



Approaches to scaling up COVID-19 vaccination: Experiences from Malawi, Kenya, and Uganda

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The logo for Anthrologica features a large, stylized, cursive letter 'A' in a dark grey color. To the right of this 'A', the word 'Anthrologica' is written in a clean, black, serif font.

INTRODUCTION AND PURPOSE OF SYNTHESIS

Vaccination against SARS-CoV-2 infection is an important public health tool to limit the spread and effects of COVID-19. Robust COVID-19 vaccination programmes are essential to meeting ambitious global targets set by the World Health Organization (WHO) that aim for 70% vaccine coverage worldwide (World Health Organization, 2022b).

As vaccines became available in early 2021, countries faced urgent operational challenges. Vaccine rollout was hindered by unequal access and inadequate procurement mechanisms, limited health system capacity to deliver COVID-19 vaccines, inadequate cold chain and storage infrastructure, and insufficient funding within countries to mobilise vaccination programmes (Ariyaratne et al., 2022). These operational challenges were accompanied by challenges to uptake, including long-standing and emerging vaccine hesitancy. Doubts were fuelled by widespread misinformation and disinformation about COVID-19 and exacerbated by shifting public sentiment about the public health interventions necessary to stop its spread (Solís Arce et al., 2021).

As COVID-19 vaccination programmes enter their third year, existing challenges to programmes combine with new needs, complexities, and hesitations. Vaccination programmes require innovative solutions to scale up COVID-19 vaccination efforts, from administering booster doses to reaching those who have yet to receive their first COVID-19 vaccination. In addition, COVID-19 is no longer the top priority for many populations or countries. The Ebola and cholera outbreaks in the region at the time of writing are cases in point, with COVID-19 vaccination programmes having effectively come to a standstill as all teams and resources have been shifted to new emergencies. This signals the need to consider innovative ways to integrate COVID-19 programmes into routine services moving forward and to shift from an emergency to a development mentality.

Chapter 1 of this synthesis presents an overview of the vaccination context in three Eastern and Southern Africa Region countries: Malawi, Kenya, and Uganda. Chapter 2 examines community-side (demand-related) challenges to improving vaccination uptake. Chapter 3 discusses challenges from the provider side. Chapter 4 outlines approaches used to increase vaccine coverage and improve supply and discusses the implementation of these approaches into vaccination programmes in each country. Chapter 5 considers experiences of other countries in the region, seeking to highlight innovative solutions and related lessons learned that may inform vaccination programmes in Malawi, Kenya, and Uganda. The concluding chapter sets out lessons learned and recommendations for vaccination efforts going forward.

METHODS

This synthesis draws on evidence from academic and grey literature, review of available data, programme documents and rapid consultations with partners working in COVID-19 vaccination programmes. It was developed by Anthrologica for the Collective Service at the request of UNICEF East and Southern Africa Regional Office, (ESARO).

I: BACKGROUND AND COUNTRY CONTEXT

This chapter reviews the current state of vaccination coverage across the three countries, the sources and quantities of available vaccine supply, and the current evidence on the populations' intention to be vaccinated.

Vaccine rollout and coverage

Across Eastern and Southern Africa, few countries have reached the WHO's global goal of 70% COVID-19 vaccine coverage by mid-2022 (World Health Organization, 2022b). As of 21 November 2022, the WHO Regional Office for Africa COVID-19 Vaccination Dashboard reported 20% of the population in Malawi had received at least one dose of COVID-19 vaccine and 16% were considered fully vaccinated, having received a primary series of two doses (World Health Organization Regional Office for Africa, 2022a). In Kenya, 27% of the population had received one dose, with 21% fully vaccinated. Uganda had higher coverage, with these indicators at 42% and 29% (World Health Organization Regional Office for Africa, 2022a).

These figures, however, mask differences by sex in uptake of vaccines. In Malawi, as of 21 November 2022, 37% of a total of over 5.9 million doses given were administered to women. Similarly, in Uganda, 27% of over 25 million doses administered up until 21 November 2022 were administered to women. In Kenya, sex-disaggregated data on vaccine administration was not available from recent Ministry of Health situation reports.

Countries have adopted a phased approach to ensure limited supplies of vaccines first reach those most at risk of infection or severe outcomes. Priority populations during the first phase of vaccine rollout in early 2021 generally included health workers, older adults, and people with chronic health conditions or who are immunocompromised.

Health workers are at high risk of exposure to COVID-19 when caring for patients, and health workers themselves also pose a risk of transmitting COVID-19 to patients while providing care. Past experience with outbreaks such as SARS, MERS, Ebola, and the continuing COVID-19 pandemic has underscored the importance of preventing transmission in health facilities (Barry et al., 2020; Rickman et al., 2021; Seto et al., 2003; Shears & O'Dempsey, 2015). Global goals set by WHO call for 100% of health workers to be vaccinated against COVID-19 (World Health Organization, 2022b). Reports from August 2022 estimated that 83% of frontline health workers were vaccinated in Malawi (Chinele, 2022). In Uganda, by November 2022, 99% of health workers had received their primary series of COVID-19 vaccines (World Health Organization Regional Office for Africa, 2022a). Reports from Kenya, dated 14 March 2022, indicated that 88.6% of health workers had received their primary series (Kenya Ministry of Health, 2022).

In all three countries, older adults and people with comorbidities were identified as a priority group for vaccination, given their higher risk of morbidity and mortality from COVID-19 (Dadras et al., 2022; Ge et al., 2021). Older adults were defined as people over 50 years of age in Uganda, (The Republic of Uganda Ministry of Health, 2021) over 58 in Kenya, (Kenya Ministry of Health, 2021) and over 60 in Malawi (Government of Malawi, 2021). As of 21 November 2022, 41% of older adults in Malawi had been fully vaccinated, whilst in Uganda 38% of older adults had been fully vaccinated (World Health Organization Regional Office for Africa, 2022a). In Kenya, as of 14 March 2021, 50% of the population over age 58 had been fully vaccinated (Kenya Ministry of Health, 2022). Amongst people with comorbidities, 14% had been vaccinated in Malawi and 10% in Uganda as of 21 November 2022 (World Health Organization Regional Office for Africa, 2022a). In Kenya, recent efforts have focused

on vaccinating the youth population, and over 1.2 million youth between ages 12 and 18 had been partially vaccinated as of October 2022 (Ministry of Health - Republic of Kenya, 2022). Vaccines have been approved for youth in Uganda, with reports of efforts to vaccinate those aged 12-17 (The Independent, 2022). In Malawi, young people have not been specifically targeted for the vaccine (O'Neill, 2022).

In all three countries, coverage has been a particular challenge for hard-to-reach populations, particularly those that traditionally lack access to health services such as refugee and migrant populations. Uganda hosts over 1.5 million refugees and asylum seekers, one of the largest refugee populations globally (UNHCR, 2022). In line with Uganda's progressive policies to protect the rights of refugees and asylum seekers, refugees who fell into priority groups (such as refugee health workers or those over age 50) were eligible to receive vaccination along with Ugandan nationals. Targeted efforts to offer vaccination in refugee settlements began in May 2021, when all refugees over age 18 became eligible to receive the vaccine (Oxfam, 2022). By June 2022, however, more than 50% of the refugee population in several settlements had not received their first dose, while 20% had received one dose (Taremwa, 2022). Vaccination campaigns have also been held in refugee camps in Malawi as part of the national rollout (UNICEF Malawi, personal communication, 24 October 2022).

Vaccine supply

When COVID-19 vaccines first became available in 2021, an historic vaccine production, procurement, and deployment effort was mobilised. It was guided by global mechanisms such as the COVID-19 Vaccines Global Access facility (COVAX) on fair allocation and regional efforts such as the African Union Vaccine Acquisition Trust (AVATT) (Gavi the Vaccine Alliance, 2022). As COVID-19 vaccination programmes began in earnest, gaps in global mechanisms and urgent supply chain challenges rapidly emerged, revealing profound inequities in vaccine production and procurement (Peacocke et al., 2021). As a result, countries across Eastern and Southern Africa were unable both to procure sufficient doses of vaccines and to ensure access to ongoing and reliable supplies.

