

The ELMA Vaccines and Immunization Foundation: Strengthening Vaccine Distribution and Protecting Routine Immunization (RI)

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Abbreviations

AEFI	Adverse Event Following Immunization
AFP	Acute Flaccid Paralysis
AVAT	African Vaccine Acquisition Trust
BMGF	Bill & Melinda Gates Foundation
CHAI	Clinton Health Access Initiative
CHV	Community Health Volunteer
DIVO	District Immunization Vaccine Officer
EIR	electronic immunization registry
eLMIS	Electronic logistic management information system
EPI	Expanded Program on Immunization
FHI 360	Family Health International 360
GOT	Government of Tanzania
HCW	Healthcare worker
HMT	Health Management Team
HPV	Human Papillomavirus
HSS	Health system strengthening
ICT	Information, Communication, and Technology
IEC	Information, Education, and Communication
JHPIEGO	Johns Hopkins Program for International Education in Gynecology and Obstetrics
KPI	Key performance indicator
MEL	Monitoring, evaluation, and learning
MR	Measles and rubella
MoH	Ministry of Health
NCD	Non-communicable disease
NVDP	National Vaccine Deployment Plan
NVIP	National Vaccine Immunization Program
PHC	Primary healthcare
PIRI	Periodic intensification of routine immunization
PORALG	President's Office, Regional Administration and Local Government
R/CHMT	Regional/ Council Health Management Team
REM	Ripple Effect Mapping
RM	Remote temperature monitoring
SDG	Sustainable Development Goals
SOP	Standard operating procedure
TImR	Tanzania Immunization Registry

1 Project Background

The ELMA Vaccines and Immunization Foundation awarded JSI Research and Training Institute, Inc. (JSI) a grant towards project support for COVID-19 vaccine technical assistance to Ministries of Health in Kenya, Malawi and Tanzania at national and subnational levels, including training vaccinators, strengthening data systems and supporting vaccination outreach sites. The project support was for the period of September 1, 2021 to October 15, 2023. This end date reflects a no-cost extension of 2 months that was granted to JSI by the Foundation. This grant had the following measures of success:

- 77.5 million people (60% of the population in Kenya, Malawi and Tanzania) partially or fully vaccinated (reporting will be disaggregated by country, partial and full vaccination, gender, age, type of site, urban or rural location as available and defined by Ministry of Health).
- Overall vaccine wastage rate (due to expiry, cold chain issues, and other) is reduced to 20% or less in Kenya, Malawi, and Tanzania.
- 2,145 (840 in Kenya, 1,305 in Malawi) health workers/support staff are trained to provide COVID-19 vaccinations.
- 20,000 health care workers are vaccinated in 21 councils in Tanzania.
- Vaccine uptake increases by 50% at health facilities with low uptake to date in Mjinji and Mwanza districts in Malawi (baseline = 3.3% in Mwanza and 4.7% in Mchinji).

In Kenya and Tanzania, JSI Research and Training Institute, Inc. partnered with its local affiliate inSupply Health to implement the grant. The implementation activities for each country were structured to address their gaps in providing COVID-19 vaccines to the population (general/priority groups). However, routine quarterly meetings that brought together teams from all three countries provided an environment for cross-country learning.

2 Kenya

2.1 Country Background

Kenya drafted its first National Vaccination Deployment Plan in December 2020 in preparation for the introduction of the vaccines by March 2021. This deployment plan prioritized vaccination of high-risk populations, specifically the front-line healthcare workers (HCWs), teachers, and uniformed staff. As the vaccination initiatives continued, the priority groups were expanded to include the elderly population above 58 years. In the early phase of vaccination, the country was faced by a myriad of challenges around the availability of vaccines. At some point, the country had to make adjustments around the second dose administration and extend the schedule from 8 weeks to 12 weeks.

As the global supply of vaccines improved and countries were able to receive more doses of vaccines through the African Vaccine Acquisition Trust (AVAT) mechanism, the country revised its national COVID-19 vaccination deployment plan in August 2021. In this revised plan, the Government of Kenya set a goal to fully vaccinate 19 million adults (70% of its adult population)

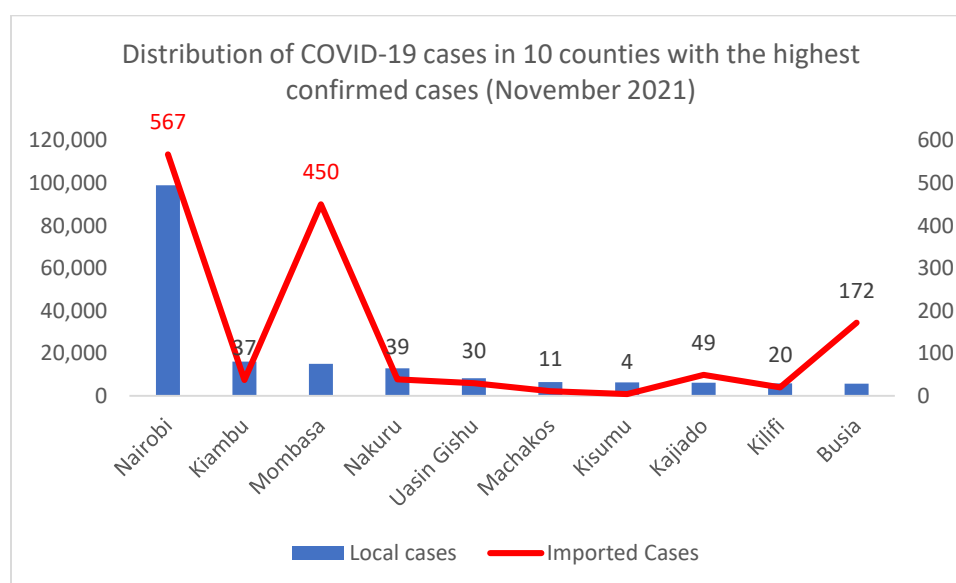
by the end of June 2022 and the entire adult population of 27 million people by December 2022. Besides vaccine availability and safety, other critical factors were required by countries to attain their COVID-19 vaccination targets. These included having an adequate pool of healthcare workers trained on the administration of the COVID-19 vaccines as well as the use of the digital platform ChanjoKe that was used to register clients and capture vaccination reports, increased awareness among the target population to generate demand for the vaccine, and increased access to the vaccine. The revised COVID-19 vaccination deployment plan cited an inadequate budget to support training, communication, community sensitization, and capacity-building efforts, as some of the key challenges that the country was facing in its COVID-19 vaccination efforts.

2.2 Selection of Focus Counties

Health functions are devolved and managed at two different levels of government, the national and the sub-national (County) levels. The national government is responsible for health policy, research, advocacy, national referral services, capacity building, and providing technical assistance to counties, while counties are responsible for community health, health facilities, pharmacies, and issues of general health within their territories. This meant that there was a need for close collaboration between the different levels of government as well as with other partners to fill some of the challenges that the country was facing.

inSupply Health relied on the COVID-19 infection rates in the selection of the counties to support through this initiative. Nairobi and Mombasa Counties had the highest infection rates of COVID-19 at 2,316 and 1,290 per 100,000 population respectively as compared to 536/100,000 for the whole country. Incidentally, the two counties also host the two main international airports in Kenya. These two counties had the highest number of imported cases as shown in Figure 1 below which provided the justification for selecting them as the focus counties to be supported through this grant.

Figure 1: Distribution of 10 counties with the highest confirmed COVID-19 cases by transmission classification (November 2021)



Source: MOH Kenya COVID-19 Situation Report

As of December 1, 2021, which was prior to the onset of the project implementation in Kenya, the country had received 16.2 million doses of COVID-19 vaccines and was expecting to receive more doses of vaccines through the AVAT mechanism as well as from bilateral donations. The country had fully vaccinated 10.3% of the adult population with county-specific coverage rates ranging between 3.8% - 28.0%. The proportion of adults fully vaccinated in Nairobi County was 28.0% while in Mombasa, it was 11.0%.

Selection of additional two counties for support: In 2023, inSupply/JSI identified additional counties to extend the support to given that we had lost implementation time due to a shortage of COVID-19 vaccines in Kenya between October through February 2023. Given that we had three months of implementation left for the project, we had to identify the counties based on the existing presence of inSupply/JSI to help leverage the existing partnership which would reduce the time spent in establishing a formal partnership with the county. It is based on this background that we selected Homabay & Vihiga counties which were being supported through the JSI's USAID-funded MOMENTUM Routine Immunization Transformation & Equity (M-RITE) Project. The coverage rates for the Homabay and Vihiga counties as of the end of February 2023 were 46.7% and 35.1% respectively compared to the national average coverage rate of 36.9%.

2.3 Objectives

2.3.1 Objective 1: Increase the number of healthcare workers equipped with skills to deliver COVID-19 vaccines

One of the critical challenges in the uptake of the COVID-19 vaccine in Nairobi and Mombasa counties was the low number of HCWs equipped with the skills to administer the COVID-19 vaccines. The MoH through the National Vaccines Immunization Program (NVIP) designed a two-day, comprehensive training curriculum that covered all issues related to COVID-19 including vaccine eligibility, infection prevention and control, vaccine attributes, storage, supply logistics, vaccine administration, vaccine safety monitoring and surveillance, as well as the use of the Electronic Immunization Registry, the Chanjo-Ke. This was to be used to train all vaccinators and was rolled out in phases as funding became available. During the planning phase of the project, JSI and inSupply planned to support training of at least 25 HCWs from each sub-county in Nairobi (425) and Mombasa (150). By the time project implementation commenced in January 2021, most of the HCWs in Mombasa had already been trained on COVID-19 vaccination and the training targets for this county had to be reduced to 75 HCWs. As of October 2022, JSI/inSupply together with MoH colleagues had successfully completed training of 538 healthcare workers including 61 in Mombasa and 477 in Nairobi. In Nairobi, the target was exceeded by 12%, in Mombasa the project trained 81% of targeted HCWs, given that most HCWs had already been trained on COVID-19 vaccination.

In addition to COVID-19 vaccination, 77 of the HCWs (16%) trained in Nairobi County were also equipped with skills on the Rota-virus and pneumococcal vaccines switch that the country was rolling out at the time of the training.

2.3.2 Objective 2: Increase access to COVID-19 vaccines through outreaches in Nairobi and Mombasa County

To increase access to COVID-19 vaccines, the Kenyan Government in the revised COVID-19 vaccines and deployment plan outlined campaigns and accelerated outreaches as some of the strategies to ramp up vaccine uptake and ensuring that as many people are vaccinated as quickly as possible. This required enlisting and involvement of all key stakeholders at both the national and the county levels. Through the microplanning process, counties were able to identify areas where they needed to prioritize through the targeted COVID-19 outreaches to ensure that they maximized on these activities towards ensuring increased uptake of COVID-19 vaccines.

In collaboration with each county, JSI/inSupply had planning meetings to structure and design the outreaches including the team composition. The outreach teams constituted vaccinators, data entry clerks, and community mobilizers. These outreaches leveraged community mobilization efforts that helped establish trust in the COVID-19 vaccine given that many individuals were hesitant to receive the vaccine due to concerns about safety or side effects. Through the course of supporting outreaches, the project held routine meetings with the county and sub-county teams to identify opportunities for increasing efficiency as well as adapting to the changing contexts thus ensuring the project achieved the maximum outputs. The following are some of the adjustments that were made in the course of providing support for outreaches from February 2022 to May 2023.

- The project evolved the team composition to reduce the number of health workers in each outreach team, which made it possible to support more outreaches, as well as increase the number of days per outreach from one to four.
- In Nairobi, the outreach teams transitioned to being mobile as opposed to being static as a strategy to broaden access and reach. These outreach teams developed route maps that guided their movement within their catchment areas.
- In Mombasa County, the teams adopted a performance-based compensation model where the community health volunteers were reimbursed with a small fee for every complete referral that they made. This motivated the teams while significantly increasing the COVID-19 vaccination outputs from the outreaches.
- JSI/inSupply adopted the integration outreaches model in 2023, where the outreaches provided the Human Papillomavirus (HPV) and other routine immunization vaccines in addition to COVID-19 vaccines. This approach worked best for school-based outreaches where the HPV and Pfizer COVID-19 vaccines were provided to those that were eligible. This approach required the mobilizers to work closely with the schools' administration to ensure that parental consent was obtained for each child vaccinated.
- Another integration model adopted incorporated COVID-19 vaccination within other campaigns, specifically the Measles-Rubella vaccination campaign conducted in Nairobi County in December 2022.
- In March 2023, the project expanded the support counties from two to four. JSI/inSupply leveraged a partner project to be able to support Vihiga and Homabay counties to conduct integrated vaccination outreaches. The selection of these counties

was based on the presence of JSI/inSupply Health as well as the low COVID-19 vaccination rates in the two counties.

By integrating COVID-19 vaccination outreaches with HPV vaccination and Measles Rubella campaigns, health care professionals were able to leverage existing relationships with community members and providers, as well as established frameworks for communication and outreach. This approach augmented efforts to help build trust in the vaccine and encouraged individuals to receive the COVID-19 vaccine.

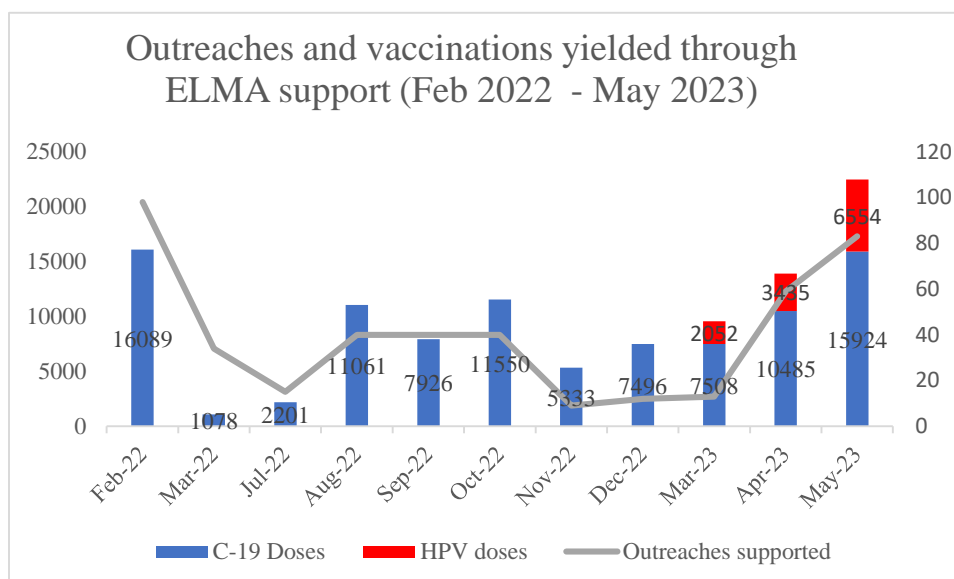


Image 1 and 2: Integrated vaccination outreaches in Homabay County in which COVID-19, HPV and RI vaccines were administered

In total, we supported 443 outreaches across four counties; Mombasa, Nairobi, Homabay and Vihiga. Through these outreaches, the teams were able to administer 96,651 doses of COVID-19 vaccines and 12,041 doses of HPV vaccines.

