

CASE STUDY

Somalia immunization programme: catching up after conflict and COVID-19 in a fragile setting

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Highlights

Need:

Increased coverage of routine childhood immunization within the Somalia Expanded Programme on Immunization.

WHO's solution:

Supporting Somalia's health authorities to: develop and implement tailored accelerated immunization activities and plans to reach zero-dose and under-immunized children; and strengthen immunization surveillance and data collection.

Impact:

The immunization delivery system has been strengthened to respond to outbreaks and the childhood immunization and vaccination of zero-dose children has improved. In 2022, country implemented accelerated COVID 19 vaccination integrated with routine immunization, resulting in 41.7% fully vaccinated against COVID 19 and identifying and vaccinating more than 84,600 zero dose children. Country also implemented integrated measles, tOPV, vitamin A and deworming campaign, reaching to more than 3,6 million under 5 years children. During 2022, country also vaccinated around 1.6 million under 5 years children as response to measles outbreaks.

Moving forward:

It is important to maintain the improved immunization delivery system to increase childhood immunization further through the Somalia Expanded Programme on Immunization.



Under the theme of 'The Big Catch-Up', WHO is working with partners to accelerate rapid progress in countries to get back on track to ensure more people, particularly children, are protected from preventable diseases.

Photo credit: WHO/Ismail Taxta

Childhood immunization: increasing coverage

The Somalia Expanded Programme on Immunization (EPI) started in 1978 with support of the World Health Organization (WHO). However, the prolonged conflict and instability in Somalia resulted in a weakened, fragmented and severely under-funded health system, which affected all health services, including immunization services.

The Somalia EPI is a priority programme of the Federal Ministry of Health and Human Service. Although it can be considered to be a successful initiative in most parts of the country, the overall immunization coverage in Somalia is nonetheless still low. The EPI has made good progress in the past few years but still there are areas of low immunization coverage in different states. Successive outbreaks of vaccine-preventable diseases such as measles have claimed the lives of a sizable number of children younger than 5 years and these diseases remain a major public health threat across the country. Without a strong and effective routine EPI, national efforts on polio eradication will also be in jeopardy. Moreover, an uncontrollable and open border poses a serious challenge to the polio endgame plan, as well as to the control of other vaccine-preventable diseases.

Most of the under-immunized children live in areas with many internally displaced people, urban neighbourhoods, nomads



Dowlay, a 4 year old child, living with his mother at an IDP camp in Dayniile district, Mogadishu receives his first childhood vaccine on 14 March 2023. His mother said “I am grateful to WHO for providing my child with a vaccine which I heard will save his life”.

Photo credit: WHO/Ismael Taxta

and areas affected by drought. Therefore, WHO has supported Somalia's health authorities in developing and implementing tailored accelerated immunization activities and plans to reach zero-dose and under-immunized urban children. And indeed, immunization coverage of all vaccines improved in Somalia in 2018 and 2019 compared with 2017. However, in 2020, the coronavirus disease 2019 (COVID 19) pandemic spread to Somalia and negatively affected the immunization programme, as it did in many countries. Given this decline in childhood immunization, WHO and its partners, including Gavi, the Vaccine Alliance and the United Nations Children's Fund (UNICEF) provided support to the federal and state ministries of health to reverse this decline and increase routine immunization coverage to higher levels than before the pandemic.

Through these efforts, the number of health facilities providing immunization services

increased substantially from 706 in 2021 to 849 in 2022. The outpatient departments of these centres serve as networks of close-to-client outlets for primary health care units. This increased number of immunization service points contributed to improved immunization coverage in 2022 with coverage of more than 80% for most vaccines, except polio zero, inactivated poliovirus vaccine 2 and measles 2 vaccine (Table 1). WHO has also supported the government to strengthen immunization surveillance and data collection.

Somalia recently revised its immunization policy with a focus on increasing the age limit of eligible children for childhood vaccines to all children under 5, and introduction of new vaccines. The country recently introduced the second dose of the measles and inactivated poliovirus vaccines. Now, proposals have been finalized to introduce the pneumococcal conjugate vaccine, rotavirus vaccine and measles–rubella vaccine in the coming months.