As global production capacity increased, COVAX has supplied the majority of doses in all three countries, representing 84%, 73%, and 68% of doses received by Uganda, Kenya, and Malawi respectively (World Health Organization Regional Office for Africa, 2022a). Doses have also been provided by AVATT, representing 27% of acquired doses in Malawi, but only 5% and 3% of doses in Kenya and Uganda. In these countries, bilateral aid was a larger source of doses, funding or providing 21% of doses in Kenya and 13% in Uganda compared to only 6% of doses in Malawi. Moderna, Pfizer BioNTech, J&J, AstraZeneca, Sinopharm, and Sinovac vaccines were administered across the three countries.

Intention to be vaccinated

Individuals' intention to be vaccinated is an important predictor of likely vaccine uptake. Intention is influenced by a variety of factors, including their perceptions of the vaccine and the disease the vaccine targets (Ogilvie et al., 2021).

According to data from the WHO Africa COVID-19 Dashboard, as of November 2022, 74% of people in Uganda reported that they wanted to get a COVID-19 vaccine, with 70% and 61% of people reporting the same in Kenya and Malawi, respectively (World Health Organization Regional Office for Africa, 2022a). Overall, people express less motivation to get booster doses, with 49% and 62% of people in Kenya and Uganda respectively reporting an intention to get a booster dose (Collective Service, 2022).

Amongst health workers in all three countries, vaccine intention is relatively higher than among members of the general population, perhaps in part reflecting workplace vaccination requirements. Data from Malawi and Kenya show variations based on health worker role, with clinical staff working in health facilities reporting greater intention to get vaccinated compared to lay cadres or community health volunteers (Moucheraud et al., 2022). Health workers reporting unwillingness to get vaccinated or vaccine hesitancy are an important group; their reticence needs to be understood and their concerns addressed. Indeed, across all three countries, health workers were viewed as trusted sources of vaccine-related information who could influence intention to be vaccinated.

Intention to be vaccinated against COVID-19 is related to how people think and feel about COVID-19 as it relates to their own health and the health of others, and how much trust they have that the vaccine will benefit them (Tulloch et al., 2021). In Malawi, 2021 data from the Collective Service COVID-19 behavioural dashboard reflected that most people surveyed thought the vaccine was important for their health (Collective Service, 2022). Other reasons for vaccination reported in Malawi in 2021 included to stop the pandemic, for the health of family, and because it was recommended by official institutions, health workers, or friends and family (Chilanga et al., 2022). Across the three reviewed countries, however, there was wide variation in measures of trust and safety. In Malawi, most poll participants said they trusted COVID-19 vaccines, but only about half felt COVID-19 vaccines were very or moderately safe. In Kenya, most people thought COVID-19 vaccines were important for their health and that vaccination was important to protect others from COVID-19, but only around half reported trusting the COVID-19 vaccines (Collective Service, 2022; Shah et al., 2022). In Uganda, most people reported thinking that the vaccine was important to their health and that they trusted it.

2: DRIVERS SHAPING ACCESS TO AND DEMAND FOR COVID-19 VACCINATIONS

Challenges to COVID-19 vaccine uptake are shaped by behavioural drivers that interact to determine access and demand. These drivers broadly include 1) environmental barriers that can impede vaccine access and suppress demand; 2) psychological barriers that influence vaccine hesitancy and determine intention to be vaccinated (or not); 3) societal barriers that interact with vaccine hesitancy and shape vaccine demand; and 4) communication barriers that can create and amplify vaccine hesitancy. The situation is dynamic, and in each of the three countries, the prominence of each of these factors has shifted over time. Table 1 offers an overview of these factors.

Table 1. Factors that shape demand and uptake for COVID-19 vaccination in Malawi, Kenya, and Uganda.

Overarching factors	Sub-factors
Environmental barriers	<ul style="list-style-type: none"> • <i>Vaccine availability and difficulty in accessing vaccination sites</i> • <i>Travel distance, lack of transport, and cost of transport to vaccination sites</i> • <i>Work, school, home, and caregiving commitments</i>
Psychological barriers	<ul style="list-style-type: none"> • <i>Concerns about side effects and health outcomes</i> • <i>Doubts about effectiveness, safety concerns and waiting to see if the vaccine is safe</i> • <i>Risk perception, acquired immunity, and other preventive strategies</i>
Societal barriers	<ul style="list-style-type: none"> • <i>Health status and prior vaccination experiences</i> • <i>Age, gender, education, and occupation</i> • <i>Rural and urban populations</i> • <i>Social norms and religious norms and beliefs</i>
Communication barriers	<ul style="list-style-type: none"> • <i>Conspiracy theories, lack of trust in the vaccine, institutions, and the government</i> • <i>Lack of information about the vaccine and vaccination</i> • <i>Negative messaging circulated on social media or messaging apps</i> • <i>Negative messaging from people in positions of authority</i>

Environmental barriers

Environmental barriers affect how, when, and at what cost people can access COVID-19 vaccination. These are factors that can enable vaccine access or create barriers that prevent even motivated individuals from accessing services.

Vaccine availability and issues in accessing vaccination sites

In Kenya, Malawi and Uganda, multiple barriers were reported at vaccination sites that prevented people from getting vaccinated against COVID-19 and, in some cases, from even seeking vaccination. These included vaccine stockouts, challenges associated with delivering multiple vaccine types with varying storage and usage requirements, and inconvenient or limited vaccination appointment times.

In 2021, Malawi faced delays in vaccine supplies that resulted in vaccine stockouts during the peak of the third wave of COVID-19 infections (Chinele, 2021a). In December 2021, it was reported that some health facilities were not able to provide vaccines during weekends and holidays, when many people had time off work or school to get vaccinated (Chinele, 2021a). Supply has since improved, so that at the time of writing COVID-19 vaccines can be found in almost every health facility across the country (UNICEF Malawi, personal communication, 24 October 2022).

In May 2022, as COVID-19 infections rose in Uganda, there was overcrowding and long line ups at many vaccination sites. In response, the government allowed private hospitals to charge for COVID-19 vaccines, increasing access for those who could afford to pay (Daily Monitor, 2022). At the time of writing, COVID-19 vaccination in Uganda has been dramatically scaled back as resources are diverted to the ongoing Ebola outbreak.

In Kenya, people seeking vaccination reported limited and inconvenient appointment times; some also reported lack of knowledge about vaccination sites or how to register for vaccination (Busara et al., 2022; UNICEF, 2022). In Uganda, people also reported not knowing the location of vaccination sites as a major barrier to vaccination (Kabagenyi et al., 2022).

Additional factors may suppress demand among marginalised groups, members of which often have longstanding distrust of institutions or negative experiences seeking healthcare. Despite Ugandan government policies and programmes to support vaccine uptake among refugee populations, many were hesitant to attend health facilities; this hesitance was associated with resistance to being vaccinated (Kisaakye et al., 2022). Refugees and asylum seekers, in Uganda and globally, face unique COVID-19 vaccination access issues. These may include administrative barriers, such as needing to show identification -- which they may not have -- in addition to more universal barriers (physical, financial, and social challenges, linguistic differences and cultural barriers, and vaccine hesitancy) (Collective Service et al., 2021; Oxfam, 2022).

Travel distance, lack of transport, and cost of transport to vaccination sites

Vaccination at health facilities or mass vaccination sites has been central to COVID-19 vaccine programmes globally. In reviewed countries, however, long distances to these sites posed a major barrier to access. In Malawi, it was estimated that 90% of the population lived in hard-to-reach areas without public transport. The Malawi Ministry of Health reported that low uptake is partially attributable to long travel distances to vaccination sites (Chinele, 2021c; Sethy et al., 2022). Distance also informed vaccine choice, with those living far from vaccination sites preferring the single dose Johnson & Johnson vaccine (Chinele, 2021a). In Kenya, poor terrain and travel infrastructure and some groups' pastoral lifestyles posed a challenge to reaching vaccination sites (Harrington & Ngira, n.d.; Muchiri et al., 2022; UNICEF, 2022). As travel distance increased in Kenya, likelihood of getting vaccinated against COVID-19 generally decreased. Indeed, there was a 68.1% decrease in vaccination coverage for people residing in areas over three hours' travel time from a site. This posed a significant barrier to access given that the mean travel time to the nearest vaccination site in Kenya was over an hour and ranged from six minutes in urban Nairobi to nearly five hours in Marsabit county (Muchiri et al., 2022). Similarly, in Uganda, people felt vaccination sites were too far away to be convenient and reported distance to vaccination sites as a difficulty (Resolve to Save Lives, 2022).

