies for public health-based socio-behavioral interventions. This underscores the power of social media as a platform to deliver important behaviorally informed messages. It also raises the question of which messages are more salient and effective. The vaccine acceptance and uptake surveys in the Caribbean were designed to leverage this social media platform and to test messaging using different behavioral approaches to identify the most effective framing. The WHO Technical Advisory Group on behavioral insights decided that strategies to improve vaccine acceptance should focus on ‘creating a conducive enabling environment, harnessing social influencers and taking measures to increase the motivation of people to get fully vaccinated’ (WHO 2020).

The eMBed approach is a three-step process and is based on a conceptual framework for vaccine uptake founded in the vaccine acceptance literature (eMBed 2021). This framework outlines epidemic, community and

individual-level factors that influence proximate determinants of vaccination intentions. Epidemic level factors include prevalence, severity, and transmission dynamics of COVID as well as the effectiveness and safety of vaccines. Community level factors cover the health system and social norms, and individual factors encompass health status and history, health system experience and education and income status. While epidemic, community and individual level factors are important and influence the proximate determinants of vaccine intentions, the eMBed approach focuses on socio-behavioral determinants. These include the role of behavioral biases and barriers that influence those proximate determinants as well as those that directly affect vaccine uptake.

Behavioral science has made critical contributions to global vaccination campaigns for COVID-19.

We wanted to understand vaccine intentions, behavioral biases and barriers limiting vaccine uptake so we can better target vaccination efforts and lead successful communication campaigns. The challenges faced by policymakers in addressing barriers to vaccination such as the intention-action gap and building vaccine confidence require recommendations rooted in data based on how people think, act and feel in regard to COVID-19 vaccination (The World Bank/UN 2021). Detailed data collection was required to gather these

perspectives from countries in the Caribbean region. This work was part of a portfolio of surveys developed by the Poverty and Global Practice Mind, Behavior, and Development group (eMBeD), in collaboration with the Development Impact Department (DIME), Health, Nutrition & Population Global Practice (HNP), Poverty & Equity Global Practice (POV), and External & Corporate Relations (ECR) of the World Bank and supported financially by the World Bank and the Alliance for Advancing Health Online.

The eMBeD approach involves using behavioral diagnostics to inform COVID-19 communication strategies, including measuring vaccine intentions, beliefs, norms, access, trust, and behaviors. This is followed by testing the impact of different message framings to promote vaccination on vaccine intentions. The final step, where applicable, is to design customized support to aid country partners in improving vaccination campaigns, including technical assistance on communication strategies, capacity building and other behavioral solutions.

The objective of this report is to synthesize the results of three social media surveys that measured COVID-19 vaccine attitudes and acceptance in the Caribbean (Haiti, Jamaica, Belize) in the first half of 2022 to provide insights into improving vaccine outreach and uptake in the Caribbean. We focused on the results of the ‘movable middle’, i.e., people who were still undecided about whether they wanted to receive a COVID-19 vaccine. Further, the surveys tested the impact of different behaviorally informed messages on vaccine intention, whose results are reported here. We present the results of recent rapid social media surveys in these countries that explore COVID-19 vaccine attitudes and acceptance rates, including experiments with vaccine messaging to explore country specific constraints and opportunities to improve vaccine outreach.

The movable middle is highlighted, as this group provides valuable input into how vaccine acceptance and uptake could be improved among those who have not made up their minds. The moveable middle is significant as this represents the remaining portion of the current population that can still be persuaded to vaccinate, with the least required effort. This survey approach was designed by the eMBeD behavioral unit at the World Bank and aims to use COVID-19 diagnostics to inform communication strategies and support country partners in improving vaccine uptake. The evidence from these studies informs country interventions. In Belize, it set the groundwork for technical assistance work to develop new outreach strategies and to adapt current vaccine campaigns.



Methods

Surveys were administered via Facebook messenger chatbot and the data was drawn from a non-probability sample. In each country, the survey sample was drawn from all Facebook accounts for users over 18 years of age, users self-selected by clicking the survey link to the questionnaire in a Facebook advertisement. Survey weights were used to aid in representing each country's population across demographic indicators using the population distribution from the Demographic and Health Surveys or other nationally representative data. The Facebook ads targeted pre-defined demographic groups (based on age, gender, and geographic region) to mirror the country's populations. To incentivize participation, entered respondents could win a gift card. The total sample was composed of both vaccinated and unvaccinated respondents who opted to take the survey.

The Caribbean eMBeD surveys were adapted from vaccine hesitancy questionnaires developed by the Mind, Behavior and Development Unit at the World Bank. These surveys were designed to better understand vaccine acceptance and hesitancy and to test behavioral messages to improve uptake of COVID-19 vaccines. The questions also covered vaccine attitudes, trust in institutions and messengers and issues of vaccine access. Annex 2 contains the complete eMBeD questionnaire. This allowed us to describe levels of intention

across countries and to characterize and describe the responses of the 'movable middle', or the segment of the population that was still unsure about vaccination. We undertook a process to adapt the questionnaires beginning with a literature review and followed by a comparative analysis of the questions asked in the major surveys focused on COVID-19 vaccine hesitancy at the time; including the UNICEF Vaccine hesitancy survey, the Johns Hopkins COVID dashboard/UMD CITS, and the study of PAHO healthcare workers and categorized and compared survey questions with the eMBeD survey across thematic domains: 1) vaccine status and intention; 2) social norms and behaviors; 3) reasons for hesitancy or acceptance (motivation); 4) knowledge, opinions and attitudes; and 5) structural and practical barriers to vaccination (access). We used this process to identify gaps and to adjust the wording of survey questions to our needs.

In each country, clusters were selected based on demographic characteristics such as age, sex and region and appropriate population weights were applied. In Belize, 24 clusters were sampled based on age, gender, and region. Population weights were based on region, age and gender from the Statistical Institute of Belize through the Facebook ads. The survey in Belize ran from April 21 to May 9, 2022. The final sample of completed surveys was 2,657 respondents

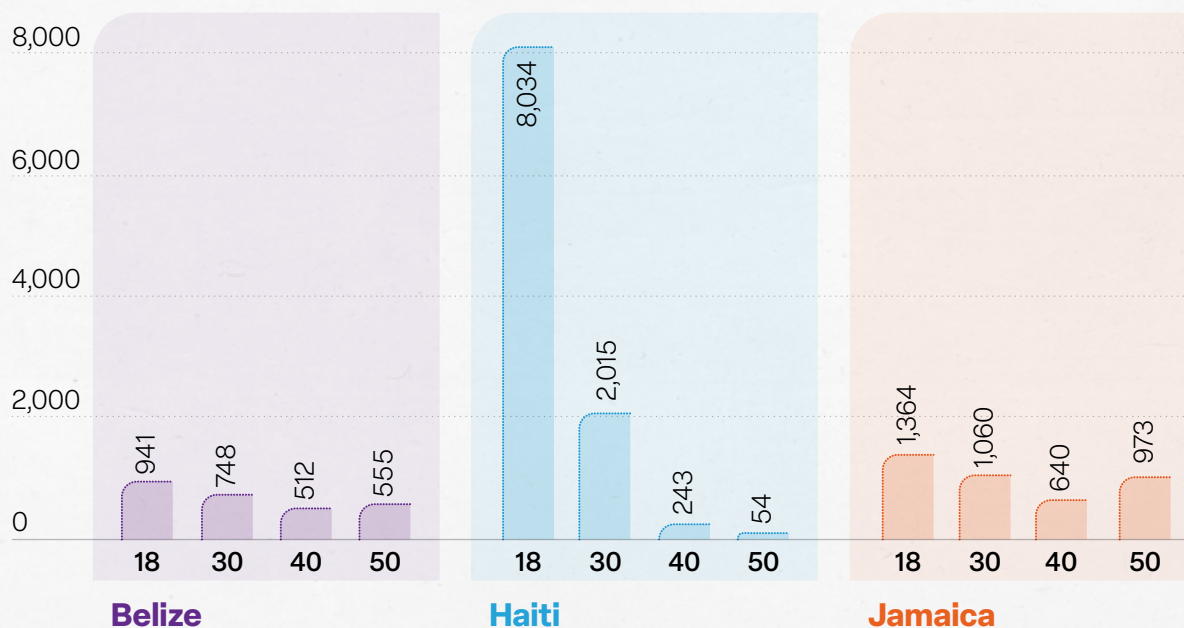
from a total of 3,142 that started the survey. In Jamaica, the sample was composed of 16 clusters based on age, gender and region. Population weights were based on region, age and gender from the Statistical Institute of Jamaica. As in Belize, the survey was administered via Facebook messenger chatbot and respondents were recruited with Facebook ads with a voucher incentive. The final sample had 4,096 completed surveys of 5,155 that were started. The survey ran from April 21 through May 23, 2022. The survey in Haiti sampled 4 clusters based on gender and region. Population weights were based on region and gender from the Institut Haïtien de Statistique (IHSI) through the Facebook ads⁶. The survey was conducted from April 21 through May 4, 2022. Of 12,685 people

that started filling out the surveys through the messenger app, 10,419 completed their data.

Generally, in all three countries the surveys attracted more young people (18-39 years of age) than older people (age groups of 40 years and above). This is to be expected as social media users tend to be younger (see Limitations section). Survey respondents in these countries also tended to have higher levels of education, secondary education or above. In Belize and Jamaica, respondents were more likely to be female, in contrast with Haiti where more men responded to the survey. Further information on samples by age, education, gender, and region for each country surveyed can be found in Box 1. Descriptive and inferential statistical analyses were conducted in Stata 17.