Figure 2 below, shows the trends over time as we increased the number of outreaches as well as teams adopting innovative approaches to ensure more vaccines were administered. In March 2023, we both adopted the integrated vaccination outreaches model as well as expanding to two additional counties.

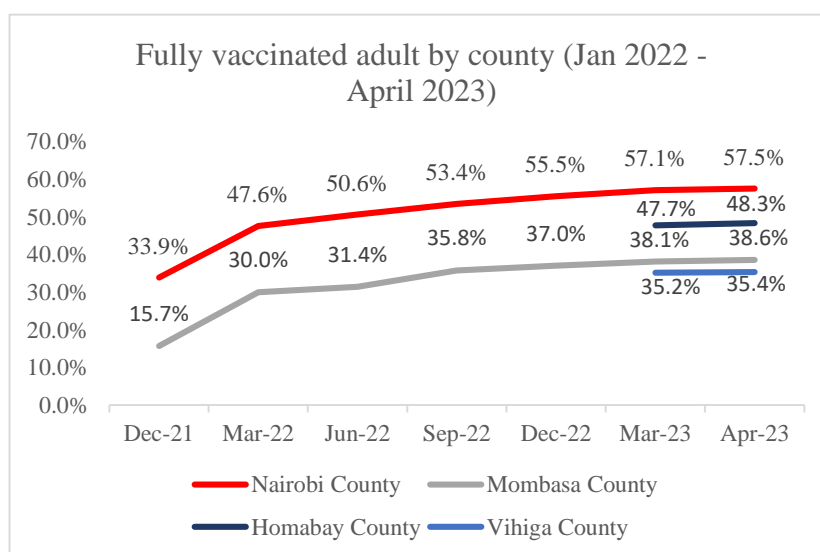
Figure 2: Number of outreaches vs a vis COVID-19 and HPV doses administered through the outreaches



Source: inSupply/ JSI Project Report

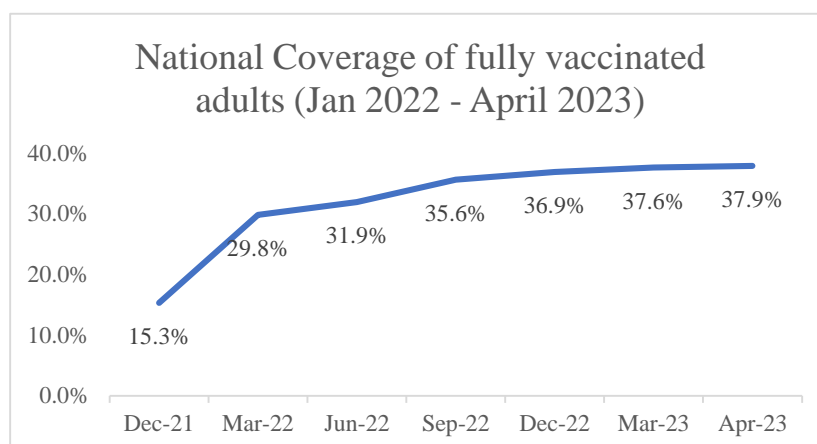
Figures 3a and 3b shows the fully vaccinated adults coverage trends for Kenya by county as well as the national coverage rate. While the country is behind in attaining the target it had set to fully vaccinate the entire adult population by December 2022, there has been a tremendous increase in the proportion of the adult's population fully vaccinated with 37.9% of this population being fully vaccinated as at April 2023 compared to 15.3% in Dec 2021.

Figure 3a: Percent of Fully Vaccinated adults by County from Dec 2021 – April 2023



Source: inSupply/JSI Project Report

Figure 3b: Percent of fully vaccinated adults (National coverage rate) from Dec 2021- April 2023



Source: inSupply/JSI Project Report

JSI/inSupply participated in the COVID-19 vaccination strategy meetings with partners to review data and progress in meeting the set targets. In Nairobi, these meetings were more regular as they were held on a weekly basis and brought together the county and sub-county Health Management Teams (HMTs) as well and all implementing partners that were supporting COVID-19 vaccinations. The team also had a WhatsApp forum for sharing routine updates with the teams. This made it easy to plan the logistics for vaccine distribution from the depots to the facilities. The sub-counties also utilized this platform to share insights, their performance and any unique strategies that were working for their teams for the other teams to consider adopting.

The outreaches also provided an opportunity for the county and sub-county HMTs to provide supportive supervision to the outreach teams. During these visits, the HMT members reinforced various aspects of COVID-19 vaccination, such as infection prevention and control, and reporting on the Chanjo-Ke, most specifically reporting on the inventory section of the report. The vaccination teams also benefited from strategies to persuade the community to get the vaccine.

Table 1 below provides a status update on the COVID-19 vaccination in Kenya as of 30th April 2023.

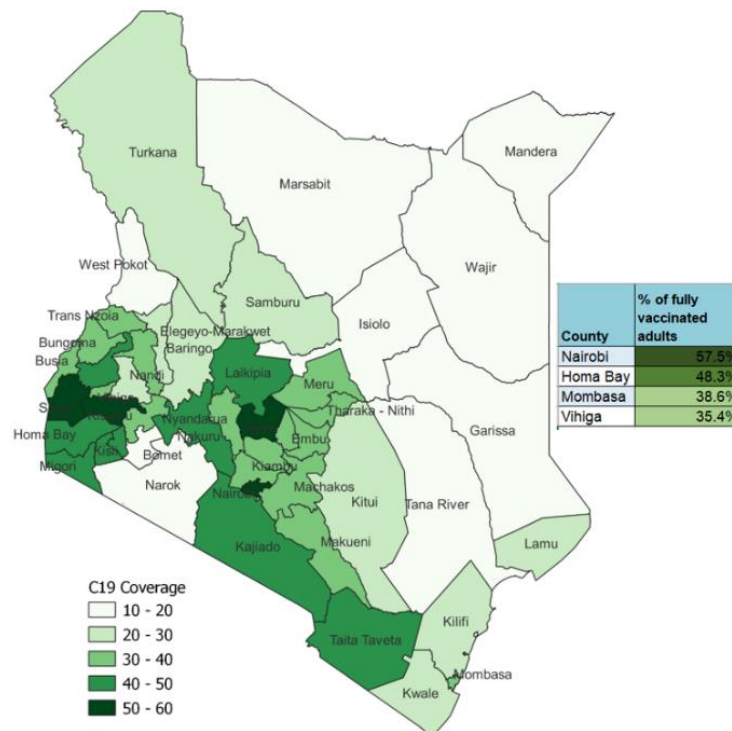
Table 1: Status of COVID-19 Vaccination in Kenya as at April 30, 2023

Total Doses of COVID-19 Vaccines Received in Kenya	31,445,700
Total Doses Administered	24,151,841
% of Eligible Population	32.1%
Persons Fully Vaccinated	10,330,496 (37.9%)
Partially Vaccinated Adult Population (18 years and above)	2,120,330
Booster Doses Administered	2,208,238
Doses Administered to Teenage Population (12 years to below 18yrs)	3,134,216
Partially Vaccinated Teenage Population (12 years to below 18yrs)	2,230,372
Fully Vaccinated Teenage Population (12 years to below 18yrs)	908,847(11.5%)

Source: MOH Kenya COVID-19 Immunization Status Report

The map in Figure 4 shows the coverage rates of fully vaccinated adults as at end of April 2023. Nairobi County which had 57.5% was presented with an award during the world immunization week for being the best performing county with the highest proportion of fully vaccinated adults. This was an improvement from being the second-best county prior to the ELMA COVID-19 support. The rest of the counties, Mombasa, Homabay and Vihiga counties had coverage rates of 38.6%, 48.3% and 35.4% respectively.

Figure 4: Percentage of fully vaccinated adults by County as of April 30, 2023



Source: MOH Kenya COVID-19 Immunization Status Report

2.3.3 Objective 3: Collaborate with Ministry of Health and stakeholders to implement key supply chain indicators, analytics, and data use processes for COVID-19 data monitoring at sub-county and country level

The Chanjo-Ke platform was developed to help with capturing COVID-19 service and logistics data from the facilities in real-time. This platform was used as the immunization client registry and individuals would either self-register themselves or be registered with the support of a healthcare worker prior to being vaccinated. Upon data entry by the health worker, the platform provided the client with visibility of the information of the vaccine received, the batch number, and the due date for the next dose. This platform was also used to record vaccine inventory data from the depots to the vaccination facilities and provide aggregated vaccination data. The process of enlisting facilities to report through the system was marred with delays and most facilities had to report through other proxy facilities as they waited to be provided with the rights. Internet connectivity challenges also added to the difficulty for most healthcare providers to submit the data into the system as they vaccinated. They used manual records to record the data and entry was done into the system at a later time. The immunization program developed a Google sheet reporting platform to help provide visibility of the vaccination progress on a weekly basis from the counties amidst the challenges. JSI/inSupply incorporated COVID-19 Key Performance Indicators (KPIs) within the IMPACT Teams KPIs to provide the counties an opportunity to closely monitor COVID-19 vaccination reporting at facility level and address arising challenges.

COVID-19 Vaccine data review through the IMPACT Teams Approach

In 2019, inSupply Health through the BMGF-supported Data Use Kenya project supported the establishment of IMPACT Teams at the sub-county level. These teams brought together multi-disciplinary teams that were trained to develop, interpret and set targets for Key Supply chain Indicators and use an action-oriented dashboard (Indicator Tracking Tool) for actions and decisions. The teams met on a monthly/ bi-monthly basis and followed structured problem-solving processes to address the supply chain bottlenecks as identified by the program and supply chain data. IMPACT Teams focused on the review of routine immunization, family planning, malaria, and nutrition program data.

This project set out to build on IMPACT teams to foster data use for COVID-19 immunization. JSI/inSupply triangulated data from the two sources (Chanjo-Ke and the Google sheet data) and developed KPIs for the sub-county IMPACT Teams to use during their monthly IMPACT Team meetings.

- **Vaccine Consumption Trends:** Teams traced the progress of vaccination campaigns and deep-dived to understand the demand for different types of vaccines. They monitored trends for doses administered on a weekly and monthly basis as well as monitoring these trends by antigen and dose (1st dose, second dose, and booster dose) to identify where they needed to focus their efforts on towards ensuring that they met their vaccination targets. This also provided the teams' visibility on the vaccine preferences and helped them in planning for the distribution of COVID-19 vaccines to the facilities from the sub-county depot.

- **Coverage Rates:** The teams monitored the proportion of the target population that was fully vaccinated on a monthly basis. This formed a fundamental part during decision-making in understanding how close they were to achieving herd immunity and identifying the areas that required additional vaccination efforts.
- **Vaccine Stock Status:** Analyzing stock status at both the sub-county depot and facility level ensured that there are enough doses of the vaccines available to meet demand amidst the various campaigns and outreaches that were being conducted. This helped the decision-makers predict potential shortages and ensure that adequate contingencies are in place as well as plan for redistribution of vaccines to avert expiries given that the country was receiving vaccines with short shelf life. The Pfizer vaccines also had a shelf-life of 30 days upon thawing.

2.3.4 Objective 4: Reduce COVID-19 vaccine wastage rate to 20% or less

The teams also monitored the wastage rates of vaccines. Monitoring and reducing wastage rates for COVID-19 vaccines was critical for the country given that the vaccines were not readily available and the need to maximize on the vaccines available to increase the proportion of the population that was fully vaccinated.

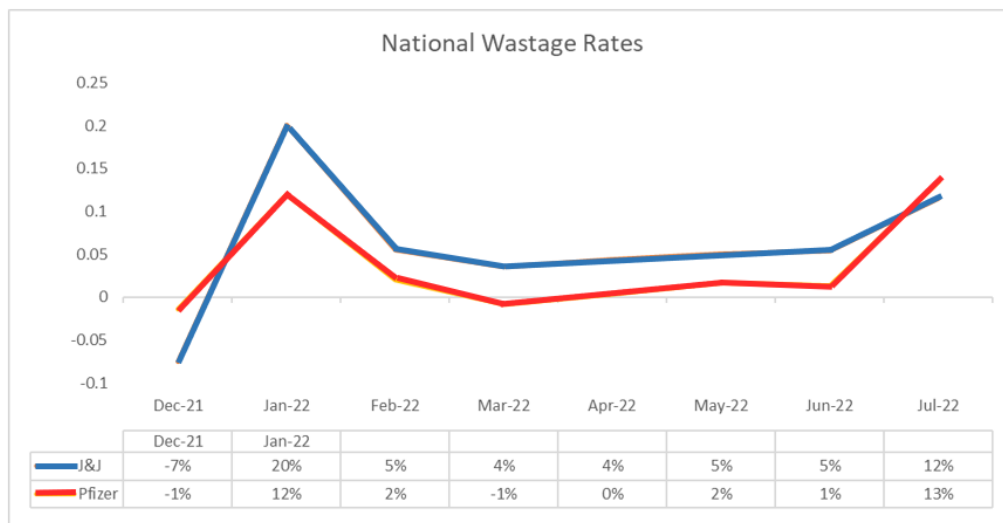
JSI/inSupply relied on the data from the Google sheet source for the calculation of COVID-19 wastage rates. However, reporting on this tool was dependent on counties coordinating their respective sub-counties down to the facility level and submitting data on a bi-weekly/weekly basis. Counties, sub counties and facilities struggled to do this consistently resulted in incomplete reports and inconsistencies in the submission of data. As more facilities were connected to the Chanjo-Ke reporting platform, they no longer saw it necessary to submit data through the Excel sheets.

One of the challenges IMPACT Teams identified through monitoring of wastage rates and stock status was that facilities were not completing the inventory section of the report on Chanjo-Ke. To mitigate this, the sub-county teams utilized different opportunities including supportive supervision during outreaches, COVID-19 training, COVID-19 review meetings as well as on-job training at the facilities to sensitize the facility teams on the need to complete this section of the report. Even with the sensitization efforts, IMPACT Teams still continued to experience inaccurate inventory reports from the Chanjo-Ke platform as some facilities still appeared to have antigens that were out of stock in their inventory. The project supported a data cleaning exercise with one of the Nairobi sub-counties bringing together representatives from all their facilities to clean up the data. From this exercise, a system bug in Chanjo-Ke was identified; the inventory records did not reflect the changes made by the teams. The project escalated this issue to system developers through the County EPI officer and had a series of virtual meetings with the ICT officer to share this system challenge. This system bug is yet to be fixed and prevented the IMPACT teams from monitoring COVID-19 wastage rates or taking action to reduce the wastage rates.