Work, school, home, and caregiving commitments

Even when vaccination sites were accessible, people across all three reviewed countries reported that not being able to leave work, school, or home presented a barrier to attending vaccination sites. As one Kenyan resident explained in a news report, "It is hard for people like me without a regular job to go line-up in order to be vaccinated...You have to put bread on the table first and if you are

not out there where the *kibarua* (temporary job) is being offered, someone else will get it," (World Health Organization, 2021). For women, lack of childcare is a barrier as they cannot leave their caregiving commitments to attend vaccination sites (UNICEF, 2022). Conversely, requiring vaccination for employment or to access services was considered a motivator to getting vaccinated. In Malawi, however, some people reported feeling political and media pressure that gave them a sense of being rushed to get the vaccine so they could continue employment and access services (Lines et al., 2022; Safary & Mtaita, 2022).

Psychological barriers

Vaccine hesitancy, defined by Larson et al. as "a state of indecision and uncertainty about vaccination before deciding to act (or not act)," is an important determinant of intention to vaccinate and is shaped by perceptions of vaccine risks and benefits (Larson et al., 2022). Vaccine hesitancy is complex, context-dependent, and exists across a spectrum ranging from outright refusal of some or all vaccines to acceptance of all vaccines (World Health Organization, 2014). Across the three countries, reasons for vaccine hesitancy have largely been related to concerns about side effects, safety and effectiveness, lack of information, and lack of trust.

Concerns about side effects and health outcomes

Across reviewed countries, fears of side effects and adverse health outcomes, including death, were widespread. In Malawi, these fears were greater amongst those who were unvaccinated and those who said that they were vaccine hesitant (Aron et al., 2022; Wollburg et al., 2022). Many adults had never received any type of vaccine until their first COVID-19 shot, so they were unprepared for the mild side effects that are common and expected with vaccines. Hearing about these side effects deterred others from getting vaccinated (UNICEF Malawi, personal communication, 24 October 2022). In Kenya, 58% of unvaccinated people reported concerns about side effects, and those who were concerned about side effects were more likely to be vaccine hesitant (Orangi et al., 2021; UNICEF, 2022). Some youth in Kenya believed that health facilities in the country would be unable to manage COVID-19 vaccine side effects. In Uganda, there were widespread concerns among the general population about side effects. One study amongst medical students found they reported high rates of vaccine hesitancy, and they cited concerns about vaccine safety and side effects as the main reasons for their attitudes (J. O. Osur et al., 2022). In Uganda, stakeholders reported that, while the importance of vaccinating the elderly was generally accepted, there was a lot of concern about vaccinating children (UNICEF Uganda, personal communication, 1 November 2022).

Individuals in all three countries reported concerns that the vaccine caused infertility, reproductive harm, or harm to pregnant women (World Health Organization, 2021). These concerns drove vaccine hesitancy in younger age groups in all three countries. Reports from 2021 in Malawi highlighted that younger people have sought vaccine brands perceived to have fewer side effects to allay these fears (Safary & Mtaita, 2022; Save the Children, 2021). In Kenya, and indeed in many African countries, a common rumour is that the COVID-19 vaccine is a tool to control the birth rate in Africa by causing infertility (Hyrkkö, 2022). Other rumours include that the vaccine would cause people to become zombies and that the vaccine was a mark of "the beast" or the devil (MoH Kenya, personal communication, 28 October 2022). In Uganda, rumours persist that the vaccine alters DNA and renders people infertile, that women can miscarry because of the vaccine, and that men can become impotent following vaccination (Athumani, 2021; Kabagenyi et al., 2022; Osuta, 2021).

The rapid development and deployment of several novel vaccines against COVID-19 has led to a common concern that the vaccines may be unsafe. This has prompted many to take a 'wait-and-see' approach to vaccination (Kanyike et al., 2021; Osuta, 2021). In Malawi, even amongst those health workers who have high confidence in vaccine safety, 60% of surveyed respondents agreed that

vaccines developed quickly are unsafe (Moucheraud et al., 2022). Amongst the general public in all three countries, many reported waiting to know more about vaccination results from other countries, with some reconsidering vaccination after friends and family members had been vaccinated with few side effects (Chilanga et al., 2022; J. O. Osur et al., 2022). Hesitancy appears to increase with the launch of new vaccine types and formulations, such as the new bivalent vaccines (Lines et al., 2022).

As people wait for more information and first-hand accounts of side effects, vaccine roll-out is challenged, because doses have short expiration dates or other cold chain requirements that favour rapid deployment. Meanwhile, rumours about COVID-19 and vaccines add to safety concerns and perpetuate the wait-and-see approach. In Kenya, people who reported believing in COVID-19 conspiracy theories were more likely to think the vaccine would be unsafe (Africa CDC, 2021).

In all three countries, people expressed doubts about vaccine effectiveness, more so amongst those reporting to be vaccine hesitant (Orangi et al., 2021; World Bank Group, 2021). In Malawi, doubts were related to a belief that for young and healthy individuals the vaccine is unnecessary at best and ineffective or dangerous at worst (Aron et al., 2022). In Kenya, uncertainty about vaccine effectiveness was a factor for pregnant women who chose not to be vaccinated (Naqvi et al., 2022).

Risk perception, acquired immunity, and other preventive strategies

For some, vaccine hesitancy was influenced by the perception that they were not at risk of COVID-19 infection, or not at risk of severe outcomes if infected (Busara et al., 2022; UNICEF, 2022). In Kenya, people who did not perceive themselves to be at risk of COVID-19 infection were more likely to be vaccine hesitant (Orangi et al., 2021). Those who accepted vaccination were more likely to believe it would be very serious if they or someone in their household contracted COVID-19 (Orangi et al., 2021). In Uganda, some people considered COVID-19 to be a 'disease of the whites', and survey respondents expected mortality to be highest amongst white people (Kasozi et al., 2020). Others in Uganda perceived that COVID-19 kills only people with underlying medical conditions (Kabagenyi et al., 2022). In the first half of 2022, cases declined in Uganda, leading people to believe COVID-19 no longer presented a risk (UNICEF Uganda, personal communication, 1 November 2022). In Malawi, people underestimated the potential severity of COVID-19, and therefore dismissed the need for a vaccine. As infections spiked during the winter of 2021, more people accessed the vaccine, but the rate of uptake decreased again after winter had passed (UNICEF Malawi, personal communication, 24 October 2022).

Some individuals in the three reviewed countries believed they had a lower risk because of some form of natural immunity. Some believed that prior COVID-19 infection negated the need for vaccination (Osuta, 2021). However, others without prior infection also reported a belief they had natural immunity. In 2021, amongst medical students surveyed in Kenya, 30.7% believed they had acquired immunity against COVID-19, although only 4.8% had reported testing positive for COVID-19 infection (Bongomin et al., 2021). In Uganda, a similar belief was held by some people with complex chronic conditions, who are considered at high risk for poor COVID-19 health outcomes. Although only 2.6% had tested positive for COVID-19, over 30% believed they had acquired immunity. Those who thought they had some natural immunity against COVID-19 were less likely to accept the vaccine (Bongomin et al., 2021). Others in Uganda believed in alternative preventive measures. Drinking alcohol for protection against COVID-19 (31%) and eating garlic as a cure for COVID-19 (41%) were prominent reasons for vaccine refusal, due to the perceived preventive effects of taking these (Kabagenyi et al., 2022).

Societal barriers

Vaccine concerns and information gaps intersect with sociodemographic factors, including age, gender, education, occupation, and location, social and cultural contexts, and prior vaccination experiences to shape vaccination intention.

Sociodemographic factors

Age

Across the reviewed countries, there was lower vaccine uptake amongst younger groups, with people under 30 years old reporting greater hesitancy and unwillingness to be vaccinated (Aron et al., 2022; Moucheraud et al., 2022; Osuta, 2021). One in five Kenyans (20%) aged 18-24 would not take the vaccine, compared to just one in fourteen (7%) people over 55. (Aron et al., 2022) Indeed, 31% of people 18 to 24 years old reported they would definitely not get vaccinated (UNICEF, 2022). While older adults have higher willingness to get vaccinated, they may also be less able to overcome barriers to access such as lengthy travel to vaccination sites.

