FINAL REPORT

UNICEF

Qualitative Research on Perceptions of Polio Vaccination in the Context of COVID-19 Vaccination (COVAX) Rollout

SEPTEMBER 2022

SUBMITTED BY:
Family Health International (FHI 360)
359 Blackwell Street, Suite 200
Durham, NC 27701 USA

POINT OF CONTACT:
Lara Lorenzetti
Scientist I
Behavioral, Epidemiological, and Clinical Sciences
FHI 360
E: llorenzetti@fhi360.org
T: (919) 544-7040

ACRONYMS & ABBREVIATIONS

cVDPV2	Circulating vaccine-derived poliovirus Type 2
FG	Focus group discussion
FLW	Frontline worker
GPEI	Global Polio Eradication Initiative
IDI	In-depth interview
nOPV2	Novel OPV
OPV	Oral polio vaccine

Contents

Acknowledgements 2
Executive Summary 3
1 Introduction 7
1.1 Research Questions 8
2 Methods 8
2.1 Ethical/administrative approvals 8
2.2 Settings 9
2.3 Target population 10
2.4 Sampling & Recruitment 11
2.5 Data collection 13
2.6 Analysis 13
3 Findings 14
3.1 Participant Characteristics 14
4 Observations of and Experiences with Community-Based Vaccination Campaigns during the Pandemic 17
5 Reasons for Vaccine Hesitancy 18
5.1 Sources of information related to hesitancy concerns 22
5.2 Concerns over vaccine-related side effects 22
5.3 Fear of vaccine overdose 23
5.4 Religious leaders are against vaccines 24
5.5 Lack of confidence in FLWs 25
5.6 Vaccines actually be a COVID-19 vaccine OR may contain COVID-19 26
5.7 Vaccine is a population control measure or causes infertility 27
5.8 Vaccine could contain a tracking device 28
5.9 Westerners may be testing vaccines on Africans 29
5.10 Gender-related differences in vaccine hesitancy 29
6 How COVID-19 Precautions Affected Community-Based Vaccination Campaigns 30
7 Community Reactions to Future OPV Campaigns 31
8 How to Maximize Community Support for OPV Campaigns in the COVID-19 Context 32
8.1 Rebuild community confidence through timely and adequate information 33
8.2 Use a variety of information sources 34
8.3 Rebuild caregiver trust for FLWs 36

8.4 Increase remuneration, resources, and training for FLWs 36
8.5 Leverage existing community influencers and groups 39
8.6 Considerations for COVID-19 vaccines and COVID-19 precautions 40
9 Discussion 41
10 Conclusions 44
11 References 45
Appendix A: Participant Demographic Characteristics 47
Cameroon 47
Ethiopia 50

Acknowledgements

This work was supported by excellent teams of qualitative researchers in Cameroon and Ethiopia. We are grateful for their professionalism and thoughtfulness in collecting these data, despite the challenges of conducting research during a pandemic. We are also thankful to the 238 caregivers, polio frontline workers, healthcare practitioners, and social influencers who provided these essential insights into how to improve OPV programming in the COVID-19 context. Below are some of the key contributors, without whom this work would not have been possible.

Cameroon

UNICEF Cameroon	Martin Engoulou
UNICEF Western and Central Africa Regional Office	Claude Monj
FHI 360 Country Office	Joel Ngechop, Agbornkwai Nyenty
Data collection team	Douglas Mbang Massom, Moise Mvetumbo, Louis Aristide Tchoteke, Awah Kum Tchouaffi, Jasmin Ndeutcheu Ndoundo

Ethiopia

UNICEF Ethiopia	Chaudhary Mohd Parvez Alam, Hnin Su Mon
UNICEF Eastern and Southern Africa Regional Office	Nasir Ateeq, Saumya Anand
Ethiopia Ministry of Health	Habtamu Alemay
FHI 360 Country Office	Kokeb Berhanu, Bethelhem Abrae
Data collection team	Ademe Tsegaye, Engdasew Feleke, Eyerusalem Girima, Fitsum Dechasa Kibret, Mazengia Birra

A team from **UNICEF Headquarters**, including Ross McIntosh, Rustam Haydarov, Melissa Corkum and Soterine Tsanga was instrumental in supporting the design and overseeing the implementation of this assessment.

Executive Summary

Study Rationale

The Global Polio Eradication Initiative (GPEI) has the goal of vaccinating children across the world against all types of polioviruses, to prevent their spread and to progress toward eradication. In March 2020, when the world experienced global lockdowns as a result of the emerging COVID-19 pandemic, WHO issued guidelines indicating that mass vaccination campaigns should be suspended until the COVID-19 situation resolved, citing safety concerns around the potential exposure of under-immunized children to COVID-19 while participating in immunization activities. The pandemic contributed to significant disruptions in routine childhood immunization programs, including the Polio Programme, which was facing widespread emergences of circulating vaccine-derived type 2 poliovirus (cVDPV2), principally in sub-Saharan Africa. Vaccination campaigns, including for oral polio vaccine (OPV) have since restarted. Importantly, there are concerns that the persistent mis- and dis-information related to COVID-19 and associated vaccines will spill over to perceptions of other vaccines, including OPV, yielding increasing rates of vaccine hesitancy in certain countries or among key groups. In response, we conducted a cross-sectional, qualitative study exploring how the experience of COVID-19 restrictions (e.g. social distancing) and perceptions of the newly developed COVID-19 vaccines influenced perceptions of OPV and polio vaccination campaigns.

Goal

The main goal of this study was to gain insight into how COVID-19 restrictions, and perceptions of the newly developed COVID-19 vaccines, influence perceptions of OPV and vaccination campaigns in order to inform recommendations for communications and social mobilization strategies.

Key Objectives

1) To develop an understanding of the ways in which the experience of the COVID-19 emergency, the introduction of COVID-19 vaccines, and the COVID-19 vaccination programme have affected perceptions of OPV and OPV vaccination campaigns;
2) To provide a description of caregiver, frontline worker, and health influencer perceptions and beliefs about the OPV in the context of COVID-19 in two countries; and
3) To highlight any perceptions related to COVID-19 that may present challenges to achieving sufficient polio vaccination coverage to halt polio outbreaks.

Methods

We used a cross-sectional, qualitative research design to gather data from key stakeholders in Ethiopia and Cameroon. This study was conducted in Addis Ababa and Adama, Ethiopia and Yaoundé and Bafia, Cameroon. These sites were purposively selected to represent countries with active cVDPV2 outbreaks that had recent OPV campaigns delivered concurrent with the roll-out of COVID-19 vaccine. We also selected urban and semi-urban sites in each country to capture populations with different access to internet and social media. In each country, we employed a team of experienced qualitative researchers, including one research lead, two qualitative research facilitators, and two translators/transcriptionists to conduct focus group discussions (FGs) and individual interviews (IDIs) among four types of stakeholders.

Data were collected in Ethiopia in late February – early March 2022 and in Cameroon between April – May 2022. Data from all countries were compiled and analyzed by FHI 360.

Target Populations

In each country, the local research team engaged with four stakeholder groups: male and female caregivers of children under age five, polio frontline workers (FLWs), health practitioners, and social influencers within the community. Social influencers included community leaders and health journalists. The number and types of individuals who participated per country are detailed in the table below.

Stakeholder Group	Ethiopia			Cameroon		
	Urban	Semi-urban	Total	Urban	Semi-urban	Total
Caregivers (FGs)	4	4	64	4	4	51
Frontline workers (FGs)	4	4	47	4	4	54
Healthcare practitioners (IDIs)	3	2	5	2	2	4
Social influencers (IDIs)	3	2	5	4	4	8
All Groups	**14**	**12**	**121**	**14**	**14**	**117**

Findings

This qualitative study included 238 participants from Cameroon and Ethiopia, most of whom were caregivers of children under 5. In Ethiopia, 71.4% of participants had already received the COVID-19 vaccine, compared to 56.4% in Cameroon. In both countries, most participants reported feeling "confident" in the vaccine-related information from the government.

Observations of and experiences with community-based vaccination campaigns during the COVID-19 pandemic

Most participants participated in vaccination campaigns during the COVID-19 pandemic. Stakeholders in Ethiopia did not report significant changes to vaccination campaigns for OPV or other childhood illnesses during the pandemic; however, stakeholders in Cameroon reported substantial changes due to caregiver suspicions and concerns about the vaccine. Notably, many caregivers reported concerns that COVID-19 vaccines were being administered instead of OPV. FLWs noted an uptick in vaccine refusals as a result of this and other caregiver concerns. FLWs in Cameroon also experienced or heard of others experiencing aggression or violence during vaccination campaigns as a result of caregiver refusals.

Reasons for vaccine hesitancy

Participants were asked to evaluate a list of potential causes of concern/vaccine hesitancy for both OPV and COVID-19 vaccines. Ultimately, participants in Ethiopia identified with very few hesitancy concerns related to OPV. In Cameroon, however, participants reported personally identifying with or knowing

others in their community who held OPV-related hesitancy concerns, primarily related to concerns over side effects, the potential for the vaccine to be a mechanism for population control, vaccinators not being qualified/trusted, religious leaders opposing vaccines, and the concern that OPV could actually be a COVID-19 vaccine.

By contrast to OPV, participants in both Cameroon and Ethiopia reported various hesitancy concerns linked to COVID-19 vaccines, with the primary concerns across countries being concerns related to side effects, fear that the vaccine could be a mechanism for population control, concern that Westerners were testing vaccines on Africans, and conflicting information on the benefits/dangers of vaccines yielding doubt about whether to be vaccinated. More FGs reported hesitancy concerns related to COVID-19 vaccines in Cameroon than in Ethiopia.

How COVID-19 precautions affected OPV campaigns

Stakeholders were asked about whether and how new COVID-19 precautions, including wearing face masks, using hand sanitizing gel, and enforcing physical distancing measures of 10 meters, may have affected OPV campaigns. Overall, stakeholders in Cameroon felt COVID-19 precautions had a greater effect on vaccination events than stakeholders in Ethiopia. Caregivers in Cameroon feared that masked FLWs would bring COVID-19 into their homes but also grew suspicious of FLWs who inconsistently practiced COVID-19 precautions. FLWs found it challenging to meaningfully engage with caregivers given the limitations on physical space and inability to have face-to-face conversations that might otherwise address reluctance among caregivers. In Addis Ababa, in particular, one of the notable shifts was away from centralized vaccination events to door-to-door campaigns, which stakeholders argued had both advantages and disadvantages.

Community reactions to future OPV campaigns

Stakeholders across both countries felt the biggest hurdle for future OPV campaigns would be to "win back" caregiver confidence and convince them that the polio vaccine being administered was not a COVID-19 vaccine in disguise. Authorities would also need to help address the trust eroded between caregivers and FLWs. Despite some challenges, most stakeholders across both countries reported that community members will likely accept OPV or other childhood vaccines. Community members in both countries reported that time and effort will be required before OPV acceptance numbers return to pre-pandemic levels.

Maximizing community support for OPV campaigns in the COVID-19 context

We asked stakeholders strategies that could be implemented to ensure caregiver concerns are addressed and, therefore, improve vaccine acceptance for OPV and childhood immunizations more broadly in the ongoing COVID-19 context. The main recommendations were to: 1) rebuild community confidence through timely and adequate information; 2) use a variety of information sources; 3) rebuild caregiver trust for FLWs; 4) increase remuneration, resources, and training for FLWs; 5) leverage existing community influencers and groups; and 6) make considerations for COVID-19 vaccines and precautions.

Recommendations

As specific recommendations, we propose:

- In the context of polio outbreak response, consider delivering OPV and COVID-19 vaccination campaigns separately rather than together, to avoid confusion and mitigate concerns. Authorities and vaccinators will need to effectively manage caregiver concerns about COVID-19 vaccines being surreptitiously delivered in place of OPV. This might include providing clear explanations on routes of administration. Note that there is no intention to recommend that vaccination services be separated in this way for broader routine immunization purposes; this is a specific recommendation for polio outbreak responses, particularly in contexts where COVID-19 vaccines may be especially controversial.
- International and local government authorities should prioritize ensuring that caregivers have clear, consistent messaging about the advantages and disadvantages of vaccination against polio. These messages need to be delivered to communities at least one week in advance of any vaccination events.
- In all communities, ensure that messaging is delivered through different mediums, including written materials that contain images of polio's effects, television, radio, and government-support social media accounts in order to reach a broad audience.
- Enlist or increase support for mobilization events from local community influencers, including *kebele* authorities in Ethiopia and other community groups, as these trusted groups are regularly relied upon by caregivers and may be able to address hesitancy concerns. It may be important to include these groups in community action planning efforts.
- FLWs should be provided with additional support in the form of increased remuneration, where possible, while recognizing the various constraints to doing so. They also require resources to increase their visibility and credibility in the communities as well as other materials to support long days in the field, such as appropriate clothing and bottled water.
- The participation of local health authorities in vaccination campaigns could improve FLW credibility, while also promoting FLW feelings of being supported and appreciated for their hard work.
- FLWs need training to effectively address caregiver concerns, including interpersonal communications skills for immunization and specific talking points to counter some of the more common reasons for hesitancy presented here.
- Campaigns should consider adhering to newly accepted COVID-19 precautions, such as using face masks and hand sanitizing gel prior to handling children.

1 Introduction

The Global Polio Eradication Initiative (GPEI) has the goal of vaccinating children across the world against all types of polioviruses to prevent their spread and to progress toward eradication. With the emergence of COVID-19 in March 2020, WHO issued guidelines indicating that mass vaccination campaigns should be suspended until the COVID-19 situation resolved, citing safety concerns around the potential exposure of under-immunized children to COVID-19 while participating in immunization activities.[1] At the same time, GPEI was facing widespread emergences of circulating vaccine-derived type 2 poliovirus (cVDPV2), principally in sub-Saharan Africa, necessitating outbreak response in many countries. Oral polio vaccine (OPV) campaigns have since restarted in most countries; however, there were 44 outbreaks of cVDPV2 in 37 countries between January 2020 and June 2021.[2]

Although the Polio Programme has now resumed vaccination campaigns, polio vaccination campaigns and COVID-19 vaccination campaigns will now in some countries be delivered by some of the same actors (governments, UNICEF, WHO), leverage the same networks of vaccinators and social mobilizers, and potentially take place at the same time. The GPEI is also in the process of introducing a new version of the oral polio vaccine type 2 (novel OPV, or nOPV2) in countries affected by cVDPV2 outbreaks. FHI 360 and UNICEF previously conducted an assessment in the Democratic Republic of the Congo (DRC), Kenya, and Nigeria on the perceptions of the introduction of nOPV2 among various stakeholders, including caregivers of children under 5.[3] We found that stakeholders were largely unaware of cVDPV2. However, caregivers across sites were aware of and expressed concern about repeated vaccination campaigns. Their concerns about existing formulations of OPV as well as the introduction of nOPV2 were primarily linked to safety and efficacy, though caregivers also reported several rumors and misinformation that raised suspicion and fear.

COVID-19 and the associated vaccines are subject to persistent mis- and dis-information[4-6] that have contributed to vaccine hesitancy. There are concerns that the rumors/concerns related to COVID-19 vaccines could spill over into perceptions of other vaccines, including OPV. There has been very little research published on the effect of COVID-19 on the uptake of OPV, but what is available suggests that there is a reasonable, growing concern over vaccine hesitancy in at least some countries. A recent report based on fieldwork conducted by UNICEF in Cameroon reported COVID-19 as one reason for a 30% refusal rate in a 2020 OPV campaign against cVDPV2 in 7 regions, noting that the "research carried out with a view to manufacturing a vaccine has sparked and amplified rumors, reluctance and suspicion with regard to vaccines and vaccination. People saw it as an unacknowledged attempt to spread the disease in their communities."[7] In Ethiopia, a series of Ministry of Health COVID-19 Taskforce surveys indicated that people were forgoing health services due to COVID-19, which also likely impacted routine vaccine uptake.[8]

It is likely that this new context will have consequences for perceptions of OPV and polio vaccination campaigns, and that the GPEI will need to find communications approaches that are able to resolve any new concerns on the part of caregivers, frontline workers, and influencers about polio vaccination in this context. In addition to vaccine-related hesitancy, although the COVID-19 pandemic is considered "over" in many contexts, the house-to-house nature of polio vaccination campaigns may create distrust, as some caregivers may be still be concerned about frontline workers spreading COVID-19 or other infectious

diseases. The GPEI certification of Africa as polio-free in 2020 adds further complexity to the information environment around polio vaccination. We conducted a study to address these information needs and provide updates to UNICEF and GPEI to inform their communications strategy and messages around OPV campaigns.

1.1 Research Questions

The **goal** of this work was to gain qualitative insights into how the experience of COVID-19 restrictions (e.g., social distancing) and perceptions of the newly developed COVID-19 vaccines may have influenced perceptions of OPV and vaccination campaigns in order to inform recommendations for communications and social mobilization strategies.

In pursuing this work, we addressed **three specific objectives**:

1) To develop an understanding of the ways in which the experience of the COVID-19 emergency, the introduction of COVID-19 vaccines, and the COVID-19 vaccination program have affected perceptions of the oral polio vaccine and OPV campaigns;
2) To provide a description of caregiver, frontline worker, and health influencer perceptions and beliefs about the OPV in the context of COVID-19 in two countries; and
3) To highlight any perceptions related to COVID-19 that may present challenges to achieving sufficient polio vaccination coverage to halt polio outbreaks.

2 Methods

We used a cross-sectional, qualitative research design to gather data from key stakeholders in Cameroon and Ethiopia that will assist GPEI in addressing its objectives. In each country, we employed a team of experienced qualitative researchers, including one research lead, two qualitative research facilitators, and two translators/transcriptionists to conduct focus group discussions (FGs) and individual interviews (IDIs). Data were collected in Ethiopia in late February – early March 2022 and in Cameroon between April – May 2022. Data from all countries were compiled and analyzed by FHI 360.