The charts below show the COVID-19 wastage rates. The drastic fluctuations in the wastage rates from negative wastage rates in some months and for certain antigens to high peaks of positive wastage rates points to the challenges around reporting on the vaccine

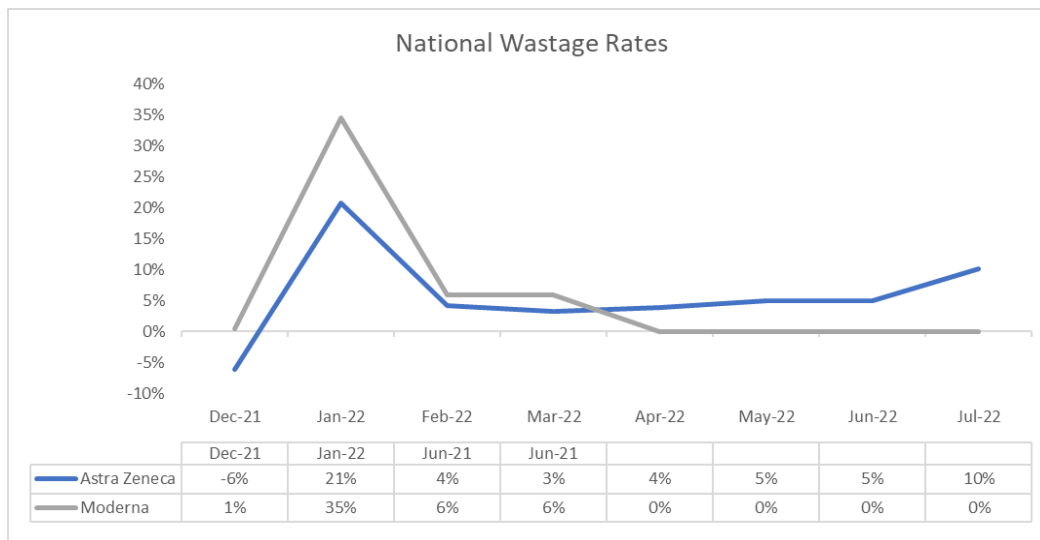
inventory as highlighted above. We observe similar patterns in the wastage rates for J&J, Pfizer and Astra Zeneca vaccines nationally (Figures 5 & 6 below) from negative wastage rates in December 2021 for all three antigens to a peak in January 2022 before dipping in February 2022. The same pattern is observed in Mombasa County (Figure 8). There was minimal change in the COVID-19 wastage rates for Mombasa County (Figure 8) from February 2022 to May 2022. Nairobi County (Figure 7) has a slightly different pattern with the negative wastage rates persisting from December 2021 to March 2022 for two of the four antigens (Astra Zeneca & J&J). Amidst the data availability challenge cited earlier as well as the system bug on the Chanjo-Ke platform and as facilities reported Chanjo-Ke platform, the submission of vaccination as well as vaccines inventory data on the Google sheets declined and it became increasingly difficult for IMPACT Teams to continue monitoring wastage rates for COVID-19 vaccines beyond July 2022. The negative wastage rates could also be attributed to the extra doses obtained in some vials which was common in the earlier phase of vaccination before manufacturers amended the information on the number of doses available in each vial. Outreaches and campaigns which was the main avenue for providing COVID-19 vaccines often attracted large number of clients for vaccination and this reduced the open vial wastages.

Figure 5: Kenya National Wastage Rate of J&J and Pfizer COVID-19 Vaccines



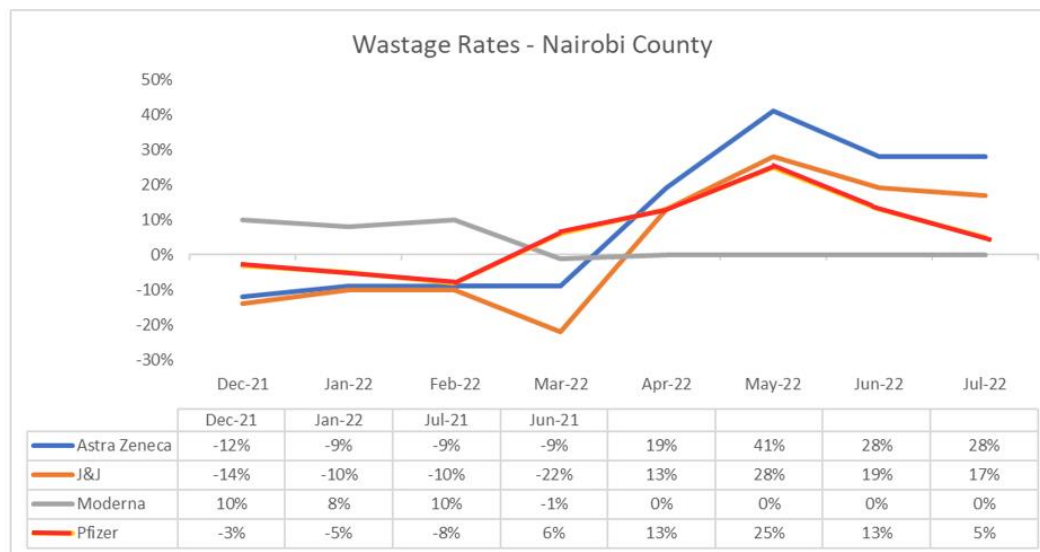
Source: MOH Kenya Bi-weekly Report

Figure 6: Kenya National Wastage Rate of AstraZeneca and Moderna COVID-19 Vaccines



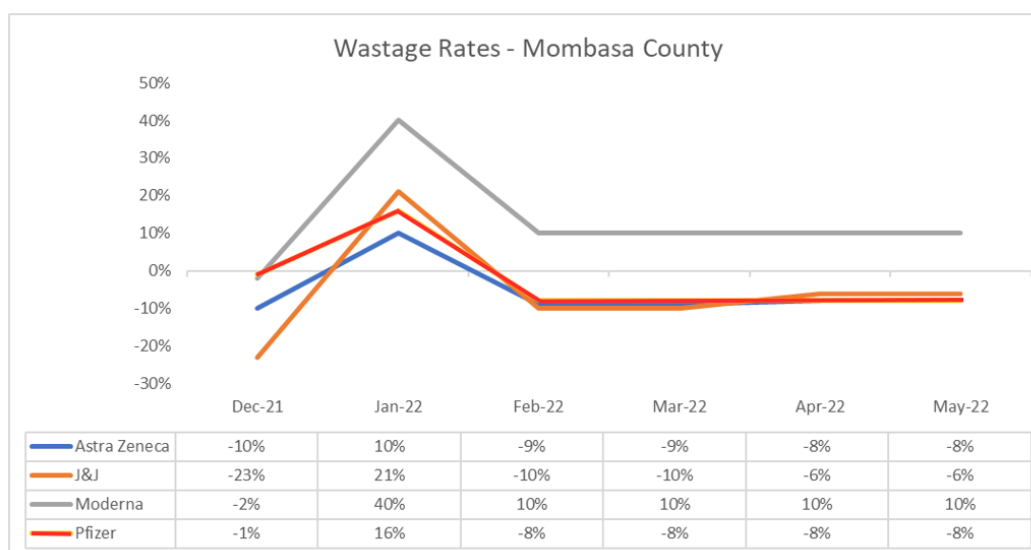
Source: MOH Kenya Bi-weekly Report

Figure 7: Nairobi County, Kenya Wastage Rates for COVID-19 Vaccines



Source: MOH Kenya Bi-weekly Report

Figure 8: Mombasa County, Kenya Wastage Rates for COVID-19 Vaccines



Source: MOH Kenya Bi-weekly Report

2.3.5 Objective 5: Facilities learning forums among stakeholders to share experiences and lessons on COVID-19 vaccines and data use initiatives

In a bid to improve the effectiveness of the project, stakeholders within Nairobi and Mombasa counties sought to optimize efforts through learning forums, which aimed to provide teams with a platform to share experiences and identify actionable next steps to address key challenges in the implementation of the COVID-19 vaccination program. Given that Nairobi was already receiving similar support from other stakeholders, JSI/inSupply's focus was to support Mombasa County in conducting these cross-learning workshops.

The cross-learning workshops were conducted twice over the duration of the project, the main objective was to share experiences, best practices, and lessons learned in the implementation of COVID-19 activities. The participants included stakeholders from various organizations, which provided a robust perspective on the challenges experienced in the program's implementation. Through this objective, the participants represented diverse experiences, such as supply chain management, communication strategies, and vaccine delivery methods. These workshops provided teams with the opportunity to brainstorm on the key challenges experienced and identify the best approach to adopt in addressing these challenges. The participants identified key challenges such as vaccine hesitancy and supply chain management issues. The teams were able to engage and derive a strategy for addressing these challenges collectively. The participants proposed several solutions, including community-based awareness campaigns and the implementation of technology to manage inventory.

In addition to these objectives, the two cross-learning workshops were structured to address two other key objectives for implementation. The first learning workshop conducted in September 2022 was structured around orienting and sensitizing the sub-county teams on

the COVID-19 KPIs and analytics as part of building ownership among the teams. The second learning workshop conducted in May 2023 applied Ripple Effect Mapping (REM), a participatory monitoring learning and evaluation approach to identify the outcomes, both intended and unintended that were achieved through the implementation of the COVID-19 support in Mombasa County through the support of the ELMA Foundation.



Image 3: inSupply Health Team conducting the Ripple Effect Mapping (REM) during the May 2023 Cross-Learning Workshop in Mombasa County

Some of the intended outcomes identified include:

- Increased number of COVID-19 vaccinations in the county.
- Sub-counties were able to successfully trace and vaccinate some of the defaulters.
- The CHVs were not only motivated but they became COVID-19 champions/ambassadors within their communities.
- Increased ownership & teamwork among facilities.
- Adoption of innovative strategies to increase COVID-19 vaccine uptake.
- Expiration of COVID-19 vaccines averted through proper coordination to prioritize utilization of vaccines that had short expiries.

The teams also identified some outcomes that were achieved through the ripples of the project implementation. These were not intended or part of the objective of the project but resulted from the work. Examples include:

- Partnerships formed with other partners to provide IEC materials in the ELMA-supported COVID-19 outreaches.
- Outreaches resulted in establishing partnerships with private sector companies. A facility in one of the sub-counties was provided with some equipment as a result of this partnership.
- Increased coverage for HPV vaccines resulting from adopting the integrated vaccination outreaches approach in March 2023.

Finally, the cross-learning workshops identified actionable next steps for continued implementation of the approach. The participants agreed on the need to implement a coordinated effort to address the challenges identified during the workshop. They emphasized the importance of continuous engagement among stakeholders for the synergy of efforts.

2.4 Challenges

Throughout the course of implementation, the project experienced challenges, some of which the project was able to address, while others were beyond the project team's control.

- **Vaccine Availability:** In October 2022, the country experienced a shortage/ stockout of some of the COVID-19 antigens which impacted on planned activities. Pfizer vaccine was stocked out, the Moderna vaccines had low stocks before eventually being stocked out in November, leaving the teams with only Johnson and Johnson (J&J) vaccine. The J&J vaccine had a low preference among the community members and individuals opted not to be vaccinated using it. This vaccine shortage also came at a time where the outreach focus was shifting from community-based outreaches to school-based outreaches which required the Pfizer antigen (the only antigen approved for school-based children). The project had to pause support for outreaches until March 2023, following the arrival of Pfizer vaccines. To make up for the lost time, JSI/inSupply increased the counties being supported to include Homabay and Vihiga.
- **Poor Reporting Practices:** Poor reporting through the Chanjo-Ke platform led to data discrepancies. The facility teams were also not used to the practice of daily reporting and this coupled with the internet connectivity challenges affected the real-time reporting from the facilities. Given that the system did not have a way of monitoring reporting rates, it was not easy for the sub-county teams to follow up with facilities that had not reported to ensure the reports were submitted into the system. Moreover, while the Google sheets was introduced to ensure weekly updates were available at the national level as facilities worked on entering data on the Chanjo-Ke platform, inconsistent reporting through this platform was a challenge as some counties did not report at all and for those that reported, the reports were not from all the vaccinating sites. Another reporting related challenge was on the manual nature of inventory management at the facility levels as they resulted to use ledger books. HCWs at facilities were not consistent in reporting on a bi-weekly basis, leading to unaccounted-for data.
- Another system challenge experienced with the Chanjo-Ke platform around the updating of the inventory data affected the ability of IMPACT Teams to monitor the COVID-19 stocks and wastages.
- Low uptake of booster doses due to limited community awareness was also a challenge, and some school heads and students were hesitant despite health education efforts.

2.5 Lessons Learned

- One of the key learnings from the project was the effectiveness of one-on-one community engagement by Community Health Volunteers (CHVs), who were offered performance-based compensation. This approach was found to increase vaccination numbers in some sub-

counties in the Mombasa outreaches. However, teams need to continuously reinvent their strategies to ensure maximum numbers, which may include rotation of wards and performance-based mobilization approaches.

- Training and supportive supervision on the inventory reporting on Chanjo-Ke were also found to be critical for the successful implementation of the project. Collaboration with other partners to learn and complement each other's implementation approaches is also vital for program success.
- Another important lesson is the strategic selection of outreach locations. Some teams strategically selected schools that had both primary and secondary school sections. By engaging with school administrators and officials from the Ministry of Education, teams prepared for school-based outreaches, where they provided health talks to the school kids.
- The COVID-19 defaulter list was used by some teams to trace and vaccinate defaulters. Proper mobilization ahead of outreaches also helped teams get clients, while heavy rains affected some outreaches.
- Teams need to continue to reinvent strategies for maximum numbers and rotate wards, utilize performance-based compensation, provide health talks during school-based outreaches, use the list of individuals not fully vaccinated with primary series of COVID-19 vaccines, mobilize ahead of outreaches, and collaborate with other partners.