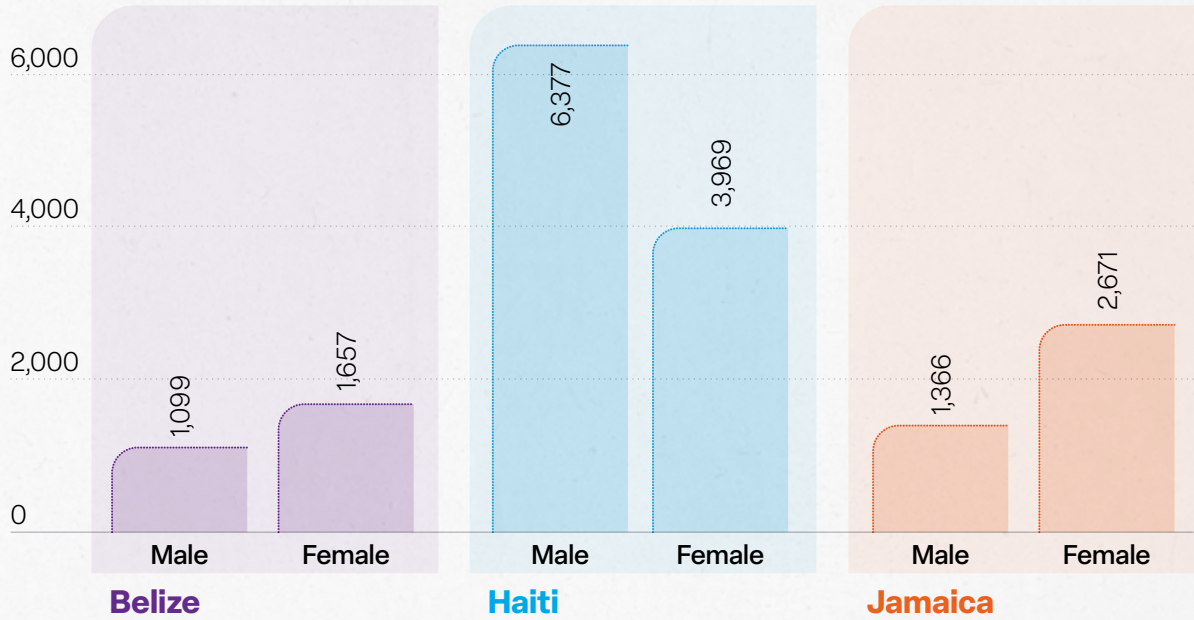
Box 1. **Survey samples by country**

Age

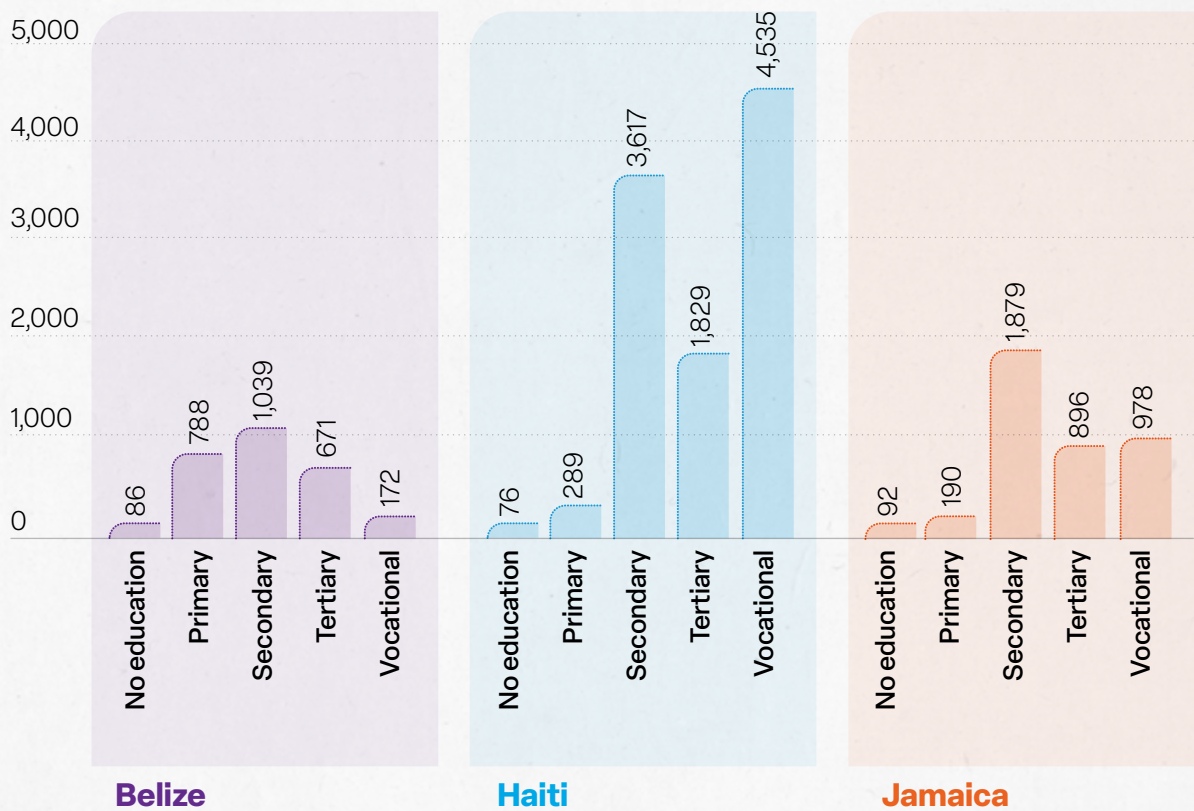


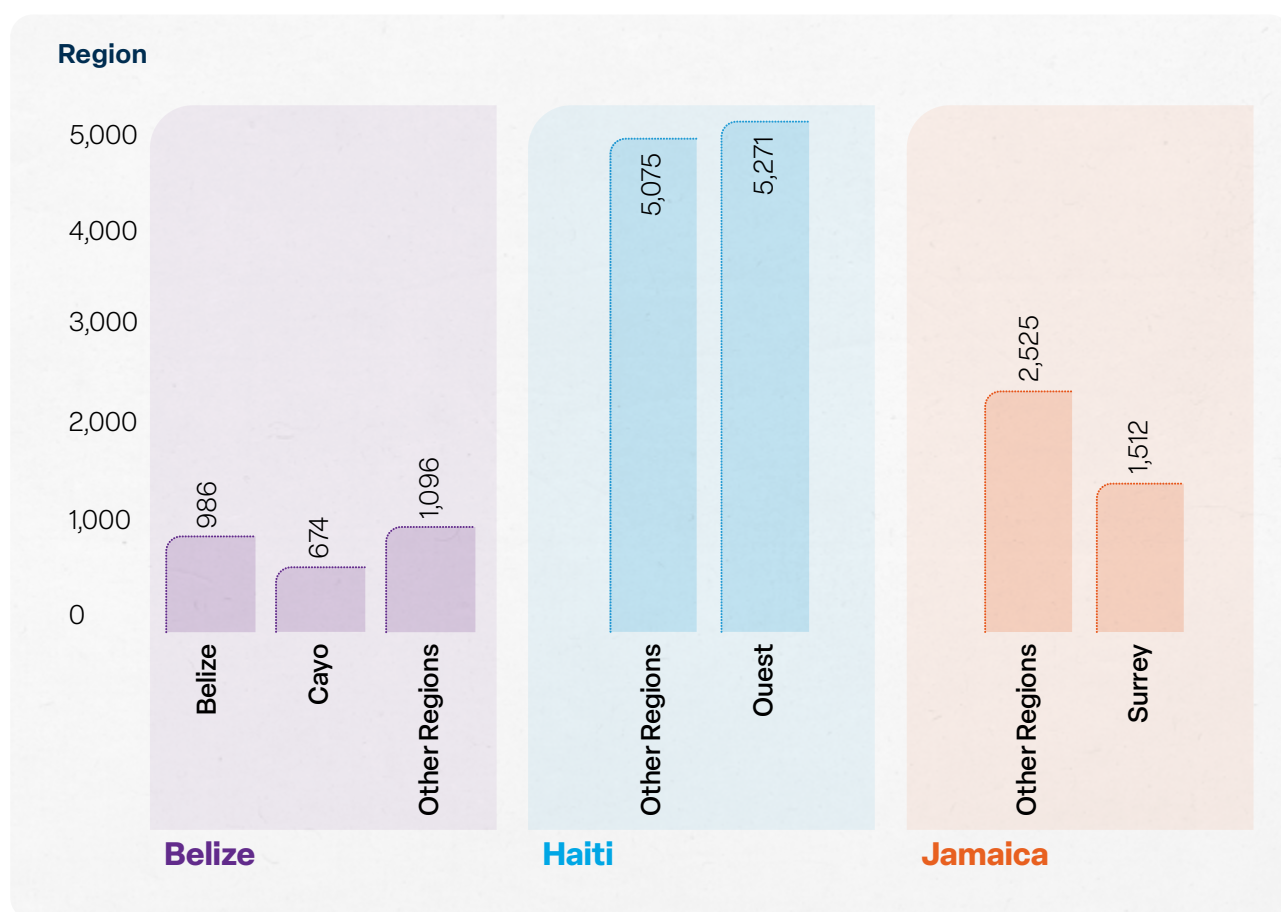
⁶ It is important to note that the survey in Haiti was conducted at a time of political disruption, growing insecurity, and deteriorating socio-economic situation.

Gender



Education





The ‘movable middle’, or those who were unsure or had not yet decided whether to receive a COVID-19 vaccine, are a key group to understand as they are potentially persuadable to be vaccinated.

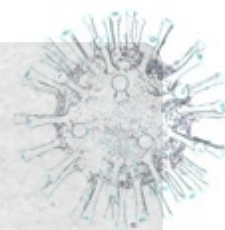
The movable middle was defined in our analysis as those respondents who self-declared as ‘undecided’ or ‘unsure’ to whether they would receive the COVID-19 vaccine/s. This definition excluded individuals who were against vaccination in general, as the assumption is those people may not be interested in changing their minds about the COVID-19 vaccines. This group had slightly different demographics than the full sample of the social media surveys. The movable middle had a similar sex composition but was younger (63 percent were in the 18-30 age group as compared to 49 percent) and more respondents had a

vocational school education (37 percent versus 25 percent) than the entire population of the surveys. Across the three countries, this group was slightly less vaccinated against diseases other than COVID-19 (-5 percent).

Ethical approval

Protocols for the protection of human subjects were obtained from a research ethics review by Health Media Lab Institutional Review Board on October 20 – 22, 2021. Data from the Facebook messenger survey was sent to Google Cloud. Data was deidentified and kept in secure servers. Ownership of the data is retained by the World Bank and is managed following World Bank policies on data management and privacy.

Results



Vaccination coverage among respondents

Survey respondents were more vaccinated than the rest of the population. In Belize, 90 percent of respondents had received at least one dose of a COVID-19 vaccine as compared to 60 percent of the Belizean population at the time of the survey. In Jamaica, 54 percent of survey respondents were vaccinated as compared to 26 percent of the rest of the Jamaican population. In Haiti, the general population is only 2 percent vaccinated as compared to 26 percent of the survey sample⁷. Vaccination status showed little variation by demographic characteristics such as region, sex, age or education in Belize.

In Jamaica, vaccination rates varied by age and education. A higher percentage of older adults (61 percent for adults 40-49 years of age, 68 percent for those 50+ years of age) were vaccinated as compared to younger adults (43 percent for 18-29 years, 45 percent for 30-39 years). Respondents in Jamaica with primary or tertiary education were more vaccinated than those with no education, vocational or secondary education. There were small but not meaningful differences by demographic characteristics in Haiti. Ethnic differences in vaccination status only varied in Belize, where the self-identified

Maya and Mestizo respondents had higher vaccination rates than the Garifuna ethnic group. A small number of respondents in Jamaica self-identified as healthcare workers (HCWs) took the survey (n=95) while a larger sample did so in Haiti (n=1,204). In Haiti, HCWs were slightly more vaccinated than non-healthcare workers. Thirty-three percent of these respondents reported being vaccinated against COVID-19 as compared to 23 percent of those who were not in the healthcare sector. By healthcare profession, doctors were most vaccinated (44 percent) in contrast to community health workers and pharmacists (36 percent) or nurses (34 percent).

Booster coverage among survey participants was very low despite booster doses becoming available in Belize and Jamaica as early as late 2021. A third of vaccinated respondents in Belize had received a booster. Among the vaccinated in Jamaica, only 13 percent reported receiving a booster dose. In Haiti, only 5 percent of survey respondents had received 3 shots.

Access to specific vaccine types may have influenced vaccination uptake among respondents. In Jamaica and Belize, 2 in 10 vaccinated respondents said the type of vaccine

⁷ Our World in Data, October 20, 2022.

influenced whether they got vaccinated. The principal reasons for interest in a specific vaccine type varied, including perceived safety of the technology (17 percent in Belize and Jamaica), effectiveness (16 percent in Jamaica) and recommendation by a healthcare worker (16 percent in Belize). However, many of these respondents did not have a choice of vaccine type when they were vaccinated (1 in 3 in Belize did not have a choice of vaccine type, and 1 in 5 in Jamaica did not choose a vaccine type).

Vaccine intentions

The vaccine intention was examined for 1) primary vaccination and 2) boosters.

The survey also allowed for a breakdown of vaccination intention by demographic characteristics such as region, age, gender, and education and profession. For the primary vaccination series, intention to vaccinate in Haiti was the lowest among the three countries – only 17 percent of unvaccinated Haitians in the survey said they planned to get vaccinated, and another 35 percent were unsure about vaccination.

Among those who received only one shot of the primary vaccination series⁸, the main reasons to not get the second dose of the vaccine showed a consistent pattern across countries: missing appointments, previously experienced side effects and perceived lack of eligibility. Missing the appointment for the second shot was a notably common problem (Belize – 39 percent, Jamaica – 34 percent, Haiti – 24 percent). However, the reason for missing the appointment was not because people were too busy (Haiti – 9 percent, Jamaica – 9 percent, Belize – 8 percent). In addition,

a surprising number of people did not think they were eligible for the second shot, particularly in Haiti and Jamaica (Haiti – 31 percent, Jamaica – 20 percent, Belize – 9 percent). Some avoided a second shot due to previously experienced side effects (Belize – 19 percent, Haiti – 14 percent, Jamaica – 6 percent). Overall, most respondents knew how to get the second dose, as only small percentages were unsure how to receive it (Jamaica – 8 percent, Belize – 5 percent, Haiti – 1 percent). Only a few respondents did not receive the second dose because they thought they were already protected (Haiti – 9 percent, Belize – 8 percent, Jamaica – 3 percent).

Most respondents vaccinated with one or two doses of a vaccine did not intend to receive a booster dose.

Among this vaccinated but not boosted group, less than half planned to get a booster (49 percent in Belize, 47 percent in Jamaica, 44 percent in Haiti). These differences varied by education level, but the trends across countries were not consistent. In Haiti, respondents with no education had low intention to boost – 57 percent did not plan to get a third shot once it became available, as compared to those with secondary education (23 percent). This was the opposite in Jamaica, where those with no education were more likely to plan to get a booster shot (59 percent). Generally, the younger ages reported lower intention to boost than older cohorts, the 18-30 group reported the lowest intention in Belize, Jamaica, and Haiti (45, 44 and 43 percent). There were very small differences by sex in booster intentions in Belize and Jamaica, but in Haiti men had higher booster intentions than women (48 percent as compared to 37 percent). Healthcare workers in Haiti survey reported only slightly higher intention to be boosted than those not in the healthcare sector (46 percent versus 42 percent).

⁸ Note that the sample sizes for the respondents who received only one dose and not a second dose were small (Jamaica=114, Haiti=364, Belize=133) as compared to those who had two doses but were not boosted (Jamaica=1698, Haiti=872, Belize=1503).

There were different reasons for not getting the booster as compared to the second shot – people were more likely to think they were already protected and did not need a booster.