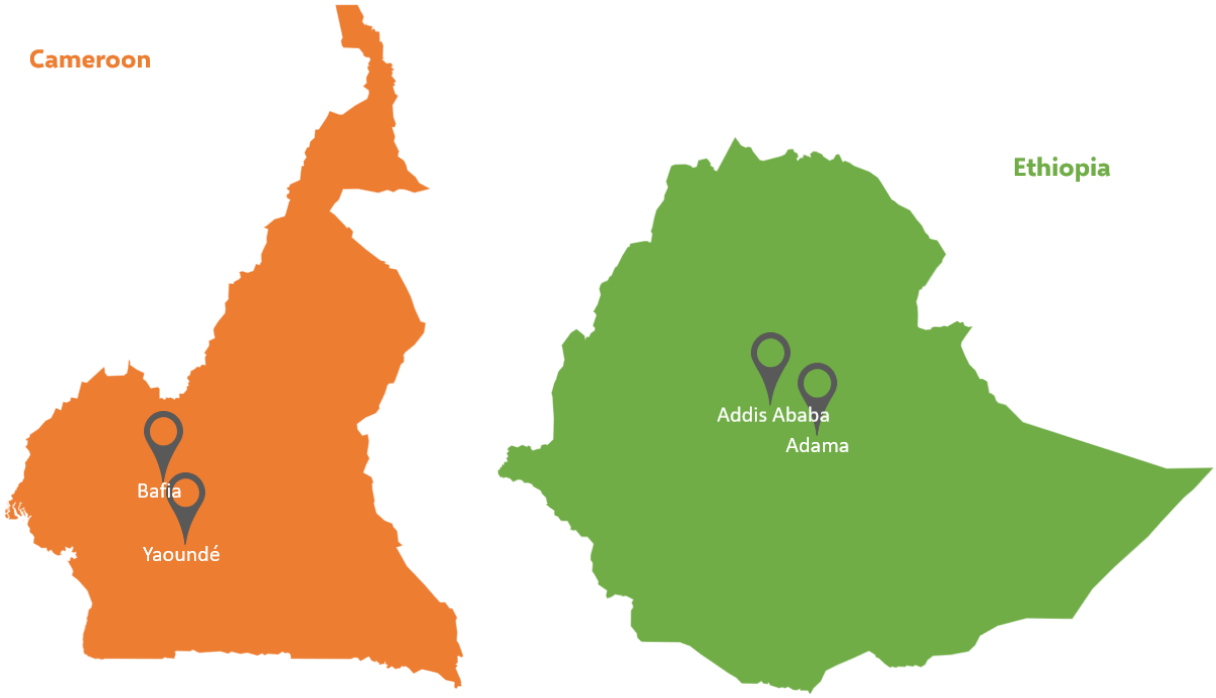
2.1 Ethical/administrative approvals

The protocol and related materials for this activity were reviewed by FHI 360's Office of International Research Ethics, and the activity was granted an exempt research determination per the federal regulatory categories of Human Subjects Research (45 CFR 46). In Cameroon, we obtained local ethical approval from the *Comité National d'Ethique de la Recherche pour la Santé Humaine* and site authorization from the Centre Regional Delegation of the Ministry of Public Health. In Ethiopia, the protocol and materials were reviewed and approved by the Ethiopian Public Health Institute Institutional Review Board. All participants provided their written informed consent to participate and be audio-recorded.

2.2 Settings

This study was conducted in Addis Ababa and Adama, Ethiopia and Yaoundé and Bafia, Cameroon. Given the growing number of outbreaks of cVDPV2 since the start of the COVID-19 pandemic, UNICEF sought to purposively select countries with 1) active cVDPV2 outbreaks, 2) recent OPV campaigns being delivered concurrent with COVID-19 vaccine roll-out, and 3) potential challenges with vaccine hesitancy, and 4) geographic variability. Cameroon was selected from the West African region, while Ethiopia was selected from East Africa. UNICEF staff at headquarters and regional offices provided input on the selection of the specific study sites, which include one urban and one semi-urban area per country. Semi-urban sites were characterized as areas of transition with hybrid urban and rural characteristics. The semi-urban site was located within driving distance from the urban site, which was purposively selected first. Urban and semi-urban locations were selected to represent greater and lesser access to information – and potentially mis-information – through internet resources.

Figure 1. Maps of study locations (one urban, one semi-urban) within Cameroon and Ethiopia



At the time these sites were selected, in Cameroon, there were 7 confirmed cases of cVDPV2 from January through July 2021,[9] and 1,577 confirmed cases of COVID-19 in July 2021.[10] At the start of the pandemic, the number of routine pediatric consultations decreased by 52% in April and 34% in May 2020 when compared to the same periods in 2019, with corresponding declines in prenatal visits and vaccine demand.[11] This led to speculation that rates of polio and other vaccine-preventable diseases would also begin to rise without effective intervention and supplemental immunization campaigns.[12] At the same time, vaccine hesitancy around COVID-19 vaccines was high in Cameroon, with 84.6% of the population expressing concerns over safety, efficacy, and confidence in a potential COVID-19 immunization between May and August 2020.[4] Later, *The New Humanitarian* reported in July 2021 that there was low vaccine

confidence among providers, who cited the speed of the vaccine development, and generally low trust in the government's COVID-19 vaccine roll-out.[13]

This work was also conducted in Ethiopia, which eradicated wild poliovirus in 2001. As part of the horn of Africa, however, Ethiopia represents a high priority for GPEI.[14] Moreover, the dispersed and mobile population of Ethiopia presents a challenge for vaccination campaigns.[15] In 2020, there were 36 cases of cVDPV2 in Ethiopia, with 9 cases reported in 2021 as of October.[16] However, as COVID-19 has spread, with more than an estimated 350,000 cases as of October 2021, health promotion for children under 5 and vaccine campaigns had been interrupted. In the North, routine vaccination was down 12.5% since before the pandemic.[17] Moreover, the polio vaccination network in Ethiopia shifted resources to support the detection of COVID-19 cases, including transitioning dedicated polio workers to conduct house-to-house visits for identifying new COVID-19 cases.[18] The extent to which COVID-19 has affected vaccine acceptance is not well documented.

2.3 Target population

Within each country, we focused on four specific groups of stakeholders: male and female caregivers of children under 5, polio frontline workers (FLWs), healthcare practitioners, and social influencers. Eligibility for all groups included being at least 18 years of age in Ethiopia and 21 years in Cameroon, speaking the local language (Amharic in Ethiopia, French in Cameroon), and providing written informed consent to participate and be audio-recorded.

Caregivers

Given that changes to the vaccine strategy could influence willingness to vaccinate children, we interviewed caregivers and parents of children under 5, which corresponds with guidelines on ages at which children should be administered the polio vaccine. At each site, we interviewed separate groups of mothers/female guardians and fathers/male guardians of children. We sought to engage a range of perspectives including caregivers whose children have/have not received the polio vaccine.

Polio frontline workers

Generally, FLWs were men or women working on mobile teams of vaccinators or as community mobilizers. They had extensive experience administering OPV, including with harder-to-reach populations who may not regularly access health or vaccination services. Participants had at least one year of experience working as an FLW in their community.

Healthcare practitioners

Healthcare practitioners were interviewed to understand how health professionals' training and the information they receive from trusted sources influence their opinions or guidance related to oral polio vaccination in the context of the COVID-19 pandemic and COVID-19 vaccines rollout. Health practitioners were doctors, nurses, or health administrators with at least one year of experience administering the polio vaccine.

Social influencers

Social or community influencers, including village chiefs, traditional leaders, local religious leaders, and other persons of influence in the community, were also identified and interviewed as integral voices in messaging and communications that can shape community perceptions about vaccination campaigns and outbreaks. In addition, health journalists, including formal journalists, bloggers, and other informal publishers of health-related information, were interviewed to understand how their knowledge and perception of COVID-19 and COVID-19 vaccines influence their presentation of information about OPV vaccination. Health journalists are an important channel for delivering appropriate and timely information to caregivers. The role of social influencers varied by country but, generally, all held a visible role in the community for at least one year, which included local health authorities, traditional leaders, and health journalists.

2.4 Sampling & Recruitment

Given the exploratory and qualitative nature of this research, all sampling was purposive. In both countries, we conducted 4 FGs with caregivers and 4 FGs with FLWs in urban and semi-urban areas (each), totaling 16 FGs per country and 32 for the entire study (**Table 1**). We aimed to have even numbers of FGs with male and female caregivers, which we achieved in Ethiopia. In Cameroon, however, because groups of male caregivers were more challenging to gather, we conducted one FG with men and three FGs with women in each site. Each FG included between 5 to 8 participants, for a total of 216 FG participants between the two countries. We also conducted a total of 12 key-informant style IDIs with health practitioners and social influencers in each country, totaling 24 IDIs. These sample sizes are based on empirical evidence that 3 to 6 FGs or 8 to 12 IDIs per sub-population should yield 80% of relevant themes on a focused topic, including the most salient themes.[19,20]

Table 1. Number of focus group discussions, individual interviews, and participants per stakeholder group in Ethiopia and Cameroon, 2022

Stakeholder Group	Ethiopia			Cameroon		
	Urban	Semi-urban	Total	Urban	Semi-urban	Total
Caregivers (FGs)	4	4	64	4	4	51
Frontline workers (FGs)	4	4	47	4	4	54
Healthcare practitioners (IDIs)	3	2	5	2	2	4
Social influencers (IDIs)	3	2	5	4	4	8
All Groups	**14**	**12**	**121**	**14**	**14**	**117**

Recruitment

In each country, we employed a team of experienced qualitative researchers, including one research lead, two qualitative research facilitators, and two translators/transcriptionists to conduct fieldwork. Recruitment efforts were led by the local research lead, who worked closely with local polio vaccination

programs, health care administrators, and providers to maximize privacy and efficiency during recruitment of participants. For recruitment, the study team first met informally with key gatekeepers at selected study sites, which led to the identification of local leaders who could facilitate community entry. This included necessary introductions to engage with staff and caregivers at local health facilities. As part of the community entry process, the study teams provided generalized information about the study objectives and procedures, making available a copy of the relevant institutional review board authorization, if requested.

IDIs with Healthcare Practitioners/Influencers

The local research lead worked with UNICEF, the Ministry of Health, and other relevant stakeholders to identify lists of health practitioners, social influencers, and health journalists who may have professional knowledge to contribute on the topic of OPV. From that list, the local research lead purposively sampled a total of 12 practitioners/influencers/journalists to participate in IDIs (6 from urban and 6 from semi-urban sites, as feasible). Since these individuals were consulted in their public/professional capacity, the field team contacted (by email, online message, or phone) these health practitioners, influencers, and journalists via their publicly available contact information to explain the nature and purpose of the research and invite their participation in an IDI, sharing the research lead's contact information. Upon response of initial interest from a potential participant, the research lead assessed the eligibility of the potential participant, and once established, obtained written informed consent before collecting additional demographic information or scheduling the interview.

FGs with Caregivers

We sampled caregivers for FGs from within the catchment areas of health practitioners included in IDIs. The research teams worked through health practitioners and their staff to recruit caregivers. All first contacts about the research were made by health care staff known to the potential participant, who were asked if they were interested in participating in the study and given the option to either contact study staff themselves or be contacted by study staff. Once eligibility was established, research staff obtained written informed consent before collecting additional demographic information and scheduling the participant for an FG. The research team recruited 8 participants for each group and held a group with a minimum of 5 participants. If 4 or fewer participants were present for a scheduled group, the FG was rescheduled.

FGs with Polio Frontline Workers

Polio FLWs in the research sites were sampled and recruited with the help of the local health administrative unit or organization responsible for organizing OPV campaigns. As with caregivers, all first contacts about the research were made by someone known to the potential participant. The local administrator or organization sent a message using established communications channels (email, text, or voice call) to let all frontline workers in the area know about the research. From there, recruitment was opt-in, with potential interested participants given the option to either contact study staff themselves or be contacted by study staff. Research staff assessed the eligibility of interested FLWs. Once eligibility was established, research staff obtained written informed consent before collecting additional demographic

information or scheduling the participant for an FG. The research team recruited 8 participants for each group and held a group with a minimum of five participants. If 4 or fewer participants were present for a scheduled group, the FG was rescheduled.

2.5 Data collection

The headquarters-based FHI 360 research leads conducted a hybrid remote/in-person training over a 5-day period for the data collection teams to cover an in-depth introduction to the OPV campaigns, common concerns related to OPV and COVID-19 vaccines, the primary research questions, the protocol, informed consent procedures, and data collection and management procedures. Training also included mock interviewing to provide practice and enhance familiarity with IDI and FG guides.

The country-based research teams conducted field work over approximately 12 days, not inclusive of travel and rest days. Each day of data collection included a mix of FGs with caregivers and FLWs and IDIs with health practitioners and influencers. All data collection efforts took place in-person in a location that offered privacy, following medically recommended and local COVID-19 precautions (e.g., social distancing, masking). Each FG was facilitated by a two-person data collection team, with one person as the detailed note-taker. FGs were conducted in French in Cameroon and in Amharic in Ethiopia. FGs took about 2 hours and IDIs approximately 1 hour. Both were audio-recorded with participants' informed consent. At the end of each day, audio files were sent to the Addis Ababa- or Yaoundé-based team of translators/transcriptionists. Study teams in the US, Ethiopia, and Cameroon were trained on data management best practices and were responsible for ensuring that data were secured and remained confidential.

Content of IDIs and FGs

In each IDI or FG, participant groups were asked questions on the same topic domains: 1) COVID-19 effects on perceptions of public health efforts generally; 2) Current perceptions around OPV campaigns (importance, process, how COVID-19 affected); 3) Current perceptions of COVID-19 vaccines and OPV (including rankings of mis-, disinformation); and 4) Suggestions for how to maximize community support for OPV and community-based vaccination in the COVID-19 context. Within these topic areas, each guide had questions targeted for the respondent group. For example, for caregivers, the questions focused on how perceptions of OPV campaigns and COVID-19 vaccines have influenced their decision to participate in vaccination campaigns. For health journalists, however, we asked what information they thought had affected caregiver perceptions rather than their own perceptions. Questions for caregivers focused more on specific rumors or information that were thought to influence caregiver decisions.

2.6 Analysis

We collected, analyzed, and interpreted FG and IDI data in an iterative manner using a team-based approach. FGs and IDIs were audio-recorded, transcribed in the local language, then translated into English. The data were transmitted to FHI 360 for combined analysis. A master NVivo project file was created into which all transcripts were entered and tagged to indicate country, site, and type and gender of respondent. A list of structural codes was developed to mirror the questions asked for each type of data collection event. The structural codes were applied to segment each transcript by question and

response, to facilitate extraction for focused analysis. Codes were grouped according to research objective and analysts used NVivo and Excel to further extract and tag responses according to primary theme, creating code summaries to indicate the primary content and the context of responses (e.g., disaggregation by country, type of respondent). Illustrative quotes were identified during this process and are included in this report to ground the summaries in the data.

3 Findings

The findings of this report are organized by key thematic findings, including: 1) observations of and experiences with community-based vaccination campaigns during the COVID-19 pandemic; 2) how COVID-19 precautions affected community-based vaccination campaigns; 3) reasons for vaccine hesitancy; 4) community reactions to future OPV campaigns; and 5) how to maximize community support for OPV vaccination in the COVID-19 context. Results for Cameroon and Ethiopia are presented together; however, we do specify where there are differences by country and stakeholder group when applicable. We also specify when there are notable differences between urban and semi-urban sites, both across and within countries, when applicable.

3.1 Participant Characteristics

To understand the demographic characteristics of our sample and provide greater context for our findings, we collected basic demographic information from participants (**Table 2**). Although our qualitative sampling approach was purposive and, therefore, did not seek a representative sample, we found that we interviewed a variety of participants across age groups, religions, and educational backgrounds. In both sites in Ethiopia, most participants were aged 26-35. Although this was the primary age group of respondents in Yaoundé, Cameroon, respondents in Bafia were more evenly distributed across age categories. Across both countries, most respondents identified as Christian. In Cameroon, roughly two-thirds of participants had achieved at least primary or lower secondary education, with another quarter having achieved university level or higher. In Ethiopia, more than half of participants had a university degree or higher. All FLWs in Ethiopia reported having a university degree or higher compared with 63% in Cameroon (**Appendix A**). Participants were asked about their COVID-19 vaccine status, as well as, in Ethiopia, their likelihood of getting the vaccine if they had not already. In Ethiopia, 71.4% of participants had already received the vaccine, compared to 56.4% in Cameroon. In both countries, most participants reported feeling “confident” in the vaccine-related information from the government, but particularly in Adama. For more detailed demographic information, including a breakdown by participant group, please refer to **Appendix A**.