Gender

Gender also played an important role in acceptance of COVID-19 vaccines in Malawi, Kenya, and Uganda. In informal settlements in Malawi, women were perceived to be more likely to follow government advice on vaccination but also more likely to be influenced by misinformation. In contrast, men were more likely to be subject to work-related vaccination requirements but were perceived to have less time to wait at vaccination centres (Lines et al., 2022). It has been speculated that women's strong community structures in Malawi may provide an opportunity for misinformation to proliferate among women -- more so than among men (UNICEF Malawi, personal communication, 24 October 2022). Similarly, in Uganda, women are generally perceived to be more open to health advice, but in the case of COVID-19 vaccines, men reported more interest in receiving the vaccine than women (Echoru et al., 2021). In Kenya, women were more likely to wait and see how other people reacted to the vaccine before themselves getting vaccinated (J. O. Osur et al., 2022).

Education and occupation

Differences in education and occupation had varied effects on vaccination behaviours. Prior to the vaccine roll-out in Malawi, those with more years of education and higher income were less willing to be vaccinated against COVID-19 (Kanyanda et al., 2021). However, once vaccination began, graduates and professionals were found to seek vaccination more than those with lower monthly incomes (who were believed to be motivated by free vaccination campaigns) (Ao et al., 2022). In Kenya, people who were unemployed and those with no or little education were less likely to have received the COVID-19 vaccine and reported higher levels of hesitancy compared to more educated groups (Orangi et al., 2021; J. O. Osur et al., 2022; Shah et al., 2022). A study in Uganda found that more educated groups were less likely to have vaccine hesitancy, although partners consulted for this synthesis suggested that hesitancy was more prevalent amongst Uganda's elite than among the general population (Kabagenyi et al., 2022).

Location

Where people live not only determined their access to vaccination sites but also is a factor in vaccine prioritisation, willingness, and hesitancy. In Malawi, reports pointed to higher vaccine acceptance in rural areas and greater scepticism in urban areas (Kanyanda et al., 2021). In informal settlements in Malawi, getting vaccinated was generally not seen as a priority compared to more pressing economic needs (Kanyanda et al., 2021). Refugee populations in Uganda had different concerns, reporting hesitancy to be vaccinated due to economic impacts should they

have a severe reaction to the vaccine (Athumani, 2021). In Kenya, people in rural areas were more likely to report vaccine hesitancy; vaccination coverage was greater in urban areas, in part due to lower levels of hesitancy (Orangi et al., 2021). Indeed, beliefs about the vaccine and vaccination differed across regions in Kenya with high willingness in Nairobi and the Rift Valley compared to Coastal and North Eastern regions where 24% of people reported that they would refuse COVID-19 vaccination (Africa CDC, 2021; J. Osur et al., 2022). In Uganda, it was a common belief among people living in rural areas that COVID-19 is a disease of urban areas (Nakato, 2022).

Social and religious norms and beliefs

Vaccine willingness was also shaped by social factors, notably by the perceptions of family and friends, as well as by community leaders. In Kenya, hesitancy was higher amongst people who believed their close family and friends would not get the vaccine, that no one would approve of them getting the COVID-19 vaccine, and that very few people would get the vaccine (World Vision, 2020). People in the interior counties in Kenya were particularly influenced by rumours spread by pastors and religious leaders, and it was challenging to counter misinformation shared by trusted leaders (MoH Kenya, personal communication, 28 October 2022). In all three countries religious norms and beliefs shaped hesitancy and vaccine acceptance. In Malawi, some people reported beliefs that the vaccine was associated with Satanism and had heard misinformation from church leaders relating the vaccines to devil worship (Chilanga et al., 2022; Lines et al., 2022). Another rumour equated COVID-19 to a symbol that the end of the world was near, as written in scripture. This rumour originated elsewhere, spreading globally via social media, and has been readily assimilated at the community level in Malawi (UNICEF Malawi, personal communication, 24 October 2022).

Health status, prior vaccination experiences and competing health priorities

An individual's health status was also found to affect willingness to take COVID-19 vaccines. In Malawi, health workers with comorbidities had slightly higher vaccine uptake than those without comorbidities (86.5% vs. 81.4%) (Moucheraud et al., 2022). Although people with comorbidities are more at risk for severe COVID-19 disease, a study amongst people with complex comorbidities in Malawi found that some patients reported unwillingness to get vaccinated because of their health problems and fears of how the vaccine would affect them given these pre-existing conditions (Aron et al., 2022). Indeed, people in Uganda with pre-existing allergies or conditions like asthma expressed greater fears of side effects from the vaccine (Oyekale, 2022).

Vaccine hesitancy and distrust in the health system or western medicine is not a new phenomenon, and those who have a history of vaccine hesitancy are less likely to accept a COVID-19 vaccine (Bongomin et al., 2021; Kanyike et al., 2021). Indeed, the COVID-19 pandemic intersects with histories and lived experiences that shape public perceptions of personal health, public health, and the relative risks and benefits of vaccination. In Uganda, reports of counterfeit COVID-19 vaccines are similar to reports of fake hepatitis B vaccines in 2018, which undermined vaccine confidence in the country (Balfour, 2021; Nakato, 2022; Nassaka, 2018).

Families in Malawi are affected by many health issues and other concerns and may be confronted with many different interventions. They may take time deciding what to prioritise. It should not be assumed that if given the 'right' information they will make the 'right' decision, given that what is 'right' is individually determined, especially when making multiple health decisions simultaneously (UNICEF Uganda, personal communication, 1 November 2022). Increasing uptake among pastoral groups in Kenya has been particularly challenging, as the number one priority for these groups is their livestock. However, focus group discussions and community dialogues have been useful in encouraging uptake among these and other community groups (MoH Kenya, personal communication, 28 October 2022).

Communication barriers

Vaccine willingness has been undermined by a lack of information about COVID-19 vaccines and the proliferation of misinformation and conspiracy theories about the vaccines. Social media and messaging apps are key channels by which misinformation, disinformation, and rumours spread. Throughout the COVID-19 pandemic, however, there have also been instances of trusted sources and leaders at the highest levels spreading false narratives that have contributed to vaccine hesitancy in communities.

Lack of information about the vaccine and vaccination

Inadequate information about the COVID-19 vaccine has affected demand for vaccination from the outset. In Kenya, for example, people reported having insufficient information to decide whether to take the vaccine as a reason for their hesitancy to do so (Africa CDC, 2021). For many in Malawi, Kenya, and Uganda, there was too little practical information to help people first decide to get vaccinated, and then determine where to get vaccinated (Kabagenyi et al., 2022; Lines et al., 2022; World Vision, 2020). Specific information gaps included little knowledge about the different COVID-19 vaccines, their efficacy, and how to navigate media reports on adverse events, such as reports of blood clots linked to the AstraZeneca vaccine in 2021 (Kabagenyi et al., 2022; Osuta, 2021). In Kenya, people reported being unable to determine true information on the vaccine from false information (Rosenzweig & Offer-Westort, 2022). In Malawi, research found that frontline health workers lacked interpersonal communication skills and adequate knowledge to be able to respond to people's queries and concerns about the side effects or benefits of the different vaccine types. This is particularly important given that health workers are a highly trusted and, for many, preferred source of information on COVID-19 (Thakwalakwa et al., 2021). Further, adequate information about the vaccines was reportedly not being provided through mass media at the national level in Malawi (UNICEF Malawi, personal communication, 24 October 2022).

Trust – a key driver for vaccine demand and uptake

Throughout the COVID-19 pandemic, misinformation and disinformation has flourished as conspiracy theories interact with longstanding and emerging lack of trust. It is increasingly difficult to discern facts from fake news. Across reviewed countries, a lack of trust in the vaccine and its manufacturers, as well as in institutions and government, has been a driver of vaccine hesitancy (Aron et al., 2022; Busara et al., 2022; Harrington & Ngira, n.d.; Shah et al., 2022). In Malawi, some people perceived that the vaccine was designed to inflict harm, and that there were different vaccines for medical teams versus the general population (Aron et al., 2022). People in Malawi had reportedly lost confidence that the government and its institutions were providing accurate information on the vaccine (Safary & Mtaita, 2022). In Kenya, people reported a lack of trust in the vaccine manufacturing process, with 25.5% of people surveyed agreeing that the vaccines were faulty or fake (Busara et al., 2022; Shah et al., 2022). In both Kenya and Uganda, some people believed that manufacturers had ulterior motives. In Kenya, 47% of people surveyed believed that people in Africa were being used as 'guinea pigs' or test subjects in vaccine trials (Africa CDC, 2021; Shah et al., 2022). In Uganda, people reported believing that vaccines were the 'white man's way of trying to control the population' in Africa or related the vaccine to biowarfare between black and white people. Others suggested that government officials should be immunised first before rolling out to the entire population (Kabagenyi et al., 2022; Osuta, 2021).