Table 1. Routine immunization coverage, Somalia, 2017–2022

Indicator	% of children covered					
	2017	2018	2019	2020	2021	2022
BCG coverage	59	75	76	77	80	88
Polio zero-dose coverage	30	45	42	41	44	48
Penta 1 coverage	75	91	89	83	90	102
Penta 3 coverage	63	78	77	73	80	90
IPV-1 coverage	41	65	71	66	72	83
IPV-2 coverage					3	21
Measles 1 coverage	60	80	71	70	79	91
Measles 2 coverage					4	8
Td coverage	61	70	62	61	94	88
Penta 1–3 drop-out	16	15	14	12	11	10
Td drop-out	13	22	22	22	24	21

BCG: bacille Calmette–Guérin vaccine; Penta: pentavalent vaccine; IPV: inactivated poliovirus vaccine; Td: tetanus toxoid and Diphtheria.

Note: IPV-2 and measles 2 were not introduced until 2021. Red cells indicate a decline in immunization from the previous year, green cells indicate an increase in immunization from the previous year.

Catch-up: capitalizing on COVID-19 vaccination campaigns

While the COVID-19 pandemic reduced routine immunization of children in 2020, the advent of the COVID-19 vaccine offered an opportunity to reverse this decline.

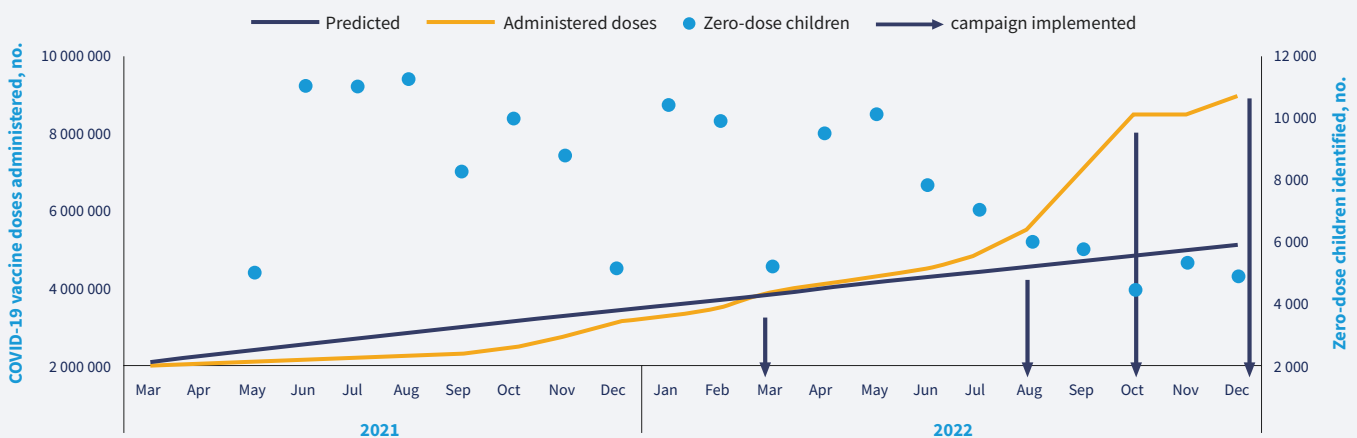
To increase COVID-19 vaccination coverage, the Ministry of Health conducted an accelerated vaccination campaign from August to December 2022, with WHO technical guidance and UNICEF logistics and communications support. The focus of the campaign was on districts with low vaccination coverage and vulnerable populations. To achieve high coverage, the aim was to provide vaccination close to where people lived. This was accomplished by involving WHO's frontline polio workforce and community health workers and organizing integrated outreach

services. The operational and logistic plans were developed well ahead of time within district-level microplans to assess needs and define strategies based on resource allocation.

Through these campaigns, the number of doses of COVID-19 vaccine administered increased significantly (Figure 1). As of 30 April 2023, 10 152 286 doses of the COVID-19 vaccine have been administered in the country.

Importantly, during the COVID 19 vaccination campaigns, routine immunizations were also administered. As a result, 139 350 zero-dose children were identified during these campaigns in the marginalized settings, with 84 600 (60.7%) receiving their first childhood vaccine in 2022 (Figure 1).

Figure 1. Predicted and actual COVID-19 vaccine doses administered, and zero-dose children identified, Somalia 2021 ad 2022



COVID-19: coronavirus disease 2019.
 Note: zero-dose children have not received any routine childhood vaccination.

Enumeration exercise: counting the young children

WHO supported the Federal Ministry of Health to conduct enumeration exercises in several districts to assess the target population for routine immunization and polio campaign to have accurate numbers. Children younger than 1 and 5 years were counted in each section/village, including camps for internally displaced people. Through this intervention, the district teams were able to register all children younger than 5 years living in the selected towns and define the demographics of the target population. This intervention contributed to improved quality of immunization services, in addition to helping address low coverage and inequitable distribution of immunization services through: (i) better microplanning; (ii) increased access to hard-to-reach populations; (iii) improved outreach; and (iv) improved planning of immunization strategies.