Table 2. Demographics for caregivers, frontline workers, healthcare practitioners, and social influencers participating in FGDs and IDIs in Cameroon and Ethiopia, 2022

Characteristic	Ethiopia			Cameroon		
	Addis (n=60)	Adama (n=61)	Total (n=121)	Yaounde (n=58)	Bafia (n=59)	Total (n=117)
Age group						
18-25	9 (15.0)	8 (13.1)	17 (14.0)	5 (8.6)	3 (5.1)	8 (6.8)
26-35	39 (65.0)	36 (59.0)	75 (62.0)	37 (63.8)	10 (16.9)	47 (40.2)
36-45	8 (13.3)	15 (24.6)	23 (19.0)	14 (24.1)	16 (27.1)	30 (25.6)
46-55	3 (5.0)	2 (3.3)	5 (4.1)	1 (1.7)	14 (23.7)	15 (12.8)
56-65	1 (1.7)	0 (0.0)	1 (0.8)	1 (1.7)	13 (22.0)	14 (12.0)
66+	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	3 (5.1)	3 (2.6)
Religion						
Christian	51 (85.0)	57 (93.4)	108 (89.3)	55 (94.8)	53 (89.8)	108 (92.3)
Muslim	9 (15.0)	3 (4.9)	12 (9.9)	1 (1.7)	5 (8.5)	6 (5.1)
No religion	0 (0.0)	1 (1.6)	1 (0.8)	2 (3.4)	1 (1.7)	3 (2.6)
Ethnicity						
Amhara	28 (46.7)	0 (0.0)	28 (23.1)	n/a	n/a	n/a
Oromo	8 (13.3)	0 (0.0)	8 (6.6)	n/a	n/a	n/a
Tigrayan	3 (5.0)	61 (100.0)	64 (52.9)	n/a	n/a	n/a
Other	21 (35.0)	0 (0.0)	21 (17.4)	n/a	n/a	n/a
Education						
Less than primary	2 (3.6)	3 (5.1)	5 (4.3)	0 (0.0)	1 (1.8)	1 (0.9)
Primary school	15 (26.8)	11 (18.6)	26 (22.6)	2 (3.6)	10 (17.5)	12 (10.6)
Lower secondary	5 (8.9)	7 (11.9)	12 (10.4)	6 (10.7)	30 (52.6)	36 (31.9)
Upper secondary	7 (12.5)	3 (5.1)	10 (8.7)	21 (37.5)	14 (24.6)	35 (31.0)
Trade school	1 (1.8)	4 (6.8)	5 (4.3)	0 (0.0)	0 (0.0)	0 (0.0)
University or higher	26 (46.4)	31 (52.5)	57 (49.6)	27 (48.2)	2 (3.5)	29 (25.7)
Likelihood of receiving COVID-19 vaccine*						
Already received	48 (81.4)	37 (61.7)	95 (71.4)	32 (55.2)	34 (57.6)	66 (56.4)
Not yet received	11 (18.6)	23 (18.3)	34 (18.6)	36 (62.1)	25 (42.4)	51 (43.6)
Unlikely	3 (5.1)	3 (5.0)	6 (5.0)	n/a	n/a	n/a
Not sure yet	5 (8.5)	2 (3.3)	7 (5.9)	n/a	n/a	n/a
Likely	3 (5.1)	18 (30.0)	21 (17.6)	n/a	n/a	n/a
Confidence in vaccine-related info from the government*						
Not confident	2 (3.4)	1 (1.7)	3 (2.5)	1 (1.7)	1 (1.7)	2 (1.7)
Somewhat confident	11 (18.6)	2 (3.3)	13 (10.9)	21 (36.2)	11 (18.6)	32 (27.4)
Confident	46 (78.0)	57 (95.0)	103 (86.6)	36 (62.1)	47 (79.7)	83 (70.9)

*Some participants declined to answer these questions and were excluded from the denominator

Participants were asked a series of specific questions during the demographics survey based on their group. The caregivers' responses are presented in **Table 3**; other groups are included in **Appendix A**. In Cameroon, local stakeholders suggested additional questions related to childhood vaccines which were not asked of caregivers in Ethiopia. In all, most caregivers in Ethiopia were married, though with notable differences between Addis Ababa and Adama. In Cameroon, half of participants identified as single.

Although most caregivers were employed in Cameroon, nearly 60% were unemployed in Ethiopia. In Ethiopia, nearly all identified as having a child under 5 vaccinated against polio compared with 84% in Cameroon, with lower self-reported rates in Bafia.

Table 3. Caregiver-specific demographic questions.

	Ethiopia			Cameroon		
Characteristic	Addis (n=32)	Adama (n=32)	Total (n=64)	Yaounde (n=25)	Bafia (n=26)	Total (n=51)
Marital status						
Domestic partner	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	3 (11.5)	3 (5.9)
Married (monogamous)	23 (71.9)	32 (100.0)	55 (85.9)	5 (20.0)	11 (42.3)	16 (31.4)
Married (polygamous)	n/a	n/a	n/a	1 (4.0)	1 (3.8)	2 (3.9)
Single	0 (0.0)	0 (0.0)	0 (0.0)	19 (76.0)	8 (30.8)	27 (52.9)
Divorced/separated	6 (18.8)	0 (0.0)	6 (9.4)	0 (0.0)	0 (0.0)	0 (0.0)
Widowed	3 (9.4)	0 (0.0)	3 (4.7)	0 (0.0)	3 (11.5)	3 (5.9)
Employed						
Yes	13 (40.6)	13 (40.6)	26 (40.6)	16 (64.0)	20 (76.9)	36 (70.6)
No	19 (59.4)	19 (59.4)	38 (59.4)	9 (36.0)	6 (23.1)	15 (29.4)
Number in household						
2	3 (9.4)	0 (0.0)	3 (4.7)	0 (0.0)	2 (7.7)	2 (3.9)
3	4 (12.5)	10 (31.3)	13 (21.9)	3 (12.0)	0 (0.0)	3 (5.9)
4	12 (37.5)	6 (18.8)	18 (28.1)	6 (24.0)	2 (7.7)	8 (15.7)
5	5 (15.6)	9 (28.1)	14 (21.9)	8 (32.0)	5 (19.2)	13 (25.5)
6	7 (21.9)	4 (12.5)	11 (17.2)	1 (4.0)	3 (11.5)	4 (7.8)
7	1 (3.1)	1 (3.1)	2 (3.1)	2 (8.0)	5 (19.2)	7 (13.7)
8 or more	0 (0.0)	2 (6.3)	2 (3.1)	5 (20.0)	9 (34.6)	14 (27.5)
Number of children under 5						
1	26 (81.3)	27 (84.4)	54 (84.4)	16 (64.0)	13 (50.0)	29 (56.9)
2	6 (18.8)	4 (12.5)	9 (14.1)	7 (28.0)	9 (34.6)	16 (31.4)
3	0 (0.0)	1 (3.1)	1 (1.6)	2 (8.0)	4 (15.4)	6 (11.8)
Responsible for health decisions for child under 5						
Respondent	15 (46.9)	3 (9.4)	18 (28.1)	13 (52.0)	16 (61.5)	29 (56.9)
Spouse/partner	1 (3.1)	3 (9.4)	4 (6.3)	3 (12.0)	5 (19.2)	8 (15.7)
Joint decision-making	15 (46.9)	26 (81.3)	41 (64.1)	9 (36.0)	3 (11.5)	12 (23.5)
Other household member	1 (3.1)	0 (0.0)	1 (1.6)	0 (0.0)	2 (7.7)	2 (3.9)
Under 5 vaccinated against polio						
Yes	31 (96.9)	31 (96.9)	62 (96.9)	23 (92.0)	20 (76.9)	43 (84.3)
No	1 (3.1)	0 (0.0)	1 (1.6)	2 (8.0)	5 (19.2)	7 (13.7)
Don't know	0 (0.0)	1 (3.1)	1 (1.6)	0 (0.0)	1 (3.8)	1 (2.0)
Polio vaccination location						
Routine immunization at HF	4 (12.9)	16 (51.6)	20 (31.3)	18 (72.0)	3 (11.5)	21 (41.2)
Community campaign	4 (12.9)	3 (9.70	7 (10.9)	5 (20.0)	8 (30.8)	13 (25.5)
Both	23 (74.2)	12 (38.7)	35 (54.7)	0 (0.0)	9 (34.6)	9 (17.6)
Polio vaccination year						
2018	n/a	n/a	n/a	0 (0.0)	0 (0.0)	0 (0.0)
2019	n/a	n/a	n/a	4 (16.0)	0 (0.0)	4 (9.3)

2020	n/a	n/a	n/a	5 (20.0)	1 (3.8)	6 (14.0)
2021	n/a	n/a	n/a	7 (28.0)	3 (11.5)	10 (23.3)
2022	n/a	n/a	n/a	5 (20.0)	16 (61.5)	21 (48.8)
Don't know	n/a	n/a	n/a	2 (8.0)	0 (0.0)	2 (4.7)
Received other vaccines						
None	n/a	n/a	n/a	3 (12.0)	1 (3.8)	4 (7.8)
Tuberculosis	n/a	n/a	n/a	15 (60.0)	13 (50.0)	28 (54.9)
Hepatitis B	n/a	n/a	n/a	0 (0.0)	1 (3.8)	1 (2.0)
Diphteria-tetanus-pertussis	n/a	n/a	n/a	2 (8.0)	0 (0.0)	2 (3.9)
Flu	n/a	n/a	n/a	2 (8.0)	0 (0.0)	2 (3.9)
Pneumonia	n/a	n/a	n/a	0 (0.0)	4 (15.4)	4 (7.8)
Rotavirus	n/a	n/a	n/a	0 (0.0)	0 (0.0)	0 (0.0)
Measles	n/a	n/a	n/a	9 (36.0)	16 (61.5)	25 (49.0)
Rubella	n/a	n/a	n/a	3 (12.0)	4 (15.4)	7 (13.7)
Don't know	n/a	n/a	n/a	6 (24.0)	4 (15.4)	10 (19.6)
Other vaccine(s) year						
2018	n/a	n/a	n/a	0 (0.0)	2 (8.0)	2 (4.3)
2019	n/a	n/a	n/a	7 (31.8)	3 (12.0)	10 (19.6)
2020	n/a	n/a	n/a	8 (36.4)	8 (32.0)	16 (31.4)
2021	n/a	n/a	n/a	13 (59.1)	14 (56.0)	27 (52.9)
2022	n/a	n/a	n/a	10 (45.5)	19 (76.0)	29 (56.9)

4 Observations of and Experiences with Community-Based Vaccination Campaigns during the Pandemic

Most participants, but not all, were exposed to vaccination campaigns since the beginning of the COVID-19 pandemic. Overall, stakeholders in Ethiopia reported some minor changes to vaccination campaigns for OPV or other childhood illnesses during the pandemic however, stakeholders in Cameroon reported changes due to caregiver suspicions and concerns about the vaccine.

For caregivers in both sites in Cameroon, some reported a sense of confusion and resistance to vaccination campaigns, largely stemming from concerns that the campaign was related to COVID-19 vaccination instead of OPV. Against the backdrop of the pandemic and since polio did not feel as urgent of a public health concern to caregivers by comparison, it seemed plausible that the vaccination campaign could instead be a ruse to vaccinate against COVID-19.

> *They wanted to vaccinate the children, but **I didn't agree because I thought was COVID.** (Bafia, Caregiver-03)*

FLWs in Bafia and Yaoundé described an uptick in vaccine refusals based on rumors and misinformation, including that all vaccines are a form of population control or that the polio vaccine might contain the COVID vaccine or the disease itself (see more under **Section 6 Reasons for Hesitancy**).

COVID-19 came to slow down all the activities as we started to say, because with regard to polio, ***all the parents made an effort to hide their children. They were very reluctant****, saying that it is the COVID vaccine that we are going to administer to children. (Bafia, FLW-04)*

In some extreme cases, FLWs in Cameroon experienced or heard of other vaccinators experiencing aggression or violence during vaccination campaigns as a result of caregiver refusal.

Since COVID came out, he has really started to have reservations about polio vaccination and whether parents will accept you entering their house. ***Even if he knows you, he will take the machete to say, "go out of my house."*** *But after having people like that you'll say, "My brother, forgive me, it is not the vaccination against COVID, it is for the polio." Therefore, it is necessary to know how to speak with the person.* ***It is COVID that has destroyed things … has changed the immunization system in Cameroon because everyone has already put it in his head that as soon as he sees you, it is COVID.*** *(Yaoundé, FLW-04)*

Similar to FLWs, healthcare practitioners in Cameroon noted that mothers were not bringing their children for vaccination like they used to before the pandemic. In Yaoundé, one healthcare practitioner observed an estimated 10% drop in routine vaccinations with the onset of the pandemic and an additional drop once COVID-19 vaccines were introduced, from roughly 50-65 children per month to about 25.

Some of the concerns reported by Cameroonian caregivers were also reported by Ethiopian caregivers, particularly related to the actual substance of the vaccine, though to a far lesser extent. Generally, Ethiopian caregivers noted that campaigns "continued like the past." Any concern among Ethiopian caregivers about vaccination events during this period seemed tied more to lack of trust for health extension workers than concerns about the vaccine itself. Meanwhile, FLWs and healthcare practitioners in Ethiopia did not report any notable difference in vaccination rates due to the pandemic.

*There were polio and measles vaccination campaign during COVID 19 epidemic. We gave vaccination like we did before. We used all preventive measures for children and ourselves****. No one resisted vaccinating their children because of COVID 19 epidemic. We did everything like we did before COVID-19.*** *There was no problem because of COVID-19. (Adama, FLW-07)*

There is no change. After the outbreak of COVID-19, there was a campaign for measles as well as for polio. ***The outbreak of COVID didn't prevent parents from getting their children vaccinated.*** *They were vaccinating their children; there was no impact. (Addis Ababa, Healthcare Practitioner-02)*

5 Reasons for Vaccine Hesitancy

We asked FGs of caregivers and FLWs about a list of reported reasons for vaccine hesitancy or concerns related to both OPV and COVID-19 vaccines. These potential reasons/causes for hesitancy were sourced from previous research in Cameroon related to COVID-19 vaccination[21] as well as from DRC, Kenya, and Nigeria related to the introduction of nOPV2.[3] FGs were encouraged to add new reasons for hesitancy not captured in the list, though no other causes for hesitancy were captured.

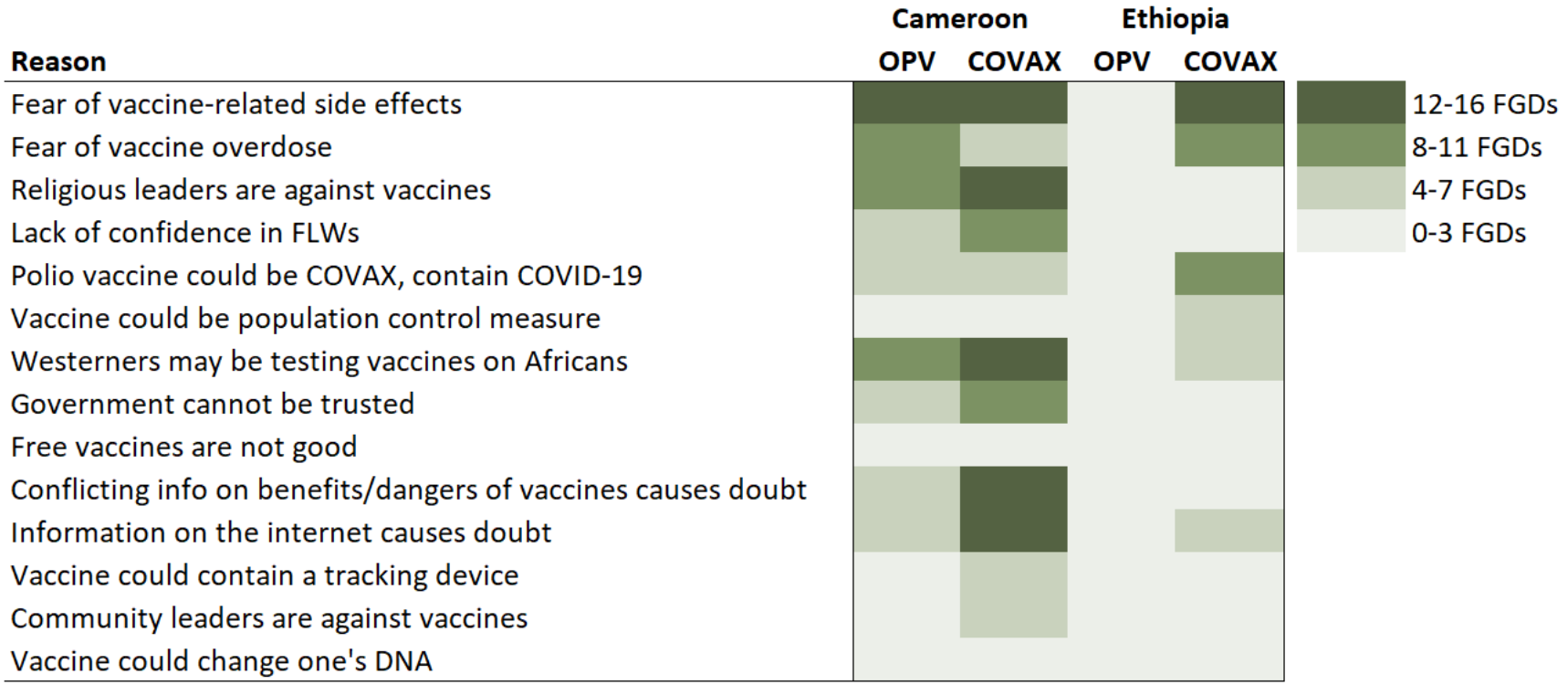
Particularly for OPV, most groups had at least one person reporting that the proposed reasons were <u>not</u> a cause of hesitancy. However, **Figure 1** provides a heatmap depicting the number of FGs of caregivers

and FLWs in which at least one participant personally thought or identified with the respective reason for hesitancy related to OPV or COVID-19 vaccines. Separately, **Figure 2** depicts the number of FGs in which at least one participant knew of other people in their community who thought/believed the concern. In the heatmap, colors correspond with the number of FGs (out of 16 total in each country) in which at least one participant reported the concern. Cooler colors depict lesser concern, whereas warmer colors show greatest concern. Overall, we found that reasons for hesitancy varied by vaccine (OPV vs. COVID-19 vaccines) as well as across countries.

Of note, participants in Ethiopia identified with very few hesitancy concerns related to OPV and almost none with which participants personally identified. Instead, OPV-related reasons for hesitancy in Ethiopia were largely community perspectives. In Cameroon, however, participants reported personally identifying with or knowing others in their community who held OPV-related hesitancy concerns, primarily related to concerns over side effects, the potential for the vaccine to be a mechanism for population control, vaccinators not being qualified/trusted, religious leaders being against vaccines, and the concern that OPV could actually be a COVID-19 vaccine.