Information channels

In Malawi, health workers reported that exposure to negative information about COVID-19 vaccination most often came from messages shared by friends, patients, over messaging apps or in

social media posts by first hand contacts such as friends or family, as well as in social media posts by companies or other organisations. In Uganda, 90% of people reported having heard negative information or rumours about the COVID-19 vaccine (Hendery, 2022). Negative information spread across traditional and social media. In a report, one health worker explained, 'I heard on the radio and read on social media that these vaccines are not good and the people that get them would die,' (Agaba, 2021; URC, 2021).

Throughout the pandemic, negative information has sometimes been delivered from people in positions of authority. In Kenya, those not intending to get vaccinated were found to be obtaining information from social media and community meetings such as *barazas* (meetings with chiefs), and from trusted local and religious leaders (MoH Kenya, personal communication, 28 October 2022; J. Osur et al., 2022). In Uganda, politicians were reported to directly spread misinformation, which further fuelled hesitancy (Agaba, 2021). Likewise, in Malawi, during a time of change in government, the opposition party spread rumours that COVID-19 did not really exist but was being fabricated by the government to divert attention from its failure to take care of basic economic needs (UNICEF Malawi, personal communication, 24 October 2022).

3: IMPLEMENTATION OF COVID-19 VACCINATION PROGRAMMES – PROVIDER-SIDE CHALLENGES

As alluded to in the preceding chapter, challenges related to vaccine supply and availability can directly affect demand and uptake. This chapter reviews some of the additional challenges on the provider side. These factors relate to delivery of COVID-19 vaccines, including insufficient resources and coordination structures, difficulties integrating vaccination into other health services and programmes, inadequate capacity-building and strategies to motivate frontline workers, difficulties collecting timely data, and ever-changing implementation contexts shaped by competing priorities and emerging threats to programme sustainability.

Resources, coordination, and integration

In Malawi, operational partners cited a lack of financial resources to carry out demand-generating programmes that are tailor made for specific populations (UNICEF Malawi, personal communication, 24 October 2022). In Kenya, finding resources to reach the vast population with vaccines was an issue, with some partners able to cover only small areas (MoH Kenya, personal communication, 28 October 2022). In Uganda, partners mentioned the need to be sure government COVID-19 vaccination programmes have started up again following the Ebola outbreak before they proceed with social and behaviour change communication activities about COVID-19 vaccination (UNICEF Uganda, personal communication, 1 November 2022).

Partner coordination was identified as an issue in Malawi. There were over 60 partners working on vaccine uptake, but most of these were centred in urban or semi-urban areas, leaving a gap in support for harder-to-reach areas. A dashboard of national partners was set up in 2020 but has not been maintained, meaning that there is currently no clear mapping of where partners are working or how their work is impacting communities (UNICEF Malawi, personal communication, 24 October 2022). In Kenya and Uganda, there has been good central coordination among partners. In Kenya, partners work closely with the Ministry of Health to ensure efforts are directed where they are needed. Some parts of the country, however, do not have a strong partner presence and not all partners support COVID-19 activities, meaning that some counties are not covered by COVID-19 vaccination efforts (MoH Kenya, personal communication, 28 October 2022).

In Kenya and Malawi, little integration has occurred with other services, although discussions on this are ongoing (MoH Kenya, personal communication, 28 October 2022; UNICEF Malawi, personal communication, 24 October 2022). In Uganda, efforts had been made to begin to integrate COVID-19 vaccination into routine services, but this ceased as a result of the Ebola outbreak that was ongoing at the time of writing. Partners report that integration may be most promising in the private sector. The Ebola outbreak has highlighted the importance of integrating and maintaining essential services, and it has become clear that COVID-19 vaccination must transition towards being a routine health service as it becomes increasingly difficult to address it as an emergency given other emergencies that must take priority (UNICEF Uganda, personal communication, 1 November 2022).

The COVID-19 landscape and people's perceptions around it are constantly changing. Rapid evidence generation is therefore needed to inform programming and effectively target specific groups. In Malawi, processes for designing tools, gaining approvals, and conducting studies are protracted. There is no strong or harmonised national community feedback mechanism, although there have been isolated efforts to collect data and track rumours (UNICEF Malawi, personal communication, 24

October 2022). In Uganda, data collection and submission was slow until the introduction of an electronic system, which presented new challenges such as the need for an increased number of data collectors (UNICEF Uganda, personal communication, 1 November 2022).

Capacity-building and motivation of frontline workers

A challenge identified in Malawi was frontline workers' need for ongoing capacity-building to keep them up to date with the constantly evolving information about COVID-19 vaccines. They also need a high level of interpersonal skills to effectively communicate complex information about different vaccine types and their efficacy and side effects to people in varying contexts who often have low levels of literacy and education (UNICEF Malawi, personal communication, 24 October 2022). To motivate health workers in Malawi, Mangochi and Blantyre districts provided lunch allowances and incentives when they vaccinated enough people to finish one vial of Astra Zeneca vaccine (Gavi the Vaccine Alliance et al., 2022). In Kenya, motivation among frontline health workers and community health workers is low. When resources are available, volunteers are given a small cash incentive, but this could be made routine to improve the motivation of these essential actors (MoH Kenya, personal communication, 28 October 2022). Motivating Village Health Teams (VHTs) was also identified as an issue in Uganda. In some cases, their allowances were delayed, which lowered morale. In areas where the VHTs were paid promptly by partners through mobile money, campaign mobilisation was more timely, and communities were more receptive to vaccination as they had already received information and engaged with VHTs (UNICEF Uganda, personal communication, 1 November 2022). Consistent support, including financial incentives, is required to overcome these challenges and motivate frontline workers giving vaccines (MoH Kenya, personal communication, 28 October 2022).

“My recommendation is to support those who are giving the vaccine. Once those things are done correctly, as a country we can achieve more than 90% in a very short period of time. Once you give them support, you see data coming in, but once the support dries up, the efforts close down again.” (Health Promotion Division, MoH Kenya)

4: APPROCHES TO INCREASE VACCINE COVERAGE IN MALAWI, KENYA, AND UGANDA

Faced with multiple challenges affecting vaccine uptake on the community side and vaccine programme delivery on the provider side, reviewed countries have taken steps to increase vaccination coverage. Many approaches to increase vaccine coverage are multi-pronged, meaning they leverage several strategies at once. Multi-pronged strategies are often intensive, time bound and have specific targets. In some cases, such campaigns are to respond increasing levels of COVID-19 transmission in communities during waves or following emergence of new variants. Others target specific groups or areas with low vaccine coverage. These multi-pronged campaigns comprise several strategies, which may include:

- Bringing vaccines and vaccine educators into communities through comprehensive mobile strategies offered in places where people gather.
- Mobilising and training sufficient human resources, including health workers, community educators, and support staff to reach all areas and groups.
- Leveraging community health workers, and youth, religious, and community leaders to deliver tailored vaccine education that addresses myths and misconceptions.
- Using traditional and social media to spread accurate information about vaccines and how to access them.

Bringing these elements together provides a comprehensive approach to motivate uptake and increase vaccine coverage as shown in initiatives from across reviewed countries. Table 2 offers an overview of some strategies and examples of their use in the reviewed countries. These and other initiatives are described in greater detail in the succeeding sections.

Table 2. Strategies used to increase vaccine uptake in Malawi, Kenya, and Uganda.