Others did not think they were eligible for the booster yet. Respondents were more likely to believe they were already protected against COVID if they were vaccinated but had not received the booster (Belize – 32 percent, Jamaica – 29 percent, Haiti – 29 percent). This is notably higher as compared to those who had not completed the primary series and only received a first vaccination dose but not the second. In Haiti and Jamaica, more than a quarter of respondents did not believe they were eligible for a booster (28 percent and 24 percent), while in Belize only 14 percent had this impression. A small but not insignificant number of people in each country were avoiding the booster due to previous side effects (Haiti – 10 percent, Belize – 9 percent, Jamaica – 6 percent).

Many parents - even parents who are vaccinated themselves - do not intend to vaccinate their younger children. There was particularly low intention to vaccinate children in Haiti. In Jamaica and Belize, parents' vaccination beliefs were aligned with parental vaccination status. More than half of vaccinated parents intended to vaccinate their children in Jamaica and Belize (Jamaica - 51 percent, Belize - 56 percent). Among unvaccinated parents in Jamaica, only 17 percent would vaccinate their children and in Belize, only 13 percent. This trend contrasted with data from Haiti, which showed few parents wanted to vaccinate children under 12 even if the parents were vaccinated. Among unvaccinated, only 19 percent plan to vaccinate their children. While the rate for vaccinated parents was higher, at 34 percent, it is still low.

There was a group of people in each country, the movable middle, who were unsure about vaccination and who are open to changing

their minds about the vaccine (Haiti – 78 percent, Jamaica – 69 percent, Belize – 54 percent). The most common reasons across the three countries that people who were unsure about vaccination gave that could affect their decision were if the vaccine was necessary for social activities, if health workers recommended it or if they had a sick family member.

Most people who did not plan to vaccinate said nothing will change their minds about vaccination (Belize – 96 percent, Jamaica – 72 percent, Haiti – 52 percent). In contrast, a smaller percentage of the movable middle (Belize – 41 percent, Jamaica – 28 percent, Haiti – 22 percent) was intransigent about vaccination.

There were also notable differences in relation to what could potentially change their minds about vaccination between the movable middle compared those of respondents who did not plan to vaccinate. Overall, a quarter of the movable middle said they would change their plans if vaccination was necessary for social activities (Belize – 12 percent, Haiti – 26 percent, Jamaica - 25 percent), as compared to respondents who did not plan to vaccinate (Belize – 1 percent, Haiti – 14 percent, Jamaica – 7 percent). Health worker recommendations were not important motivating factors for those without vaccination intention (Belize – 0 percent, Haiti – 9 percent, Jamaica – 3 percent), while the movable middle was potentially more influenced by the opinion of healthcare workers (Belize – 13 percent, Haiti – 15 percent, Jamaica - 12 percent).

Among the vaccinated in Belize and Jamaica, approximately one fifth of respondents said the vaccine type affected their decision to vaccinate. This is even though many of them did not have a choice of vaccine (33 percent in Belize, 20 percent in Jamaica). Safety of the vaccine technology was the second most

common reason for choosing a vaccine type (17 percent in both countries).

The most noted benefit of the vaccine was self-protection among both unvaccinated and vaccinated people.

Among the vaccinated in Jamaica, Belize, and Haiti, close to two-thirds of respondents believe protecting themselves is the most important benefit of the vaccines.

The unvaccinated feel similarly (Haiti – 50 percent, Jamaica – 30 percent, Belize – 22 percent), as do older adults over 50 (Jamaica – 62 percent, and Belize – 63 percent). However, a significant portion of unvaccinated people do not believe there are any benefits of the vaccine at all (Belize – 48 percent, Jamaica – 38 percent, Haiti – 28 percent). Few of the unvaccinated see the vaccine as a critical way to resume interactions (Jamaica – 16 percent, Haiti – 13 percent, Belize – 12 percent).

The movable middle, however, was more interested in self-protection and was less likely to report that they did not see any benefit of vaccination.

The largest difference was seen in Belize, where only 38 percent of the movable middle felt there were no benefits to the vaccines as compared to only 78 percent of those who did not intend to vaccinate. In terms of self-protection, in Belize 23 percent of the movable middle noted this vaccination benefit, while only 9 percent of those without vaccination intention felt similarly. In Haiti, 44 percent of the movable middle emphasized the need to protect themselves as compared to 27 percent of those who did not intend to vaccinate and in Jamaica, 26 percent of the movable middle valued self-protection as contrasted with 8 percent of those lacking vaccination intention. Likewise, most of the movable middle agreed with the statement that “everyone should get a vaccine to protect others” (83 percent) but were also highly likely to agree that they would “wait for others to get the

vaccine first” (81 percent). The discrepancy in these responses between the movable middle and those who did not intend to vaccinate was largest in Belize, where 76 percent of the movable middle supported the statement on the need to protect others in contrast to only 27 percent of those without vaccination intention.

Risk behaviors and vaccine access

Mask wearing behaviors were most consistent in Jamaica, while in Haiti and Belize a quarter to a third of respondents decreased masking after vaccination.

Masking intention was examined to explore the persistence of risk mitigation behaviors and to see whether vaccination would alter these practices. In Jamaica, vaccination status did not affect mask wearing. Most people continued with same masking behavior as before being vaccinated. Vaccinated respondents overwhelmingly continued to wear masks after vaccination, revealing strong risk mitigation practices among this group (74–86 percent continued as before, depending on how many shots they received). In Haiti, a quarter of people reduced mask wearing after vaccination. In Belize, it was more common to reduce mask wearing after vaccination, only half of vaccinated respondents maintained the same mask wearing as before. A third of Belizean respondents reduced mask wearing after vaccination. In broader context, however, face mask use and frequency of use has been documented to be on the decline in some countries due to ‘pandemic fatigue’ and decreased perception of risks of disease (MacIntyre 2021).



Photo: Dominic Chavez / World Bank

A portion of the unvaccinated reported issues with accessing vaccines, particularly among individuals who intended to get vaccinated.

Haiti had the largest group of people reporting access issues. Thirty-three percent of unvaccinated people who intended to be vaccinated had problems with vaccine access. The most common reason reported for issues with access was the vaccination location or problems with registration, a busy vaccination site or vaccine preference. Some of the unvaccinated in Belize and Jamaica had problems accessing vaccines, the most common issues being: they were too busy to get vaccinated, they preferred a specific vaccine type, the vaccination site was overcrowded and other logistical issues. In Belize and Jamaica, the age group 50+ and older was the most likely to experience barriers to the vaccine and the most common reason was that personal commitments prevented from accessing the vaccination site.

In terms of access problems for the vaccine, the movable middle was less likely to say being too busy was a problem (Belize – 24 percent vs 45 percent, Haiti – 31 percent vs 33 percent, Jamaica – 20 percent vs 51 percent). Overcrowding was an issue in Jamaica and Belize (Belize – 27 versus 0 percent, Jamaica – 20 percent versus 11 percent). Vaccine preference was less of a deciding factor among the movable middle as compared to those without vaccine intention, except for Jamaica where nearly a third of the movable middle (28 percent) cited vaccine preference as an issue as compared to only 12 percent of those who did not plan to vaccinate. A significant percentage of the movable middle believed that getting sick was outside their locus of control and it was inevitable they would get COVID (59 percent). Additionally, most of the movable middle said they would wait for others to get the vaccine

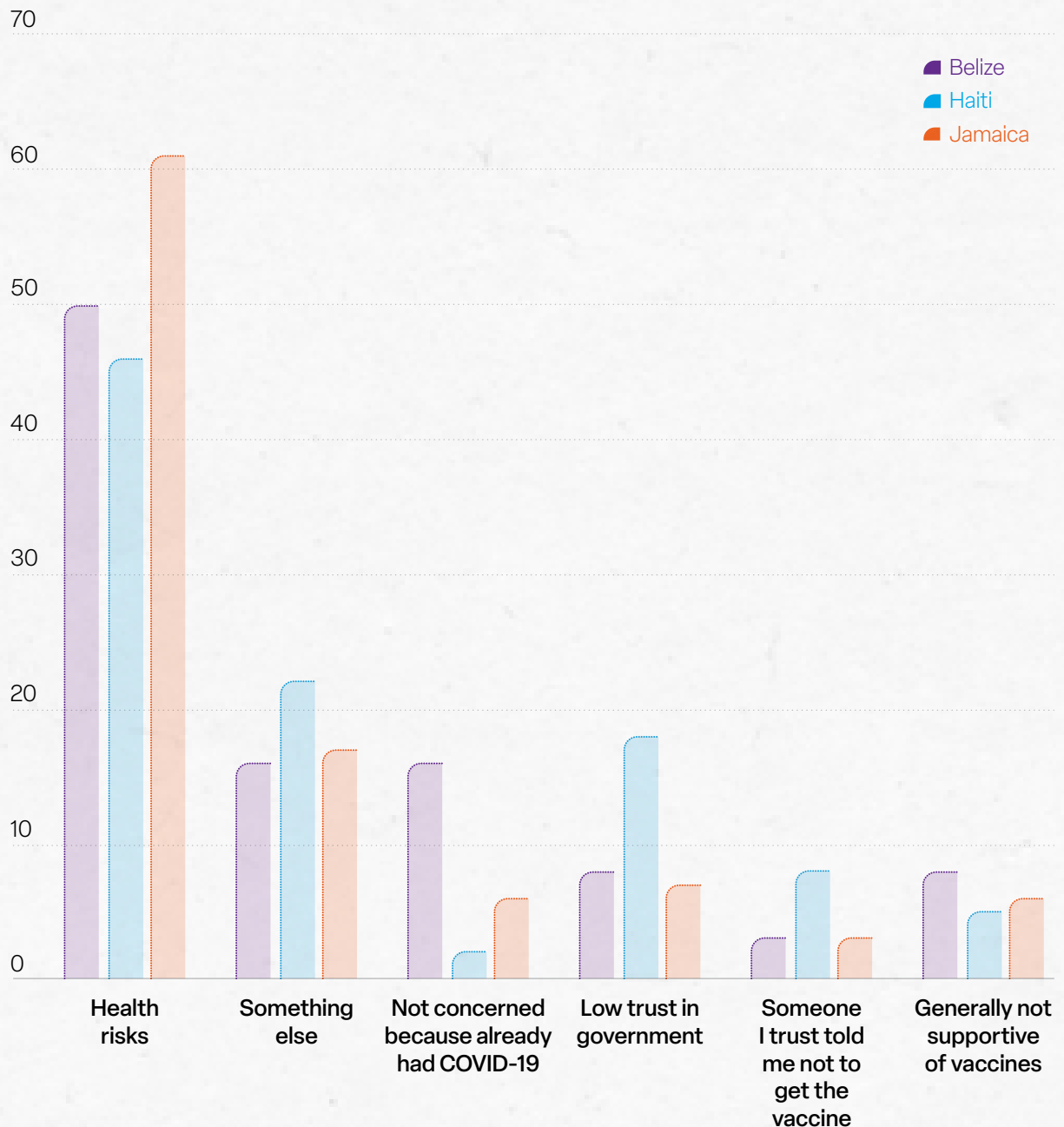
first (81 percent) and believe there will be other effective treatments soon (85 percent).

Vaccination concerns

Health risks were the overwhelming vaccine concern across all three countries (Figure 1).

Following this, low trust in government was a more common response in Haiti (18 percent) than in Jamaica or Belize (8 and 7 percent respectively). Between 15-20 percent of people in each country said “something else” as their concern. Unfortunately, due to the structure of the survey we do not have further information about those other concerns. Very few people said they were anti-vaccination or against vaccines in general. There were similar concerns about vaccines among the unvaccinated who were unsure about vaccination or who did not want to be vaccinated. The primary concern of the unvaccinated were also potential health risks, and the secondary concerns varied by country.

There were few notable differences in vaccine concerns by age, sex, region, or education in the three countries. A greater portion of men in Belize were concerned about health risks than women (55 versus 44 percent) and had vaccine concerns related to low trust in government (12 percent versus 3). There were no geographical differences by region except for Belize. Concerns about health risks were higher in Belize City than Cayo province (55 and 42 percent respectively). The only difference by educational background was that a greater portion of those in vocational school were concerned about health risks (Belize – 73 percent, Haiti – 54 percent, Jamaica – 69 percent) as compared to those with no education, primary, secondary, or tertiary education.

Figure 1. **Vaccination concerns by country**

Vaccine concerns among the movable middle showed a higher percentage reporting health risk as a concern. The largest difference between the movable middle and the rest of the population in health concerns was in Belize (62 percent movable middle compared to 53

percent of those who didn't intend to vaccinate). In Jamaica, this difference was 69 percent of the movable middle as compared to 59 percent of those who didn't intend to vaccinate, while in Haiti – 51 percent of the movable middle noted health concerns, slightly higher than 47 percent

of those who did not intend to vaccinate. To this end, the movable middle was most interested in knowing more about the safety (side effects) of the vaccines (41 percent), followed by vaccine efficacy (25 percent) and length of effectiveness (17 percent).