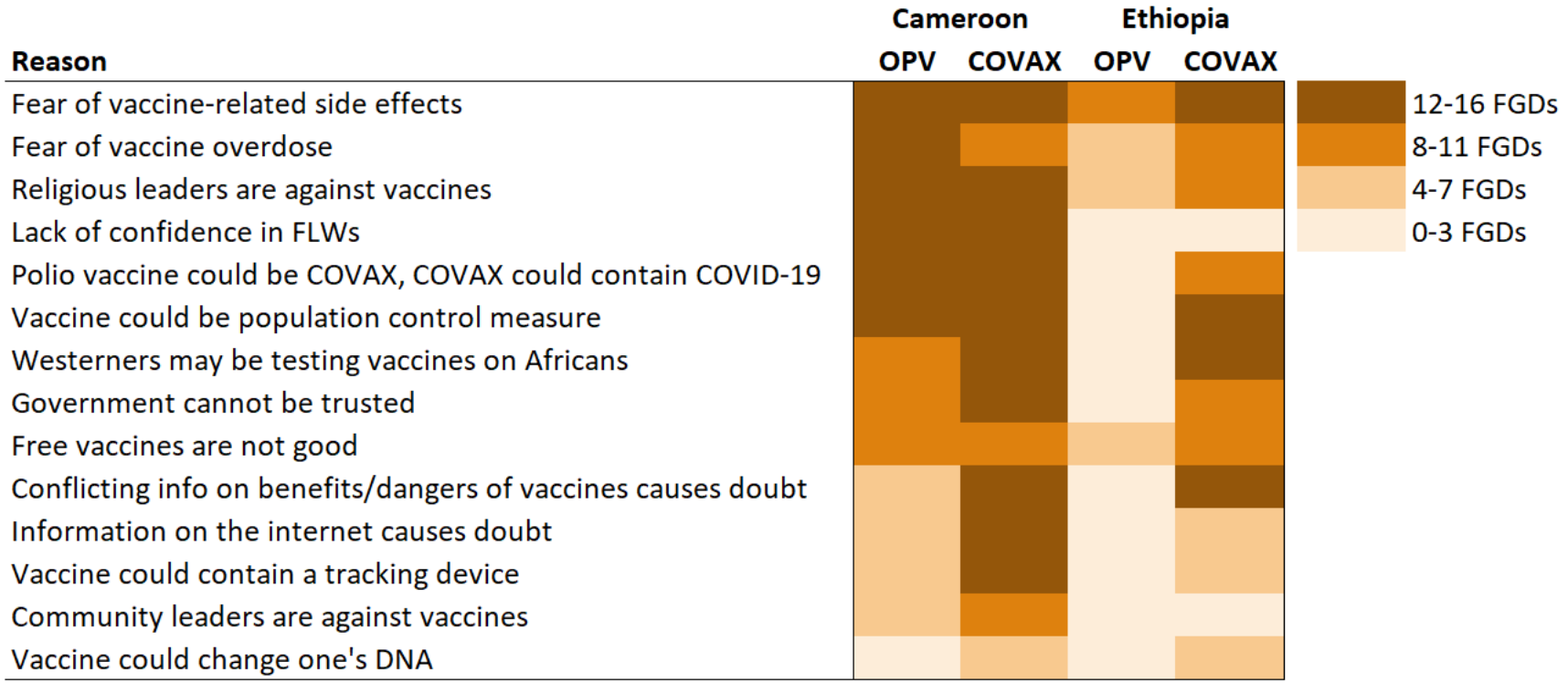
In contrast to OPV, participants in both Cameroon and Ethiopia reported various hesitancy concerns linked to COVID-19 vaccines, with the primary concerns across countries being concerns related to side effects, fear that the vaccine could be a mechanism for population control, concern that Westerns were testing vaccines on Africans, and conflicting information on the benefits/dangers of vaccines yielding doubt about whether to be vaccinated. In Ethiopia, with the exception of concerns related to side effects, it was notable that most groups reported these concerns as community perspectives rather than concerns held personally by participants. More FGs reported hesitancy concerns related to COVID-19 vaccines in Cameroon than Ethiopia, with some of the additional key concerns in Cameroon held personally by participants being religious leaders being against COVID-19 vaccines and information on the internet causing doubt or concern about whether to become vaccinated. In the remainder of this section, we provide details on the most salient themes discussed by stakeholders.

Figure 1. Number of focus groups (n=16) in which at least one participant reported that <u>they personally felt hesitant</u> to take OPV or COVID-19 vaccines for the following reasons in Cameroon and Ethiopia, 2022



COVAX = COVID-19 vaccines; OPV = oral polio vaccine

Figure 2. Number of focus groups (n=16) in which at least one participant reported that <u>they knew of someone in their community who felt hesitant</u> to take OPV or COVID-19 vaccines for the following reasons in Cameroon and Ethiopia, 2022

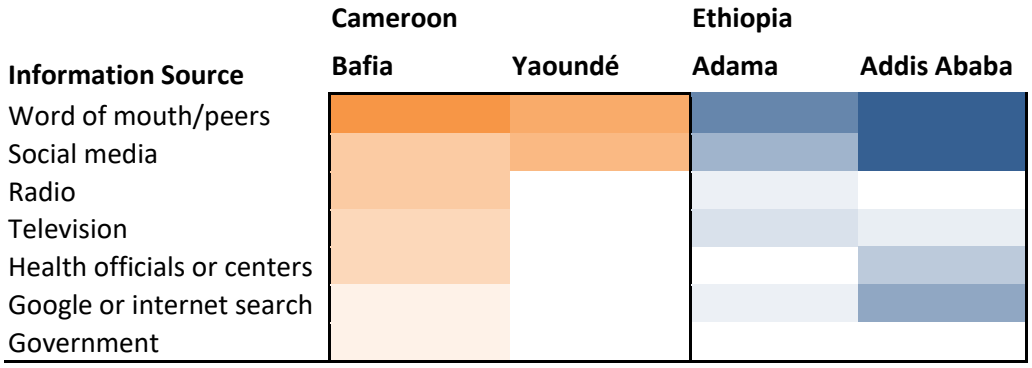


COVAX = COVID-19 vaccines; OPV = oral polio vaccine

5.1 Sources of information related to hesitancy concerns

We asked participants about where they received information that contributed to the reasons for hesitancy related to both OPV and COVID-19 vaccines. As indicated in **Figure 3**, across both countries, word of mouth or peers was the number one source from which they received information that contributed to hesitancy. As indicated by the darker shading, this was more prominent in the urban center (Addis Ababa) in Ethiopia but more prominent in the semi-urban center (Bafia) in Cameroon. The second most common source was social/media, which was more prominent in the urban centers. For example, nearly three-quarters of transcripts in Addis Ababa mentioned social media as a source that provided information causing hesitancy, compared with one-third in Adama. In Cameroon, the distinction narrower between the urban and rural locations. Facebook was the most commonly cited social media site used in both Cameroon and Ethiopia, but WhatsApp, TikTok, YouTube, and Instagram were also noted. Radio, television, health centers, internet searches, and the government were also cited as sources of information leading to hesitancy among at least some participants. However, it is worth noting that no participants in Ethiopia reported that the government provided information leading to hesitancy compared with only a few participants in Bafia, Cameroon reported.

Figure 3. Number of transcripts in which at least one participant reported the source from which they received information related to hesitancy concerns Cameroon and Ethiopia, 2022



5.2 Concerns over vaccine-related side effects

Overall, there was limited concern related to potential side effects related to OPV in both Cameroon and Ethiopia. After many decades of OPV vaccination within these communities, stakeholders are familiar with OPV, and many expect to experience minor side effects with all vaccines. Compared with participants in urban sites, participants in semi-urban sites more often commented that all vaccines have side effects, including that they were worried about the "usual" OPV side effects. Although there were no notable differences in how male and female caregivers responded to this concern in Cameroon, men in Bafia reported having greater personal concerns over OPV-related side effects than men in Yaoundé. Men in Ethiopia were slightly more concerned about OPV-related side effects than women.

Side effects were more often discussed in relation to COVID-19 vaccines, especially in Ethiopia, where concerns about side effects did initially delay many respondents' vaccination – and vaccination in their communities. Men and women in Cameroon and Ethiopia were equally concerned about side effects associated with the COVID-19 vaccine. Respondents in urban areas more often commented about major

side effect concerns related to COVID-19 vaccines. However, in general, concerns related to vaccination side effects were minimized as people became more familiar with COVID-19 vaccines.

	OPV	COVID-19 vaccines
Cameroon	*To my knowledge all vaccines can cause side effects, that can vary from an organism to another... According to me, saying that polio or COVID vaccines have no side effect cannot be true, because it will depend on the organism. It causes side effects that can be minor or severe. (Bafia, Health Journalist-01)*	*I've been vaccinating a lot of people against COVID-19, but the side effects that I had were sometimes itching, not serious side effects, and a lot of them didn't even come back and complain. So, there are side effects, but at my level I haven't had any serious side effects yet, so it was really minor. (Bafia, HP-02)*
Ethiopia	*N/A*	*Health workers told us the vaccine side effects like chills, nausea, headache, fever, rigor when we take the vaccine. I hesitated to take the vaccine when I heard the side effects. Most people left when they hear it side effects. I also took the vaccine after a week. Side effects become severe for some people but for others it is asymptomatic. (Addis Ababa, CG-04)*

5.3 Fear of vaccine overdose

Fear of vaccine overdose for OPV was mentioned by a few groups in Ethiopia but was not a notable concern or cause for hesitation for men or women. In a few instances, participants described being reassured that "double-dosing" was not problematic by the vaccinator. By contrast, caregivers in Cameroon did report this concern. In Bafia, very few (one caregiver and one SI) shared a concern that children might receive the same vaccine twice, either because of multiple OPV campaigns or from being administered the same vaccine once at home and then again at school. However, several noted explicitly that they were not concerned about an overdose of childhood vaccines, citing the marking of pinky fingers or the use of nail polish to indicate that a child had already been vaccinated.

Some FLWs also indicated that a double dose could actually be beneficial to the child's immune system, and as such, were not worried about a potential vaccine overdose. In Yaoundé there was also a low level of concern. Other stakeholders that were aware of community concerns (e.g., healthcare practitioners and health journalists) noted that issues can arise in instances where caregivers have questions about double or overdosing and FLWs cannot adequately explain the relevant information. One social influencer in Yaoundé described receiving specific training to be able to respond to caregivers' questions and assuage fears of clinic and community-based "double" vaccination.

Concerns about over-dosing related to COVID-19 vaccines were more prominent in both countries, especially women in Yaoundé and men in Addis Ababa. FLWs in Cameroon discussed feeling confidence that certain routine childhood immunizations could be "double-dosed" to children without endangering the child, but there was little information about how this would apply to a novel vaccine for COVID-19. Vaccines against COVID-19 being an injection formulation seemed to cause more concern compared to orally administered polio vaccine. In Ethiopia, there was confusion over the one and two-dose regimens for COVID-19 vaccines. Specifically, those taking the Johnson & Johnson vaccine were told it would be a one-dose vaccine, but then questions arose when a booster shot became available.

	OPV	COVID-19 vaccines
Cameroon	*The lack of information causes parents around us to refuse the vaccine for children at school when they have already vaccinated them in hospital, because they are afraid of the overdose; as I said before, when you have incompetent health workers who cannot explain if an overdose of vaccine can cause a disorder in the child or not, it is really difficult. (Yaoundé, Health Journalist-02)*	*There is a risk of overdose if it is injections. But if it is polio, the drops, there is not. When there is a polio campaign, they give the vaccine to this child here in the hospital and when he goes out, he receives the same polio and is marked on the finger to determine he was covered by the campaign. But for the COVID, the injections we are given, that's what I'm afraid of, because injection is injection, drops are drops. (Bafia, FLW-04)*
Ethiopia	*Last time I get my child vaccinated here in the health center. After three days they came to our locality in campaign and asked us to vaccinate our children. I told them that my child is already vaccinated three days ago and asked her if it doesn't have any problem for him if he takes this one too. It was oral vaccine. She said that it doesn't have any problem so they gave him the oral vaccine. (Addis Ababa, Caregiver-01)*	*In the first round, there was AstraZeneca and Johnson. By that time we were told that AstraZeneca will have second round, but Johnson is given in one round. In fact, there is also now what they called booster for Johnson as well. So, personally I may also hesitate to take that. The community also hesitates. (Adama, Caregiver-05)*

5.4 Religious leaders are against vaccines

Nearly all stakeholder groups in Bafia and Yaoundé were very familiar with the idea that vaccine hesitancy could be borne from teachings of local religious leaders. In particular, some women in Bafia and some men in Yaoundé expressed this concern over OPV, whereas men in Bafia and Yaounde expressed this concern related to COVID-19 vaccines more often than women in those sites. That said, a few caregiver groups did not think religious leadership would resist vaccines in their communities and some cited examples of religious leaders providing community engagement and vaccine promotion. Mostly, respondents noted born-again churches, Pentecostalists, Jehovah's Witnesses, and other sects as known resisters. Nearly all FLWs had encountered a household or leader at some point who had referred to religion as a reason for refusal, either because God would heal the sick or the vaccine was related with

the devil. Despite the widespread recognition of this reason for hesitancy, it seemed to be regarded as a fringe reason among "funny churches and the churches feed them with beliefs."

In Ethiopia, this concern was not quite as prominent. Only a few men in Adama noted that some members in their communities held this concern related to COVID-19 vaccines. However, there was discussion about some religious leaders considering the pandemic to be punishment for man's sins and sentiment that only God could protect people, not vaccines. Similar to comments from Cameroon, there was discussion that COVID-19 vaccines could inject the "666 spirit" or devil into a person, though several noted that this information – though ubiquitous on social media – was false.

	All vaccines
Cameroon	*Whether it is Muslims or churches, religious leaders think that vaccines will destroy their children by disabling them or making them sterile. (Bafia, FLW -05)*
Ethiopia	*Some people say God protects us, we don't need to take the vaccine. This vaccine doesn't prevent us from this disease, only God has the power to protect us. (Addis Ababa, Caregiver-04)* *There is also an advertisement which mentioned people's wrong thinking on COVID vaccine, by stating 666 spirit. Though they are trying to teach the people, it could create some wrong perception in the mind of the people. It could have been presented in a different way. So, people may perceive that it may be a 666 spirit and decide not to receive the vaccine. (Adama, Caregiver-05)*

5.5 Lack of confidence in FLWs

Overall, there was very little concern among Ethiopian stakeholders related to caregiver confidence in FLWs' ability to deliver OPV. There were a few comments across caregiver and FLWs groups about how the potential lack of training and skills of FLWs, including resources and skills to maintain vaccine cold chain, could affect caregiver confidence, but the majority of male and female Ethiopian caregivers reported that this kind of trust was not a major contributor to hesitancy for OPV or COVID-19 vaccines.

However, men and women in Yaoundé expressed concern over lack of confidence in FLWs related to delivering OPV. Men in Bafia and both men and women in Yaoundé also expressed this concern linked to COVID-19 vaccines. There were two threads linked to caregiver concerns about community delivery of OPV and other routine vaccinations. Though in the minority, the first of these caregiver concerns was linked to unfounded theories, such as that vaccinators could be posing but actually have intent to "form clans and decide to hurt this or that community." The second concern was that some FLWs were known to be "brutal," causing pain during the administration of routine childhood vaccinations, though this was typically linked with injectables rather than orally administered vaccines like OPV. One group of FLWs from Bafia also reported hearing some caregiver being concerned that FLWs hold this role solely for the money, and some FLWs reported that their fellow FLWs shared this suspicion. In Yaoundé, some stakeholders also commented on the lack of confidence related to the selection of FLWs (e.g., nepotism or low entry standards). Some also questioned vaccine quality if vaccinators were inadequately trained or

resources and, therefore, unable to maintain the proper temperature for vaccines as they worked throughout the day.

	All vaccines
Cameroon	*There is actually a trust issue with those community vaccinators, because no one know how they got trained, what are their habits and other things like that. Mainly for community vaccinators. It is different at a hospital. (Yaoundé, Caregiver-01)*
Ethiopia	*Sometimes guards and nonprofessional people are suspected they provide the vaccine. Do they have the knowledge and provide the appropriate amount? That is why I have concern. …Health facility guards. It could be cleaners or those working in the record/card yard. They don't have knowledge related to health. We see them open and give. (Adama, Caregiver-08)*

5.6 Vaccines actually be a COVID-19 vaccine OR may contain COVID-19

Regarding OPV, all stakeholder types from both countries reported community-level concerns that campaigns being billed as protecting against polio might, in fact, be a way to administer COVID-19 vaccines without the community's consent. This concern was more pronounced in Cameroon, especially among women in Yaoundé, but hesitation around OPV was similar in both locations. This included the need for explanation and reassurance that the vaccine provided during an OPV campaign was **NOT** a COVID-19 vaccine. The suspicion and hesitancy around this topic hinged on the fact that people did not have a way of knowing what was in the syringe.

There was also concern reported by men and women in both countries that they may be infected with the virus that causes COVID-19, rather than being inoculated against it. In both countries, but more strongly in Cameroon, this was tied to rumors and theories about population control and Westerners testing medications on Africans. In Ethiopia, this was also borne from the fact that many people who had been vaccinated experienced symptoms of COVID-19, and therefore, the vaccination must have been an intentional injection of the virus.

	OPV	COVID-19 vaccines
Cameroon	*I believe this, because they can see that there are some people who are reluctant and then now they schedule a polio vaccination campaign, and they take the opportunity to do the vaccine against COVID. (Yaoundé, Caregiver-04)*	*That's is my reason for not taking the vaccine because I know that they will inject me with Covid-19, because I know that they want to reduce the population of Cameroon and I don't want to be part of that. (Bafia, Caregiver-02)*

	OPV	COVID-19 vaccines
Ethiopia	*People associate it with politics. They think government will give us COVID vaccine saying it is polio vaccine. They say we don't know whether it is polio or not. (Addis Ababa, FLW-04)*	*The reason why I believe that [the vaccine contains COVID] is that on the day that I have received the vaccine I have repeated sneezing, high fever, high back pain]; I was in an intense pain and sickness; I had huge perspiration. So, I concluded that they gave me the virus. I had all the symptoms of people who contract corona; there was continuous sneezing, back pain, shivering. I swear, I said that they gave me the vaccine itself. I was highly sick though it didn't last long. So, I was confused. (Adama, FLW-05)*

5.7 Vaccine is a population control measure or causes infertility

Concerns linking vaccination and infertility were very familiar across countries, communities, and respondent types. In neither country did concerns about infertility seem a major determinant of OPV decision-making for respondents, who usually reported that they had heard these concerns but did not share them personally. Though few overall, men more often reported this than women in both countries. Across both countries, the HPV vaccine seemed more associated with fertility concerns than OPV, among known childhood vaccinations. In Cameroon, in a few cases, the multiple rounds of OPV were specifically implicated as being aimed at controlling reproduction. By contrast, in Ethiopia, there was very little association between OPV or childhood vaccines and infertility.

Suspicions about COVID-19 vaccines causing infertility were very familiar to respondents in Cameroon, especially men, even if participants themselves did not share the belief. The "experimental" nature of the vaccine, its newness, and the lack of clarity about what was in the vaccine contributed to perceptions that the aim of this new type of vaccination was to make Black Africans infertile, which was particularly true in Bafia over Yaoundé. In Ethiopia, more respondents were personally hesitant to take a COVID-19 vaccine due to beliefs related to infertility than in Cameroon, and nearly all respondents knew someone who believed COVID-19 vaccines could cause infertility. Several respondents described community beliefs that COVID-19 vaccines were intended to reduce or eliminate specific ethnic groups, one using the term "genocide." In these cases, the Ethiopian government, rather than Western countries, were the "mastermind" behind population control, though some respondents did mention Western plots to reduce African fertility as well.