Strategy	Examples
Comprehensive mobile strategies that bring vaccines to communities or specific groups	<ul style="list-style-type: none"> • In Kenya, vaccination campaigns have been held for drivers of local minibuses (<i>matatu</i>), buses, and motorcycle taxis (<i>boda boda</i>) (Hyrkkö, 2022). • Kenya has recently begun to offer COVID-19 vaccines, accompanied by health educators, at large sporting events. • In Malawi, the 'Vaccinate my Village' initiative has Health Surveillance Assistants (HSAs) visit every household within their jurisdiction during an intensive week-long door-to-door campaign.
Mobilising and training human resources	<ul style="list-style-type: none"> • At the PEN-Plus Clinics in Neno District, Malawi, health workers have been trained to be vaccine ambassadors for patients. Health workers have received coaching to use routine clinic visits as opportunities to emphasise the importance of vaccination for pregnant women and those with chronic conditions (Aron et al., 2022).
Leveraging community health workers, youth, religious, and community leaders, local associations, and other influential groups	<ul style="list-style-type: none"> • In Malawi, local champions (influential community members such as chiefs) fight vaccine hesitancy and misinformation. Champions rally and summon village organisations such as church groups, mothers' groups, youth groups, and others to talk about the pandemic and vaccination. Champions spread accurate information, run door-to-door outreach in the community, and promote vaccination using their influential status (Save the Children, 2021). Religious communities have also been supported to lead discussions about the vaccine with their congregations, and vaccination is offered after religious services. • Early in the vaccine campaign, Malawian President Dr. Lazarus Chakwera, First Lady Monica Chakwera, Vice President Saulos Chilima, religious leaders (notably Catholic Archbishop Thomas Luke Msusa), and traditional leaders were vaccinated (Chinele, 2021b). • The Organization of African Youth (OAY) in Kenya trained 1000 local women's and youth leaders on COVID-19 risk communication. They also trained 40 youth champions to mobilise access to and uptake of COVID-19 vaccination in Kisumu, Kenya (World Health Organization, 2022a). • In Kenya, religious leaders held sermons providing COVID-19 vaccination education and themselves were vaccinated on live TV to publicly show their commitment to COVID-19 vaccination (UNICEF, 2021, 2022). • Community health volunteers in Kenya have been instrumental in providing tailored information to vaccine-hesitant mothers. These workers have used their existing trust and status in communities to offer COVID-19 vaccine education and dispel myths (Brown, 2022).

	<ul style="list-style-type: none"> • In Uganda, a community-led process was used, where local leaders were trained to identify and communicate with vulnerable community members and ensure they were able to access vaccines when they became available in the area (UNICEF Uganda, personal communication, 1 November 2022).
Using traditional and social media to address misinformation and spread accurate information	<ul style="list-style-type: none"> • In Kabarnet, Kenya, the Alpha radio station broadcast key messages, including the importance of being vaccinated and raising awareness of COVID-19. Messages are broadcast in three languages. The radio station has a range of 120 kilometers and up to 300,000 regular listeners (Hyrkkö, 2022). • In Malawi, partners engaged with local drama groups, community radio, and social media influencers.

Malawi initiatives

Launched by the Malawi government in November 2021 with support from UNICEF and WHO, the COVID-19 Vaccination Express (CVE) is a programme to increase vaccine uptake across Malawi. CVE addresses barriers to vaccination, including distance and hesitancy, through mobile outreach to even the most remote communities (Chinele, 2021c). The campaign comprises several interrelated activities including a mobile van to bring the vaccine to communities, logistic and supply chain support, and a suite of human resources (Chinele, 2021c). The vans supported efficient use of vaccine stocks by drawing from local health facilities to ensure doses on hand were not wasted (United Nations, 2022). Vans were equipped with a public address system to alert people and to disseminate accurate information about the COVID-19 vaccine (Chavula, 2022). Teams travelling in the vans consisted of Health Surveillance Assistants (HSAs), vaccinators from District Health Offices and social mobilisers. Teams provided registration and vaccination including recording, reporting, and treating adverse events following immunisation (AEFI), collecting all biowastes and disposing of them after vaccination. The HSAs were on hand to provide information, respond to people's queries and concerns about vaccination and build trust in the vaccine. CVE increased uptake by 61%, accelerated the daily vaccination rate, including in the elderly, and increased utilisation and rationalised the uptake of doses that were set to expire (Sethy et al., 2022; World Health Organization, 2022c). Initially a 60-day campaign, CVE is ongoing at the time of writing, focusing on 15 of the 29 districts of Malawi (UNICEF Malawi, personal communication, 24 October 2022).

In early 2022, a door-to-door campaign called Vaccinate my Village was introduced, in which 11,000 HSAs across the country spend one intensive week each month visiting every household within their jurisdiction. The HSAs provide information to villagers about the vaccine and can provide vaccinations on the spot. The campaign was initially led by UNICEF but is now run by the Ministry of Health. In the first four months of the campaign, the vaccination rate increased from 11% to around 20% nationally, suggesting lack of information and accessibility had been material barriers to uptake (UNICEF Malawi, personal communication, 24 October 2022). Teams also worked with traditional and community leaders to facilitate door-to-door vaccinations at homes, workplaces, and community gathering points. Vans provided targeted community outreach, including offering vaccination of non-resident Malawians returning at borders during the Christmas period. In communities, vaccination was promoted through van-mounted loudspeakers and over community radio.

"People wanted to understand better the challenges. They wanted to ask someone and address their personal concerns and that the vaccine can also be made readily available to them. So when we do these campaigns, we see some households that immediately say, 'No, we don't want the vaccine.' But what we are seeing is that if the HSA goes a step beyond to address the household, they can shift around and maybe even say I'll come later when I make a decision. So those are the positive aspects that we're seeing." (Social and Behaviour Change (SBC) Specialist, UNICEF Malawi)

While mobile and outreach programmes can be highly successful in bringing vaccines and information to people, programme sustainability is an ongoing challenge. Mobile programmes are resource intensive, often requiring additional funds for travel, logistics, additional personnel and so on. Extra incentives are given to HSAs to participate in the intensive week of household visits, but if funds run out the programme may be jeopardised (UNICEF Malawi, personal communication, 24 October 2022). A possible solution to this could be integration of COVID-19 vaccination services with other services that people also need to access (Butler & Karam, 2022; UNICEF Malawi, personal communication, 24 October 2022).

Mass media has also been used in Malawi to reach a broad population with messages about COVID-19 vaccination. At the community level UNICEF has worked with drama groups, civil society organisations (CSOs) and the Malawi Red Cross to carry out community mobilisation. These efforts included training local journalists at community radio stations to help them produce accurate content addressing vaccine hesitancy. UNICEF has also worked with religious institutions, providing them with adequate resources for faith-based vaccination campaigns. Religious communities have been supported to initiate discussions with their congregations, address rumours, arrange health talks in their places of worship, and offer vaccination services after their religious services. UNICEF has also engaged with young social media influencers to target the young urban and semi-urban population with messaging about COVID-19 vaccination. Although it is difficult to monitor the outcome, comments and feedback suggest positive engagement from young people.

Kenya initiatives

Several coordinated, multi-pronged campaigns have been implemented in Kenya to boost vaccination uptake. Mass campaigns have used national television broadcasts, billboards, and posters. Village-level interventions across the country include focus group discussions and community dialogues (MoH Kenya, personal communication, 28 October 2022).

In early 2022, a ten-day campaign in 11 counties with low vaccination uptake was mounted by WHO along with county governments, NGOs, and other community partners (World Health Organization Regional Office for Africa, 2022b). The campaign focused on RCCE, including intensive vaccination outreach activities in markets, bus parks, and other social settings. The campaign prioritised engagement with many local groups, such as women's and youth groups, motorcycle taxi driver associations, religious leaders, an association for people living with disabilities, and a street families consortium. Outreach efforts included public information campaigns delivered through print, public announcements, and community radio, which was particularly useful for providing information in local languages (MoH Kenya, personal communication, 28 October 2022). The information specifically dispelled local vaccine myths and misconceptions, while also announcing the dates and locations of vaccination sites. These sites were located in communities, or in the case of remote areas, at places communities would gather, such as watering points. Door-to-door programmes were not feasible because of the vast areas needing to be covered and the resources required (MoH Kenya, personal communication, 28 October 2022). Vaccination efforts were supported by donations of face masks, tents, snacks, and transport from the local business community. In urban areas, public announcement systems were used to encourage people to make their way to vaccination sites (MoH Kenya, personal communication, 28 October 2022).

During the most recent wave of infections, in July 2022, the Saving Lives and Livelihoods initiative implemented a vaccination drive in Kenya. Funded by the Mastercard Foundation and the Africa Centres for Disease Control and Prevention (CDC), the initiative has four areas of focus: purchasing vaccines, deploying them across the continent, developing regional vaccine manufacturing capacity and workforce, and strengthening the capacity of Africa CDC (The New Dawn, 2022). Through the initiative, IFRC are supporting countries to elevate the role systematic community data plays in understanding and breaking the context-specific barriers to rapid vaccine uptake (IFRC Kenya, personal communication, November 2022). The initiative plans to target more than 8,000 outreach events, strengthen 672 vaccination centres, and vaccinate more than one million people in Kenya within 12 months.