Vaccination information and messengers

Across the three countries, health workers were the most trusted messengers for COVID-19 information (Figure 2). Scientists are the second most trusted while others rely on family to provide advice. Health workers were most trusted in Jamaica (49 percent), then Haiti (42 percent), followed by Belize (38 percent). Forty-one percent of the movable middle trusted health workers. Scientists are trusted by more people in Haiti (29 percent) than in Jamaica (21 percent) or Belize (19 percent). In Belize, nearly a third of respondents trust family as messengers for COVID information, whereas much fewer do in Jamaica and Haiti (15 and 11 percent). Trust in other messengers, such as religious leaders, friends, community leaders and celebrities was low across the three countries.

Concerningly, among all respondents, the government is not universally trusted as a messenger (Haiti – 13 percent, Belize and Jamaica – 10 percent). Those who did not plan to vaccinate generally did not agree that the government response to COVID was effective (Belize – 29 percent, Haiti – 27 percent, Jamaica – 50 percent). The movable middle was slightly more supportive of the effectiveness of the response (Belize – 56 percent, Haiti – 26 percent, Jamaica – 64 percent). Haiti had the lowest level of support for an effective government response.

People who do not intend to vaccinate express lower trust in the authenticity and/or effectiveness of vaccines than the movable middle. Those who did not intend to vaccinate were more likely to agree with the statement that COVID vaccines may be fake or not work than the movable middle (Belize – 78 percent versus 55 percent, Haiti – 49 percent versus 30 percent, Jamaica – 66 percent versus 47 percent).

Social media is the primary source of COVID-19 information among survey respondents (Figure 3). Belize is the country with the greatest percentage of respondents using social media as their primary source for COVID information (53 percent). In Jamaica, more people rely on television (27 percent) than in Belize or Haiti (13 and 5 percent), while radio is more popular in Haiti than in the other countries. For older people (50 years of age and above), TV was the most popular communication source about COVID-19 in Jamaica (36 percent) and social media was more common in Belize (45 percent). There were few differences by vaccination status, but in Haiti and Jamaica a larger portion of unvaccinated respondents relied on social media sources for COVID-19 information than the vaccinated. It is important to note that these percentages may be higher percentage than in the rest of the population as the survey respondents were identified through social media. Thus, they may be more likely to rely on social media for COVID-19 information.

The movable middle had similar preferences on preferred sources of COVID-19 information as the rest of the survey population. There was some variation by country, for example, in Belize where a greater percentage of the movable middle reported using social media (57 percent) as compared to those who didn't intend to vaccinate (48 percent).

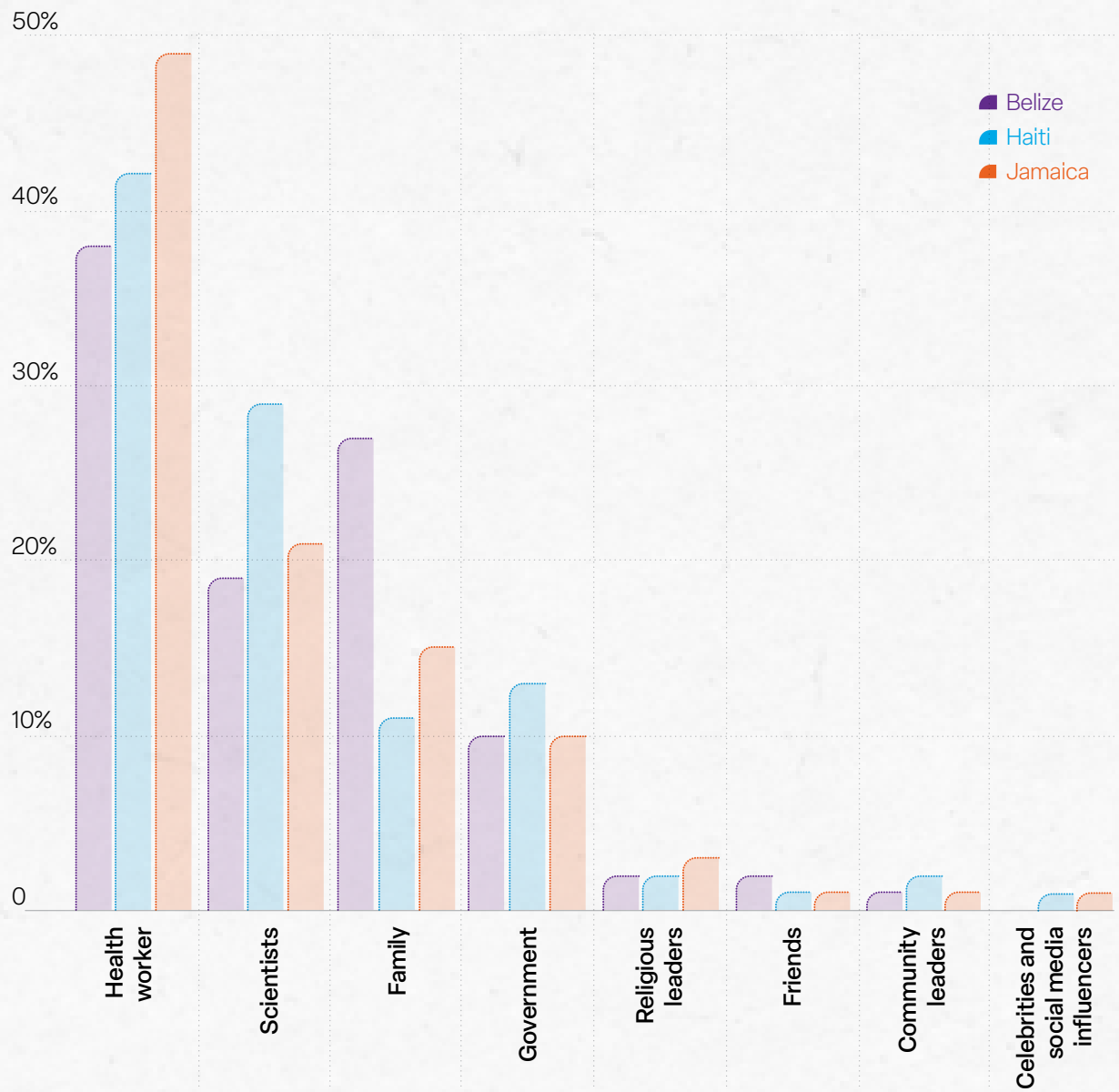
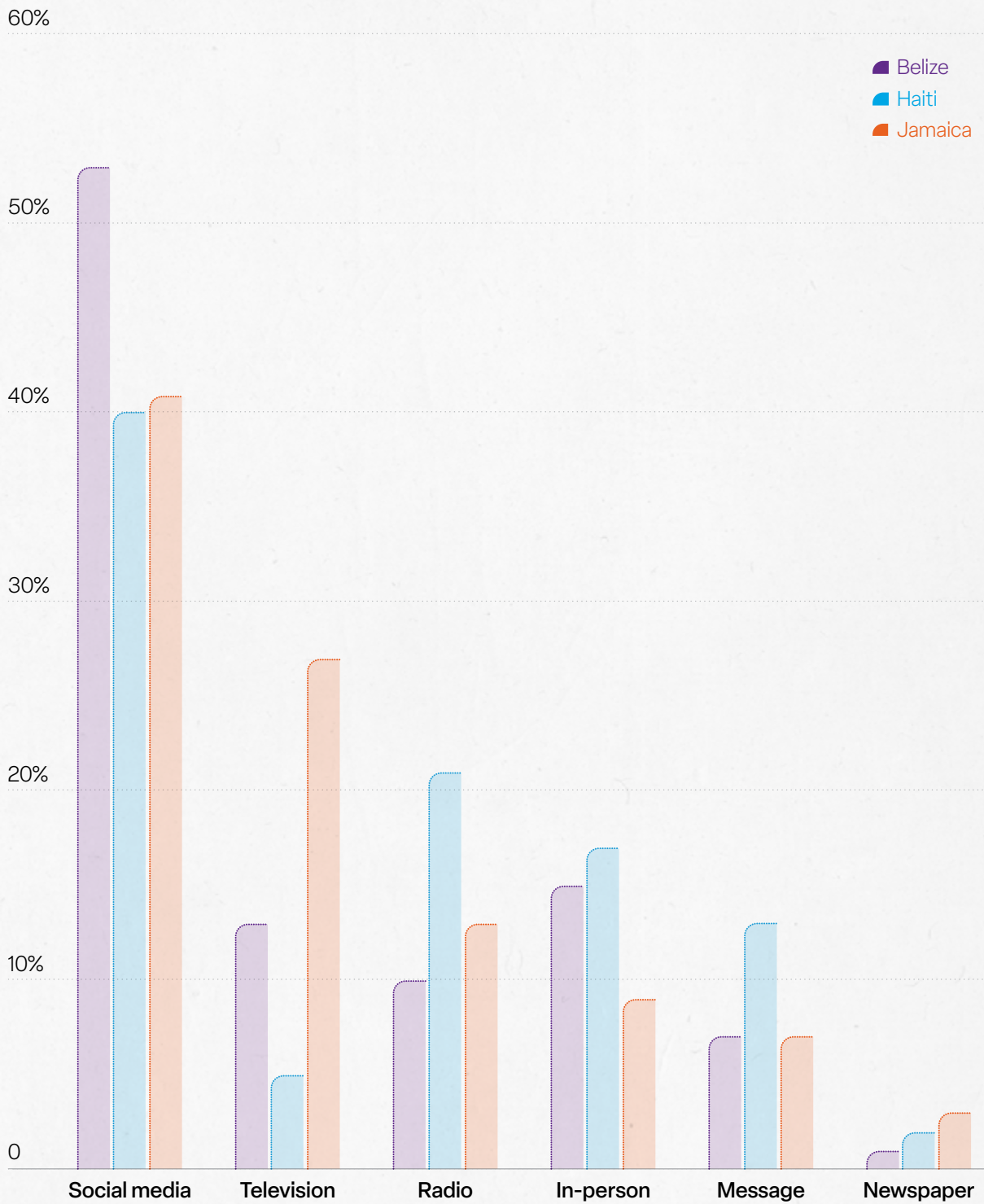
Figure 2. **Trusted messengers by country**

Figure 3. **COVID-19 Information sources by country**

Healthcare workers were as vaccinated or more vaccinated than the general population⁹.

Healthcare workers in the Haiti survey were more vaccinated than respondents with other professions (67 percent versus 26 percent). However, there was no difference in vaccination coverage between Jamaican healthcare workers and non-healthcare workers (55 percent and 54 percent respectively). Despite generally higher vaccination coverage among healthcare workers in Haiti, the unvaccinated in this group mirrored the vaccination intentions of the general population (54 percent unsure about vaccination and 15 percent did not plan to be vaccinated). In Jamaica, among unvaccinated healthcare workers, 1 in 2 plan to vaccinate - slightly higher than the rest of the population. However, 1 in 3 healthcare workers in Jamaica are unsure about vaccination.

Intentions to be boosted among older adults

Only half of older adults 50 years of age and above who were vaccinated planned to get a booster shot¹⁰. Further, many older adults in Belize and Jamaica were unwilling to change their minds about vaccination. Fifty percent of vaccinated older adults in Jamaica and 53 percent in Belize intended to get the booster shot. Those that were unvaccinated but would consider vaccination wanted more information on vaccine efficacy (Jamaica – 44 percent, Belize

– 42 percent). However, 41 percent in Jamaica reported that nothing will change their mind about getting vaccinated, while in Belize this figure rose to 75 percent. Seventeen percent of Belizean and Jamaica older adults who had completed the primary vaccination series did not plan to be boosted. This change in vaccination decisions shows how vaccination preferences are mutable.

Booster uptake was also challenged by the fact that many vaccinated older adults did not feel at risk of severe disease from COVID-19.

Moreover, there was also confusion about booster eligibility among older people. The most common reason for not getting boosted among older adults in Jamaica and Belize (30 percent) was that they already feel protected against COVID-19. In addition, a portion of older adults incorrectly believe they are not yet eligible for boosters yet (Jamaica – 23 percent, Belize – 14 percent).

Experiment on vaccine messaging: can behavioral framing affect vaccination intention?

The survey also explored the impact of message framing on unvaccinated participants' intention to vaccinate.

Unvaccinated participants in all three countries were randomly assigned four messages to test

⁹ Healthcare workers made up 29 percent of the sample in Haiti and 12 percent of the sample in Jamaica. The sample in Belize did not include enough healthcare workers.