	OPV	COVID-19 vaccines
Cameroon	*Yes, people were saying that concerning the Whites, that the Whites didn't want Africans to have a higher population than the White population. So, they sent the vaccines to reduce our population, but I don't share that point of view. I don't know if in my community people think like this, but nobody has ever said such to me. (Bafia, Social Influencer-01)*	*The anti-vaccines think that the vaccine today is the new tool for the new world order, to control the birth rate, fertility and even the development of countries … Let's say it's much more focused on the COVID-19 vaccine, but there are some who will generalize on other vaccines. (Yaounde, Health Journalist-02)*
Ethiopia	*Before, we never heard such a thing. Now we heard that this vaccine is used to decrease population size of Amhara ethnic group. (Adama, Caregiver-06)*	*Some people were saying that the government has intention to make us infertile, and it is not COVID protection medicine. They thought that it is the government's intention to reduce the number of people. (Adama, FLW-06)*

5.8 Vaccine could contain a tracking device

The idea that vaccines could contain a tracking device was almost exclusively related to COVID-19 vaccines. There were a few general statements from Cameroonian stakeholders indicating that any vaccine might be used in this way, but none that specifically named OPV. In Ethiopia, the idea that OPV could contain a tracking device was irrational, with one participant laughing and saying, "There is no one who thinks like this."

Regarding COVID-19 vaccines, most Cameroonian stakeholders had heard rumors about vaccines containing tracking technology, and some personally shared this belief as well. Stakeholders spoke about a metal chip or coin that could be secretly inserted. About half of respondents in Ethiopia (more from Addis Ababa than Adama) were aware of this rumor, circulated early in the pandemic primarily on TikTok and other social media platforms, that COVID-19 vaccines were related to the devil and/or an emerging New World Order where people would be controlled. Although most respondents in both countries dismissed these conspiracy theories, most were aware of them.

	COVID-19 vaccines
Cameroon	*When you hear such rumors, if you intended to take the vaccine you get scared and hesitant because you have heard that the whites have put a chip in the vaccine to control blacks like robots and slaves. This discourages a lot. (Bafia, Caregiver-05)*
Ethiopia	*In the community, they feel that after they put the microchips in your body, they control ever activity you make like where you are and what you do. SO, you are under control of them. They related microchips with the vaccine. (Addis, Social Influencer-06)*

5.9 Westerners may be testing vaccines on Africans

There was little concern about Africans being used to test OPV specifically given that it is considered an established, familiar drug. However, there was one report from a health journalist in Cameroon and a few from FLWs and a social influencer in Ethiopia that community members who are broadly anti-vaccine might feel this way, but without specifically mentioning or targeting OPV. More so than testing, conversations typically revolved around the "free" nature of the vaccines. There was some sentiment that free supplies from another country might be low quality or expired, concerns which might seed hesitancy.

For COVID-19, the belief that the vaccine was experimental and/or being tested on Africans was prevalent, across countries and respondent types. The newness, unfamiliarity, and donation of the vaccine all contributed to suspicions. In Ethiopia, particularly in Adama, there was a political dimension underlying these sentiments, with several mentions of not trusting COVID-19 vaccines because they were from America (or China). For a few, this sentiment was related to the belief that vaccines were sent to reduce or harm African populations, an idea that was shared by respondents in both Ethiopia and Cameroon.

	OPV	COVID-19 vaccines
Cameroon	*For polio vaccines especially, people think that it is a way to kill their children, to make them disabled, to destroy children's intelligence. It is a way to keep us subjugated to them and to keep us ill, so that we will always be depending on drugs that great pharmaceutical firms propose. (Yaounde, Health Journalist-01)*	*They say that when people make the vaccine, they come and test it on us, so they take us as rats in the laboratory, so it's not what they use there that they send to us, so there it's the real. (Bafia, Caregiver-04)*
Ethiopia	*Westerners donate vaccine for African nations. People think African nation always expect aid. So westerners send vaccines for free to African nations to test the vaccine, because we are poor. People say if the vaccine is effective why don't westerners take it first. A mother said, I don't vaccinate my children for polio. She told us she doesn't trust vaccines which is sent for African nations. (Addis, FLW-04)*	*Most of it comes from America. People say, we don't know what they add into it. There are people who think that way. (Adama, Caregiver-08)*

5.10 Gender-related differences in vaccine hesitancy

We identified some differences in how men and women reported on vaccine hesitancy in the sections above. Notably, women in Yaoundé were more concerned than men that OPV could be the COVID-19 vaccine. Men in Ethiopia were more concerned than women about OPV-related side effects. Women in Yaoundé and men in Addis Ababa were more concerned about over-dosing with the COVID-19 vaccine than their counterparts, while men in Bafia, Yaoundé, and Adama were more concerned that religious leaders were against the COVID-19 vaccines than women. Despite these differences, however, men and women commonly shared concerns across sites.

We asked participants to reflect on gender-related aspects of vaccine hesitancy – in particular, who would be more likely to believe in misinformation and therefore modify their behaviors due to vaccine hesitancy. Overall, urban participants more likely to name women as believers of misinformation leading to vaccine hesitancy, whereas participants in semi-urban areas more often named men as those believing in misinformation. In both sites in Ethiopia, many participants said women are more vaccine hesitant than men due to their belief in misinformation. Some potential reasons for increased vaccine hesitancy among women included fear about side effects, particularly infertility. Participants theorized that women spend more time in public places with friends where topics of vaccines may be discussed (see 5.1 on word of mouth as misinformation source). Women are also typically responsible for children's healthcare and, therefore, may spend more time discussing the topic. In Cameroon, however, there was not a significant perceived difference between the views and behaviors of men and women related to vaccines. Slightly more groups in Bafia suggested men might be more susceptible to misinformation. Some reasons – from all sites – why men may be more vaccine hesitant included that they spend more time outside of the home where they can be exposed to new information, and perhaps relatedly, tend to be more skeptical of the "main" narrative. Some suggested men are more likely to believe and spread rumors while also being less likely to worry about the serious effects of polio.

6 How COVID-19 Precautions Affected Community-Based Vaccination Campaigns

With the COVID-19 pandemic came a number of mandated precautions that were applied across the globe. These included wearing face masks, using hand sanitizing gel, and enforcing physical distancing measures of 1 to 2 meters. Although most participants characterized the overall COVID-19 response as adequate in urban and semi-urban sites, some urban caregivers in Yaoundé and Addis Ababa characterized the response as very poor. Stakeholders were asked about whether and how these precautions may have affected OPV campaigns. Overall, stakeholders in Cameroon felt COVID-19 precautions had a greater effect on vaccination events than stakeholders in Ethiopia.

In Cameroon, there was mixed response as to whether COVID-19 precautions affected vaccination campaigns. Some stakeholders said there was no effect and that measures were respected and integrated into standard practice. However, some FLWs described tension between vaccination teams and the community, including being "chased away" due to the fear that those wearing masks might be infectious with COVID-19. This fear was corroborated by some caregivers who expressed concerns over social distancing.

> *Personally, I do not adhere to campaigns.* ***When vaccination teams came, I did not receive them, simply because they had to touch the child to administer the vaccine.*** *The virus could circulate with hand contact and the child could be contaminated. (Yaoundé, Caregiver-02)*

Although some caregivers feared FLWs in masks, on the other hand, the inconsistency with which some FLWs exercised COVID-19 precautions eroded trust in FLWs and the vaccines themselves.

> *In the small health facilities that I attended, those who were giving vaccinations,* ***I did not see anyone washing their hands, wearing face masks or respecting social distancing, so it makes you doubt the vaccine they are giving to the children.*** *(Yaoundé, Caregiver-04)*

Some FLWs in Cameroon also found it challenging to engage with reluctant caregivers and gain their trust due to a variety of rumors that surfaced. Moreover, the physical limitations of not being able to go into people's homes and have personal face-to-face conversations made it challenging to convince caregivers hesitant to vaccinate. At the facility-level, healthcare practitioners in Cameroon had mixed reactions, with only one in Yaoundé explicitly stating that vaccinations were affected. Others said they were able to adapt to COVID-19 precautions without issue. The biggest challenge was in needing to maintain a safe distance and how this affected healthcare practitioners' ability to physical touch children, including to calm them for vaccination.

In Ethiopia, many stakeholders said COVID-19 precautions did not affect OPV campaigns. However, some caregivers and FLWs recalled that the pandemic caused a decrease in access to routine immunization services, which meant some children experienced delays in their vaccine schedules.

> *When I came here to get my child vaccinated, there was no service for some period of time.* ***They had suspended the vaccination service for nearly one month. So, my baby girl missed the vaccine that she was expected to take on her ninth month,*** *and they didn't give me appointment for other time. So, she didn't take the vaccine. So, it has affected our vaccination program. (Adama, Caregiver-01)*

For stakeholders who did report that precautions affected campaigns, some noted new regulations around the number of people allowed to congregate (typically a maximum of 10 people), as well as needing to maintain 1 to 2 meters of distance, and how this limited vaccination efforts. The few reported challenges with administering vaccines were often linked to the newly enforced COVID-19-related precautions.

> *It has many impacts on the vaccine campaign because* ***people may not come to a central site because of the lockdown and social distancing.*** *We couldn't get many people in vaccination site; we couldn't do the vaccination until evening because of the curfews. (Addis Ababa, Healthcare Practitioner-01)*

Similar to what was experienced in Cameroon, FLWs and healthcare practitioners noted it was more challenging to control or comfort children during campaigns given physical distancing. However, whereas inconsistent application of safety standards eroded trust between FLWs and caregivers in Cameroon, some FLWs described how trust was increased as community members observed FLWs respecting COVID-19 precautions in Ethiopia.

> ***People most of the time look at our behaviors, like when we use sanitizer, for instance.*** *They then say, "They are careful."* ***Then they take action to get the service or vaccination.*** *It is helpful and important in that regard. (Addis Ababa, FLW-01)*

7 Community Reactions to Future OPV Campaigns

Future vaccination campaigns for OPV, or other routine childhood illnesses, will be challenged to overcome the long list of concerns caregivers noted as influencing hesitancy or refusal among themselves and other members of the community. As noted by a caregiver in Bafia, future vaccination campaigns, generally, may be held with suspicion.

*[Another vaccination campaign] will make me more suspicious…**I will think they are looking for all means possible to put in my body something bad,** something I consciously do not want. It will traumatize me, even make me to run away from other vaccines. (Bafia Caregiver-01)*

Fortunately, however, **most stakeholders across both countries reported that community members will likely accept OPV or other childhood vaccines**. Stakeholders did not share the same optimism about COVID-19 vaccines. Stakeholders reminded interviewers that OPV and other childhood vaccines are more familiar to caregivers, and as such, acceptance for these vaccines are likely to continue, assuming caregivers feel assured that the vaccine their child is receiving is not, in fact, a COVID-19 vaccine.

***Polio is common. Its name is familiar. Parents know it very well in urban areas.** I think it is also well known in rural areas. There is no one who didn't know polio because it has become familiar ever since we were child. There is resistance mostly to this new vaccine. (Addis Ababa, Social Influencer-05)*

*If we know that a disease can lead to death, why neglect a disease? **I believe that according to my community, all campaigns will be taken seriously.** (Bafia Social Influencer-01)*

*There will be this question that will come up **"So you came back again?" "Isn't this COVID?"** Because these people are adamant. That's always the question that comes up, and we always tell them that COVID is an injection, but polio is in drops. (Bafia, FLW-01)*

However, erosion of trust between caregivers and FLWs will need to be addressed. This may be particularly true for caregivers who did not have contact with the medical system during the pandemic and require a re-introduction, as was the case for many in Ethiopia whose children's vaccine schedules were delayed. Community members in both countries reported that caregivers would generally be glad for community-based campaigns to restart, though time may be required before acceptance numbers return to pre-pandemic levels.

***I believe that after the slowdown in activities, the vaccine against polio will be welcome** because there is an age group that has not received this vaccine because of the confusion that was made between COVID 19 vaccination and polio. It will allow a quick catch up with this generation. (Bafia, FLW-04)*

*I think that with the next polio campaigns and the other campaigns **the numbers will not be the same as before. It will take time for the numbers to go back to what they were** in the past for all vaccinations. (Yaoundé FLW-01)*

8 How to Maximize Community Support for OPV Campaigns in the COVID-19 Context

We asked stakeholders strategies that could be implemented to ensure caregiver concerns are addressed and, therefore, improve vaccine acceptance for OPV and childhood immunizations more broadly in the ongoing COVID-19 context. The main recommendations were to: 1) rebuild community confidence through timely and adequate information; 2) use a variety of information sources; 3) rebuild caregiver trust for FLWs; 4) increase remuneration, resources, and training for FLWs; 5) leverage existing community influencers and groups; and 6) make considerations for COVID-19 vaccines and COVID-19 precautions.

These recommendations emerge directly from the research findings and are proposed by the research leads. They do not necessarily represent the position of the GPEI or UNICEF. Many of these recommendations are already central aspects of SBC strategies in polio vaccination campaigns around the world. The data, however, suggests that there is further room to strengthen such approaches and activities in the two countries covered by this study.

8.1 Rebuild community confidence through timely and adequate information

A key sentiment to improving future vaccination campaigns was to build back caregiver "confidence" about vaccination. This was particularly salient given that many caregivers across both countries – but particularly in Cameroon – harbored concerns that OPV was actually a COVID-19 vaccine in disguise.

> *Nowadays, people go to vaccinate against polio, but rumors say that it is COVID that they are bringing. The State should try and* ***find ways to build back the confidence in people…who are traumatized by COVID****. (Bafia, Caregiver)*

Stakeholders across countries and groups felt the best way to build back caregiver confidence was through the timely dissemination of appropriate information. Many stakeholders, particularly caregivers and social influencers in Addis Ababa and Adama, reported that greater awareness seemed to be directly equated with an increase in trust among community members. A health journalist also noted the importance of this clear communication given Cameroon's status as polio-free and how that could be interpreted by stakeholders.

> ***You accept everything when you have awareness.*** *It would be better if volunteers are provided training, like I said before, so that we will have better awareness. The community will accept us. But if you don't have good awareness, they might not accept what you tell them. (Addis Ababa, Social Influencer)*

> *From my point of view, a vaccination campaign now would basically require a good communication, because if I come back on polio, remember that Cameroon was declared polio free 2 years ago. It would be necessary to explain very well to the people why Cameroon is considered a polio free country, they still want to vaccinate the children.* ***You agree with me that if there is not enough explanation, people will think that there is something else hidden behind this new vaccination.*** *(Yaounde, Health Journalist-02)*

Specific information needs reported by stakeholders across countries and groups included accessible messaging on the disease itself as well as the advantages and disadvantages of vaccination. Health practitioners in Bafia, for example, emphasized that appropriate sensitization should include an explanation of the differences in how COVID19 vaccines and OPV are administered. Clarifying that the polio vaccine is administered orally (most often in these communities) whereas the COVID-19 vaccine is administered via injection could assuage caregiver concerns that OPV is a COVID-19 vaccine in disguise. Health practitioners in Yaoundé also felt the government should ensure health professionals, including FLWs, have the most up-to-date information on the advantages and disadvantages of certain vaccinations so that these messages could be appropriately be passed to caregivers.

Community sensitization is certainly not a new component of OPV campaigns. However, stakeholders across countries and groups discussed a key point in how these awareness raising efforts could be improved. Principally, timing in between sensitization events and the campaign itself needed to be

lengthened. Health journalists in Yaoundé agreed that a strong communication campaign needed to come first and provide sufficient information to help people feel at ease.

> *The first thing is that **the campaigns must never again be done as they happened last year and this year.** We need to have before each vaccination campaign, a large communication campaign, to explain in the smallest details what will be done. People need to be informed about what will happen in order to hope for their participation. (Yaounde, Health Journalist)*

Social influencers in Adama felt strongly the timing between sensitization events and the campaign itself was lacking.

> *Most of the time the campaign work stars in the 11th hour. But rather than that, **it should be started in advance so that the community gets ready and waits.** It is not only once or twice, it should be done continuously in terms of programs, ads, and drama/play. This will help the community to pass the message to others, too. (Adama, Social Influencer)*

Most FLWs in both Cameroon and Ethiopia emphasized that there needed to be enough time between events to appropriately inform caregivers and proactively address rumors. However, one FLW from Adama also noted that this time lag was important for the FLW themselves, who often have competing priorities and need enough time to prepare.

> *We are informed one day before campaign started. **We should be informed in advance to be ready. We might be on other duty.** We quit this and start the campaign. Activities overlap. We should be informed several days ahead. This is what she said. (Adama, FLW)*

In standard polio social mobilization activities, community members are made aware of the upcoming campaign and given information about OPV benefits in advance of the vaccination event. Although stakeholders across countries and types generally agreed that sensitization and its appropriate timing before a campaign was important, the ideal spacing between sensitization and vaccination events seemed up for debate. For example, whereas one healthcare practitioner in Addis Ababa suggested mobilization events should occur three days prior to the campaign, one healthcare practitioner in Adama suggested that was not enough time.

> *For polio vaccination, three or four days prior to the vaccination campaign, it is good to give orientation for the community on a door-to-door or gathering them at central site. (Addis Ababa, Healthcare Practitioner)*

> *Sometimes they communicate to us about a polio vaccination campaign just two or three days beforehand. In such cases, **the vaccination campaign may begin before disseminating that information to the community**… This is one big challenge. (Adama, Healthcare Practitioner)*

8.2 Use a variety of information sources

Providing timely information was mentioned about as often as the importance of using a variety of information sources to disseminate clear and consistent messages about vaccination events, including information on when they would occur, but perhaps more importantly, crucial information about polio and advantages to being vaccinated.

It is worth noting that some stakeholders, including some caregivers in the cities of Yaoundé and Addis Ababa, felt that their respective ministries of health were already doing a good job of disseminating

information. Social influencers and at least one caregiver per group in Addis Ababa reported the information received was adequate.

> ***I don't think there is shortage of information about vaccination campaigns.*** *We hear information from radio and TV. The community hears information easily. It is good. (Addis Ababa, Caregiver-04)*

However, another social influencer in Addis Ababa argued that information was not flowing in the typical ways, suggesting a return to using some tried and true methods.