Another recent innovation in Kenya is to bring vaccination to sporting events or other social events. Sporting events tend to draw large crowds of all ages, but predominantly youth, and the intention is to have both vaccinators and health educators on site to provide concurrent access to information

and vaccines. This initiative is just commencing at the time of writing and its success has not yet been measured; however, the resources required to mount and sustain these campaigns have been flagged as an issue (MoH Kenya, personal communication, 28 October 2022).

Other comprehensive efforts in Kenya have been delivered in partnership with religious groups. In late 2021, a vaccination drive was launched that converted 280 places of worship in Nairobi into vaccination centres. Organised by the Inter-Religious Council of Kenya (IRCK), the Ministry of Health, and UNICEF, the campaign enabled congregations to get vaccinated at churches, mosques, and temples, after hearing tailored communication on COVID-19 and vaccination during a sermon (Brown, 2021). The campaign is thought to have significantly increased vaccination rates and was successful because it provided an avenue for people to have their concerns addressed by trusted leaders. Religious leaders became champions and role models for the vaccine because they initiated and owned the campaign (MoH Kenya, personal communication, 28 October 2022).

Uganda initiatives

Uganda has used similar multi-pronged strategies to increase vaccination coverage. In February 2022, the Ministry of Health, supported by USAID's Regional Integration to Enhance Services in East Central Region of Uganda (RHITES-EC) Activity, launched a vaccination campaign that aimed to increase coverage in areas with lower COVID-19 vaccination uptake (URC, 2022). The campaign included district task force meetings to support planning, coordination, and mobilisation of resources for vaccine delivery. Health workers participating in the campaign were given trainings and orientation to align vaccine education and delivery approaches. In addition, data clerks were recruited for real-time data entry and registration of vaccination. The public were mobilised through radio talk shows and mobile public address systems that provided information on COVID-19 vaccination and vaccination sites. At vaccination sites, services were offered under tents with meals provided.

With support from UNICEF Uganda and USAID, a community-led approach to vaccination was employed. Vaccinators worked closely with village leaders, who were best placed to identify the community members most in need of a COVID-19 vaccine (particularly the elderly), to communicate with them about the vaccine, and to ensure they were able to access the vaccination site. Local leaders also communicated with schools and parents in the vicinity, informing people where and for how long the vaccines would be available. The local leaders were able to communicate with the health facilities and inform them about how many people in their area needed a vaccine, so that they could source and prepare the right number of vials to reduce waste (UNICEF Uganda, personal communication, 1 November 2022). This approach worked well in areas where there was a strong partner to coordinate the local government districts and ensure VHTs were paid promptly, such as in

"Part of the disappointment was vaccinators would not open a vial because each bottle catered for ten people, so if only two people are there, the rest of the vaccine would be wasted. So it was reducing wastage by making sure there was effective mobilisation before the dates." (UNICEF Uganda)

parts of the northern region.

A campaign to accelerate vaccination in refugee settlements was also implemented in Uganda to address low rates of vaccination (Taremwa, 2022). In June 2022, the Ministry of Health, in partnership with UNHCR, launched a mass vaccination exercise in 13 districts across Uganda, focusing on refugee settlements. The campaign used outreach posts in refugee settlements staffed by two health workers, one refugee welfare officer and two village health team members. The campaign has

been advertised through local talk radio shows and posters in local languages that address myths and misconceptions. These campaigns were facilitated by the fact that service delivery structures within settlements are very clear and organised and could easily be tapped into. The main challenge was in cross-border host communities, where people are highly mobile and it becomes a challenge to keep rigorous vaccination data (UNICEF Uganda, personal communication, 1 November 2022).

The Ebola outbreak in Uganda has shown the importance of integration and routinisation of COVID-19 programmes, as the country cannot sustain two emergency programmes simultaneously. Indeed, COVID-19 vaccination programmes have come to a standstill given the Ebola crisis, as teams have been reassigned, funds have been redirected, and media campaigns have switched to Ebola messaging (UNICEF Uganda, personal communication, 1 November 2022).

5: REGIONAL INNOVATION TO RAPIDLY RAMP UP VACCINE COVERAGE

Across the Eastern and Southern Africa region, countries have adopted innovative strategies to increase vaccine uptake. These efforts rely on many of the strategies employed in Malawi, Kenya, and Uganda, but they are extended by various means (Table 3).

Creative approaches include:

- Using digital innovations for health worker training, vaccine appointment booking, and data linkages.
- Leveraging existing disease programmes and community services for vaccine education and delivery.
- Rolling out open, transparent, and creative communication campaigns coordinated across channels and linked to vaccination services.
- Strengthening multisectoral partnerships for vaccine delivery and deployment.

Table 3. Innovative approaches for vaccine delivery across ESAR

Approaches	Innovations
<i>Using digital innovations for health worker training, vaccine appointment booking, and data linkages</i>	<ul style="list-style-type: none"> • Using drive-through services with online booking systems and daily data transfer to district health authorities. • Implementing virtual training for health workers on vaccination, cold chain and AEFI case management.
<i>Leveraging existing disease programmes and community services for vaccine education and delivery</i>	<ul style="list-style-type: none"> • Using existing community knowledge and engagement strategies from HIV-oriented programmes to tailor COVID-19 vaccine outreach strategies.
<i>Rolling out open, transparent, and creative communication campaigns coordinated across channels and linked to vaccination services</i>	<ul style="list-style-type: none"> • Partnering with local artists and influencers to re-enforce vaccine information and dispel myths and misinformation. • Ensuring open and accurate information is consistently disseminated from the highest levels of influence from the national to the local level.
<i>Strengthening multisectoral partnerships for vaccine delivery and deployment</i>	<ul style="list-style-type: none"> • Forming partnerships across the public and private sectors • Using multisectoral partnerships to ensure COVID-19 vaccination information reaches different segments of the population

Using digital innovations for health worker training, vaccine appointment booking, and data linkages

In November 2021, Namibia was recovering from its third wave of infections and seeking to increase vaccination to minimise the impact of future waves (World Health Organization Regional Office for Africa, 2021b). As part of a comprehensive strategy to promote vaccine uptake, 500 health workers were provided with a virtual training and mentoring intervention. The training covered topics related to COVID-19 vaccination delivery, cold chain requirements for available vaccines, and protocols for AEFI case management. The comprehensive strategy also included the development of forms and

processes to create a pre-booking system to increase demand, reach targets and ensure that multidose vaccines were utilised effectively to reduce and minimise vaccine wastage.

In Botswana, drive-through vaccination services were established in late 2021 to reach more than 20,000 people in Gaborone and Francistown (Surette et al., 2022). These sites were created through a partnership between the Ministry of Health and Wellness (MOHW) and district health management teams (DHMTs). Drive-through services were promoted on local radio and tv stations and through newspaper advertisements and on implementing partner social media pages. People accessing the sites for vaccination were able to pre-register for vaccination slots and wait in their cars to receive a dose of the Johnson & Johnson vaccine. Sites were run by nurse vaccinators and data clerks equipped with tablets for data entry. These vaccinators and clerks were engaged as paid consultants and trained by the DHMTs. Technical assistance was provided to DHMTs so that vaccination data collected could be synced daily directly to the District Health Information Software 2 (DHIS-2) system. A private sector partnership with a local mobile network was essential to securing data transfer capacity.

Leveraging existing disease programmes and community services for vaccine education and delivery

In Lesotho, mobile campaigns relied on existing community knowledge and engagement strategies to tailor vaccine outreach strategies (Gray, 2022). The Reaching Impact, Saturation, and Epidemic Control (RISE) project applied strategies from previous HIV work to reach adults with correct information about COVID-19 and provide vaccination in communities. The teams knew that men had difficulty opening up to female health workers and community mobilisers, instead preferring to discuss health issues and receive information from other men closer to their age. Using this knowledge, RISE set up tents at sites where men were known to gather and held vaccination days with a mix of providers of all ages and genders. Information about vaccination days and COVID-19 vaccination in general was also shared in local languages on the Facebook pages of local grassroots organisations and in local WhatsApp groups. RISE also partnered with the Determined, Resilient, Empowered, AIDS-Free, Mentored and Safe (DREAMS) Program to train ambassadors for vaccine outreach. DREAMS is a youth-oriented, public-private partnership designed to reduce the transmission of HIV in 16 countries while protecting, empowering, and investing in adolescent girls and young women (USAID, 2022b).

Similarly, in Zambia, existing HIV programmes and outreach initiatives had already trained tens of thousands of community health workers, who were mobilised to extend vaccine outreach deeper into communities (USAID, 2022a). These workers were tasked with promoting vaccine uptake through one-on-one interactions with people in their local area. Vaccination teams of community health workers spread correct information and countered misinformation in markets, bus stations, schools, places of worship, and door-to-door, while also increasing demand for vaccines.