¹⁰ Older adults are defined as those over 50 years of age and was only reported on in Jamaica and Belize where the survey sample of this group was sufficiently large. However, it is important to note that these individuals are only a small sample of the overall elderly population in each country (Annex 1). Detailed results from the elderly population can be found in the World Bank publication 'Redirecting Efforts to the Most Vulnerable and Documenting Lessons from COVID-19 for Future Pandemics – Evidence from the Caribbean (2022)'.

which one was most effective. Each message had a specific behaviorally informed approach that addressed different motivations to receive the COVID-19 vaccine: 1) control framing, 2) endemic framing, 3) variant framing, 4) prosocial framing (Annex 2). In the control framing, there was no behavioral angle, rather this message served as a “control group” for comparison with the other experimental messages. In Belize and Haiti, 62.5 percent of respondents were randomly assigned to the control group and 12.5 percent to each treatment message, whether in Jamaica 50 percent were randomly assigned to the basic framing and 16.6 percent to each

treatment message. The endemic message is framed around the inevitability of the COVID-19 virus becoming regularly found in that country (i.e., becoming endemic). This messaging approach on endemicity helps make continued risks more salient. The framing of the variant message emphasized the likelihood of new COVID-19 variants but continued effectiveness and protection from vaccines against them. The variant message framing places emphasis on efficacy, even against new variants of the virus. The prosocial message framed the importance of protecting yourself, your friends, family, and others around you through vaccination.



Box 2. Experiment on framing vaccine messaging to encourage vaccination intention

For unvaccinated respondents, the survey then generated distinct messages framed towards increasing vaccine uptake. This experiment on message framing randomly generated one of three treatments or a control message. The control message was basic framing, while treatment 1 was framed around how COVID will become an endemic disease, treatment 2 was focused on the risks of virus variants and treatment 3 had a pro-social framing that encouraged

respondents to consider the risks for others if they do not get vaccinated (Annex 2). The survey also asked questions on vaccine behaviors and intentions, role models and trust, concerns and hesitancy, social norms and COVID-19 knowledge and behaviors. The surveys were launched April 21, 2022.

Table 1 details the framing approaches delivered in this experiment as well as the text for each message used in the survey.

Table 1. **COVID-19 Information sources by country**

Framing approach	Message text in survey
Control framing	Do you plan to get the COVID-19 vaccine?
Endemic framing	As we learn to live with COVID-19, it is likely we will all be exposed to the virus eventually. The best way to protect yourself is to get fully vaccinated because it greatly reduces the risk of hospitalization and death. Do you plan to get the COVID-19 vaccine?
Variant framing	New variants of the COVID-19 virus can be worrying, but the best evidence so far indicates that vaccines are still highly protective against serious illness and death from COVID-19. Do you plan to get the COVID-19 vaccine?
Pro-social framing	The latest studies from around the world confirm that the COVID-19 vaccines are safe and protect you, your friends and family from COVID-19 by reducing hospitalizations and death. Do you plan to get the COVID-19 vaccine?

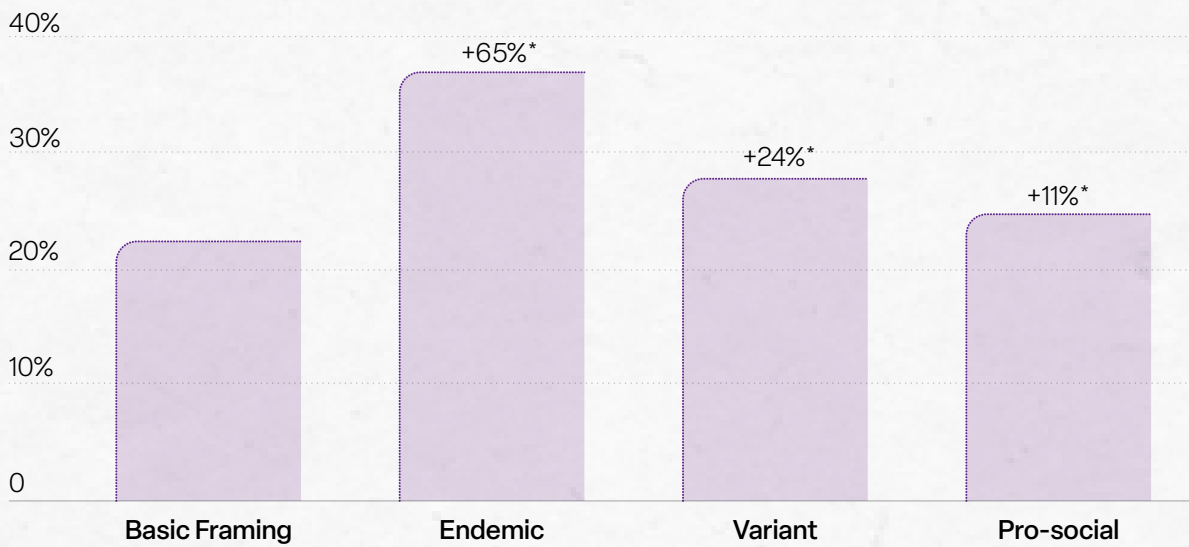
The results from the experiment on behavioral messaging for COVID-19 vaccination are shown in Box 3.

Box 3. Experimental behavioral messaging

I will take the COVID-19 vaccine when it's available, by treatment status

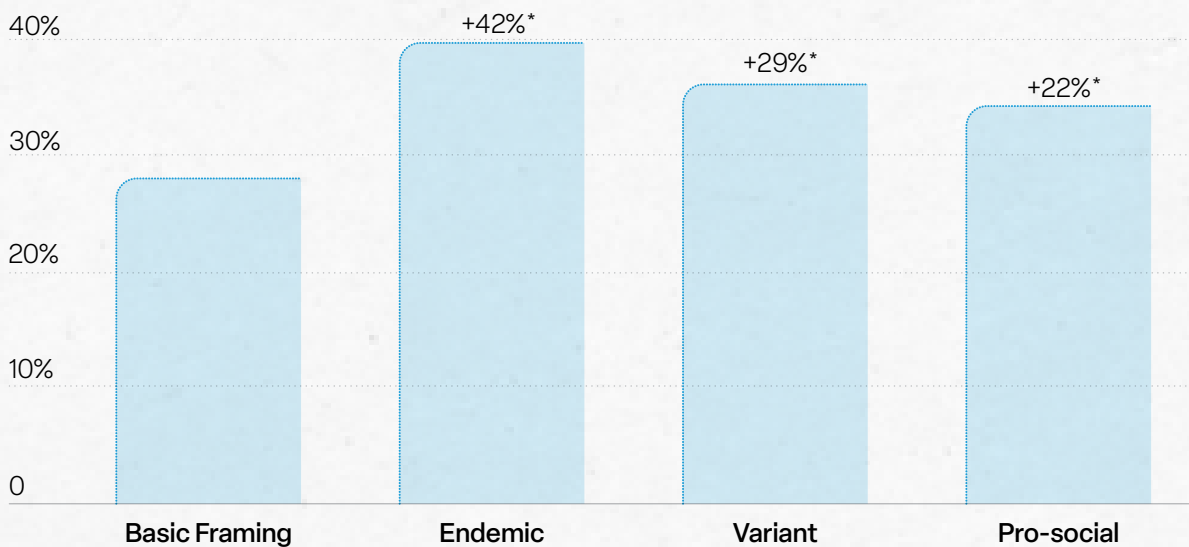
1. Belize (n=258)

* Statistically significant



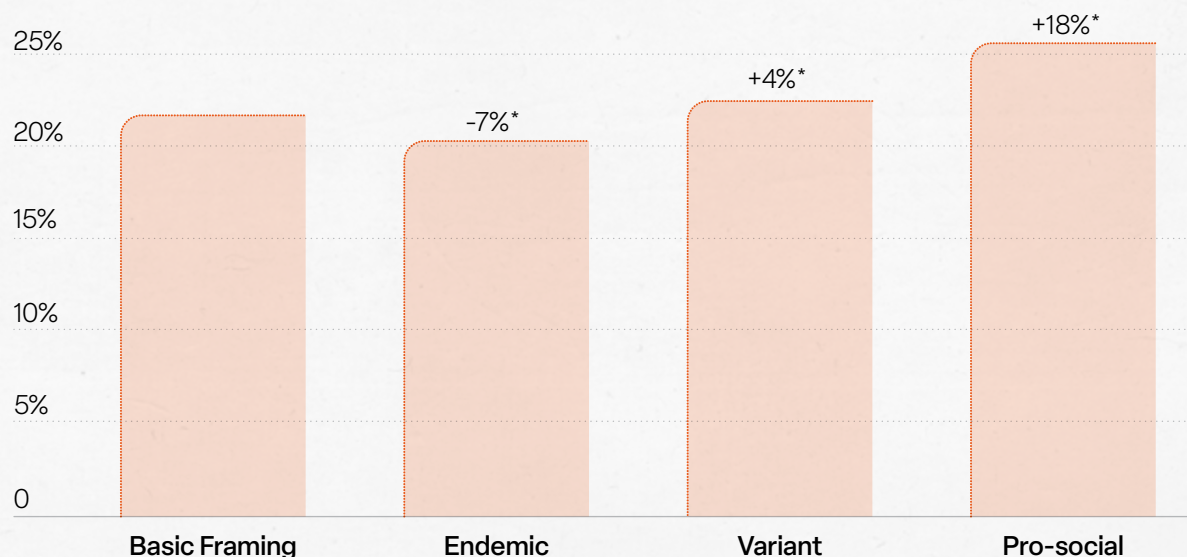
2. Haiti (n=7,672)

* Statistically significant



3. Jamaica (n=489)

* Statistically significant



The messages that emphasized that the virus would become endemic were the most effective in improving vaccination intentions in Haiti and Belize. Other messaging approaches such as protection against variants and emphasizing the need to protect yourself and others through vaccination were also successful in Haiti. None of the messages significantly impacted vaccination intention in Jamaica, although the pro-social messaging was more successful than the other messages¹¹. In Jamaica, targeted advertisements reached the unvaccinated (n=489), with 50 percent of respondents randomly assigned to the control group and 16.6 percent to each treatment message. Unfortunately, despite this targeted approach, none of the messages were effective in increasing vaccine intention. Messages in Belize reached a smaller sample of people (n=258) as there were fewer unvaccinated participants in the survey. People who received messages with endemic framing significantly increased their vaccination intentions by 65

percent as compared to the control message. The larger unvaccinated sample in Haiti reflects lower levels of vaccination coverage among the general population (n=7,672). As in Belize, the endemic framing – which emphasizes that everyone will eventually be exposed – was the most effective, increasing vaccination intentions by 42 percent. Other messaging was also impactful in Haiti. Variant framing increased vaccination intentions by 29 percent and prosocial framing by 22 percent.

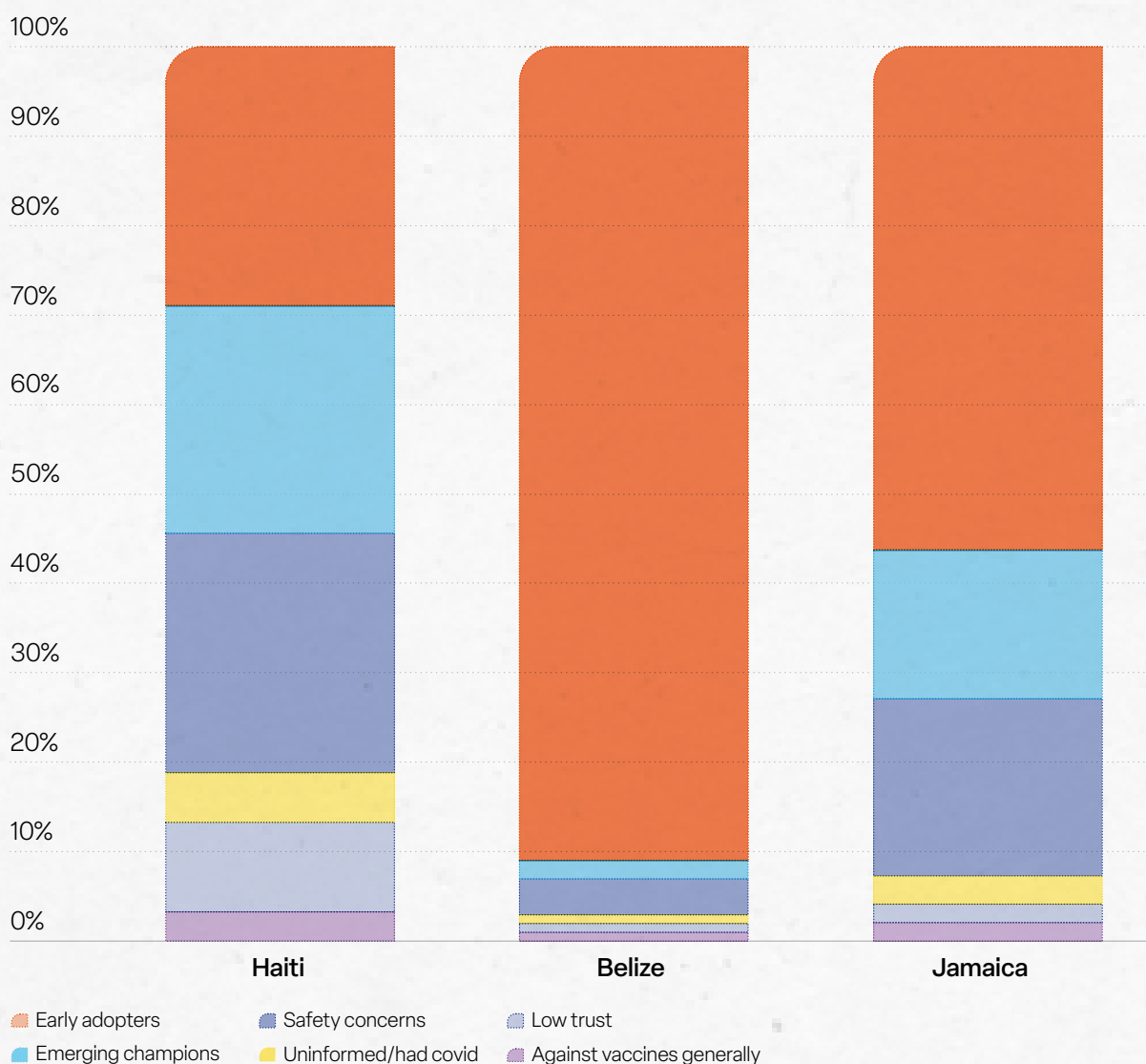
Finally, we developed vaccination personas or characterizations to better understand the concerns of survey participants. Survey respondents were grouped into categories such as early adopters (those who got vaccinated as soon as vaccines became available), emerging champions, those who had safety concerns (issues with vaccine side effects), uninformed/had covid, individuals expressing low trust, and those against vaccines generally (Figure 4). These categorizations represent how vaccine