The investment on routine immunization programme is the best public health buy for a country like Somalia where many lives of the children are lost from preventable causes. The COVID-19 pandemic has backslided the immunization gains in this fragile settings. WHO's work has shown that even in most challenging operating environment, immunization and vaccine delivery system can be strengthened and be sustained. I congratulate WHO and all its partners to showcase their value and strength in preventing reversal of gains in childhood immunization and other public health programmes.



Mr Adam Abdelmoula

Deputy Special Representative of the Secretary-General, United Nations Resident and Humanitarian Coordinator for Somalia (2019-May 2023)

The accelerated campaign for routine childhood immunization through deployment of fixed and outreach teams helped immunize large number of women of reproductive age against tetanus and diphtheria.

Photo credit: WHO/Ismail Taxta



Vaccine-preventable disease surveillance: strengthening detection and reporting

The surveillance system for acute flaccid paralysis in Somalia is functioning well and measles surveillance is dependent on this surveillance network. Since January 2023, the country has transitioned from aggregated data of suspected measles cases to case-based measles surveillance as testing capacity has improved. The measles case investigation form has been updated and training on vaccine-preventable disease surveillance has been conducted. Now, all suspected measles cases meeting the standard definition of measles must be investigated and reported.



WHO deployed over 30,000 additional vaccinators in 2022 who went house to house to look for children who were not immunized at all against any of the life saving vaccines or were not fully immunized. This led to identifying and vaccinating more than 84 600 zero dose children in 2022 against the childhood vaccines.

Photo credit: WHO/Mukhtar Sudani

Investment in laboratories: strengthening capacity and skills

The WHO country office has supported the strengthening of national and state public laboratories and has provided the necessary equipment, reagents and other consumables to help build the country's serological testing capacity. The testing capacity has expanded from three to 11 measles-testing laboratories across the country. In 2022, ELISA readers, ELISA washers, anti-measles IgM detection reagents and other consumables were provided to seven regional laboratories in Puntland, Somaliland, Hirshabelle, Galmudug, and Southwest states to expand testing capacity at the regional laboratory level.

WHO supported several capacity-building workshops to scale up the knowledge and skills of regional hospital laboratory staff, district management teams and health care workers. For example, from 26 to 28 June 2021, WHO supported measles cases-based surveillance training for health workers in Puntland, including measles surveillance, case investigation, sample collection and shipping. Moreover, in July and August 2021, the WHO country office also provided

support to the Somaliland Ministry of Health to conduct surveillance training on vaccine-preventable diseases for 145 health care workers from 73 sentinel sites. The training emphasized the significance of public health surveillance, specifically vaccine-preventable diseases surveillance and measles case-based surveillance. The training also covered case investigation, data management, sample collection and transportation procedures. The country office also supported a 3-day training course for Somaliland's district health management teams in July 2023. The training focused on polio and vaccine-preventable disease surveillance to improve knowledge, technical competence and surveillance skills.

In other federal member states, WHO assisted the Federal Ministry of Health in providing standard technical and biosafety training for 12 laboratory technicians. The technicians were trained in serum sample collection, preparation, storage, transportation, ELISA testing, data management, biosafety, waste management and supply inventory.



Somalia is among the most fragile and conflict-affected states. It faced serious challenges when rolling out COVID 19 immunization, such as inexperience in managing adult immunization programme, inadequate health workforce, poor infrastructure and insecurity in many parts of the country to name a few. In addition, displacement of large number of people owing to the country's worst drought in its history made the roll out of COVID-19 vaccination a tremendous challenge. The change in strategy in 2022 helped the country reach substantially more people with the COVID-19 vaccine and a coverage of 41.7% by the end of 2022. The increased coverage has led to public health benefits, which have outweighed the investment in the COVID-19 vaccination campaigns.