2.6 Recommendations Moving Forward

- Stakeholders must continue to engage and coordinate efforts toward optimizing the program's success. Cross Learning Workshops proved to be an excellent initiative for optimizing the effectiveness of the COVID-19 vaccination program. The workshop provides a platform for stakeholders to share experiences and brainstorm on solutions to address the challenges experienced in the program's implementation. The workshop also highlights the importance of data collection and analysis to inform decision-making and promote accountability.
- Kenya did not have an Electronic Immunization Registry and Chanjo-Ke was rapidly developed and deployed to serve as both the EIR and an eLMIS for COVID-19 vaccines to provide visibility of vaccines at facility level, something that lacked in the current eLMIS (Chanjo.org) which provides visibility of vaccines to the sub-county level in 80% of the sub-counties. In future, it is critical to ensure that there is adequate support available for users to ensure that user challenges are addressed in real-time (e.g., develop and disseminate SOPs) and that even when a new system is developed and deployed, it can either be built on to already existing systems or borrow from those systems to ensure that it is robust. There should also be mechanisms put in place ensure system bugs are identified, reported and addressed as fast as possible to improve the system. The country is currently exploring opportunities to integrate the Chanjo-Ke with other systems as part of the vision to ensure that all facilities are digitized and move away from manual reporting. While Chanjo-Ke is already integrated with the Kenya Health Information System, there are gaps that limit the ability to monitor vaccine wastage (open and closed vial wastage) which is a critical KPI in the immunization program.
- Advocacy for continuation of the strong collaboration and partnership seen among stakeholders during the COVID-19 pandemic and channeling it to address challenges facing

immunization services in general such as vaccine stock outs, low immunization coverage rates in certain areas, zero dose children and waste management.

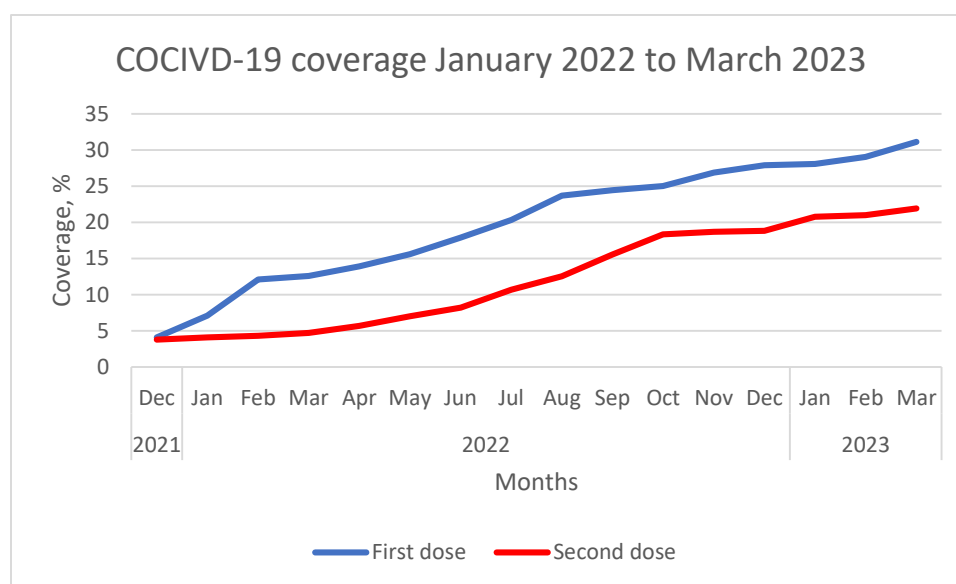
- The immunization program conducted an assessment to inform the development of country specific guidelines for integration of COVID-19 services into primary health care services. While these guidelines are yet to be drafted, integration of the COVID-19 services with primary health care has happened. There is need expedite the development and rollout of these guidelines and close monitoring of its implementation to identify and address arising challenges. This is critical to ensuring that there is ample demand and uptake of the COVID-19 vaccines especially since the country is yet to attain its target of fully immunized individuals (adults and teenagers). Subsequently, it will also minimize wastage of vaccines. The lessons learnt will also be useful in future in ensuring a smooth introduction of other new vaccines by the program. The integration guidelines will also lay out structures for continuous capacity building among health care workers on COVID-19 services and vaccines management.
- Quality improvement is critical for the success of any program. Following the successful integration of COVID-19 KPIs within IMPACT Teams and the subsequent integration of COVID-19 with RI, there is need to ensure continued monitoring of COVID-19 by IMPACT Teams beyond the two counties supported through this initiative. inSupply Health through its current grant by BMGF on Workforce Development is keen to establish a National level IMPACT Team for the immunization program and subsequently partnering with others to ensure this is cascaded beyond the 5 project counties.
- Vaccine stock outs impede continuation of vaccination services. There is an opportunity to strengthen the supply planning and monitoring of COVID-19 vaccines to avoid the national stock out of vaccines that result in an increase in missed opportunities.

3 Malawi

3.1 Country Background

Malawi registered a first case of COVID-19 on 2nd April, 2020. As of July 9, 2023, the country has registered a total of 88,791 cases and 2,686 deaths (COVID-19 weekly epidemiological report, July 14, 2023). Malawi started providing COVID-19 vaccines in March 2021. The vaccine was provided to populations of 12 years and above with 4 priorities of the elderly, health workers, social workers and people with comorbidities. The strategies used for providing the vaccine include static clinics, outreach clinics, mobile clinics, door to door, and schools. The services were being provided through both routine and campaign. Introductory activities included collaboration amongst partners, ACSM activities, AEFI monitoring, performance monitoring, vaccine management and service delivery. The vaccines that have been provided in country include; AstraZeneca, Johnson and Johnson, and Pfizer. The vaccine uptake has been low due to mostly vaccine hesitancy on safety of the vaccine, however, there has been a steady increase in the uptake over the years. As of March 31, 2023, the overall coverage for the total population was 31% and 22% for dose 1 and 2 respectively, However, the coverage of dose 1 and 2 for the adult population aged 18 years and above was 45% and 33% respectively.

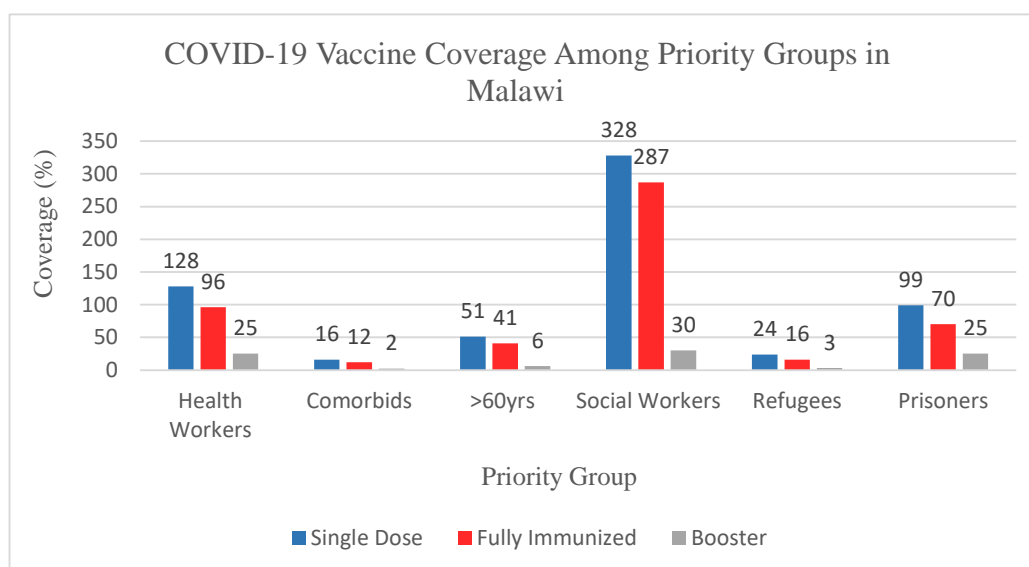
Figure 9: COVID – 19 Coverage for Malawi Total Population



Source: Malawi EPI COVID-19 Database

The country also monitors the coverage in priority groups. Social workers and health workers have a higher coverage as seen in the chart below, however, there is a challenge with denominators for the social workers.

Figure 10: COVID-19 Coverage Amongst Priority Groups



Source: Malawi EPI COVID-19 Database

NB: The coverage among some priority groups including health workers and social workers is above 100% and this indicates data quality issues due to under-estimation of target in those respective groups.

Using experience from introduction of previous new vaccines in the country, JSI, with funding from Gavi and ELMA, supported the Ministry of Health with development of the National Deployment Vaccination Plan (NDVP), setting of targets, identification of priority groups, development of training and communication guidelines, training of health workers, microplanning, monitoring through data quality improvement activities and supervision and community mobilization. From September 2021 to May 2023, JSI implemented the ELMA funded project which mainly focused on supporting the EPI program at district and facility level to increase knowledge and skills for health workers through trainings, increasing vaccine demand through community mobilization and data quality improvement to ensure accurate data, which is reliable to use for decision making. The activities were implemented in various districts across the country.

3.2 Selection of Focus Districts

The project was implemented in the districts of Zomba, Mangochi, Thyolo, Mzimba North, Salima, Machinga, and Mwanza. However, not all activities were implemented in all the districts as shown in the Table below:

Table 2: Activities Implemented in Various Districts

DISTRICTS	ACTIVITIES		
	COVID-19 Training	Data Management	Drama Shows
Zomba	X	x	
Mangochi	X		
Thyolo	X		x
Mzimba North	X	x	
Salima	X		
Machinga	X		
Mwanza	X		X

Source: Malawi EPI COVID-19 Database

Selection of districts for COVID-19 trainings

The seven districts were chosen for the training of vaccinators because of the insufficient number of trained vaccinators in the district. During the initial trainings, all districts were covered however, the number of health care workers trained differ from one district to the other and that makes some of the districts to have insufficient number of health care workers trained. The ELMA project in collaboration with the MoH/EPI identified those districts with insufficient trained health workers and supported the trainings.

Selection of districts for drama shows

Mwanza and Thyolo districts were selected because they had coverage below the national coverage. Although there were other districts with the same coverage, EPI recommended these districts because of presence of other partners in the other districts.

Selection of districts for data management support

The EPI program recommended that we support urban districts for data quality management improvement because there were more doses being administered in urban compared to rural districts. Therefore, Zomba and Mzimba North were selected among other urban districts in the country.

3.3 Objectives

The project had the following 5 objectives:

- Improve timely and accurate reporting of COVID-19 vaccination data in districts.
- Increase the knowledge of COVID-19 vaccinations in communities to ultimately increase demand for vaccines in districts.
- Improve Capacity of Vaccinators in delivering COVID-19 vaccines.
- Support Monitoring and evaluation of COVID-19 vaccines.

- Reduce COVID-19 vaccine wastage rate by 20% or less.

3.4 Activities Implemented

3.4.1 Objective 1: Improve timely and accurate reporting of COVID-19 vaccination data in districts

This was implemented in 2 districts of Mzimba North and Zomba. The activities included piloting of COVID-19 Tally sheets, supervision of data management in health facilities, data verification exercise, training of vaccinators in electronic register and procurement of solar chargers.

• **Piloting of COVID-19 tally sheets**

JSI piloted the implementation of tally book in two districts, Mzimba North and Zomba. These tally books were used in all clinics alongside the registers for four months; from July to November 2022. The project supported printing and distribution of 400 copies of the developed tally book. Following the distribution of tally book, one-day meeting was held in August, 2022, at district-level in both, Zomba and Mzimba North, to orient health workers (including EPI focal persons, senior HSAs, and their supervisors) on the use of COVID-19 vaccination tally sheets. Two participants from each health facility attended the meeting. The total number of 185 participants were oriented. In turn, these facility representatives briefed the rest of the vaccinators in their facilities on the use of the tally book. After the orientation of health care workers on the use of tally book, the districts were supported to conduct supportive supervision in health facilities to monitor the use of the tally book alongside the registers.

The evaluation which was conducted by EPI officials, district supervisors, JSI, and other partners focused on the key areas below:

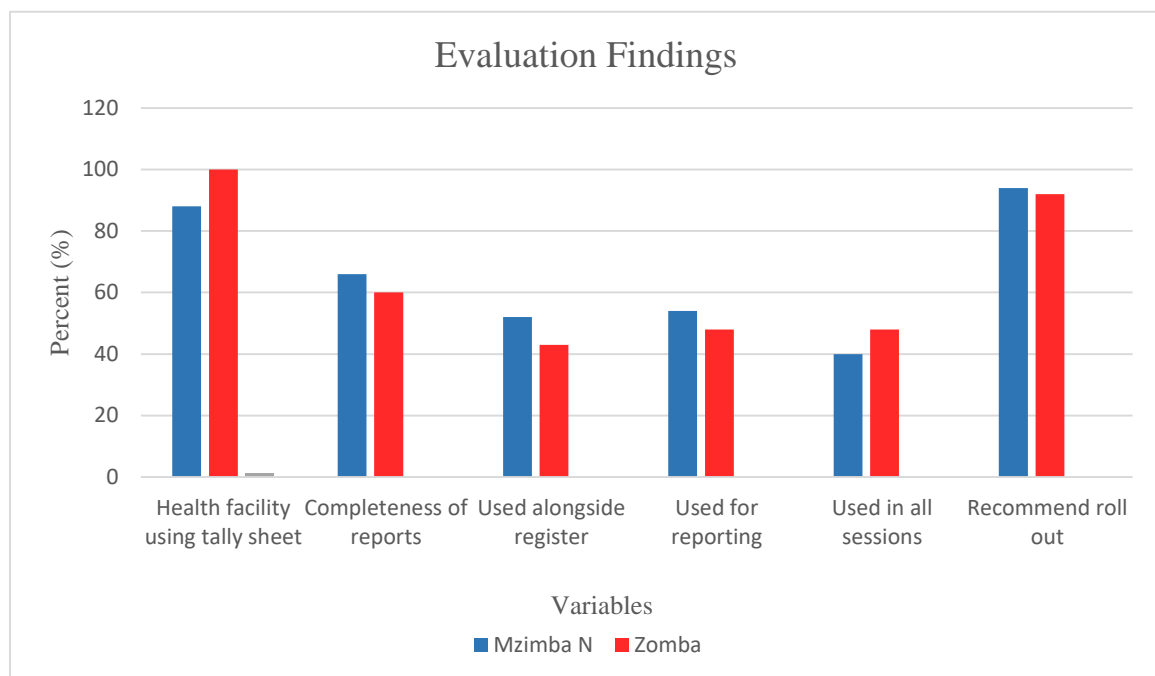
- Availability of the COVID-19 tally book at health facility.
- Usage of the COVID-19 tally books during vaccination session.
- Identify and document key lessons learned on the usage of the COVID-19 vaccination tally sheet.
- Discussion with health workers on the successes and challenges of using COVID-19 vaccination tally sheets.
- Assess the general delivery of COVID – 19 vaccinations and data quality in the health facilities.