¹¹ We refer to impacts on messaging when the results are statistically significant at least at the 90% confidence level.

beliefs exist on a continuum according to the specific concerns of individuals. Belize had the highest percentage of early adopters – or people who were already vaccinated (91 percent), followed by Jamaica (54 percent) with Haiti far behind (26 percent). The unvaccinated or unsure group could be primarily categorized as those with safety concerns (19 percent in Jamaica, 24 percent in Haiti, 4 percent in Belize). We also analyzed the predictors of vaccination status and concerns by country (Annex 4). In Haiti, predictors of safety concerns were older, more

educated individuals who believe in COVID but think that better treatments will become available. In Jamaica, predictors of vaccination status for those concerned about safety included higher education, waiting for others to vaccinate first, and believing in other effective treatments being available soon. In Belize, predictors of vaccination status were more education, older age, vaccinating to protect others, belief in the efficacy of vaccines, having a household member hospitalized and wearing a mask.

Figure 4. **Vaccination personas**



Limitations



The surveys had limitations, including sample composition and survey design constraints.

Respondents were Facebook social media users, and their distribution was not nationally representative. Facebook users tend to be younger and more educated than the general population and are more likely to be vaccinated. This is potentially problematic as less educated and older people may be harder to reach through social media surveys as well as through vaccination outreach; they may also be less likely to be vaccinated. Reports show that while older populations are prioritized in the latest WHO vaccination target, vaccination coverage within this group is well below the desired level in most countries in the Caribbean (Margolies, Mussini, Kim, & Di Giorgio, 2022). More research is needed to better understand the socio-behavioral motivations of those populations in these countries. That said, these surveys provide important insights into vaccine intentions for many others in the population, and these people may also hold sway over vaccination decisions of older members of their households. Additionally, each survey was able to capture unvaccinated respondents and gain key information on their decision-making in regard to questions such as message framing and trusted messengers. Other limitations to the survey were due to design constraints of the chatbot. For example, vaccine beliefs and behaviors were self-reported and were restricted to single

choice answers. The findings do not capture the full range of vaccine beliefs in each context, rather they provide a rapid view of the current state of vaccine attitudes among a sample of respondents. This information can be very useful to feed into country-led vaccination campaigns to improve uptake. The survey results show a snapshot of vaccine attitudes and uptake; however, these beliefs can change over time. Finally, the surveys were launched in April of 2021, a period when some countries were still in the process of rolling out vaccines. Thus, some vaccine uptake might have been from early adopters who would have gotten vaccinated anyway, not necessarily due to exposure to messaging. On the other hand, phased vaccination – i.e., prioritizing vaccination to specific groups in phases, may have restricted some groups from vaccinating early.

Discussion



Each country presented unique vaccination uptake challenges which required specific interventions or outreach strategies to change vaccination attitudes and behaviors.

Our synthesis of results from the three Caribbean countries, i.e., Belize, Haiti, and Jamaica, provides insights about the vaccinated and unvaccinated populations, highlights commonalities and differences as well as opportunities for outreach and communication. The results of these rapid social media surveys provide evidence for the need for tailoring targeted efforts to each context to affect vaccination behaviors. We highlighted the movable middle as a group that is ripe for messaging efforts, as they are still open to be vaccinated and have not yet made up their minds. We excluded anti-vaxxers as this group is small and is often resistant to receiving messages on vaccination. Understanding context-specific vaccine behaviors can also aid in tackling more general concerns related to vaccination. There is concern that backsliding may be occurring or could occur with routine immunizations due to new vaccine concerns and vaccine hesitancy issues that emerged with the COVID-19 vaccine.

Completing the primary vaccination series is still an issue for a portion of the population.

Missing the appointment for the second shot was common (Haiti - 24 percent, Jamaica - 34

percent, Belize - 39 percent). This is an opportunity to analyze and address problems or obstacles with scheduling or rescheduling shots and making shots more easily available.

Despite the WHO recommendation to reprioritize vaccine allocation and coverage, coverage among high-risk groups such as older adults in the Caribbean was still low.

Most Caribbean countries have not achieved the new WHO target of vaccinating 100 percent of the highest risk populations; their priority groups are not being reached adequately with full primary vaccination and booster doses. As of mid-2022, out of eleven countries and territories in the Caribbean, only one territory (Cayman Islands) reported achieving 100 percent primary immunization coverage of their elderly population and booster coverage is even lower among this group (7 of 9 countries had coverage below 50 percent) (Margolies et al., 2022). Our surveys in Belize and Jamaica provided timely insights into the older population's behavioral and social motivations. The share of older people in Jamaica and Belize who intend to get a booster or are unsure offer a window of opportunity to increase booster coverage. However, the number of older adults that say nothing will change their minds about vaccination is concerning. This reflects the need to refocus vaccination efforts on vulnerable groups such as the elderly - which entails improving monitoring



of vaccination coverage of priority groups as well as targeted outreach to these populations (Margolies et al., 2022).

Boosters are a priority that must be addressed with focused and intensified efforts, and it is particularly important to target those groups that are most vulnerable, like the elderly. The booster dose vaccination rate was very low in our survey. Approximately a third of people across the three countries who already received the primary vaccination series believed they were already protected with the primary vaccination series and did not need the boosters. This is a common problem with the boosters which has been reported among vulnerable priority groups such as the elderly and others (Margolies et al., 2022). The highest vaccination rate was in Belize, but only 27 percent of respondents were boosted. That said, 53 percent of the sample of older adults in Belize intended to get the booster shot. This is a challenge and an opportunity for countries to focus on increasing progress in the vaccine series and ensure continued protection. The necessity of boosters is a communication challenge for countries as risk perception is lower once the primary vaccination series is completed. Understanding the behavioral drivers of vaccination can help craft messaging that address the motivations of different populations. Surveys are one way to gather this information, focus group discussions and social listening can also provide these insights. As the communication strategies and information on vaccines have evolved over time in response to changing science and vaccination priorities, it is difficult for many in the public to understand why additional vaccination doses are needed. In low and middle-income countries, the focus is still on the initial booster. However, this problem is also seen in high-income countries such as the United States where the new bivalent Omicron booster has seen low uptake despite evidence of its efficacy against the variant.

While there was low intention to vaccinate children, parental vaccination aligned with their own vaccination status in Jamaica and Belize. This opens a potential opportunity to engage or opening to encourage under-vaccinated parents or those without the complete series to get their children vaccinated when they get their remaining vaccines. In Haiti, the challenge is greater as adults are generally less vaccinated and even those who are vaccinated are reluctant to vaccinate their children. A broader outreach campaign on the benefits of the under-12 vaccines and safety information is warranted in the more challenging context of Haiti.

Healthcare workers are key actors in risk communication and in community engagement. A contribution of this work is testing messages and messengers before implementing targeted communication strategies. Insights from harmonized data collected in 25 countries also confirmed healthcare workers were the most trusted sources of information (eMBeD, 2021). Healthcare worker intention to vaccinate was similar to the rest of population as it was in Haiti and Jamaica – but a significant portion are still unsure about vaccination (Haiti - 54 percent, Jamaica and Honduras - 30 percent).

In the Latin American and Caribbean region, only one other country – Honduras - received an eMBeD COVID-19 social media survey. The results show similarities with themes from the recent Caribbean countries, such as concern over vaccine health risks and trusting health workers for medical information. The Honduras survey had the same methodology, using the Facebook messenger but was conducted earlier in the pandemic (March 19 – April 8, 2021). Only half of respondents were willing to get vaccinated and 3 of 10 people are unsure about vaccination. As in the Caribbean countries, health

risks are also the most common concern with the COVID-19 vaccines, but in Honduras there also was low trust in health institutions (eMBed, 2021). Despite this low trust in health institutions, as in the Caribbean countries, people in Honduras trusted healthcare workers such as doctors and nurses for medical advice. However, fewer healthcare workers in Honduras said they would not get vaccinated as compared to the Caribbean countries (Jamaica – 22 percent, Haiti – 15 percent, Honduras – 8 percent). In Honduras, those that did not plan to vaccinate trusted family and friends more. In Honduras, there was a different framing experiment that focused more on messengers rather than messages. The messengers were grouped together in different formulations to see if the combinations of messengers affected vaccination intention. In this case, experts and religious leaders (19 percent), experts (15 percent), and celebrities (14 percent) increased vaccine intention. This trust in religious/ community leaders and/or celebrities contrasted with Haiti, Belize, and Jamaica where trust in these messengers was low. Even among people with no plan to vaccinate in Jamaica, only 8 percent considered religious leaders a trusted source of medical advice. In Honduras, targeting people who are concerned with vaccine safety saw the highest increase in vaccine intention (29 percent). Also, vaccination

intention aligned with community norms – whether family and friends consider it important to get the vaccine or whether family and friends will get vaccinated. Recommendations from this survey aimed at improving trust and transparency around vaccines, using religious leaders and focus on local community norms instead of national institutions. Nuanced differences of which messages or messengers are most effective serve as an important reminder of the diversity in the LAC region and the need for focused socio-behavioral research to identify sub-groups to target to increase vaccine acceptance and uptake.

The movable middle is aptly named – this group is more likely change their minds about vaccination. They specifically noted they would change plans if vaccination was necessary for social activities or by recommendation of a health worker. The movable middle is younger (63 percent in the 18-30 age group) and slightly less vaccinated against diseases other than COVID-19 (-5 percent) than the rest of the survey population. The movable middle is also more interested in self-protection and less likely to believe there are no benefits to vaccination. The responses of the movable middle as compared to those without vaccination intention provide insights into how this group could be targeted for improving uptake.

Recommendations



- i. National targeting may not be the most effective means to reach the ‘movable middle’, or people who are undecided about vaccination.** Large-scale national vaccination campaigns have not proved successful in reaching priority populations or in convincing the undecided population to vaccinate. Effectively identifying who is in the ‘movable middle’, targeting their concerns and understanding their motivations is key to engaging them in discussions about vaccination.
- ii. Knowledge of the movable middle as a group can aid in targeting messaging, selection of trusted messengers and channels.** Variation in their responses by country is informative for the development of context-specific strategies targeted to this group. The lack of concern with self-protection and the perceived lack of benefits of vaccine indicate there is a messaging or information gap targeted to this population. Messaging should focus on health risks/safety issues followed by information on efficacy – which were greater concerns for the movable middle. As this group was more likely to agree to wait to see if others got the vaccine first, messages could emphasize how many people have already gotten vaccinated or feature local leaders or stories of fellow community members who have been vaccinated. There was low trust in government as a messenger for medical advice or in conducting the COVID response, so Ministries of Health should not be relied upon for communication of vaccine messages. Despite the higher level of skepticism by Haitians for an effective government response to COVID, it was Jamaicans and Belizeans who expressed the least trust in the government to provide medical advice. HCWs were still the most trusted messengers, but also a third of the movable middle also trusted scientists. Scientists could be used as communicators particularly to speak on safety and benefits of vaccines.
- iii. Ensure immediate, constant, and easy availability of second doses particularly on-site where people receive other health services.** Reinforcing messaging, reminders, mobile clinics or prompts and/or opportunities to receive second doses could aid in improving completion of the full series. The same approach can work for boosters, however, more education and outreach are needed to convince the vaccinated that boosters are necessary. The exception is in Haiti, where access

to vaccination sites to receive first doses is the priority due to very low vaccination coverage.