Dr Sk Md Mamunur Rahman Malik

WHO Representative and Head of Mission, Somalia

Impact of increased measles testing capacity

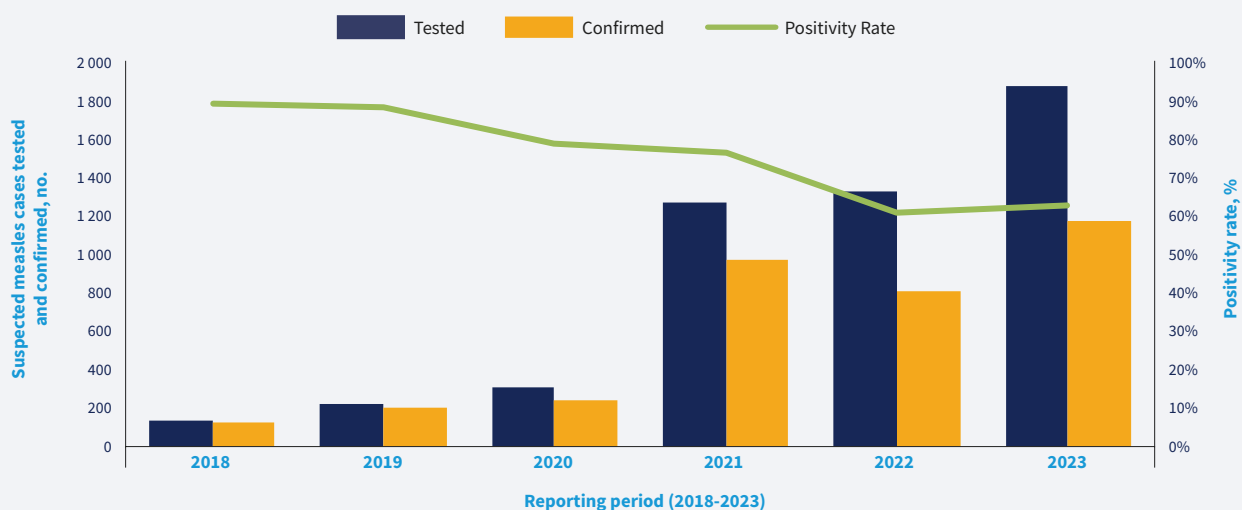
The number of suspected cases of measles that have been tested has increased substantially, from 142 in 2018 to 1879 in the first 8 months of 2023 (Figure 2).

Furthermore, the number of cases tested in the states has increased, particularly in Hirshabelle, Galmudug, and Southwest states, which had previously faced significant challenges in

shipping samples to the National Public Health Laboratory in Mogadishu.

With the support of WHO, all states have become self-sufficient in testing measles cases, with Kismayo regional hospital being the first to be equipped with the ELISA machine in 2021, followed by other states in 2022. The expansion of the measles testing capacity has enabled the federal member states to conduct measles confirmatory testing during the drought where increased numbers of measles cases are being reported.

Figure 2. Cases tested for measles confirmation, Somalia, 2018 to August 2023



One of the main lessons we learnt is that zero-dose children living in marginalized settings can be reached if the immunization services are integrated with delivery of basic health care and when such services are delivered close to where these people live. The use of frontline community health workers and WHO’s polio workforce for the acceleration phase of COVID-19 vaccination drive proved decisive. These health workers demonstrated that they can overcome barriers to access and be the vital link between the communities and the health system.