The key recommendation from the evaluation team was for the EPI to work on the recommendations provided by health workers who are the main users of the tally books and roll out the use of tally books in the remaining districts. The MoH/EPI in collaborations with implementing partners and donors are expected to print and distribute enough tally books for all health facilities in the country and orient health workers on how to use the tally books.

- **Review meeting**

Review meetings to evaluate COVID-19 vaccination status including the piloting of the books was conducted in both districts in the month of November 2022. Participants at the meeting included, 2 vaccinators from each health facility, district supervisors, and DHMT members. The participants discussed their experiences in using tally books including challenges and successes, and made recommendations based on their perceptions. A tool was used to assess the usability of the tally sheet and recommendation on the roll out of the tally sheet nationally. Responses from the tool were entered and analyzed in an excel sheet and the Figure below shows the summary of responses on the evaluation variables for both districts.

Figure 12: Evaluation Findings for Tally Sheets in Mzimba North and Zomba Districts



Source: Malawi EPI COVID-19 Database

Overall, 94% of the respondents in Mzimba North and 92% of the respondents in Zomba recommended the roll out on the use of the tally books in the routine delivery of the COVID-19 vaccination. However, they recommended some corrections to be made on some sections of the tally book. The report was shared with Ministry of Health and EPI and it is expected that the tally books will be revised accordingly and printed/distributed to all health facilities to be used alongside registers in order to improve data accuracy.

- **Data verification exercise**

It was noted that there was discrepancy of data between the national and district levels. As such a data verification exercise was conducted twice in the 2 districts, the first one in July

2022 and the second in February 2023, to assess improvement made over time. The verification assessed the consistency of data between the district and health facilities. During this exercise, the team also included an evaluation of the monitoring system to identify challenges and solutions for improvements. The objectives of the verification were to;

- Assess the data accuracy and consistency at district and health facility level.
- Evaluate the immunization monitoring system at district and health facility level.
- Impart knowledge and skills to health workers on data quality self-assessment.

Specifically, the exercise focuses on;

- Verification of the reported doses in registers; both paper and electronic
- Assessing the archiving of COVID-19 immunization source documents including reports
- Assessing information on COVID-19 immunization demographic aspects.
- Assessing the level of evidence on COVID-19 data use

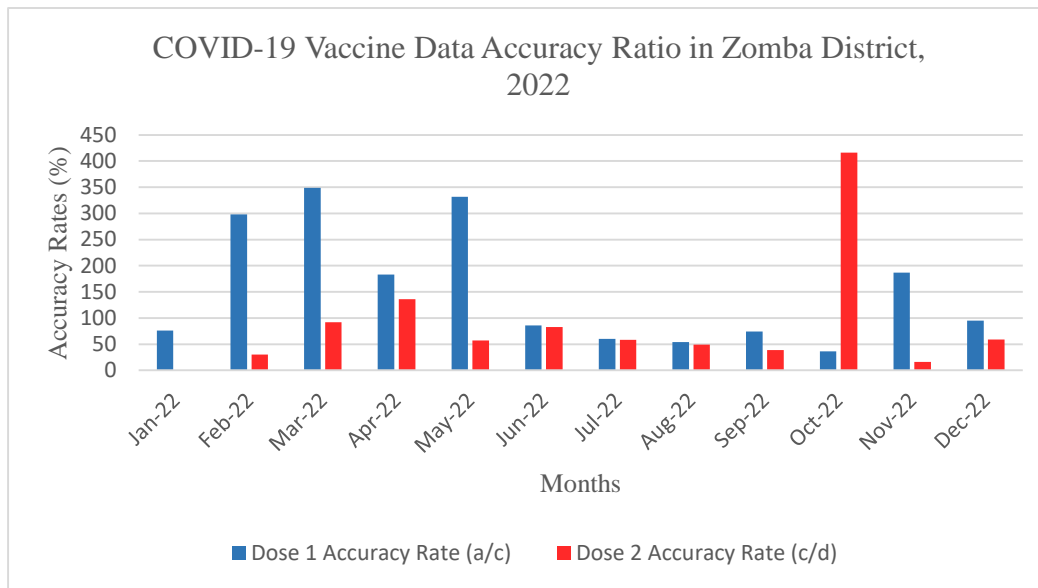
Data collection tools were adapted from the generic data verification tools. Teams were set up to conduct the verification exercise in health facilities. Accuracy data was collected from facility paper and electronic documents and district data base, while data on quality was collected through interviews with vaccinators. The following documents were reviewed; COVID-19 registers, improvised registers, vaccine stock books, reported data recorded on plain papers, e-registers in the DHIS 2 platform, and data reports in WhatsApp.

The data was collected onto the data collection templates and entered into the data analysis excel sheets which generated the accuracy rates and quality indices for health facilities and districts. Later, SWOT analysis was conducted to enable development of recommendations and implementation plans.

The verification findings were classified into 3 categories; accuracy ratios, quality indices, and SWOT analysis.

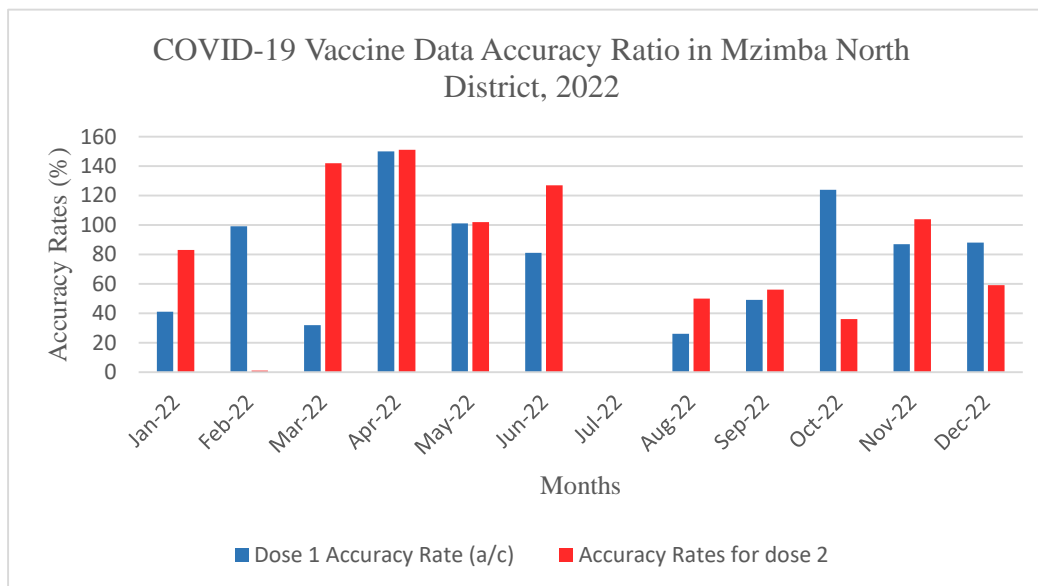
Accuracy Ratios: The accuracy ratios varied across the year in 2022, with most months showing over reporting because the doses found at the district could not be verified at facility level and others under reporting, see Figure 11 and 12 below.

Figure 13: Data Accuracy Ratios in Zomba District 2022



Source: Malawi EPI COVID-19 Database

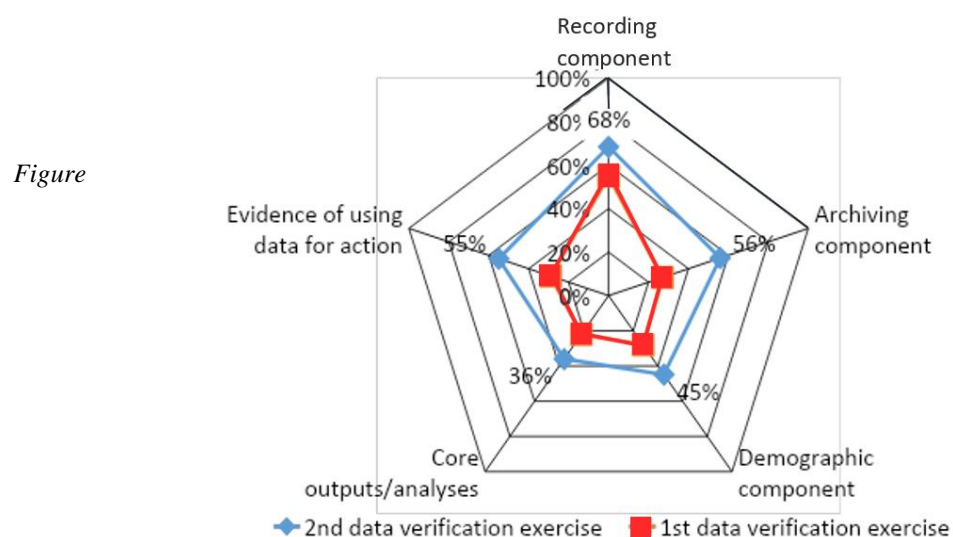
Figure 14: Data Accuracy Ratios in Mzimba North District 2022



Source: Malawi EPI COVID-19 Database

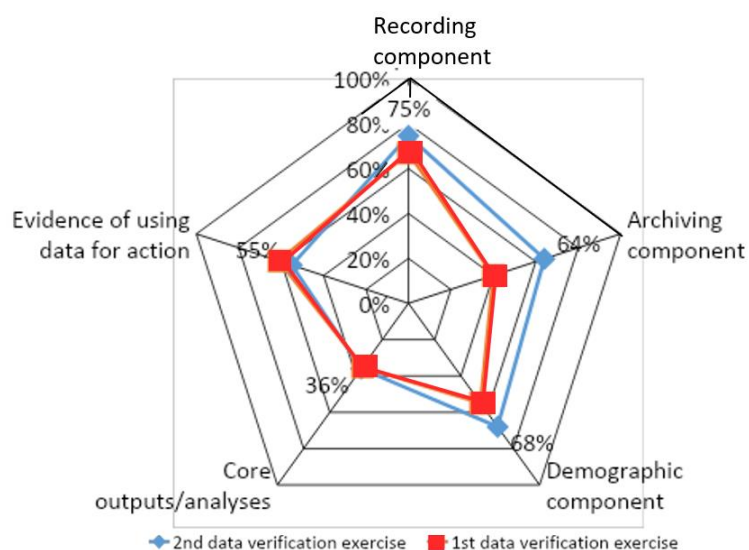
Quality Indices: It was noted that the discrepancies continued over time, however, there were significant improvements noted in the second verification exercise, see Figures 15 and 16 below.

Figure 15: Quality Indices for Zomba District Verification Exercise



Source: Malawi EPI COVID-19 Database

16: Quality Indices for Mzimba North District Verification Exercise



Source: Malawi EPI COVID-19 Database

There is an improvement in scores in all components from the first verification in Zomba. The recording component rose from 55% to 68%. However, in Mzimba North, great improvements are seen in demographic, recording and archiving, but challenges still exist in data use and analysis.

Recommendations

- DHO should distribute revised registers to health facilities that are still using old versions.
- DHO should consider organizing refresher trainings on all updates on the changes made in COVID-19 vaccination including how to record second dose in cases of mix and match situations.
- Enhance Data quality supervision and provide written feedbacks.
- Enhance development of micro-plans so that targets are known to all facilities

Improvement plans were developed. It is noted that the plans from the first round were implemented and yielded improvements noted in the second verification. Since the discrepancies are still there, it is expected that districts and partners will continue working on these recommendations to improve the data accuracy

- **Training of vaccinators in electronic register**

Training of vaccinators in electronic registers took place in May 2023 in Mzimba North district. A total of 65 vaccinators and data clerks were trained. These are expected to enter data during the vaccination session and improve the accuracy of data and enable real time data visibility of data.

- **Procurement of solar power banks**

EPI program had requested the ELMA project to procure power banks for the facilities to use during outreach clinics in order to keep power for electronic data collection gadgets. A total of seventy power banks were procured and distributed to Zomba and Mzimba North districts for further distribution to seventy health facilities. Each district is expected to receive a total of 35 power banks for the purpose of ensuring vaccinator have powered tablet for data collection all the time especially during outreach and mobile services and enable them to timely recording of all doses provided and improve the data accuracy.

3.4.2 Objective 2: Increase the knowledge of COVID-19 vaccinations in communities to ultimately increase demand for vaccines in districts

Drama shows were conducted in April and May 2023 in communities of Thyolo and Mwanza districts. As stated earlier, these districts were chosen because they were the lowest performing in the country in comparison to the other districts. The baseline coverage for these two districts in December 2021 was 1% and 2% respectively.

Drama shows were conducted in communities in order to engage community members in COVID-19 disease and vaccines and ultimately increase the demand for the vaccines. The drama shows were performed by local actors in the communities, who were first oriented by the health workers. The shows were directed by the village heads who mobilized people in their villages to come to the shows. In some cases, the shows were integrated with some village development activities. The shows provided a forum for presenting the information

about the vaccine and community members were provided chance to ask questions and concerns that were responded by health workers.



Image 4: Drama Show in Thyolo District

Afterwards the vaccine provided to individuals who were willing to be vaccinated. The informal conversations people made during the shows provide some information on the main reasons why the demand was low in these districts

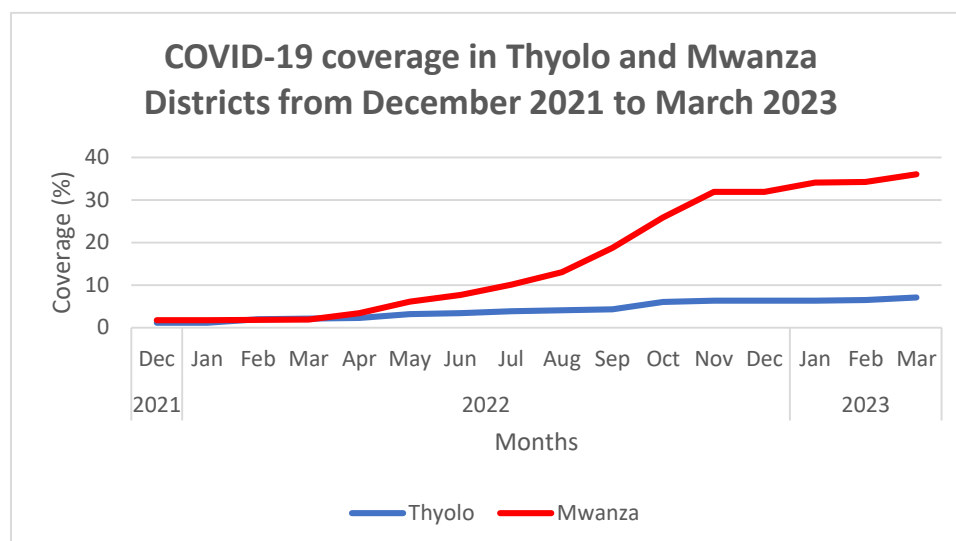
- Lack of knowledge on the vaccine.
- Misinformation about the safety of the vaccine.
- Political influence.
- Religious reasons.