> *It is good if it is announced on the media.* ***I encountered people who say, we haven't heard.*** *In the past they used to announce it on media the date and where they give the vaccines. They used to promote using cars.* ***But this year there was no such campaign.*** *(Addis Ababa, Social Influencer-02)*

Most stakeholders across groups and countries had a variety of suggestions for how authorities could leverage different information sources to improve their reach. The most commonly-requested mode of communication was through written and visual materials, like leaflets or brochures. FLWs in both Cameroon and Ethiopia requested these as counseling support tools, but they also felt adding images of children debilitated by polio to leaflets, or even large banners put in a central location, would be a strong visual cue on the importance of vaccination. Healthcare practitioners in Adama concurred with the use of visuals to help caregivers understand the debilitating effects of polio.

> *The sensitization can be done for 8 days, using image boxes, showing people the diseases against which children will get vaccinated.* ***Image boxes are very explicit to explain about diseases and complications.*** *(Bafia, FLW)*

Television was mentioned in Cameroon and Ethiopia by caregivers was an important medium for communicating with caregivers. One FLW in Yaoundé commented that a coordinator regularly went on a local television station prior to campaigns to share information, which they thought was a useful strategy. FLWs suggested that having commercials on polio play during popular television programs could be a good approach.

> *I praise the involvement of* ***the coordinator who always goes on CRTV before a campaign where he holds a debate to present the different types of vaccines.*** *If all the health workers, including the community health workers, were involved, it would be a very good thing. (Yaoundé, FLW-01)*

Given that television is not accessible to everyone, a group of caregivers in Adama noted that radio is ubiquitous and still often used, even accessed regularly through mobile phones.

> *People talk about what they heard on TV. They have to announce it through TV and radio.* ***People now listen to radio using their phone. Everyone listens to the radio now.*** *If they hear that the people will send their children to be vaccinated. (Adama CG-08)*

Although television and radio are tried and true forms of communication, a health journalist in Bafia stressed that authorities not forget about social media, including Facebook and Whatsapp groups. They felt it was important to have a good sensitization strategy that leveraged both traditional and social media.

Today for instance, there are social media and traditional media we know. The State must not neglect one side. ***People get more information from social media. The State itself must communicate on social media.*** *(Bafia, Health Journalist-01)*

8.3 Rebuild caregiver trust for FLWs

As mentioned, lack of caregiver confidence in FLWs was a notable reason for hesitancy, particularly for caregivers in Cameroon. As such, there was some discussion on the need to rebuild this trust in order for caregivers to feel comfortable receiving vaccines from these community actors. Caregivers in Yaoundé felt professionalism was a significant part of building back caregiver confidence in FLWs. Vaccinators needed to not only look the part (e.g., have a badge that clearly links the worker to a known health facility), but FLWs needed to be trained such that they were able to easily answer caregiver questions.

> ***These vaccinators should be given badges that clearly display the name of the health facility****, so that if there is anything wrong, we can go there. Also, [they should have] a mission order from the Ministry of Public Health that they show. (Yaoundé, Caregiver)*

> *The first thing to improve is the quality of the information given on the vaccine by the vaccinators,* ***it must be convincing and satisfactory, presenting the advantages and disadvantages of said vaccine.*** *(Yaoundé, Caregiver)*

Another recommendation from a group of caregivers in Addis Ababa was to ensure the same FLWs who deliver the vaccines also participate in the mobilization events. Having consistency between these events would build familiarity between caregivers and FLWs.

> ***The awareness should be given by the same health workers who administer the vaccine.*** *Then they have familiarized themselves with the community. The community acceptance will be increased. (Addis Ababa, Caregiver)*

8.4 Increase remuneration, resources, and training for FLWs

As mentioned by caregivers, FLWs need to have the tools and resources to effectively do their jobs. FLWs in both Cameroon and Ethiopia felt this acutely. There were three key issues: lack of appropriate remuneration, lack of resources, and lack of training, all of which contribute to a feeling of being unsupported.

Inadequate remuneration was mentioned by caregivers in Cameroon and Ethiopia. In Bafia, for example, FLWs felt campaigns were under-resourced and some noted that per diems that were promised were ultimately not provided. As in Bafia, FLWs in Yaoundé reported remuneration as a central issue, including a perceived imbalance in how funds were distributed across community workers and decision-makers.

> *The actors in the field are not taken care of, and* ***I always say that if the district wants its action to be effective, the budget must be concentrated on the actors in the field and not on the decision-makers.*** *The decision-makers must take a little and give the rest to the actors in the field, and then community health will have a meaning. The actors must be motivated to obtain a good result in the field. (Yaoundé, FLW)*

In Adama, there was strong discussion within one group of FLWs about a lack of transparency on how funds are distributed for work completed on the campaigns. Similar to FLWs in Yaoundé, some FLWs in

Adama felt they received too little remuneration compared to others who they perceived as playing a less active role in the vaccination events.

> *What I want to add regarding polio vaccination is that **the burden of the task is totally on health extension workers, but the highly paid are those who just sit at their office.** Why is this happening? We were always asking this. We mostly get home in the evening whereas those people working in the office get back home early. The payment is the opposite. So, it would be good to improve this. (Adama, FLW)*

Moreover, FLWs in Adama discussed that the funds they received were often not adequate for the work they give up in order to participate in the vaccination campaign.

> *Last time they were complaining because of the payment. That time was the time of crop harvesting. If they were engaged in crop harvesting as a day laborer, they would have been paid more than 200 Birr per day, but for the ten-day mobilization, they were paid around 700 Birr…In such a campaign in which they have funds, it is not justifiable to pay them such a low payment…**We are happy with the service we give to the community for polio vaccination, but the payment needs to be greatly improved.** (Adama, FLW)*

Beyond remuneration, FLWs in Cameroon and Ethiopia discussed **how a lack of resources made it challenging for them to be effective in their jobs.** FLWs in Bafia, Yaounde, and Adama discussed the need for materials like megaphones/microphones that could be used to support sensitization efforts, allowing them to more effectively gather and reach caregivers with information prior to the campaign. However, FLWs in Bafia discussed often having to utilize their own meager per diems to pay for campaign-related expenses, including transportation costs and batteries for their megaphone.

> *It's all about finances. Here we have a megaphone. It needs 10 batteries. When there is a campaign and we go to the chief of the health area, we get told that as communicators we have to take charge of purchasing batteries. **From the little per diem that we receive, we have to take money out and purchase batteries.** It makes everything to be complicated at our level. (Bafia, FLW-01)*

> *They say that the mobilizers are in their respective villages and do not deserve transport. Meanwhile, there are villages found 6 km away, and the mobilizer has to walk. That is 6 km of daily walking with the megaphone to speak around villages. If I do not use my personal bike, it will not be possible. We have no bike here…**The transport from there to here is 6.000 francs, so the mobilizer there cannot come here because the transport is very expensive.** (Bafia, FLW-04)*

FLWs in Adama, Addis Ababa, and Yaounde also discussed the need for materials that enhance their visibility and credibility within the communities, such as badges and shirts, hats, or gowns with official branding. These types of materials were considered essential for improving their reputation within the communities and ensure they are "taken seriously." One social influencer in Yaoundé concurred with this sentiment that mobilizers and vaccinators must look the part.

> ***You see, we usually say that the clothing does not make the man, but we recognize the man by his attire.** When we send people to the field, they need to be a little equipped, for it to show a little seriousness, so that when someone opens his gate, he looks and sees someone a little well-dressed. Even a mobilizer can be well-dressed, with maybe a shirt and a badge, he presents himself and*

greets them. Because we see them here, when they arrive they are like you and I. Simply, it is not serious. (Yaounde Social Influencer-02)

Beyond simply looking the part, as noted above, having the right professional credentials and branded materials advertising the campaign can rebuild trust between FLWs and caregivers. These materials can also help support FLWs in managing caregiver expectations and concerns. In one case in Addis Ababa, a FLW experienced aggression from a caregiver over concerns that the vaccination event was not sanctioned, and the lack of advertising materials contributed to this concern.

> ***He looked around and said you don't have a tent and advertising board that show you come from a health center.*** *I showed him my professional Identification card, but he didn't want to accept, and he* ***insisted that he will bring police****. Lastly, I told him that he can bring the police. So, I recommend we arrange vaccination centers and to notify caregivers about the vaccine and the center in advance of the vaccination practice. I think this can contribute to the success of the vaccination practice. (Addis Ababa FLW-03)*

In addition to financial and other materials, FLWs in all sites discussed the need for **more training opportunities to enhance their credibility and effectiveness**. FLWs in Yaoundé and Bafia, for example, discussed needing appropriate training so they can answer questions and build confidence among caregivers. FLWs in one group in Yaoundé felt addressing rumors head-on would be an important step to addressing refusals/hesitancy. In Addis Ababa, two groups of FLWs discussed needing the right information to be able to adequately educate caregivers on the advantages or disadvantages of getting the vaccine.

> *We are the ones who explain to them.* ***We need to have enough information to convince refusals and have them take the vaccine.*** *Awareness education needs to be given to us. (Addis Ababa, FLW-04)*

A health journalist from Yaoundé made the point that mobilizers require communication-specific training – not just education on the pros and cons of vaccination – to ensure they can appropriately speak with and convince caregivers. This is not a skillset that comes naturally to everyone, and as such, interpersonal communication skills, in addition to having clear talking points, must be intentionally taught.

> *There are a lot of vaccinators and community actors who do not know how to speak fluently and explain things to people, to convince people, to make them understand what's going on.* ***They need to be trained on how to be diplomatic, how to respectfully convince a skeptical parent without causing frustration or anger.*** *(Yaounde Health Journalist-01)*

Stakeholders identified a number of needs to support FLWs in delivering more effective campaigns. Without the proper remuneration, resources, and training, **FLWs ultimately felt unsupported and unappreciated for their efforts.** Essential materials to address the elements were also requested, such as water supplies and weather appropriate clothing. Two groups from Addis Ababa discussed how having these basic materials could improve morale, given that the job of vaccinating house-to-house is very tiring.

> *Other sectors don't want to work on polio. They consider it like punishment. Therefore, for us who work on it, there needs to be morale. It could be cape, umbrella, or water to be supplied.* ***It is good if there are such kinds of support. It makes you like what you do rather than hating it. When you***

are so tired and thirsty you may miss households because you lose energy. *(Addis Ababa FLW-02)*

There was some discussion among FLWs and health journalists, particularly in Cameroon, about the uptick in violence or aggression experienced and how this also weighs heavily on their ability to be effective in their roles.

> *I think that the challenges today are enormous. We have observed aggressivity during the last campaigns, that means* ***what mechanism are they going to put in place today to protect the vaccinators who will go on the field?*** *And also, the motivation of the staff is one of the challenges. It has been noticed that the people who often go to the field are not motivated well enough. (Yaoundé, Health Jouralists-02)*

Two groups from Bafia suggested that a representative of the MOH should accompany FLWs for the purposes of seeing the challenges that FLWs regularly face, show their support for FLWs, but also to increase FLW visibility.

> ***The government must always come to support the community health workers for field work.*** *When they remain in their office, they expect statistics of 100%, but it doesn't work that way. We are the ones to face all field difficulties. May the State come to support us and do the follow-up, right down to the base. (Bafia, FLW-01)*

8.5 Leverage existing community influencers and groups

Stakeholders in Cameroon and Ethiopia, across groups, reported that campaigns could be made more effective if existing community influencers and groups were used to support the mobilization and vaccination efforts.

Community leaders were noted by social influencers across both countries as critical for facilitating community entrée. In Bafia and Yaoundé, social influencers discussed how traditional and religious leaders can support efforts to rebuild community confidence in vaccination campaigns and assuage any concerns. Providing a small amount of funding to local leaders to accompany on mobilization events could be very helpful in ensuring their participation.

> *This means that* ***you must first meet with the person in charge of the church or the community who will invite you in the presence of his community****, and that you, as health personnel, can sensitize this community. There you will sensitize in a theoretical and perhaps also a practical way, and* ***the man of God, in spite of your sensitization, will also need to make his community confident.*** *(Bafia, Social Influencer-01)*

> *Why?* ***Because when someone already sees me, he knows that the chief is there****. Even if he was reticent to take out the children. (Yaounde, Social Influencer-02)*

In Adama and Addis Ababa, there was strong consensus among all stakeholder groups that it is important to engage the *woreda* or *kebele* authorities in sensitization efforts, as these authorities are seen as those with the greatest ability to encourage compliance among caregivers. *Kebele* authorities, in particular, were known to have communication events for a variety of community concerns and were, therefore, well-positioned to support mobilization for vaccination events as well. At least one caregiver suggested utilizing the kebele militia to encourage compliance.

*If that person **is a kebele official, he has the power to mobilize and enforce people to receive the vaccine, which we can't do.** If the kebele official gives an order for the people to receive the vaccine, if they don't do that, they may not get services from the kebele. Every time we give a vaccine, we involve at least one individual working at kebele. People hear and accept kebele people more that they hear us. (Adama, Healthcare Practitioner-03)*

*Currently, it is the health center promoting the campaign. They work half day and promote it on the remaining half. We are the ones who register and give the vaccine. **But the Woreda leadership needs to own it.** (Addis Ababa, FLW-02)*

***It should be by kebele people. They have their own communication people.** They can do the announcement. (Adama, Caregiver-05)*

Caregivers and FLWs in Ethiopia suggested other key groups to help disseminate information, support vaccination, and otherwise ensure a successful campaign. In particular, *gotes*, or peasant organizations, and women's development groups were named as being influential among the communities and poised to identify unvaccinated children given their familiarity with local families.

***"Gote" leaders** know the community very well, so they know in which houses there are children living. They **can identify immunized and unimmunized children easily.** (Adama, Caregiver-06)*

***It is through women's development groups that most of the activities of COVID vaccination were done.** Since the community doesn't have that much awareness, they asked you about the side effect of the vaccine. So, we tried to explain things for them. We just do that not to get monetary benefit, but it is our moral obligation to protect our people and our country. We have exerted a lot of effort to convince the community in our locality. So**, I suggest doing the polio campaign like it was done for COVID.** (Addis Ababa Caregiver-03)*

Overall, stakeholders in Cameroon and Ethiopia offered a long list of groups that could be leveraged to support sensitization efforts and included: hospitals, traditional chiefs, mayors, bars, churches, schools, social networks, media outlets.

8.6 Considerations for COVID-19 vaccines and COVID-19 precautions

As OPV campaigns are continually rolled out in the ongoing COVID-19 context, stakeholders had some recommendations for how this could be managed. This included ensuring that OPV and COVID-19 vaccination campaigns remained distinct, that FLWs and practitioners maintained COVID-19 precautions, and finding the right balance between centralized and door-to-door campaigns.

For example, at least two groups of FLWs and one healthcare practitioner in Addis Ababa discussed how important it was that OPV and COVID-19 vaccinations not be administered at the same time. By spacing them, this would reduce community anxiety over which vaccines they were receiving.

*It is better to have a little break. There should be a gap between two vaccines. **We know that polio vaccine is free for children and COVID is for adults and children above 12, but the community doesn't understand that since we are also going house-to-house.** There should be a little break for them so that they will accept us. (Addis Ababa, FLW-04)*

For any type of campaign, a few stakeholders across countries felt it was important to maintain the new safety standards that had been rolled out under COVID-19, such as maintaining physical distance, wearing masks and gloves, and using hand sanitizing gel. A caregiver from Addis Ababa also suggested continuing to use some of incentives that were instituted during COVID-19, including rewards for fully vaccinating children.

> *Before touching a baby, **first take the trouble to clean the hands with gel**. (Yaoundé, Caregiver_04)*

> *They were coming once in a week before the COVID-19 pandemic. The community was getting rewards. There was **a reward if one mother kept her personal and environmental hygiene and vaccinated her children fully. I think this should continue.** (Addis Ababa, Caregiver -04)*

Particularly in Ethiopia, there was debate among caregivers and healthcare practitioners in Adama and Addis Ababa about how vaccines should be given going forward – either door-to-door or via a tented, centralized location. One healthcare practitioner from Addis Ababa advocated for a centralized location since anyone with COVID concerns could come directly and this would reduce the burden of refusers for vaccinators. However, one healthcare practitioners from Adama felt it was important to go door-to-door to vaccinate so as to not miss any children. The men's group in Adama, in particular, discussed the issue of maintaining cold chain and compromising vaccine quality if going house-to-house rather than having a centralized location. Ultimately, most felt that going house-to-house would ensure that more children would be accessed, though it was better to go during the morning when the vaccines would be colder or less exposed to high heat.

> *For example, **if you give a vaccine which is exposed to high temperature, we can't say that this is reaching all children.** If we give a less quality vaccine, the children may get the disease, and he and the family may suffer from those things that we have discussed earlier. (Adama, Male Caregiver-05)*

> ***I don't agree with what my brothers have said earlier; it should not be given at a central location because all people or children can't come.** For example, there may be children whose age is below one, a child may be born yesterday or before yesterday or we can say a week ago. This child should take the vaccine, but at that level of his age it may be difficult for the mother or the father to bring the child to the central place for vaccination. It is not also good for the child. But the health professionals can give the vaccine door-to-door. (Adama, Male Caregiver-05)*

9 Discussion

The COVID-19 pandemic introduced new challenges into the vaccination landscape for polio and other routine childhood immunizations in Cameroon and Ethiopia. More immediate effects of the pandemic included delays in vaccination schedules as human and financial resources were shifted away from childhood immunization toward the COVID-19 efforts and caregivers feared bringing children into contact with health personnel. This experience was shared by other countries across the globe,[22] with an estimated 23 million children not receiving routine childhood immunizations in 2020.[23]

However, there were other detrimental effects identified in Cameroon and Ethiopia that will require more thoughtful strategies to overcome. Namely, this research identified several rumors linked to vaccines that need to be addressed with clear, consistent messaging in order to "win back" caregiver confidence in routine vaccinations, including vaccines as well known to community members as OPV. The World Health Organization estimated that 80% of infants around the world received 3 doses of polio vaccine in 2021[24], and yet vaccine hesitancy can threaten progress made to date. A main concern affecting future OPV campaigns cited by stakeholders in both Cameroon and Ethiopia was the fear that the vaccination to be received by their child was, in fact, a COVID-19 vaccine in disguise or would serve as a mechanism for infecting their child with COVID-19. Other concerns included a fear of vaccine side effects, fear of vaccine over-dosing, religious leaders being against vaccines, lack of confidence in health workers, the potential that westerners could be testing vaccines on Africans, and that the vaccine could be a measure to enforce population control. In general, however, hesitancy was reportedly much higher for COVID-19 vaccines than OPV among stakeholder groups in this study, and many stakeholders felt confident that OPV campaign attendance would ultimately return to pre-pandemic levels if these concerns were addressed.