In Tanzania, the integration of COVID-19 vaccination into routine HIV/AIDS care and treatment clinics in the Dar es Salaam region allowed increased vaccinations among clinic attendees (Tingua et al., 2022).

Rolling out open, transparent, and creative communication campaigns coordinated across channels and linked to vaccination services

In response to hesitancy and low vaccine uptake in 2021, the government of Namibia redesigned a comprehensive and coordinated strategy that aimed to improve vaccination acceptance, while also increasing access to vaccination sites (World Health Organization Regional Office for Africa, 2021b).

The strategy centred on a revamped communication plan and mass media campaign under the tagline 'Get Vaccinated! Help Kick COVID-19 Out of Namibia.' Under this banner, communication materials were produced in all local languages and information was disseminated via radio, television, and print media across the country. The government initiated several roadshows that featured local artists and celebrity influencers and travelled to all 14 regions in Namibia. The campaign engaged regional and community leaders to act as influencers. The Ministry of Health and Social Services at both the regional and the district levels partnered with these influencers to ensure communications activities were integrated with other outreach activities and vaccination services.

In Tanzania, outreach immunisation services were intensified through a campaign using the slogan "Timua vumbi" (Erupt the Dust) in the Ruvuma region. This campaign led to vaccination coverage that is twice the national average (12% vs. 5%) (Tingua et al., 2022). In Chamwino district, students from the University of Dodoma were involved in supporting vaccination activities on weekends. Vaccination rates, which usually drop during weekends, dramatically increased (from 20 to more than 500 people per day) once students were involved in programme delivery and outreach.

In Rwanda, trust in the public health system was high prior to the pandemic, reflected in a consistently high childhood vaccination rate (Bao et al., 2018; Wellcome, 2022). This trust was reinforced during the COVID-19 pandemic by the government's open communication, which was supported by the Ministry of Health in partnership with faith-based organisations, NGOs, local authorities, and the media to provide more information on the vaccines and dispel misinformation. Information was regularly communicated through one-page fact sheets, and COVID-19 vaccine information shared on radio and TV channels (Rwanda Biomedical Centre, 2022).

In Kigali, Rwanda a successful communication campaign was launched in July 2021 to address misinformation and hesitancy and inform urban residents when and where to get vaccinated (Resolve to Save Lives, 2022). By the end of the campaign 93% of Kigali's population had received a first dose and 56% had received a second dose. A major part of the campaign was video testimonials from those who had been vaccinated where they shared their positive experiences and explained their motivations for getting vaccinated. For example, a market vendor spoke about her desire to protect fellow vendors from getting sick. These testimonials were shared and promoted on social media. In addition, nine digital billboards at major intersections were used to promote COVID-19 vaccination, reaching 1.7 million viewers weekly. To complement the digital campaign, 3,747 community health workers were trained on accurate and motivating COVID-19 vaccine messaging. A second version of the campaign was run from December 2021 to February 2022 urging residents to complete their primary vaccine series and get a booster shot and encouraging vaccination amongst youth aged 12-17 years old who had just become eligible for vaccination. As of August 2022, two thirds of youth had received two doses of COVID-19 vaccine in Rwanda.

Strengthening multisectoral partnerships for vaccine delivery and deployment

In January 2022, the tourism sector in Namibia held a COVID-19 vaccination drive (CGTN, 2022). The initiative aimed to foster awareness of the importance of COVID-19 vaccination amongst those working in the tourism sector. The drive debunked rumours, addressed vaccine hesitancy, and educated tourism employees and business owners about the need for COVID-19 vaccination to stimulate tourism and travel demand in the country. Other strategic alliances to boost COVID-19 vaccination efforts in Namibia included partnerships across government ministries, as well as initiatives between the public and private health sectors, in addition to those by farmers' associations, NGOs, and community- and faith-based organisations. These partnerships all sought to increase vaccine uptake and strengthen vaccination services.

In South Sudan, faith-based organisations were leveraged to engage with women, who face unique challenges to accessing COVID-19 vaccination services and specific hesitations that need to be addressed (Butler et al., 2022). The Catholic Medical Mission Board (CMMB) saw that women were not getting vaccinated in their communities and set up vaccination tents outside places of worship (Jerving, 2022). Meetings were first held to sensitise religious leaders and provide them with accurate information on COVID-19 that they could relay to their congregation. Religious leaders then spoke to their congregations with health professionals present to answer questions. Women's church groups were also trained to mobilise other community members. After this approach was adopted, of the 80,000 people CMMB had vaccinated, 52% were women, up from 25%.

Case study: Innovative and comprehensive strategies in Angola

To increase demand for and access to COVID-19 vaccines, Angola leveraged existing systems and experience gained responding to a 2017 yellow fever outbreak (United Nation South Africa, 2022). The approach emphasised multi-sectoral partnerships at the national, district, and local levels, to ensure capacity from international partners and businesses should official resources become over-stretched (United Nation South Africa, 2022). During the initial COVID-19 vaccine rollout in 2021, 21 hubs were created across 18 provinces (World Health Organization Regional Office for Africa, 2021a). The hub at the Paz Flor Mall in Luanda, one of such hubs, could vaccinate over 5000 people in one day.

Setting up these hubs required three key elements: 1) investment in cold-chain technology; 2) digital pre-registration systems; and 3) trained counsellors to counter vaccine hesitancy (Abass, 2021).

Cold chain

- Angola invested heavily in cold chain logistics and storage facilities to ensure that all COVID-19 vaccines, including those that must be stored at ultra-cold temperatures, can be used in the country in the coming months.
- Cold Chain Angola is making use of the Oxford-AstraZeneca, Pfizer-BioNTech and Sinopharm COVID-19 vaccines and has invested heavily in cold chain capacity so all vaccines can be used.

Digital pre-registration

- Angola implemented a pre-registration system where people verify their identities and confirm pre-arranged appointments by showing QR codes or SMS or email confirmations on their phones or in hard copy.
- An online system facilitates reminders for subsequent doses.
- Angola's electronic pre-registration system helped ensure the right people were vaccinated and that they knew where and when to get the vaccine. SMS messaging, email confirmations and QR codes for on-site verification have also proven useful in preparing to deliver second doses, as well as collecting data to monitor the safety of vaccines (United Nation South Africa, 2022).

6: CONCLUSION AND LESSONS LEARNED

Scaling up COVID-19 vaccination programmes requires an understanding of the vaccination context, supply profiles, and major demand issues that shape whether or not people get vaccinated. Across Malawi, Kenya, and Uganda there are environmental, psychological, societal, environmental, and communication factors affecting COVID-19 vaccine demand and uptake. Yet despite complex contextual and demand-side challenges, several innovative solutions have emerged to increase vaccine coverage, from both within reviewed countries and across the Eastern and Southern Africa Region. From mobile and community outreach programmes to efforts to mobilise and train health workers, leveraging trusted voices in communities and addressing misinformation, efforts have been made to ensure information and vaccines go hand in hand into communities. Implementing these programmes has been hindered by insufficient resources, coordination, human resources and data collection, and programmes have been shaped by constantly changing contexts. Programmes have met these challenges by using digital technologies and local resources, supported by pre-existing structures and experience.

Key lessons learned to increase COVID-19 vaccination coverage include:

- Consider innovative ways to integrate COVID-19 vaccination with other services people routinely access, given that for many people COVID-19 is no longer considered a top priority, and stand-alone campaigns are not sustainable amidst multiple crises and concerns.
- Provide training, incentives, and adequate resources to ensure a breadth of health workers (including community health workers and others that reach the most local levels) are motivated to deliver vaccination programmes in communities and able to adequately, safely, and sustainably do so.
- Strengthen the use and uptake of digital technologies for targeted programme implementation, contextually specific micro-strategies, programme monitoring and evaluation, better user experience in registering for vaccination, and more timely data collection and use.
- Leverage existing resources and infrastructures in communities to bring vaccines to where people gather and enhance outreach activities by ensuring interventions and communication campaigns are targeted specifically to different groups (e.g., women, refugees, young people and older adults).
- Partner with trusted voices in the community, including religious and youth leaders, to develop community-led RCCE and SBC approaches that ensure different groups receive information in ways that are acceptable to them, and then offer vaccination in appropriate locations for these groups to easily access.

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