- iv. Address specific access issues for the movable middle for vaccination in each country.** In Belize, a third of the movable middle complained of overcrowded vaccination sites. In Haiti, they struggled with the vaccination locations and registration process. Vaccine preference became an obstacle to receiving a vaccination in Jamaica in addition to overcrowding.

- v. Improved booster availability must be reinforced by concerted outreach and educational information (especially regarding protective benefits and eligibility) delivered by trusted messengers such as healthcare workers or others identified in each country.**

This information should also be delivered through communication mediums including social media to reach those who are unsure (i.e., “movable” in their opinions) or have low motivation to seek out information.

One example of a clear opportunity to intensify uptake efforts is in Belize, where the movable middle was more likely to use social media, and the Government was already utilizing the medium for health communication. People that are ready for a booster are presumably not completely against vaccination in general as they have already received the primary series.

However, there is still a large group that is not getting the booster: some which believe it is not needed or are too busy, others who think they are not eligible or are not prioritizing it as the pandemic shifts into a different phase. Countries can facilitate rapid and easy access to the

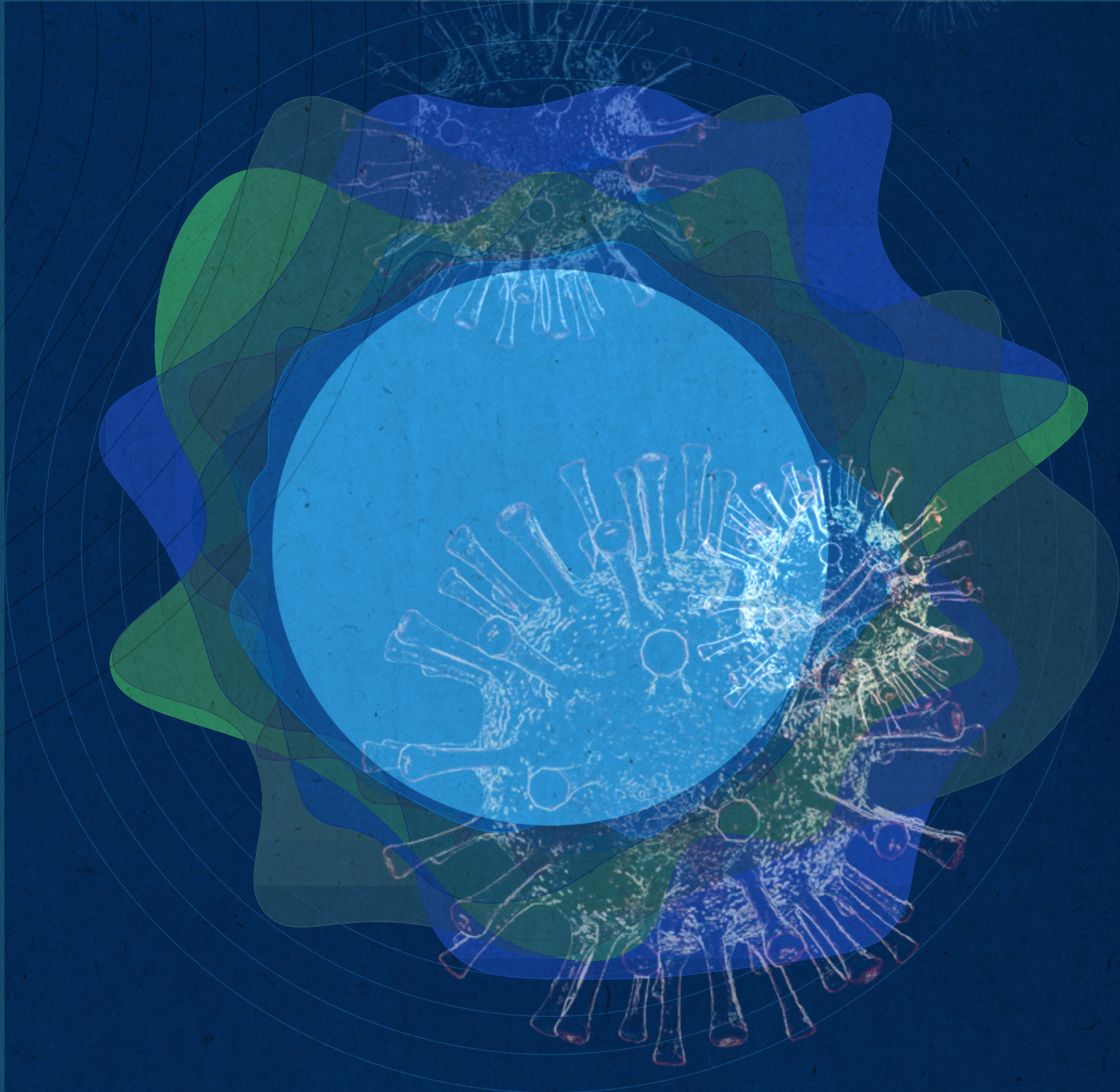
booster for those that do not seek it out but are not against it. Many respondents emphasized the importance of self-protection as a motivation for vaccination; communication efforts should focus on the short and long-term protective benefits of the shot to those that are unsure or believe they are already protected.

- vi. Behavioral approaches to messaging can aid in the development of targeted risk communication and vaccination outreach.**

However, each context is distinct – in Haiti and Belize, endemic framing was successful in increasing vaccination intention while in Jamaica none of the tested messages had a positive impact although the pro-social framing appeared to work better than other messaging. In Haiti, there also needs to be follow-up for missed appointments and to clarify confusion about eligibility – for example, text reminders, automating follow-up appointments, providing information on walk-in sites. Sending multiple vaccination reminders has been found to be effective in a variety of contexts (Lim et al., 2022). Messages in Haiti and Belize should be tailored to be more effective towards the unvaccinated, for example, using the endemic approach tested in the survey. Trusted healthcare workers can also be leveraged to respond to concerns at the community level, to emphasize how COVID-19 is here to stay (i.e., endemic) and the protective role vaccines and boosters play. Unfortunately, in Jamaica, none of the different messages positively impacted vaccination intention. This suggests the need for further research to better understand what other messages or issues would best appeal to Jamaicans.

- vii. To address the low interest in child vaccination against COVID-19, governments can work with pediatricians to engage parents to communicate COVID risks and vaccine safety (Lim et al., 2022).** Education workers such as teachers can also be important partners to share information with families. Collaborating with healthcare professionals can help leverage the trust and relationships they have with local communities, as many people do not view government as a trusted source of COVID-19 information. Working with families could also have ripple effects to other relatives, for example, in Belize where family are seen as trusted messengers of COVID-19 information. Identifying influential parents to be communicators within their networks can expand those impacts. Messages should focus first on the primary concerns of parents – vaccine safety and efficacy and self-protection but can also reinforce learning loss due to COVID-19 and community protective benefits.
- viii. Develop multi-component interventions to provide healthcare workers of different professions – such as frontline workers and nurses - with materials, capacity building opportunities such as trainings and advice on how to communicate with patients.** This engagement should also target unvaccinated healthcare workers to provide more information about COVID-19 vaccination and to address their own vaccine concerns confidentially. Interventions to increase healthcare workers COVID vaccination uptake have already shown some effect, such as providing different forms of information (leaflets, lectures), non-monetary incentives, vaccination reminders, institution-wide vaccination campaigns and discussions on vaccine concerns (Peterson, Lee, & Nugent, 2022).
- ix. Social media is a key medium that can disseminate vaccine information as well as misinformation.** Because of its ubiquity and popularity, it is necessary to use the same social media tools to combat vaccine misinformation spread through those platforms. Techniques to address this include pre-bunking, de-bunking, and reminders to check information before sharing on social media. Tools such as the eMBED WhatsApp chatbot or misinformation video clips or games can support these efforts (Basol et al., 2021; Lim, Vakis, Cameron, & Dugas, 2022).

Annexes



Annex 1. EMBeD social media surveys

EMBeD social media surveys are part of a knowledge product series that the World Bank is leading to collect global information on COVID-19 vaccine attitudes. The main trends are based on data collected from social media using stratification techniques that allow population weighing. The data includes information on respondents' current beliefs and attitudes towards COVID-19 vaccination.

The social media surveys on COVID vaccine perceptions and uptake in the Caribbean were conducted through Facebook in three countries (Jamaica, Belize and Haiti) from April 21-May, 2022. Sample sizes from each country including samples by vaccination status are included in Table 1:

Table 1. **eMBeD survey sample sizes**

Country	Total sample	Unvaccinated	Vaccinated
Haiti	10,346	7,643	2,703
Jamaica	4,037	1,864	2,173
Belize	2,756	261	2,495

Sample sizes for the elderly (50+) for from each country including samples by vaccination status are included in Table 2:

Table 2. **eMBeD survey sample sizes for people aged 50+**

Country	Total sample	Unvaccinated	Vaccinated
Haiti	54	41	13
Jamaica	973	314	659
Belize	555	40	515

The eMBeD surveys are limited by a small sample among this age category. In addition, the fact that the survey was delivered via social media may limit its applicability to the wider elderly population.

eMBeD uses COVID-19 diagnostics to inform communication strategies. This approach measures intentions, beliefs, norms and trust and creates a typology of vaccine intention personas. The eMBeD team then assesses the impacts of message framing on vaccine intentions. This leads to expanded tests of vaccine messaging applying survey insights, such as applying insights to message framing for each vaccine intention persona identified in Phase 1. Ultimately, the eMBeD team provides customize support

to country partners on vaccination uptake efforts including technical assistance on communication strategies, capacity building for communication approaches and for frontline staff as well as behavioral solutions beyond communication (e.g., registration and appointments).

This work was part of a portfolio of surveys developed by the Poverty and Global Practice Mind, Behavior, and Development group (eMBeD), in collaboration with the Development Impact Department (DIME), Health, Nutrition & Population Global Practice (HNP), Poverty & Equity Global Practice (POV), and External & Corporate Relations (ECR) of the World Bank and supported financially by the World Bank and the Alliance for Advancing Health Online.

For more information on eMBeD's global vaccine hesitancy work using social media surveys, see the blog post "Vaccine hesitancy: 10 lessons from chatbotting about COVID-19 in 17 countries."

More information about eMBeD can be found at: <https://www.worldbank.org/en/programs/embed>

Annex 2. EMBeD questionnaire

Question Number	Question (English)
1	<p>Which language would you like to conduct this survey in?</p> <p>A- English B- French C- Spanish</p>
2	<p>Thank you for agreeing to participate in this chat-survey around the COVID-19 vaccination efforts. This survey will take 5 minutes. By agreeing to participate, you agree to Facebook's privacy policy. This survey is conducted by the World Bank. If at any point there are any questions you do not feel comfortable answering, you can choose not to answer them and may withdraw from the survey at any time, without consequence.</p> <p>Your answers will be stored securely and kept confidential, they will only be seen by the research team. If at any time you wish to see your personal data or request that all your personal data be deleted, you can write an email to embedresearch@worldbank.org.</p> <p>You can delete this thread after you have finished the survey, to keep your answers private from anyone else using your phone.</p>

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Question Number	Question (English)
3	To thank you for your participation, once you complete the chat-survey, you will be automatically enrolled to a chance of winning a [\$100 USD] voucher. Do you agree to participate? A- Yes, I want to do the survey B- No, thanks
4	What is your gender? A- Male B- Female C- Other D- Don't want to answer
5	Have you been vaccinated with any of the COVID-19 vaccines? A- Yes B- No
6	Which vaccine did you start your vaccination with? A- Johnson & Johnson (Jansen) B- Moderna, AstraZeneca, Pfizer, or Sinopharm C- I don't know
7	If Q5=A = vaccinated How many COVID-19 shots have you received to date? A- One shot B- Two shots C- Three shots D- Four shots E- I don't know
8	Do you plan to vaccinate your children (under 12 years) against COVID-19? A- Yes B- No C- I haven't decided yet D- I do not have children under 12 years old
9	If Q5=A vaccinated but no booster (Q6 / 7 : Johnson & Johnson (1 dose), mRA (<=2 doses) Do you plan to get a third shot (booster shot) when you are eligible? A- Yes B- No C- I haven't decided yet