OPV-related vaccine hesitancy is not new[3]; however, the mis- and dis-information related to the COVID-19 vaccines seems to have inflated concerns, with caregivers commonly reporting hesitancy fears being widespread in their communities. Word of mouth/peers and social media were prominent sources of information across countries and urban/semi-urban areas that caregivers felt directly contributed to vaccine hesitancy. Social media's influence, particularly through Facebook, was slightly stronger in urban areas. Some external evidence also suggests that vaccine hesitancy was higher in sub-Saharan Africa among those getting their information from social media and television than those who got their information from newspapers.[25] A separate study from Ethiopia also found that hesitancy was 3.6 times higher among those receiving information from social media.[26] By contrast, respondents in our study did not identify government agencies as sources of mis- or dis-information, which presents an opportunity to increase reliable information from government-sponsored sources, including social media accounts.

One consideration for improving caregiver confidence in OPV campaigns included ensuring clear, consistent messaging is reaching caregivers through different, reputable sources. Written pamphlets, television, radio, and social media were also mentioned along with promotion cars and providing mobilization teams with megaphones to ensure a broader reach. More than any one form of communication, stakeholders felt government authorities should use all possible avenues to reach caregivers with appropriate information. They also reported it was important to enlist existing community influencers, including local authorities, as well as prominent community groups, such as peasant organizations or women's groups, in the community mobilization and vaccination process. Community leaders and groups are both known and trusted and could, therefore, help assuage concerns community members feel toward vaccination. They can also support FLWs in identifying unvaccinated households and children.

Another strategy for improving OPV uptake in the COVID-19 context included equipping and training FLWs to effectively deliver vaccinations. A lack of trust in FLWs reported by caregivers was particularly salient, and FLWs themselves noted new challenges engaging with caregivers due to COVID-19 precautions and not being able to effectively gather in groups either for awareness raising efforts or for vaccination. To

more effectively run community-based campaigns in the future, FLWs and healthcare practitioners suggested increasing remuneration for vaccinators; providing materials, such as badges and branded clothing, to increase visibility and credibility in their communities; and increasing training to be able to accurately reflect the advantages of vaccination to hesitant community members.

Other specific recommendations for mobilizing community support for future OPV campaigns emerging from these results include:

- In the specific context of polio outbreak response, and in particular in countries or with communities where there is evidence that COVID-19 vaccines are especially controversial, consider delivering OPV and COVID-19 vaccination campaigns separately to avoid confusion and mitigate concerns. Authorities and vaccinators will need to effectively manage caregiver concerns about COVID-19 vaccines being surreptitiously delivered in place of OPV. This might include providing clear explanations on routes of administration.
- International and local government authorities should prioritize ensuring that caregivers have clear, consistent messaging about the advantages and disadvantages of vaccination against polio. These messages need to be delivered to communities at least one week in advance of any vaccination events.
- In all communities, ensure that messaging is delivered through different mediums, including written materials that contain images of polio's effects, television, radio, and government-support social media accounts in order to reach a broad audience.
- Enlist or increase support for mobilization events from local community influencers, including *kebele* authorities in Ethiopia and other community groups, as these trusted groups are regularly relied upon by caregivers and may be able to address hesitancy concerns. It may be important to include these groups in community action planning efforts.
- FLWs should be provided with additional support in the form of increased remuneration, where possible. They also require resources to increase their visibility and credibility in the communities as well as other materials to support long days in the field, such as appropriate clothing and bottled water.
- The participation of local health authorities in vaccination campaigns could improve FLW credibility, while also promoting FLW feelings of being supported and appreciated for their hard work.
- FLWs need training to effectively address caregiver concerns, including interpersonal communications skills for immunization and specific talking points to counter some of the more common reasons for hesitancy presented here.
- Campaigns should consider adhering to newly accepted COVID-19 precautions, such as using face masks and hand sanitizing gel prior to handling children.

Limitations

Our qualitative study does not include a nationally representative sample, and as such, is not intended to generalize findings to all people living in Cameroon and Ethiopia. That said, we were mindful to include at least one semi-urban and one urban site per country in an attempt to capture perceptions of people living in different areas. The list of reasons for hesitancy was not generated from our participants but instead

from existing literature from Cameroon and other sub-Saharan African contexts (e.g., DRC, Kenya, and Nigeria). This means we may not have captured every possible concern related to vaccine hesitancy. However, we did allow participants to add new concerns, though no salient concerns were mentioned. Another potential limitation was the recall period. We asked participants to consider a two-year period as they reflected on changes over the course of the pandemic, which may be subject to recall bias.

10 Conclusions

The COVID-19 pandemic has had far-reaching effects on routine childhood immunization, including community-based polio vaccination campaigns. In particular, caregivers in Cameroon and Ethiopia raised concerns over an erosion of trust for community vaccinators and fears related to their children being surreptitiously vaccinated against COVID-19 instead of polio. Stakeholders noted a variety of concerns that were personally held or reported by community members that contributed to vaccine hesitancy. Although participants in both Cameroon and Ethiopia expected vaccine acceptance for OPV to eventually return to pre-pandemic levels, there were a number of suggestions for mobilizing community support for OPV campaigns in the COVID-19 context, including: 1) ensuring timely and appropriate sensitization efforts that explain advantages and disadvantages of vaccination; 2) using multiple information sources to disseminate this information; 3) rebuilding trust for FLWs; 4) ensuring FLWs are well-supported in terms of remuneration, resources, and training; 5) leveraging community influencers and groups to support mobilization events; and 6) making considerations for COVID-19 vaccines and COVID-19 precautions.

11 References

1. World Health O. *Guiding principles for immunization activities during the COVID-19 pandemic: interim guidance, 26 March 2020.* Geneva: World Health Organization; 2020 2020.
2. Venkatesan P. Global polio eradication set back by COVID-19 pandemic. *The Lancet Microbe.* 2022;3(3):e172.
3. Lorenzetti L, Haydarov R, Namey E, et al. Exploring public perceptions of vaccine-derived poliovirus and a novel oral polio vaccine in the Democratic Republic of the Congo, Kenya, and Nigeria. *Vaccine.* 2022;epub ahead of print.
4. Dinga JN, Sinda LK, Titanji VPK. Assessment of Vaccine Hesitancy to a COVID-19 Vaccine in Cameroonian Adults and Its Global Implication. *Vaccines.* 2021;9(2).
5. Samarasekera U. Feelings towards COVID-19 vaccination in Africa. *The Lancet Infectious diseases.* 2021;21(3):324.
6. Bono SA, Faria de Moura Villela E, Siau CS, et al. Factors Affecting COVID-19 Vaccine Acceptance: An International Survey among Low- and Middle-Income Countries. *Vaccines.* 2021;9(5).
7. UNICEF, Health Mo. *Survey on Reasons for Vaccination Refusals During Supplementary Immunization Activities.* Yaounde, Cameroon2021.
8. Abuya TA, Karen; Isaac, Adan; Kangwana, Beth; Mbushi, Faith; Muluve, Eva; Mwanga, Daniel; Ngo, Thoai D.; Nzioki, Mercy; Ochako, Rhoune; Pinchoff, Jessie; Tidwell, Ben; White, Corinne. Experiences among adults and adolescents during the COVID-19 pandemic from four locations across Kenya. In: Dataverse H, ed. Vol V15. Cambridge, MA2020.
9. GPEI. Where We Work: Cameroon. 2021; https://polioeradication.org/where-we-work/cameroon/.
10. Johns Hopkins University of Medicine Coronavirus Resource Center. 2021; coronavirus.jhu.edu.
11. Chelo D, Nguefack F, Enyama D, et al. Impact and projections of the COVID-19 epidemic on attendance and routine vaccinations at a pediatric referral hospital in Cameroon. *Archives de pediatrie : organe officiel de la Societe francaise de pediatrie.* 2021.
12. Abbas K, Procter SR, van Zandvoort K, et al. Routine childhood immunisation during the COVID-19 pandemic in Africa: a benefit-risk analysis of health benefits versus excess risk of SARS-CoV-2 infection. *The Lancet Global health.* 2020;8(10):e1264-e1272.
13. Fonyuy E. Cameroon: 'A vaccine takes many years of trial and erorr for it to be tested and approved'. *The New Humanitarian.* July 14, 2021, 2021.
14. Losey L, Ogden E, Bisrat F, et al. The CORE Group Polio Project: An Overview of Its History and Its Contributions to the Global Polio Eradication Initiative. *Am J Trop Med Hyg.* 2019;101(4_Suppl):4-14.
15. Tessema F, Bisrat F, Kidane L, Assres M, Tadesse T, Asegedew B. Improvements in Polio Vaccination Status and Knowledge about Polio Vaccination in the CORE Group Polio Project Implementation Areas in Pastoralist and Semi-Pastoralist Regions in Ethiopia. *Am J Trop Med Hyg.* 2019;101(4_Suppl):52-58.
16. Global Polio Eradication Initiative. Polio this week in Ethiopia. 2021; https://polioeradication.org/where-we-work/ethiopia/. Accessed October 6, 2021.
17. Miretu DG, Asfaw ZA, Addis SG. Impact of COVID-19 pandemic on vaccination coverage among children aged 15 to 23 months at Dessie town, Northeast Ethiopia, 2020. *Human Vaccines & Immunotherapeutics.* 2021;17(8):2427-2436.
18. World Health Organization. *Contributions of the Polio Network to COVID-19 Response: Turning the Challenging into an Opportunity for Polio Transition.* Geneva, Switzerland: World Health Organization;2020.

19. Guest G, Bunce A, Johnson L. How Many Interviews Are Enough? *Field Methods.* 2006;18(1):59-82.
20. Guest G, Namey E, McKenna K. How Many Focus Groups Are Enough? Building an Evidence Base for Nonprobability Sample Sizes. *Field Methods.* 2016;29(1):3-22.
21. Dinga JN, Sinda LK, Titanji VPK. Assessment of Vaccine Hesitancy to a COVID-19 Vaccine in Cameroonian Adults and Its Global Implication. *Vaccines.* 2021;9(2):175.
22. Dinleyici EC, Borrow R, Safadi MAP, van Damme P, Munoz FM. Vaccines and routine immunization strategies during the COVID-19 pandemic. *Human Vaccines & Immunotherapeutics.* 2021;17(2):400-407.
23. COVID-19 pandemic leads to major backsliding on childhood vaccinations, new WHO, UNICEF data shows [press release]. 2021.
24. World Health Organization. *Immunization Coverage: Overview.* Geneva, Switzerland2022.
25. Osuagwu UL, Mashige KP, Ovenseri-Ogbomo G, et al. The impact of information sources on COVID-19 Vaccine hesitancy and resistance in Sub-Saharan Africa. 2022.
26. Dereje N, Tesfaye A, Tamene B, et al. COVID-19 Vaccine hesitancy in Addis Ababa, Ethiopia: A mixed-methods study. *medRxiv.* 2021:2021.2002.2025.21252443.

Appendix A: Participant Demographic Characteristics

Cameroon

	All Stakeholders (n=117)		Yaounde										Bafia									
			Total (n= 58)		Caregivers (n= 25)		FLWs (n= 27)		Health Practitioners (n=2)		Social Influencers (n= 4)		Total (n= 59)		Caregivers (n= 26)		FLWs (n= 27)		Health Practitioners (n=2)		Social Influencers (n= 4)	
Variable	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Age group																						
18-25	8	6.8%	5	8.6%	3	12.0%	2	7.4%	0	0.0%	0	0.0%	3	5.1%	3	11.5%	0	0.0%	0	0.0%	0	0.0%
26-35	47	40.2%	37	63.8%	17	68.0%	16	59.3%	2	100.0%	2	50.0%	10	16.9%	8	30.8%	1	3.7%	0	0.0%	1	25.0%
36-45	30	25.6%	14	24.1%	5	20.0%	8	29.6%	0	0.0%	1	25.0%	16	27.1%	6	23.1%	7	25.9%	2	100.0%	1	25.0%
46-55	15	12.8%	1	1.7%	0	0.0%	0	0.0%	0	0.0%	1	25.0%	14	23.7%	2	7.7%	11	40.7%	0	0.0%	1	25.0%
56-65	14	12.0%	1	1.7%	0	0.0%	1	3.7%	0	0.0%	0	0.0%	13	22.0%	6	23.1%	7	25.9%	0	0.0%	0	0.0%
66+	3	2.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	3	5.1%	1	3.8%	1	3.7%	0	0.0%	1	25.0%
Religion																						
Christian	108	92.3%	55	94.8%	22	88.0%	27	100.0%	2	100.0%	4	0.0%	53	89.8%	22	84.6%	26	96.3%	2	100.0%	3	75.0%
Muslim	6	5.1%	1	1.7%	1	4.0%	0	0.0%	0	0.0%	0	0.0%	5	8.5%	3	11.5%	1	3.7%	0	0.0%	1	25.0%
No religion	3	2.6%	2	3.4%	2	8.0%	0	0.0%	0	0.0%	0	0.0%	1	1.7%	1	3.8%	0	0.0%	0	0.0%	0	0.0%
Education																						
Less than primary	1	0.9%	0	0.0%	0	0.0%	0	0.0%	n/a	n/a	0	0.0%	1	1.8%	1	3.8%	0	0.0%	n/a	n/a	0	0.0%
Primary school	12	10.6%	2	3.6%	0	0.0%	1	3.7%	n/a	n/a	1	25.0%	10	17.5%	5	19.2%	4	14.8%	n/a	n/a	1	25.0%
Lower secondary	36	31.9%	6	10.7%	3	12.0%	3	11.1%	n/a	n/a	0	0.0%	30	52.6%	14	53.8%	16	59.3%	n/a	n/a	0	0.0%
Upper secondary	35	31.0%	21	37.5%	15	60.0%	6	22.2%	n/a	n/a	0	0.0%	14	24.6%	6	23.1%	7	25.9%	n/a	n/a	1	25.0%
Trade school	0	0.0%	0	0.0%	0	0.0%	0	0.0%	n/a	n/a	0	0.0%	0	0.0%	0	0.0%	0	0.0%	n/a	n/a	0	0.0%
University or higher	29	25.7%	27	48.2%	7	28.0%	17	63.0%	n/a	n/a	3	75.0%	2	3.5%	0	0.0%	0	0.0%	n/a	n/a	2	50.0%
Confidence in vaccine-related information received from government																						
Not confident	2	1.7%	1	1.7%	1	4.0%	0	0.0%	0	0.0%	0	0.0%	1	1.7%	1	3.8%	0	0.0%	0	0.0%	0	0.0%
Somewhat confident	32	27.4%	21	36.2%	16	64.0%	2	7.4%	1	50.0%	2	50.0%	11	18.6%	11	42.3%	0	0.0%	0	0.0%	0	0.0%
Confident	83	70.9%	36	62.1%	8	32.0%	25	92.6%	1	50.0%	2	50.0%	47	79.7%	14	53.8%	27	100.0%	2	100.0%	4	100.0%
Received COVID-19 vaccine																						
Yes	66	56.4%	32	55.2%	3	12.0%	27	100.0%	0	0.0%	2	50.0%	34	57.6%	4	15.4%	26	96.3%	2	100.0%	2	50.0%
No	51	43.6%	36	62.1%	22	88.0%	0	0.0%	2	100.0%	2	50.0%	25	42.4%	22	84.6%	1	3.7%	0	0.0%	2	50.0%
Time in role																						
Less than 5 years	19	32.8%	15	51.7%	n/a	n/a	13	48.1%	2	100.0%	0	0.0%	4	13.8%	n/a	n/a	4	14.8%	0	0.0%	0	0.0%
5-10 years	22	37.9%	13	44.8%	n/a	n/a	13	48.1%	0	0.0%	1	25.0%	9	31.0%	n/a	n/a	9	33.3%	0	0.0%	2	50.0%
11-20 years	16	27.6%	1	3.4%	n/a	n/a	1	3.7%	0	0.0%	1	25.0%	15	51.7%	n/a	n/a	14	51.9%	1	50.0%	2	50.0%
More than 20 years	1	1.7%	0	0.0%	n/a	n/a	0	0.0%	0	0.0%	0	0.0%	1	3.4%	n/a	n/a	0	0.0%	1	50.0%	0	0.0%