A total of 57 drama groups from each health center were oriented on COVID-19 vaccine. In turn, every group performed eight shows in hard-to-reach communities within the catchment area of the facility. A total of 456 shows were conducted in the three districts as follows; 352 in Thyolo, 32 in Mwanza, and 72 in Phalombe. A total of 13,680 people were reached in the three districts.

To support other districts in the country, a video from one performance was recorded and produced in a disc. These discs were distributed to all the districts to be used at Out Patient Departments (OPDs). These recordings contributed towards the increase in COVID-19 coverage. Over time, the districts have increased their coverage, but there is still low uptake in the whole country, mainly due to vaccine hesitancy.

At the baseline in December 2021, the coverage for Thyolo and Mwanza was 1% and 2% respectively, and as of March 2023, the coverage increased to 7% and 36% respectively. Thyolo has the least performance in the country mainly because of religious influence and political reasons.

Figure 17: COVID-19 in Thyolo and Mwanza Districts from December 2021 to March 2023



Source: Malawi EPI COVID-19 Database

3.4.3 Objective 3: Improve capacity of vaccinators in delivering COVID-19 vaccines

The project supported the training of vaccinators in order to increase their knowledge and skills in delivery of COVID-19 vaccines. The trainings were conducted in the months of February and March 2022 in the following districts; Zomba, Mangochi, Thyolo, Mzimba North, Salima, Mwanza, and Machinga. A total of 35 training sessions which included 1,698 vaccinators were conducted (see the distribution in Table 4 below).

Table 4: Number of Vaccinators Trained in COVID – 19 Vaccines Across Districts

District	Number of Vaccinators Trained	Number of Training Sessions
Zomba	400	8
Mangochi	306	6
Thyolo	450	9
Mzimba North	35	1
Salima	240	5
Machinga	235	5
Mwanza	32	1
Total	1698	35

Source: Malawi EPI COVID-19 Database



Image 5: Training of Vaccinators in Zomba District

3.4.4 Objective 4: Support monitoring and evaluation of COVID-19 vaccines

Supportive supervisory visits were conducted to districts and health facilities to monitor provision of the covid-19 vaccine in the routine and also campaigns. There were nine visits that were conducted during the project period to various districts and health facilities throughout the country. The campaigns were also integrated with other antigens including Oral Cholera Vaccine (OCV) and Malaria vaccine. Key findings from the supportive supervision conducted were communicated to the MoH/EPI program where action was needed and also shared during NTF meetings for follow up actions. Feedback was given to the districts and health facilities.

As part of the support on monitoring and evaluation of the COVID-19 vaccination, the Ministry requested EPI and its partners to conduct an assessment of the impact of Cyclone Freddy on immunization service delivery in the southern region districts. JSI integrated this request with the supportive supervision activity in the following districts Thyolo, Chiradzulu, Blantyre, Machinga and Mangochi. The assessment was done in health facilities and camps. The assessment in facilities looked at the impact on immunization program in terms of vaccines, cold chain equipment, data tools, clinics conducted, and in camps interviews were conducted with the caretakers of under two children to assess the vaccination status of the children.

Key findings

- Damaged roads and bridges rendering the delivery of vaccines and supplies impossible and even longer routes taken to access clinic sites.
- Cancellation of clinics due to heavy rains.
- High cost of running generators due to power outage.
- Inadequate bikes and fuel for bikes to be used for mobile clinics in camps.

- Increased workload for HSAs to support in provision of health interventions in camps.
- Difficult to do follow-ups of AFP cases due relocation to camps.
- Damaged cold chain equipment and motorcycle due to the flooding and most outreach structure were washed away.
- No health profiles (home based records) for most children as these were washed away, making it difficult to screen for the vaccines already received.



Image 6: Damaged vaccines at Mbenje Health Centre



Image 7: Damaged Nalikolo Health Post in Mangochi District



Image 8: Damaged Nkhulambe Health Centre in Phalombe



Image 9: Damaged Vaccines at Mbenje Health Centre in Nsanje

Recommendations

- Continue providing services using longer routes to reach affected areas.
- Need to provide additional support for fuel to running generators used when electricity is off.
- EPI to supply the other cold chain equipment e.g., cold boxes to health facilities to help keep the vaccines when they run out of electricity.
- Health workers to work out a system of continuing with surveillance activities amidst the other task of working in camps.
- Facilities to strengthen active surveillance of cases of VPDs and continue providing immunization services in the areas where they can reach
- Conducting outreach clinics in camps to avoid disruption of the schedule.
- Provision of solar or gas-powered refrigerator to the affected facilities.
- Strengthen health talk in the camp on hygiene promotion and vaccination.
- Support maintenance of motorbikes and provision of fuel to ensure hard to reach camp are reached with immunization services.
- EPI to distribute new health profiles to the affected children and record the vaccines received based on caregivers' knowledge.

3.4.5 Objective 5: Reduce COVID-19 vaccine wastage rate by 20% or less

The country has not been tracking the wastage rate of COVID-19 vaccines due to lack of funding for conducting a verification exercise. JSI supported the aggregation of data at national level, but the program wanted to verify the figures in the districts.

3.5 Challenges

The delivery of COVID-19 vaccine in the country faced a number of challenges some of which affected the project implementation as well. Below is the list of some key challenges faced:

- Vaccine hesitancy has continued in the country which has led to people refusing the vaccine.
- Data discrepancy between the district and national, which has led to under reporting.
- Backlog data which due to delayed data entry into electronic register because data is entered by data clerks, who are mostly not included during campaigns.
- No data on wastage rates to help show the utilization of the vaccine.
- Inadequate supervision of health facilities by the districts.
- Inadequate community engagement activities to help increase the vaccine demand.
- More competing priorities as the country is experiencing many challenges including outbreaks and natural disasters including Cyclone Freddy, which interrupted service delivery in the southern region for some weeks.
- Inadequate use of data for action, as most facilities are not analyzing their data.
- Vaccines not provided routinely due to many reasons including the willingness of people to visit health facilities for vaccination. The country mainly provides COVID-19 vaccination through campaigns.
- Shortage of data collection tools including registers which forced health workers to use loose papers to keep records and sometimes the papers get lost with all data.

3.6 Lessons Learned

There were some lessons that were learnt during project implementation. These will inform the continuation of COVID-19 vaccinations in the country.

- Drama shows are effective and cheaper tool (compared to TV and Radio spots) for passing on information to the communities. In addition, drama shows can easily be customized to specific community need
- Building capacity of health workers through trainings, and supervision was found to be effective in improving quality service delivery and improving data quality. Areas with a smaller number of health workers received trainings and less supervision visits found to have more challenges on provision of COVID-19 vaccination and always found to have data quality issues as well.
- Data verification was found to be effective in improving data quality if it is embedded as part of the system improvement and supportive supervision.

3.7 Recommendations Moving Forward

Given the many challenges that country is facing including outbreaks of VDPs and natural disasters, the country need more support both financial and technical to recover and strengthening RI and HPV vaccination. From the experiences and lessons learnt in this project, the following recommendations are made;

- EPI and partners to rollout and strengthen the use of electronic register to facilitate timely collection and reporting of COVID-19 vaccination data.
- To improve the accuracy of data collection and reported, it is recommended to EPI and partners to support rollout of the COVID-19 vaccination tally books and ensure its availability in all health facilities.
- Continue strengthening capacity and advocate for data use for planning and decision making at all levels including Health facility.
- Support on adaptation of WHO guideline on consideration for integration of COVID-19 vaccination into RI and Primary Health Care need to be considered to allow the country to determine the services where COVID-19 vaccination can be integrated since resources for campaign are not always available.
- Health promotion and community health sections also need to determine how COVID-19 vaccination can be integrated into broader immunization ACSM activities to increase demand for the vaccine.

4 Tanzania

4.1 Country Background

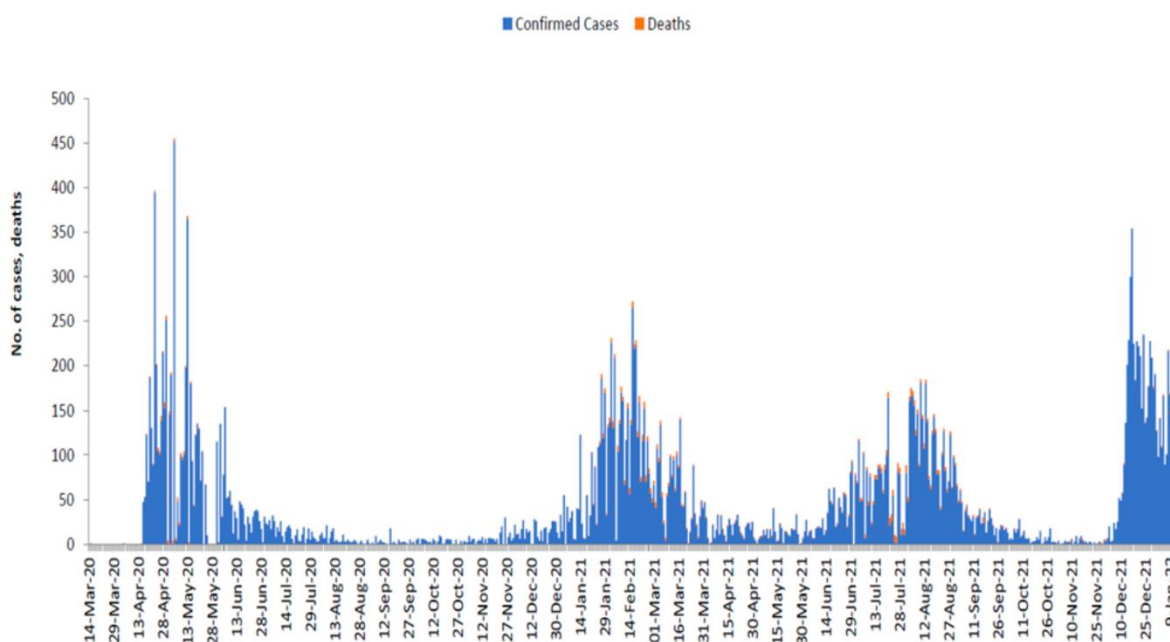
The United Republic of Tanzania is a union between Tanzania Mainland and Zanzibar and is one of the countries in East Africa within the Great Lakes regions. According to the 2022 national census, Tanzania has a population of 61,741,120 people of which 59,851,347 people are in Tanzania mainland and 1,889,773 are in Zanzibar and 30,740,928 people are aged 18 years and above. United Republic of Tanzania comprises of 31 regions and 195 councils and about 6,784 health facilities offer vaccination services.

The first case of COVID-19 in the United Republic of Tanzania was registered on 16th March 2020. Data obtained from the National Deployment Vaccination Plan (NDVP) showed that Tanzania experienced four waves of COVID-19 infections between April 2020 and January 2022 as shown in figure 16. A decision was made by the Government of Tanzania (GOT) to introduce COVID-19 vaccines on July 2021 due to the following reasons:

- Increase in morbidity and mortality due to the COVID-19 disease. A total of 32,393 cases had been confirmed, and 753 deaths were reported with Crude Fatality Rate of 2.4%.
- Inadequate capacity for the country to handle severe and critical cases.
- Emergence of new viral variants which may cause resistance at the immunity level against current vaccines.
- Be a part of the global response.

To support the decision above, the National Task force recommended five COVID-19 vaccines under WHO Emergency Use Listing to be used in the country. These included Pfizer, Moderna, Johnson and Johnson, Sinopharm and Sinovac. As of 14th January 2022, the country had received a total of 8,822,380 doses of COVID-19 vaccines and distributed a total of 6,375, 456 doses. The coverage for fully vaccinated adults for COVID -19 vaccines in the United Republic of Tanzania was 3.2%.

Figure 18: Confirmed COVID-19 cases and deaths, as of January 2022



Source: NDVP 2022-2025

As of January 2022, the country had two electronic immunization systems used to manage data in the COVID-19 response. The Vaccine Information Management System (VIMS) is used for vaccine stock management at the regional and district level and the newly developed Chanjocovid system is used by health facilities for client registration, vaccination, and issuance of certificates. The gap lied in the fact that these two systems were not integrated and both systems needed more features to be added in line with the changing COVID-19 country response.

The Ministry of Health (MOH) in Tanzania has made great strides in training vaccine off the icers on management of COVID-19 vaccines but further training was required for new staff, newly introduced vaccines and refresher training for all staff across all levels. There was a need to conduct supportive supervision visits after vaccine introduction to provide technical assistance and mentorship to vaccine officers and other health workers.

The ELMA Vaccines and Immunization Foundation issued funds to JSI/inSupply Health for the implementation of the COVID-19 support project specifically to provide technical assistance to the MOH in Tanzania at national and sub-national levels. The support covered, training vaccinators, strengthening data systems, supporting vaccination services through outreaches/campaigns and supportive supervision for the period September 2021 to June 2023.

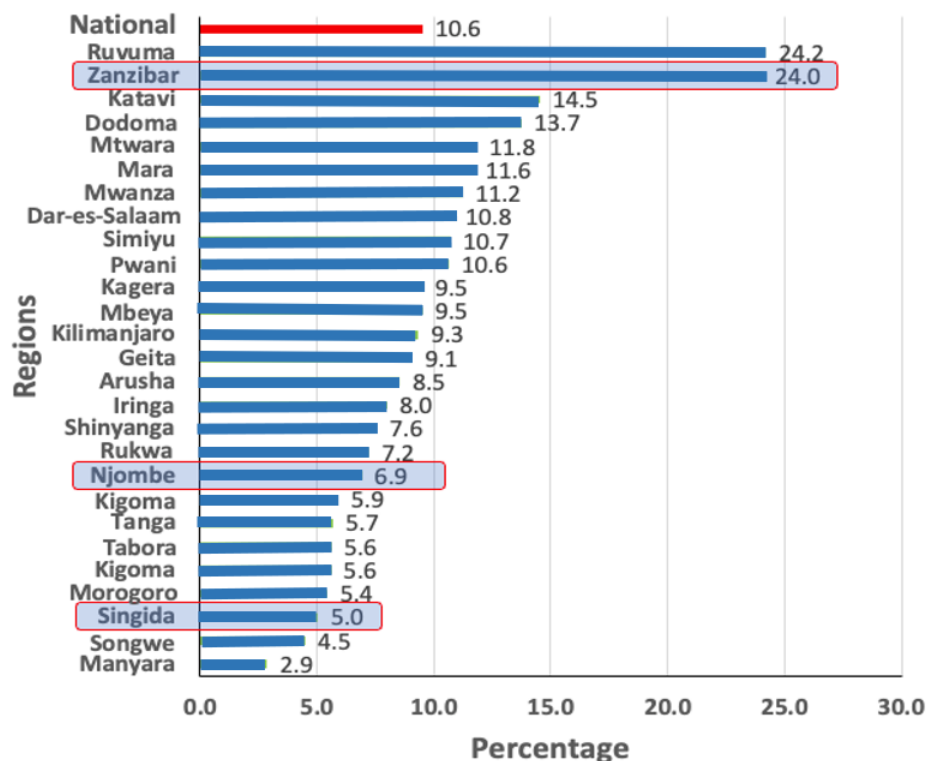
Implementation of the project activities was done in collaboration with the Ministry of Health though IVD program, PORALG, and other implementing partners.