... table continues next page

Question Number	Question (English)
10	<p>If Q5=A vaccinated but no booster (Q6 / 7 : Johnson & Johnson (1 dose), mRA (=2 doses))</p> <p>What is the main reason you haven't you received your "additional" shot (booster) yet?</p> <p>A- I am waiting to be eligible for the next vaccine dose B- I missed the date/time and have not rescheduled C- It is too difficult to arrange with my work schedule D- I think one dose is enough protection E- I felt sick with one dose and didn't want to take another F- I'm not sure when or where to get my second dose G- Other</p>
11	<p>If Q5=A=Yes</p> <p>Now that you have received at least one COVID vaccine, have you changed when and where you wear a mask?</p> <p>A- No, I wear masks the same as before my vaccine B- Yes, I wear a mask less often than before C-Yes, I wear a mask more often than before, D-Not applicable (I did not wear a mask before my vaccine)</p>
12	<p>If Q5=A vaccinated but no booster (Q6 / 7 mRA (=1 doses))</p> <p>Why haven't you taken the next dose?</p> <p>A- I am waiting to be eligible for the next vaccine dose B- I missed the date/time and have not rescheduled C- It is too difficult to arrange with my work schedule D- I think one dose is enough protection E- I felt sick with one dose and didn't want to take another F- I'm not sure when or where to get my second dose G- Other</p>
13	<p>If Q5= Yes, vaccinated</p> <p>Did the vaccine type available to you affect your intention to take the second or booster shots?</p> <p>A-Yes B-No</p>

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Question Number	Question (English)
14	<p>If Q13=Yes</p> <p>Why did you choose a particular vaccine type?</p> <p>A- I feel the vaccine technology is safer B- I feel more confident because of the country where the vaccine was produced C- I wanted fewer shots D- I think the vaccine I chose works better than others E- The vaccine I chose has less side effects F- Someone I knew took that vaccine G- A healthcare provider (Doctor, nurse, community health worker) recommended it</p>
15	<p>If Q5= No, not vaccinated</p> <p>Are you facing any problems with accessing the COVID-19 vaccine?</p> <p>A-Yes B-No</p>
16	<p>If Q15=Yes</p> <p>What is the main problem preventing you from accessing the COVID-19 vaccine?</p> <p>A- Vaccine location or time didn't work for me B- I lack access or had technical difficulties with website or phone line C- I was unable to provide a required document D- Personal commitments prevented me accessing vaccine site (work, childcare, school) E- Too crowded or long waits for vaccination F- Vaccine type I want is not available G- I did not know where to go to get vaccinated</p>
Randomized message testing	
17	<p>if Q3=No: Do you plan to get the COVID-19 vaccine?</p> <p>A- Yes B- I am not sure yet C- No</p>
17A	<p>if Q5=No: Unvaccinated only</p> <p>As we learn to live with COVID-19 it's likely we will all be exposed to the virus eventually. The best way to prepare yourself is to get fully vaccinated because it greatly reduces the risk of hospitalization and death. Do you plan to get the COVID-19 vaccine?</p> <p>A- Yes B- I am not sure yet C- No</p>

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Question Number	Question (English)
17B	<p>if Q5=No: Unvaccinated only</p> <p>New variants of the COVID-19 virus can be worrying, but the best evidence so far indicates that vaccines are still highly protective against serious illness and death from COVID-19. Do you plan to get the COVID-19 vaccine?</p> <p>A- Yes B- I am not sure yet C- No</p>
17C	<p>If Q5=No: Unvaccinated only</p> <p>The latest studies from around the world confirm that the COVID-19 vaccines are safe and protect you, your friends and family from COVID-19 by reducing hospitalizations and death. Do you plan to get the COVID-19 vaccine?</p> <p>A- Yes B- I am not sure yet C- No</p>
18	<p>If Q5=No, Not vaccinated</p> <p>What is the main reason you have not been vaccinated?</p> <p>A- Someone I trust told me not to get the vaccine B- Vaccines are against my beliefs or religion C- Had side effects or bad experience from another vaccine D- I don't think I am at risk or think the risk of side effects from the vaccine is higher than the risk from COVID-19 E- I already had COVID-19 and don't think I need the vaccine F- I do not trust the government G- I am unsure about the long term side effects of the vaccine H- Something else</p>
19	<p>If Q5=No and Unsure/No. Don't intent to get vaccinated (after treatment)</p> <p>Which of the following is most likely to change your beliefs or plans about getting the Covid - 19 vaccination?</p> <p>A- If I or someone from my family gets very sick B- My relatives/friends or someone I know gets the vaccine first C- Doctors/health workers recommended the vaccine to me D- If I received a financial incentive to get the vaccine E- If my employer or school requires me to get vaccinated F - If it will be necessary in order to return to social activities (eat out at restaurant/cafe, shops, public events, travel) H- Nothing can convince me to get the vaccine</p>

... table continues next page

Question Number	Question (English)
20	<p>What is the main benefit/advantage of taking the COVID-19 vaccine, in your view?</p> <p>A- Protecting myself B- Protecting others C- Resuming work/school and in-person social interactions D- Something else E- None, I don't believe the vaccine has any benefits</p>
21	<p>Who of the following do you trust the most to give you health and medical advice?</p> <p>A- Family B - Friends C- Religious or traditional leaders D- Doctors/nurses/pharmacists E- Community leaders F- Scientists and epidemiologists/public health experts G- Celebrities and social media influencers H-Government/Ministry of Health</p>
22	<p>Think of the last time you got information about COVID-19 vaccines. Where did you get it?</p> <p>A- I saw it on social media (ex. Facebook, Instagram, Twitter, and/or YouTube). B- It was sent to me on a messaging service (ex. WhatsApp, FB Messenger, SMS, etc.) C- I heard it on the radio. D- I saw it on television E- I read it in a newspaper F- I saw the information in-person (ex. notice board or billboard) G- Someone told me about it in-person</p>
23	<p>Thank you for your answers so far, you are 50% done.</p> <p>To what extent do you agree with the following statements:</p> <p>When you get vaccinated, it is not only to protect yourself but also to protect others</p> <p>A- Agree B- Disagree</p>
24	<p>When a new vaccine is available, I would prefer to wait to see what other people do rather than get the vaccine right away</p> <p>A- Agree B- Disagree</p>
25	<p>I believe that most of my friends and family members will get the COVID vaccine</p> <p>A- Agree B- Disagree</p>

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Question Number	Question (English)
26	No matter what I do, if I am going to get sick, I will get sick A- Agree B- Disagree
27	The government has generally responded effectively to the COVID-19 pandemic. A- Agree B- Disagree
28	I don't believe COVID exists A- Agree B- Disagree
29	I think COVID vaccines offered may be fake/not work A- Agree B- Disagree
30	I am confident there will be other effective COVID treatments soon A- Agree B- Disagree
31	I feel I am not at risk for severe COVID. A- Agree B- Disagree
32	The process for getting vaccinated is easy for people like me. A- Agree B- Disagree
33	Which of the following is the most important thing you want to know about the COVID-19 vaccines available in the country? A- How effective it is in preventing severe COVID or death B- How safe it is (side effects) C- Whether my doctor thinks I should get it D- What my friends and family think E- Whether national health authorities recommend taking it F- Whether local officials recommend taking it G- Whether celebrities/bloggers recommend taking it H- How long the effectiveness lasts

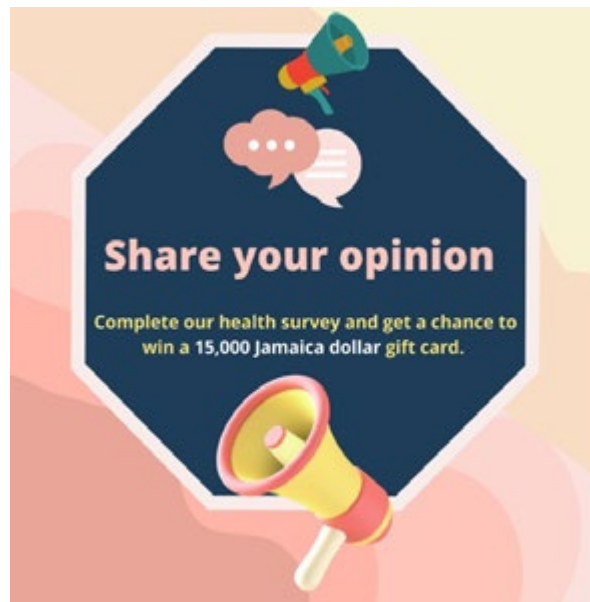
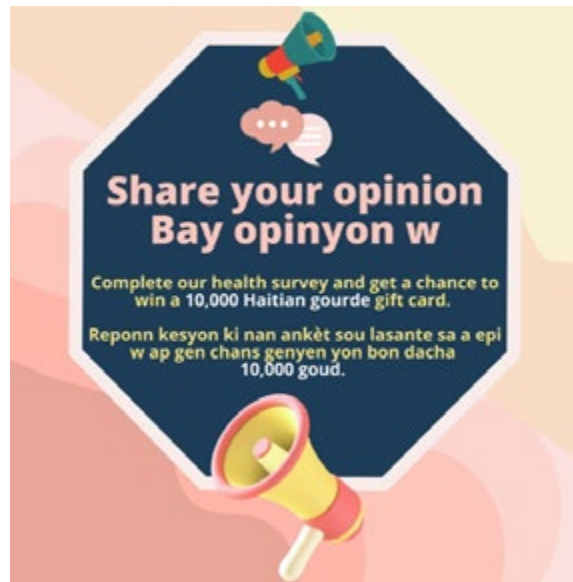
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Question Number	Question (English)
34	In the last 7 days, did you always wear a mask when in public indoor spaces? A- Yes B- No
35	Have you ever been vaccinated against diseases such as polio or rubeola, or flu? A- Yes B- No C- I don't know
36	Was your child vaccinated with the recommended vaccines (e.g, polio, measles) A-Yes B-No C-I don't have children
37	Has anyone in your household been hospitalized or died from COVID-19? A- Yes B- No C- I don't know
38	Including you, how many people live in your household and regularly share meals together? A- 1-2 B- 3-4 C- 5-6 D- 7+
39	Are there any of the following people in your household? A- Older adults age 65 and over B- Children under 18 C-Children under 12 D-Children under 5 E- People with underlying conditions such as diabetes and cardiovascular disease F- At least two of the previous five groups G- None
40	Do you work in the education sector in any capacity (teacher, administrator, other staff)? A- Yes B- No

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Question Number	Question (English)
41	<p data-bbox="427 421 959 450">Do you work in the health sector in any capacity?</p> <p data-bbox="427 488 587 517">A- Yes, doctor</p> <p data-bbox="427 521 571 551">B- Yes, nurse</p> <p data-bbox="427 555 639 584">C- Yes, pharmacist</p> <p data-bbox="427 589 783 618">D-Yes, community health worker</p> <p data-bbox="427 622 560 651">E-Yes, other</p> <p data-bbox="427 656 491 685">F- No</p>
42	<p data-bbox="427 712 1126 741">What is the highest level of education that you have completed?</p> <p data-bbox="427 779 608 808">A- No education</p> <p data-bbox="427 813 544 842">B- Primary</p> <p data-bbox="427 846 730 875">C- Secondary (high-school)</p> <p data-bbox="427 880 1198 909">D- Higher education (Bachelor's degree or higher, any post-secondary)</p> <p data-bbox="427 913 647 943">E-Vocational school</p>
43	<p data-bbox="427 981 836 1010">What ethnic group do you belong to?</p> <p data-bbox="427 1048 544 1077">A- option 1</p> <p data-bbox="427 1081 544 1111">B- option 2</p>
44	<p data-bbox="427 1137 959 1167">How would you describe the area where you live?</p> <p data-bbox="427 1205 544 1234">A - Big city</p> <p data-bbox="427 1238 587 1267">B - Small town</p> <p data-bbox="427 1272 676 1301">C - Village or rural area</p>
45	<p data-bbox="427 1339 1366 1406">Thank you for your responses! To thank you for your participation, you are now enrolled to a lottery with a chance of winning a voucher.</p>
... table ends.	

Annex 3. EMBeD Facebook messenger advertisements for survey participation



Annex 4. Predictors of vaccination status by country

a) Belize

 Against Vaccines Generally	 Low Trust	 Uninformed	 Safety Concerns	 Emerging champions	 Early Adopters
Less educated Wait for others to vax first Not at risk for severe Covid Process of getting vax is hard	Male	Older Large HH Past vaccinations	Younger Small HH Wait for others to vax first	Younger Large HH At risk for severe Covid Wear mask Live with vulnerable	More educated Older Vax to protect others Vaccines work HH member hospitalized Wear mask
Unvaccinated, don't intend to vaccinate, unsure: 7% (n=171)				Intend to vaccinate: 2% (n=65)	Already vaccinated: 91% (n=2,495)
Other reasons: 0%					

b) Haiti



c) Jamaica



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ECO-AUDIT

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