Variable	All Stakeholders (n=117)		Yaounde										Bafia									
			Total (n= 58)		Caregivers (n= 25)		FLWs (n= 27)		Health Practitioners (n=2)		Social Influencers (n= 4)		Total (n= 59)		Caregivers (n= 26)		FLWs (n= 27)		Health Practitioners (n=2)		Social Influencers (n= 4)	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
CAREGIVERS ONLY																						
Marital Status																						
Domestic partner	3	5.9%	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3	11.5%	n/a	n/a	n/a	n/a	n/a	n/a
Married (monogamous)	16	31.4%	n/a	n/a	5	20.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	11	42.3%	n/a	n/a	n/a	n/a	n/a	n/a
Married (polygamous)	2	3.9%	n/a	n/a	1	4.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	3.8%	n/a	n/a	n/a	n/a	n/a	n/a
Single	27	52.9%	n/a	n/a	19	76.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8	30.8%	n/a	n/a	n/a	n/a	n/a	n/a
Widowed	3	5.9%	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3	11.5%	n/a	n/a	n/a	n/a	n/a	n/a
Employed																						
Yes	36	70.6%	n/a	n/a	16	64.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	20	76.9%	n/a	n/a	n/a	n/a	n/a	n/a
No	15	29.4%	n/a	n/a	9	36.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6	23.1%	n/a	n/a	n/a	n/a	n/a	n/a
Number in household																						
2	2	3.9%	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2	7.7%	n/a	n/a	n/a	n/a	n/a	n/a
3	3	5.9%	n/a	n/a	3	12.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a
4	8	15.7%	n/a	n/a	6	24.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2	7.7%	n/a	n/a	n/a	n/a	n/a	n/a
5	13	25.5%	n/a	n/a	8	32.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	19.2%	n/a	n/a	n/a	n/a	n/a	n/a
6	4	7.8%	n/a	n/a	1	4.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3	11.5%	n/a	n/a	n/a	n/a	n/a	n/a
7	7	13.7%	n/a	n/a	2	8.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	19.2%	n/a	n/a	n/a	n/a	n/a	n/a
8 or more	14	27.5%	n/a	n/a	5	20.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	9	34.6%	n/a	n/a	n/a	n/a	n/a	n/a
Number of children under 5																						
1	29	56.9%	n/a	n/a	16	64.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	13	50.0%	n/a	n/a	n/a	n/a	n/a	n/a
2	16	31.4%	n/a	n/a	7	28.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	9	34.6%	n/a	n/a	n/a	n/a	n/a	n/a
3	6	11.8%	n/a	n/a	2	8.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4	15.4%	n/a	n/a	n/a	n/a	n/a	n/a
Responsible for health decisions for children																						
Respondent	29	56.9%	n/a	n/a	13	52.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	16	61.5%	n/a	n/a	n/a	n/a	n/a	n/a
Spouse/partner	8	15.7%	n/a	n/a	3	12.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	19.2%	n/a	n/a	n/a	n/a	n/a	n/a
Joint decision-making	12	23.5%	n/a	n/a	9	36.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3	11.5%	n/a	n/a	n/a	n/a	n/a	n/a
Other household member	2	3.9%	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2	7.7%	n/a	n/a	n/a	n/a	n/a	n/a
Under 5 vaccinated against polio																						
Yes	43	84.3%	n/a	n/a	23	92.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	20	76.9%	n/a	n/a	n/a	n/a	n/a	n/a
No	7	13.7%	n/a	n/a	2	8.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	19.2%	n/a	n/a	n/a	n/a	n/a	n/a
Don't know	1	2.0%	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	3.8%	n/a	n/a	n/a	n/a	n/a	n/a
Polio vaccination location																						
Routine immunization at HF	21	41.2%	n/a	n/a	18	72.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3	11.5%	n/a	n/a	n/a	n/a	n/a	n/a
Community campaign	13	25.5%	n/a	n/a	5	20.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8	30.8%	n/a	n/a	n/a	n/a	n/a	n/a
Both	9	17.6%	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	9	34.6%	n/a	n/a	n/a	n/a	n/a	n/a
Polio vaccination year																						
2018	0	0.0%	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a
2019	4	9.3%	n/a	n/a	4	16.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a
2020	6	14.0%	n/a	n/a	5	20.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	3.8%	n/a	n/a	n/a	n/a	n/a	n/a
2021	10	23.3%	n/a	n/a	7	28.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3	11.5%	n/a	n/a	n/a	n/a	n/a	n/a
2022	21	48.8%	n/a	n/a	5	20.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	16	61.5%	n/a	n/a	n/a	n/a	n/a	n/a
Don't know	2	4.7%	n/a	n/a	2	8.0%	n/a	n/a	n/a	n/a	n/a	n/a			0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a

Variable	All Stakeholders (n=117)		Yaounde										Bafia									
			Total (n= 58)		Caregivers (n= 25)		FLWs (n= 27)		Health Practitioners (n=2)		Social Influencers (n= 4)		Total (n= 59)		Caregivers (n= 26)		FLWs (n= 27)		Health Practitioners (n=2)		Social Influencers (n= 4)	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
CAREGIVERS ONLY																						
Received other vaccines																						
None	4	7.8%	n/a	n/a	3	12.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	3.8%	n/a	n/a	n/a	n/a	n/a	n/a
Tuberculosis	28	54.9%	n/a	n/a	15	60.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	13	50.0%	n/a	n/a	n/a	n/a	n/a	n/a
Hepatitis B	1	2.0%	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	3.8%	n/a	n/a	n/a	n/a	n/a	n/a
Diphteria-tetanus-pertussis	2	3.9%	n/a	n/a	2	8.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a
Flu	2	3.9%	n/a	n/a	2	8.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a
Pneumonia	4	7.8%	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4	15.4%	n/a	n/a	n/a	n/a	n/a	n/a
Rotavirus	0	0.0%	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a
Measles	25	49.0%	n/a	n/a	9	36.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	16	61.5%	n/a	n/a	n/a	n/a	n/a	n/a
Rubella	7	13.7%	n/a	n/a	3	12.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4	15.4%	n/a	n/a	n/a	n/a	n/a	n/a
Don't know	10	19.6%	n/a	n/a	6	24.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4	15.4%	n/a	n/a	n/a	n/a	n/a	n/a
Other vaccine(s) year																						
2018	2	4.3%	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2	8.0%	n/a	n/a	n/a	n/a	n/a	n/a
2019	10	19.6%	n/a	n/a	7	31.8%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3	12.0%	n/a	n/a	n/a	n/a	n/a	n/a
2020	16	31.4%	n/a	n/a	8	36.4%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8	32.0%	n/a	n/a	n/a	n/a	n/a	n/a
2021	27	52.9%	n/a	n/a	13	59.1%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	14	56.0%	n/a	n/a	n/a	n/a	n/a	n/a
2022	29	56.9%	n/a	n/a	10	45.5%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	19	76.0%	n/a	n/a	n/a	n/a	n/a	n/a
FLWs ONLY																						
Number of OPV campaigns																						
Between 1 and 5	n/a	n/a	n/a	n/a	n/a	n/a	9	33.3%	n/a	n/a	n/a	n/a	14	25.9%	n/a	n/a	5	18.5%	n/a	n/a	n/a	n/a
Between 6 and 10	n/a	n/a	n/a	n/a	n/a	n/a	5	18.5%	n/a	n/a	n/a	n/a	7	13.0%	n/a	n/a	2	7.4%	n/a	n/a	n/a	n/a
More than 10	n/a	n/a	n/a	n/a	n/a	n/a	13	48.1%	n/a	n/a	n/a	n/a	33	61.1%	n/a	n/a	20	74.1%	n/a	n/a	n/a	n/a
HPs ONLY																						
Type of facility																						
Health clinic	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	50.0%	n/a	n/a	2	50.0%	n/a	n/a	n/a	n/a	1	50.0%	n/a	n/a
Hospital	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a	1	25.0%	n/a	n/a	n/a	n/a	1	50.0%	n/a	n/a
Private clinic	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	50.0%	n/a	n/a	1	25.0%	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a
Immunization frequency																						
At least once a day	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2	100.0%	n/a	n/a	2	50.0%	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a
At least once a week	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a	2	50.0%	n/a	n/a	n/a	n/a	2	100.0%	n/a	n/a
Opinion on community-based campaigns																						
Unsupportive	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a
Neutral	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a
Supportive	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2	100.0%	n/a	n/a	4	100.0%	n/a	n/a	n/a	n/a	2	100.0%	n/a	n/a
SOCIAL INFLUENCERS ONLY																						
Primary means of communication with comm																						
At community gatherings/events	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	25.0%	3	37.5%	n/a	n/a	n/a	n/a	n/a	n/a	3	75.0%
In person (one on one)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2	50.0%	2	25.0%	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%
Online	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	25.0%	2	25.0%	n/a	n/a	n/a	n/a	n/a	n/a	1	25.0%
In print	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	25.0%	1	12.5%	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%

Ethiopia

Variable	All Stakeholders (n=121)		Addis Ababa										Adama									
			Total (n= 58)		Caregivers (n= 25)		FLWs (n= 27)		Health Practitioners (n=2)		Social Influencers (n= 4)		Total (n= 59)		Caregivers (n= 26)		FLWs (n= 27)		Health Practitioners (n=2)		Social Influencers (n= 4)	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Age group																						
18-25	17	14.0%	9	15.0%	4	12.5%	3	13.6%	2	66.7%	0	0.0%	8	13.1%	5	15.6%	3	12.0%	0	0.0%	0	0.0%
26-35	75	62.0%	39	65.0%	17	53.1%	19	86.4%	1	33.3%	2	66.7%	36	59.0%	16	50.0%	18	72.0%	1	50.0%	1	50.0%
36-45	23	19.0%	8	13.3%	7	21.9%	0	0.0%	0	0.0%	1	33.3%	15	24.6%	10	31.3%	4	16.0%	1	50.0%	0	0.0%
46-55	5	4.1%	3	5.0%	3	9.4%	0	0.0%	0	0.0%	0	0.0%	2	3.3%	1	3.1%	0	0.0%	0	0.0%	1	50.0%
56-65	1	0.8%	1	1.7%	1	3.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Religion																						
Christian	108	89.3%	51	85.0%	25	78.1%	20	90.9%	3	100.0%	3	100.0%	57	93.4%	30	93.8%	23	92.0%	2	100.0%	2	100.0%
Muslim	12	9.9%	9	15.0%	7	21.9%	2	9.1%	0	0.0%	0	0.0%	3	4.9%	1	3.1%	2	8.0%	0	0.0%	0	0.0%
No religion	1	0.8%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	1.6%	1	3.1%	0	0.0%	0	0.0%	0	0.0%
Ethnicity																						
Amhara	28	23.1%	28	46.7%	16	50.0%	10	45.5%	2	66.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Oromo	8	6.6%	8	13.3%	3	9.4%	3	13.6%	0	0.0%	2	66.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Tigrayan	64	52.9%	3	5.0%	12	37.5%	1	4.5%	1	33.3%	0	0.0%	61	100.0%	32	100.0%	0	0.0%	0	0.0%	0	0.0%
Other	21	17.4%	21	35.0%	1	3.1%	8	36.4%	0	0.0%	1	33.3%	0	0.0%	0	0.0%	25	100.0%	2	100.0%	2	100.0%
Education																						
Less than primary	5	4.3%	2	3.6%	3	9.4%	0	0.0%	n/a	n/a	0	0.0%	3	5.1%	2	6.3%	0	0.0%	n/a	n/a	1	50.0%
Primary school	26	22.6%	15	26.8%	14	43.8%	0	0.0%	n/a	n/a	1	33.3%	11	18.6%	11	34.4%	0	0.0%	n/a	n/a	0	0.0%
Lower secondary	12	10.4%	5	8.9%	5	15.6%	0	0.0%	n/a	n/a	0	0.0%	7	11.9%	7	21.9%	0	0.0%	n/a	n/a	0	0.0%
Upper secondary	10	8.7%	7	12.5%	6	18.8%	0	0.0%	n/a	n/a	1	33.3%	3	5.1%	3	9.4%	0	0.0%	n/a	n/a	0	0.0%
Trade school	5	4.3%	1	1.8%	1	3.1%	0	0.0%	n/a	n/a	0	0.0%	4	6.8%	1	3.1%	3	12.0%	n/a	n/a	0	0.0%
University or higher	57	49.6%	26	46.4%	3	9.4%	22	100.0%	n/a	n/a	1	33.3%	31	52.5%	8	25.0%	22	88.0%	n/a	n/a	1	50.0%
Confidence in vaccine-related information received from government																						
Not confident	3	2.5%	2	3.4%	2	6.5%	0	0.0%	0	0.0%	0	0.0%	1	1.7%	1	3.2%	0	0.0%	0	0.0%	0	0.0%
Somewhat confident	13	10.9%	11	18.6%	4	12.9%	5	22.7%	1	33.3%	1	33.3%	2	3.3%	2	6.5%	0	0.0%	0	0.0%	0	0.0%
Confident	103	86.6%	46	78.0%	25	80.6%	17	77.3%	2	66.7%	2	66.7%	57	95.0%	28	90.3%	25	100.0%	2	100.0%	2	100.0%
Likelihood of receiving COVID-19 vaccine																						
Already received	85	71.4%	48	81.4%	23	74.2%	21	95.5%	2	66.7%	2	66.7%	37	61.7%	11	35.5%	22	88.0%	2	100.0%	2	100.0%
Unlikely	6	5.0%	3	5.1%	3	9.7%	0	0.0%	0	0.0%	0	0.0%	3	5.0%	3	9.7%	0	0.0%	0	0.0%	0	0.0%
Not sure yet	7	5.9%	5	8.5%	3	9.7%	0	0.0%	1	33.3%	1	33.3%	2	3.3%	2	6.5%	0	0.0%	0	0.0%	0	0.0%
Likely	21	17.6%	3	5.1%	2	6.5%	1	4.5%	0	0.0%	0	0.0%	18	30.0%	15	48.4%	3	12.0%	0	0.0%	0	0.0%
Time in role																						
Less than 5 years	17	29.8%	15	53.6%	n/a	n/a	14	63.6%	0	0.0%	1	33.3%	2	6.9%	n/a	n/a	1	4.0%	0	0.0%	1	50.0%
5-10 years	21	36.8%	10	35.7%	n/a	n/a	7	31.8%	2	66.7%	1	33.3%	11	37.9%	n/a	n/a	9	36.0%	1	50.0%	1	50.0%
10-20 years	18	31.6%	2	7.1%	n/a	n/a	1	4.5%	0	0.0%	1	33.3%	16	55.2%	n/a	n/a	15	60.0%	1	50.0%	0	0.0%
20 or more years	1	1.8%	1	3.6%	n/a	n/a	0	0.0%	1	33.3%	0	0.0%	0	0.0%	n/a	n/a	0	0.0%	0	0.0%	0	0.0%

Variable	All Stakeholders (n=121)		Addis Ababa										Adama									
			Total (n= 58)		Caregivers (n= 25)		FLWs (n= 27)		Health Practitioners (n=2)		Social Influencers (n= 4)		Total (n= 59)		Caregivers (n= 26)		FLWs (n= 27)		Health Practitioners (n=2)		Social Influencers (n= 4)	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
CAREGIVERS ONLY																						
Marital Status																						
Married	55	85.9%			23	71.9%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	32	100.0%	n/a	n/a	n/a	n/a	n/a	n/a
Separated	2	3.1%			2	6.3%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a
Divorced	4	6.3%			4	12.5%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a
Widowed	3	4.7%			3	9.4%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a
Employed																						
Yes	26	40.6%			13	40.6%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	13	40.6%	n/a	n/a	n/a	n/a	n/a	n/a
No	38	59.4%			19	59.4%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	19	59.4%	n/a	n/a	n/a	n/a	n/a	n/a
Number in household																						
2	3	4.7%			3	9.4%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a
3	14	21.9%			4	12.5%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	10	31.3%	n/a	n/a	n/a	n/a	n/a	n/a
4	18	28.1%			12	37.5%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6	18.8%	n/a	n/a	n/a	n/a	n/a	n/a
5	14	21.9%			5	15.6%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	9	28.1%	n/a	n/a	n/a	n/a	n/a	n/a
6	11	17.2%			7	21.9%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4	12.5%	n/a	n/a	n/a	n/a	n/a	n/a
7	2	3.1%			1	3.1%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	3.1%	n/a	n/a	n/a	n/a	n/a	n/a
8	2	3.1%			0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2	6.3%	n/a	n/a	n/a	n/a	n/a	n/a
Number of children under 5																						
1	54	84.4%			26	81.3%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	27	84.4%	n/a	n/a	n/a	n/a	n/a	n/a
2	9	14.1%			6	18.8%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4	12.5%	n/a	n/a	n/a	n/a	n/a	n/a
3	1	1.6%			0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	3.1%	n/a	n/a	n/a	n/a	n/a	n/a
Responsible for health decisions for children under 5																						
Respondent	18	28.1%			15	46.9%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3	9.4%	n/a	n/a	n/a	n/a	n/a	n/a
Spouse/partner	4	6.3%			1	3.1%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3	9.4%	n/a	n/a	n/a	n/a	n/a	n/a
Joint decision-making	41	64.1%			15	46.9%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	26	81.3%	n/a	n/a	n/a	n/a	n/a	n/a
Other household member	1	1.6%			1	3.1%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a
Under 5 vaccinated against polio																						
Yes	62	96.9%			31	96.9%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	31	96.9%	n/a	n/a	n/a	n/a	n/a	n/a
No	1	1.6%			1	3.1%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a
Don't know	1	1.6%			0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	3.1%	n/a	n/a	n/a	n/a	n/a	n/a
Polio vaccination location																						
Routine immunization at HF	20	31.3%			4	12.9%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	16	51.6%	n/a	n/a	n/a	n/a	n/a	n/a
Community campaign	7	10.9%			4	12.9%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3	9.7%	n/a	n/a	n/a	n/a	n/a	n/a
Both	35	54.7%			23	74.2%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	12	38.7%	n/a	n/a	n/a	n/a	n/a	n/a
FLWs ONLY																						
Number of OPV campaigns																						
Between 1 and 5	26	55.3%			n/a	n/a	21	95.5%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	20.0%	n/a	n/a	n/a	n/a
Between 6 and 10	15	31.9%			n/a	n/a	1	4.5%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	14	56.0%	n/a	n/a	n/a	n/a
More than 10	6	12.8%			n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6	24.0%	n/a	n/a	n/a	n/a

	All Stakeholders (n=121)		Addis Ababa										Adama									
			Total (n= 58)		Caregivers (n= 25)		FLWs (n= 27)		Health Practitioners (n=2)		Social Influencers (n= 4)		Total (n= 59)		Caregivers (n= 26)		FLWs (n= 27)		Health Practitioners (n=2)		Social Influencers (n= 4)	
Variable	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
HPs ONLY																						
Type of facility																						
Health clinic	4	80.0%			n/a	n/a	n/a	n/a	2	66.7%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2	100.0%	n/a	n/a
Other	1	20.0%			n/a	n/a	n/a	n/a	1	33.3%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a
Immunization frequency																						
At least once a day	3	60.0%			n/a	n/a	n/a	n/a	2	66.7%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	50.0%	n/a	n/a
At least once a week	1	20.0%			n/a	n/a	n/a	n/a	1	33.3%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a
At least once a month	1	20.0%			n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	50.0%	n/a	n/a
Opinion on community-based campaigns																						
Unsupportive	0	0.0%			n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a
Neutral	1	20.0%			n/a	n/a	n/a	n/a	1	33.3%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a
Supportive	4	80.0%			n/a	n/a	n/a	n/a	2	66.7%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2	100.0%	n/a	n/a
SOCIAL INFLUENCERS ONLY																						
Primary means of communication with community																						
At community gatherings/events	3	60.0%			n/a	n/a	n/a	n/a	n/a	n/a	2	66.7%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	50.0%
Via social media	1	20.0%			n/a	n/a	n/a	n/a	n/a	n/a	1	33.3%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%
Announce using speaker	1	20.0%			n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	50.0%