4.2 Selection of Focus Regions

The project was implemented in the regions of Singida and Njombe in Tanzania mainland and Zanzibar. In Zanzibar, a total of six districts were supported, Micheweni from Pemba Island and North A, West A, West B, Central, and South districts from Unguja Island. In Singida region, seven councils of Singida MC, Singida DC, Ikungi DC, Itigi DC, Manyoni DC, Mkalama DC, and Iramba DC were supported. For the Njombe region, Wanging'ombe DC, Ludewa DC, Njombe TC, Njombe DC, Makambako DC, and Makete DC were supported.

The criteria used in the selection of the geographical areas for implementation were low COVID-19 vaccination coverage and no or few implementing partners supporting COVID-19 activities in that region.

Figure 19: Fully Vaccinated Persons in Tanzania by Percent, as per March 31, 2022

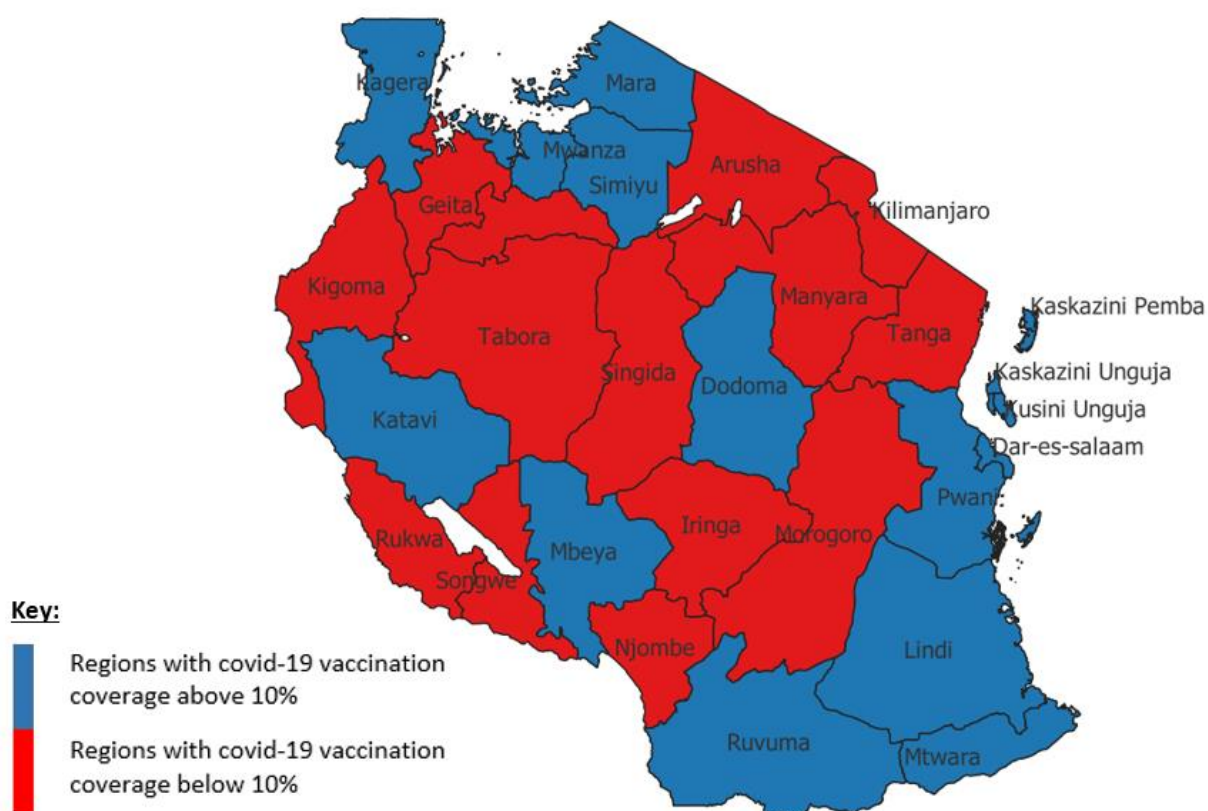


Source: MOH-IVD

Figure 19 shows the coverage rates at the national and regional levels just before project implementation began on March 31, 2022. From this figure, the MOH pointed out that all regions with coverage above 10% had implementing partner's support hence the area of selection was reduced to regions with coverage below 10% and which had no or less support from implementing partners.

Except for Zanzibar, which had a coverage rate of 24%, Singida and Njombe regions fulfilled the selection criteria. For Zanzibar despite the high cumulative country coverage the project was able to select six districts that had coverage below 10% to support. The team also considered other factors in the selection of regions such as the continuation of support in identifying gaps and implementing Electronic Immunization Systems solutions as well as the opportunity to strengthen both COVID-19 and routine immunization.

Figure 20: COVID-19 Coverage Rates in Tanzania by Region, as per March 2022



Source: MOH-IVD

4.3 Objectives

4.3.1 Objective 1: Support country COVID-19 vaccine efforts through outreaches and campaigns to reach 60% coverage rate of the population of Tanzania

To improve the country coverage rate from 10.6% as of March 2022 to 70% as recommended by WHO, the MOH through the IVD program planned to implement COVID-19 vaccination through massive campaigns. Toward the end of May 2022, the program held a preparatory meeting and invited all key stakeholders. During the meeting, the scope of the campaign, availability of vaccines and consumables, and the targets for all

regions were shared emphasizing priority to be given to the elderly, healthcare workers, and people with disabilities.

The project conducted coordination meetings with Regional/Council Health Management Team (R/CHMT) members and implementing partners in their focus regions. These meetings enabled RHMT to allocate councils and areas of support to partners according to their budget which improved efficiency during the campaign. In Zanzibar and Njombe regions the COVID-19 campaigns were conducted in collaboration with other implementing partners such as Clinton Health Access Initiative (CHAI), John Hopkins Program for International Education in Gynecology and Obstetrics (JHPIEGO) and Family Health International 360 (FHI360). In Singida region JSI/inSupply Health was allocated Itigi district for support with COVID-19 activities hence for Itigi district most COVID-19 activities were supported by inSupply Health and JSI/inSupply Health except for a few massive campaigns that were funded by JHPIEGO and CHAI.



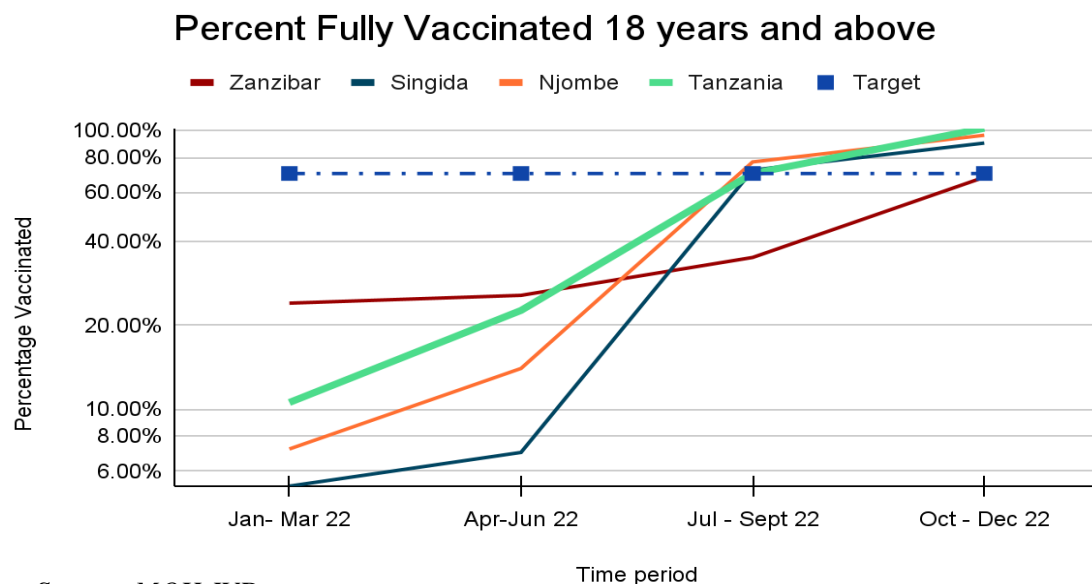
Image 10 and 11: JSI/inSupply coordination meeting with RAS, RHMT, and CHMT in Zanzibar and Njombe

The target of Tanzania as a country was to vaccinate 70% of adults who are 18 years and above by September 2022 and all adults 18 years and above by December 2022. For the quarter of July to September 2022, JSI/inSupply Health supported and participated in five COVID-19 campaigns in their focus regions. All the campaigns were conducted in collaboration with other implementing partners. During the campaigns, Zanzibar vaccinated 28,302 clients and the coverage improved from 37% to 42%. In Njombe region the campaign activities enabled vaccination of 79,874 clients and coverage improved from 17.4% to 33%. In Singida region, three campaigns were conducted where a total of 542,407 clients were vaccinated.

For the quarter of October to December 2022, JSI/inSupply Health supported facility-based outreaches in Itigi district where 10,816 clients were vaccinated, and in Njombe region where 19,483 clients were vaccinated. All these efforts enabled project focus regions to improve COVID-19 coverage as seen in Figure 19 below, which shows that as of 30th September 2022, Singida and Njombe had reached the vaccination target, and nationally 70.15% of the eligible population had been vaccinated.

In collaboration with other implementing partners, in total JSI/inSupply Health facilitated the vaccination of 650,583 clients in Singida, Njombe, and Zanzibar. As of May 2023, 105.82% of clients 18 years and above in Tanzania were fully vaccinated, the coverage in Singida region was 92%, Njombe region 103%, and in Zanzibar 80.9%.

Figure 21: Country and Regional Vaccination Rates in Tanzania (18 years and above), January 2022 – December 2022



Source: MOH-IVD

NB: The national coverage for covid-19 vaccination as of December 2022 was above 100% and this indicates data quality issues that maybe contributed by under-estimation of target population

The project conducted the following activities that enabled the successful implementation of the COVID-19 campaign and outreach activities.

- **Facilitated stakeholder forums** that brought together all regional implementing partners prior to the implementation of any COVID-19 campaign. The main purpose of these meetings was to plan, budget, and assign tasks. The team was quick in preparing the meeting agenda, informing all the invitees, and sharing the budget. The joint planning and multi-stakeholder involvement in these meetings

enabled the JSI/inSupply Health team to leverage support from other partners such as JHPIEGO, WHO, and CHAI through sharing of responsibilities and resources hence establishing a holistic response in tackling COVID-19.

- **Provided both technical and financial support to the focus regions and districts** to conduct the distribution of COVID-19 vaccines and other consumables prior to the commencement of campaigns. This support enabled accurate and timely distribution of vaccines and related supplies at health facilities based on the health facility micro-plans.
- **Supported engagement and payments to community health workers (CHW)** who accompanied vaccinators and helped in sensitizing and mobilizing the community to turn up for COVID-19 vaccines. The health education provided by CHWs helped in addressing COVID-19 misconceptions and enhanced vaccine acceptance at the community level.
- **Supported facilitation of vaccinators who provided COVID-19 vaccination services** using multiple vaccine delivery strategies such as outreaches, house-to-house, and monthly intensification campaigns which increased vaccine uptake.



Image 12 and 13: COVID-19 outreach activities in Singida and Zanzibar

- **Provide technical support to review and update micro-plans.** Prior to any campaign or outreach activity the project team assisted the region and council level in updating their micro-planning including setting their performance targets and the resources required including number of vaccines and related supplies. Vaccination targets for each council were further broken down to health facilities which acted as a motivation for vaccinators to reach the targets. Furthermore, the vaccination teams requested to provide daily feedback to health facilities using common platforms (WhatsApp group) which facilitated constant communication, experience sharing, and feedback as well as quick identification and resolution of bottlenecks.
- **Project reinforced and supported the use of the Chanjocovid system.** In alignment with the IVD program, the project reinforced and supported the use of the Chanjocovid system for COVID-19 data reporting and analysis that helped improve data visibility and decision-making. The project also supported the

requisition for internet data bundles to enable data clerks to enter COVID-19 vaccination data gathered during campaign and outreach activities.

- **Provided technical support during supportive supervision.** The project team in collaboration with R/CHMT members used supportive supervision visits as an opportunity to distribute and redistribute vaccines to the health facilities to ensure the availability of vaccines for COVID-19 vaccination services.

4.3.2 Objective 2: Reduce COVID-19 vaccine wastage to 20% or less

COVID-19 vaccine wastage data was not captured at the regional, district, and health facility level hence there is no data to report on this milestone. It was difficult to obtain and report on COVID-19 vaccine wastage data due to:

- Lack of standardized tools: In Tanzania, about 6 types of COVID-19 vaccines were used for vaccinating clients. Each type of vaccine requires a separate wastage rate calculation as there are manufacturing and storage specification differences among vaccines. Tools that capture vaccine wastage rates were available but were not updated to reflect the actual situation on the ground and the speed at which new vaccines were being introduced.
- The Health Management Information Systems (VIMS and Chanjocovid system) used for reporting COVID-19 data had no channel for reporting COVID-19 vaccine wastage data. This reduced the visibility of COVID-19 vaccine wastage data to key stakeholders and decision-makers.

Despite these challenges, JSI/inSupply Health team discussed the issue of tracking COVID-19 vaccine wastage in different avenues such as technical working group sessions and meetings with other implementing partners. In general, standardized reporting protocols and data collection and reporting tools could help improve the accuracy and availability of wastage rate data over time.

4.3.3 Objective 3: Strengthen Electronic Immunization Systems by supporting regions/districts in Tanzania to report COVID-19 data as outlined in the National Deployment Vaccine Plan

Currently the main information system used in Tanzania is called Vaccine Information Management System (VIMS) which is system used for capturing COVID-19 vaccine stock management data. VIMS also capturing remote temperature monitoring (RM) data for the cold chain equipment used to store covid-19 vaccines at all level and this ensure the safety storage of the vaccines. This system is used at national, regional and district levels. The Chanjocovid system is used for capturing COVID-19 vaccination data at the health facility level including client registration, vaccination, and issuance of certificates.

The project team gathered feedback from users to improve features in these electronic immunization systems as VIMS had been newly configured to include COVID-19 vaccines and the Chanjocovid system had just been introduced. Feedback was gathered from users on gaps in reporting and using the systems, a plan was prepared and timelines were set for

conducting system improvements. The team also used this opportunity to revise and update COVID-19 vaccination tools considering the feedback obtained. Furthermore, the roles and responsibilities related to electronic immunization system reporting and use at the district and health facility levels were reviewed.



Image 14 and 15: Review of system features for COVID-19 vaccination data collection

The Electronic immunization systems specifically VIMS and Chanjocovid are not integrated making it difficult to monitor stock movement and usage across all levels. The project team provided technical support during the review meeting organized by IVD program to review action plan for electronic immunization system. The meeting participants provided the following recommendations;

- Create a governance structure for system integration and system updates that is coordinated by the MOH- ICT unit.
- System development should be controlled to minimize frequent changes.
- All electronic immunization systems should be hosted in the country for better management and accountability.
- Capacitate the in-country MOH technical team to be able to manage all the systems.
- Harmonization of data collection tools at lower levels to minimize the burden on healthcare workers who are entering the same information in multiple systems.
- IVD to review the Health System Strengthening (HSS) - II budget and the amount allocated for systems enhancement.

To enable the continuation of services at health facilities with limited availability of internet connectivity the project team in collaboration with other stakeholders attended a workshop on requirement gathering and validation for the Chanjocovid offline mode. The main output of this workshop was to develop a System Requirement Specification (SRS) document for the offline module.

The project team also participated in developing the data comparison tool that was used in comparing COVID-19 vaccination data from all levels to assess the quality of reported data. The tool was used in the national data verification exercise for COVID-19 that helped data quality improvement efforts.

4.3.4 Objective 4: Train 2145 healthcare workers and support staff to provide COVID-19 vaccines

- **Training on COVID-19 microplanning**

In alignment with the WHO recommendations and country policies, the project started supporting the COVID-19 response with micro-planning training in the focus regions of Zanzibar, Singida, and Njombe. The main purpose of the training was to strengthen district and health facility capacity to produce high-quality micro plans, review submitted district and facility micro plans, and come up with a detailed roadmap for the implementation of the COVID-19 response.

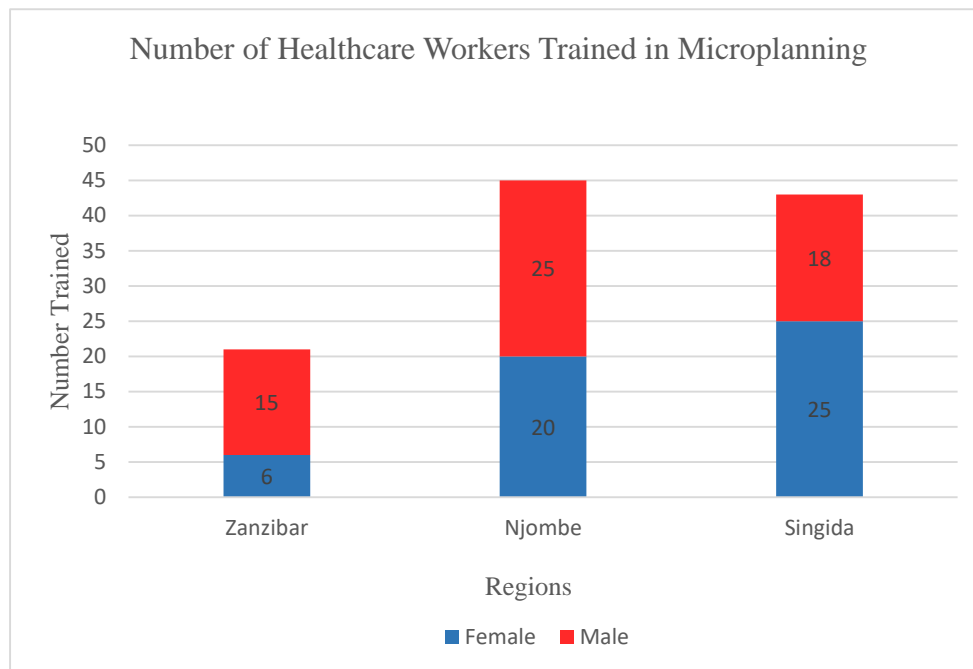


Image 16 and 17: Microplanning review meetings in Njombe

The project team provided technical support to prepare the training package that included a template for the review of routine immunization and COVID-19 performance for each district, a facilitator's guide, and an orientation presentation on micro plans as per WHO guidelines. This template was shared with the District Immunization Vaccine Officers to populate COVID-19 vaccination and routine immunization performance data, district micro plans, challenges, and proposed plans for improvement.

The project team co-facilitate the training together with other immunization experts from the regional level. To facilitate cross-learning, immunization staff from well-performing regions were invited to the workshops to share their success stories. Different modalities were used to deliver the workshop content including lectures, interactive discussions, group discussions, and presentations. For the microplanning training, 109 healthcare workers were trained.

Figure 22: Number of Healthcare Workers Trained in Microplanning



Source: JSI/inSupply Health Training Reports

During the micro-planning training and workshops, the project team picked up several important discussion points to consider and try to address before rolling out the COVID-19 vaccination:

- There is a need for better planning and coordination among implementing partners for better execution of activities and to prevent the implementation of similar activities.
- Limited monitoring of COVID-19 vaccine wastage rates.
- Limited resources to conduct house-to-house campaigns as not so many people show up at the health facilities to be vaccinated against COVID-19.

The vaccination coverages improved over time after the completion of micro-planning training.

- **Conduct supportive supervision**

To improve the quality of vaccination services, enhance health workers skills and improve performance, the project team conducted supportive supervision in all of its focus regions. The supportive supervision checklist was prepared and customized to include contributions from health workers at different levels. In Zanzibar, supportive supervision was conducted in 36 health facilities, in Singida region 24 health facilities, and in Njombe region, 68 health facilities were visited. The supportive supervision visits in Singida region combined with supervision of periodic intensification of routine immunization (PIRI) of children that are under five and had missed the opportunity to receive vaccines during routine immunization. A total of 5,342 children were vaccinated, 2,207 children received the first dose of MR vaccine, and 3,135 children received the second dose of MR vaccine.



Image 18 and 19: COVID-19 supportive supervision at facilities in Zanzibar

- **Conduct review meeting and training on data quality improvement**

Considering the recommendations from the supportive supervision visits and the emphasis on supporting the use of the Chanjocovid system, the project team conducted data review meetings in all the focus regions. For Singida region, RIVO and six DIVOs trained on how to fill in the daily COVID-19 aggregation form and submit it into the Chanjocovid system. This greatly increased the visibility of COVID-19 vaccination data at the national level for Singida region. 24 healthcare workers, 3 from each district were oriented on the Chanjocovid system, and that helped to reduce the backlog of data and over 9,000 client records were entered in the Chanjocovid system.

- **Provide technical support to develop reporting templates**

In Zanzibar, the project team provided technical support to the immunization program to design a daily reporting template for covid-19 vaccination data used in collecting daily vaccination data from health facilities. This process went hand in hand with identifying focal persons responsible for aggregating data and disseminating it at the national level and with other stakeholders. Moreover, all DIVOs from Unguja and Pemba were oriented on

how to fill in the monthly reporting tool and submit it to the DHIS2 system. Since the reporting tools and system were put in place there has been improved visibility of Zanzibar COVID-19 data at the national level.



Image 20 and 21: HCW training and designing of COVID-19 reporting tool in Zanzibar.

4.3.5 Objective 5: Support of priority activities suggested by the MoH/PORALG that are directly linked to improved vaccination or improved data management

JSI/in Supply provided technical support to the IVD program to develop strategies to reach high priority groups including older adults, people with comorbidities, pregnant women, and frontline health workers.

As seen in Table 5 below, there is low coverage for special populations, especially the elderly and people with comorbidities. JSI/inSupply Health in collaboration with other implementing partners targeted special populations while conducting COVID-19 campaigns including house-to-house sensitization and providing COVID-19 vaccinations in non-communicable diseases clinics (NCDs).

Table 5: Vaccination Status of Priority Groups in Tanzania, as of March 31, 2022

Priority Group	Estimated Population	Number of Fully Vaccinated	Estimated % Fully Vaccinated
Health workers	150,000	118,447	79%
*Older adults	7,470,235	82,287	1%
People with comorbidities	3,441,764	208,850	6%
Refugees and Internally Displaced Persons (IDPs)	256,399	109	1%
Tourists	330,000	106,909	32%
Security Personnel	100,000	30,545	31%
Teachers	130,000	42,763	33%
* Older adults are classified as > 45 years (Source: Jan 2022, NDVP 2)			

4.4 Challenges

Some of the challenges in implementing project support for COVID-19 Vaccine Technical Assistance to the Ministry of Health in Tanzania include:

- **Political Considerations:** During the implementation of the project, the team experienced dynamic situations due to complex political environments, causing delays until the project objectives could be aligned with the MOH efforts.
- **Changing Circumstances:** The COVID-19 pandemic and response was evolving rapidly and its effects created other unwanted situation, and the MOH's response strategies and guidelines changed frequently in response to new developments. Such circumstances included shifting priorities in responding to the Polio outbreak in the middle of 2022, where MOH had introduced some national campaigns as a result, we had to be flexible and adaptable to keep up with changing circumstances.
- **Limited Public Awareness:** Vaccine hesitancy and misinformation made it challenging to implement a project that requires the public's cooperation and participation. There was a need for public awareness campaigns and education to promote the safety and effectiveness of the COVID-19 vaccine.
- **Geographic Challenges:** Tanzania has a large geographical area, which posed logistical challenges in distributing vaccines to remote and hard-to-reach areas. This necessitated additional resources and personnel to ensure that the vaccine was distributed equitably across the country.
- **Limited Resources:** The COVID-19 pandemic has strained health systems in Tanzania, and the country have limited resources to support COVID-19 vaccination including human and financial resources.

4.5 Lessons Learned

Lessons learned from a project supporting COVID-19 vaccine technical assistance in Tanzania include:

- **Monitoring and evaluation are essential:** The following best practices under monitoring and evaluation helped ensure that the COVID-19 response for Tanzania was on track.
 - Use of VIMS as well as the Chanjocovid system for COVID-19 data reporting and analysis which improved data visibility and use for decision-making that accelerated COVID-19 uptake.
 - The project participated and contributed to the weekly vaccine pillar meetings where COVID-19 data was shared with a wide range of stakeholders. This avenue allowed for cross-learning among different stakeholders but most importantly it was a great forum for addressing reported challenges.
 - Data review meetings that included orientation on how to fill in different reporting tools including the Chanjocovid system resulted in an improved quality of data entered in COVID-19 registers.
- **Equity must be prioritized:** In a public health crisis, it is crucial to ensure that vaccine distribution is equitable. The project prioritized reaching vulnerable populations and ensuring that no one was left behind through the following practices:
 - Identification and categorizing of hard-to-reach areas in terms of infrastructure (areas that have very poor roads or roads don't exist at all), distance (these are areas that are located far from where the health facilities are), and game reserve areas (national parks areas) and coming up with different strategies to vaccinate the community in these areas.
 - Community Health Workers were used to sensitize community on COVID-19 vaccination and in Zanzibar special vehicle with megaphones to convey messages such as vaccination dates and areas were used.
 - Bodabodas (local motorcycles) used as a means of transport by vaccinators to move around during outreaches and mobile services for COVID-19 vaccination to reach far and hard-to-reach areas.
 - Game reserve wardens were used to guide vaccinators during mobile/outreach/campaign services in the areas surrounded by game reserve

4.6 Recommendations Moving Forward

On successfully implementing the ELMA COVID-19 Vaccine Technical Assistance support project to MOH Tanzania, below are some recommendations moving forward:

- **Integration of COVID-19 into Primary Health Care (PHC):** The MOH through the IVD program is continuing to provide COVID-19 vaccination services including the introduction of booster doses for the high-risk groups. The provision of COVID-19 services cannot continue to be implemented as a vertical program as it has been proved that it affects the provision of other health services, eventually affecting Tanzania from achieving the targets set for Sustainable Development Goals (SDG) 3. Moving beyond 2022, in line with the WHO recommendations, COVID-19 vaccination must be

integrated with primary health care to improve programmatic efficiency and ensure sustainability and efficient use of the available resources. Tanzania has adopted the integration of COVID-19 into routine immunization services and currently, the country is preparing the COVID-19 and routine immunization integration manual.

- **Enhance data collection and reporting mechanisms:** MOH through the IVD program to review the existing data collection and reporting mechanisms used (for example the Chanjocovid system) and identify areas for improvement. The IVD Program, through support from donors and partners, should implement measures to streamline the process of data collection and reporting, such as standardized data fields and enforcing the use of available automated reporting tools. This will ensure accuracy and efficiency in capturing vaccination data at all levels.
- **Enhance Monitoring, Evaluation and Learnings (MEL):** To conduct data analysis and research and evaluate the impact of the vaccination campaign, identify any gaps or challenges, and inform future public health strategies. Moreover, the IVD program in collaboration with implementing partners should continue with existing efforts to integrate the COVID-19 vaccination data system (Chanjocovid system) with existing health information systems, such as VIMS and the Tanzania Immunization Registry (TImR). This integration will facilitate data sharing, improve interoperability, and enable comprehensive analysis of vaccination data in conjunction with other health indicators.
- **Collaborations beyond immunization partners:** Collaboration with technology partners, software developers, or data management experts is highly recommended to leverage their expertise in strengthening the COVID-19 vaccination system. The team must explore opportunities to enhance data visualization, analytics, or interoperability through innovative technologies or platforms.

5 Conclusion

The ELMA Foundation support to COVID-19 vaccine implementation in Kenya, Malawi, and Tanzania through JSI has been a successful project which has improved the capacity of health workers in delivering COVID-19 vaccines, improved data quality management, increased vaccine demand in some communities and supported monitoring of vaccine delivery in districts and health facilities. The EPI and partners have done a lot of work, but there is still a need and opportunity for continued partner support to the countries, especially in;

- Demand generation in order to increase coverage amongst the priority groups.
- Integration of COVID-19 vaccination into the Primary Health Care (PHC) services.
- Continue strengthening routine immunization services to reach zero-dose and under-vaccinated children.
- Advocate for strengthening life-course vaccination platform especially with other vaccines provided beyond infancy that are coming in.