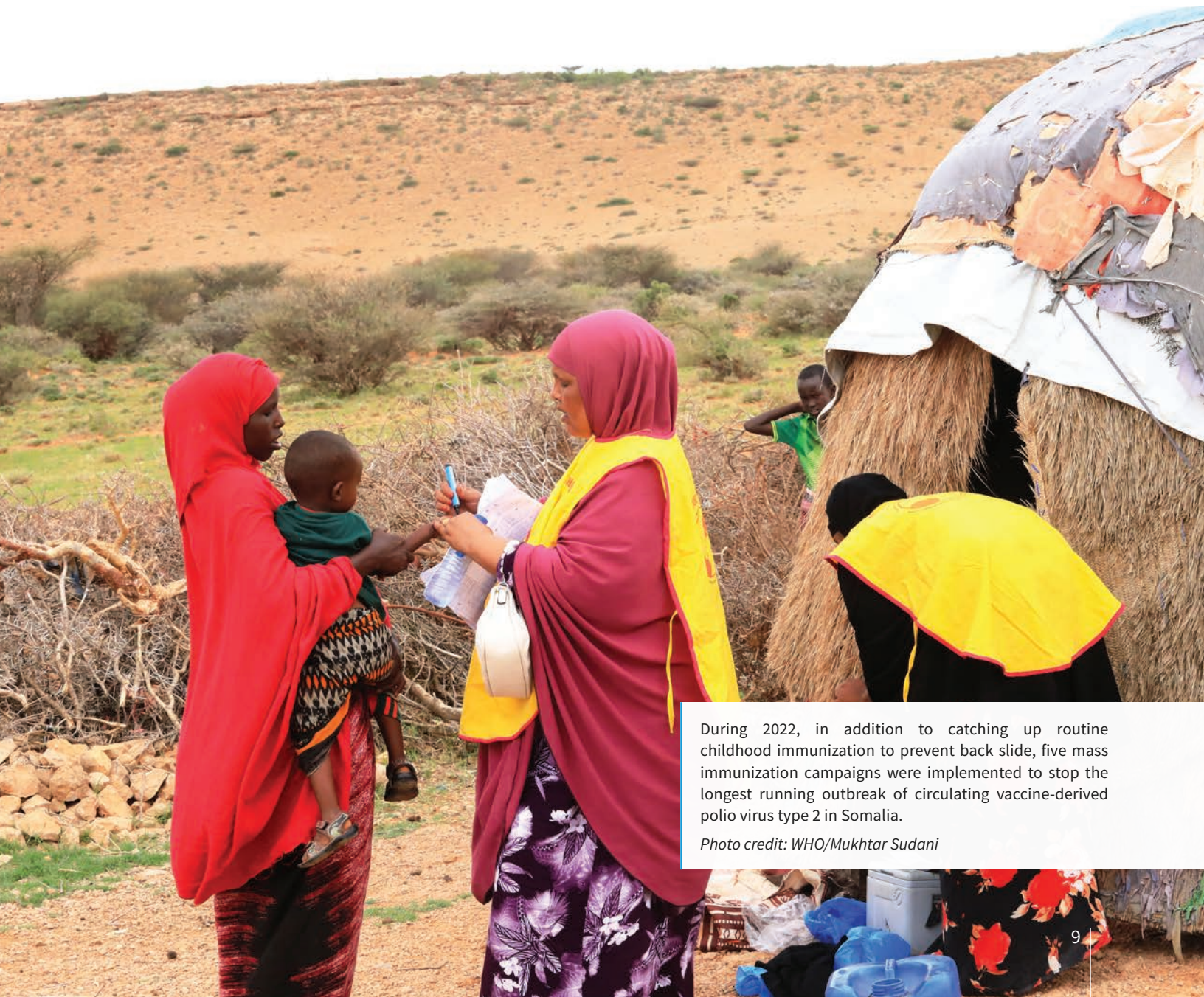


Dr Muhammad Farid

Medical Officer, Expanded Immunization Programme,
WHO Somalia country office

Polio, measles and cholera campaigns: reaching the unvaccinated

Since 1997, Somalia with the support of WHO and partners implements campaigns against polio, measles and cholera. During 2022, the following campaigns were implemented: five campaigns against polio; one integrated campaign against measles and polio with vitamin A supplementation and deworming; and two campaigns against cholera in targeted districts.



During 2022, in addition to catching up routine childhood immunization to prevent back slide, five mass immunization campaigns were implemented to stop the longest running outbreak of circulating vaccine-derived polio virus type 2 in Somalia.

Photo credit: WHO/Mukhtar Sudani

Data collection and analysis: towards improving data quality

Electronic immunization registry

During the COVID 19 vaccination campaigns and with WHO support, Somalia introduced an electronic recording and reporting tool to register every individual who received a COVID-19 vaccine which has captured important information. This tool also helped track people who were due for a second dose of the COVID-19 vaccine and issued electronic COVID 19 vaccination certificates.

Based on this experience and lesson learnt, Somalia with support of WHO is planning to replicate the electronic tool for routine immunization by piloting an electronic immunization registry in Banadir.

The electronic immunization registry enables health workers to track children in need of vaccines, identify the ones who are delayed and send alerts to parents for the due date of vaccination. In most cases of immunization

drop-out, the cause is that parents forget when they should bring their children for the next vaccination. A complete immunization course is essential to protect against deadly vaccine-preventable diseases such as measles, pneumonia, tetanus and diphtheria. These digital health solutions can help health workers track every child's immunization history and ensure that no one is left behind. The user-friendly software has offline and online options, and both workers and supervisors can monitor the status of every child. With this software, it is easy to register and track all target groups in the vaccination programme, strengthen EPI activities by reducing drop-outs and invalid doses, and improve the data management system.

This electronic immunization registration tool has the potential to ensure that no one is left behind in Somalia.



Despite having a fragile healthcare system, we have shown that a resilient immunization delivery system can be built with right strategy and investment. Many lives have been saved by reaching out to unimmunized, under-immunized and zero dose children in last year owing to acceleration of routine immunization activities. These gains need to be sustained to ensure that every child in Somalia gets an opportunity to lead a healthier and happy life. ”

Mukhtar Abdi Shube

Head of the Expanded Programme on Immunization (EPI),
Ministry of Health, Federal Government of Somalia

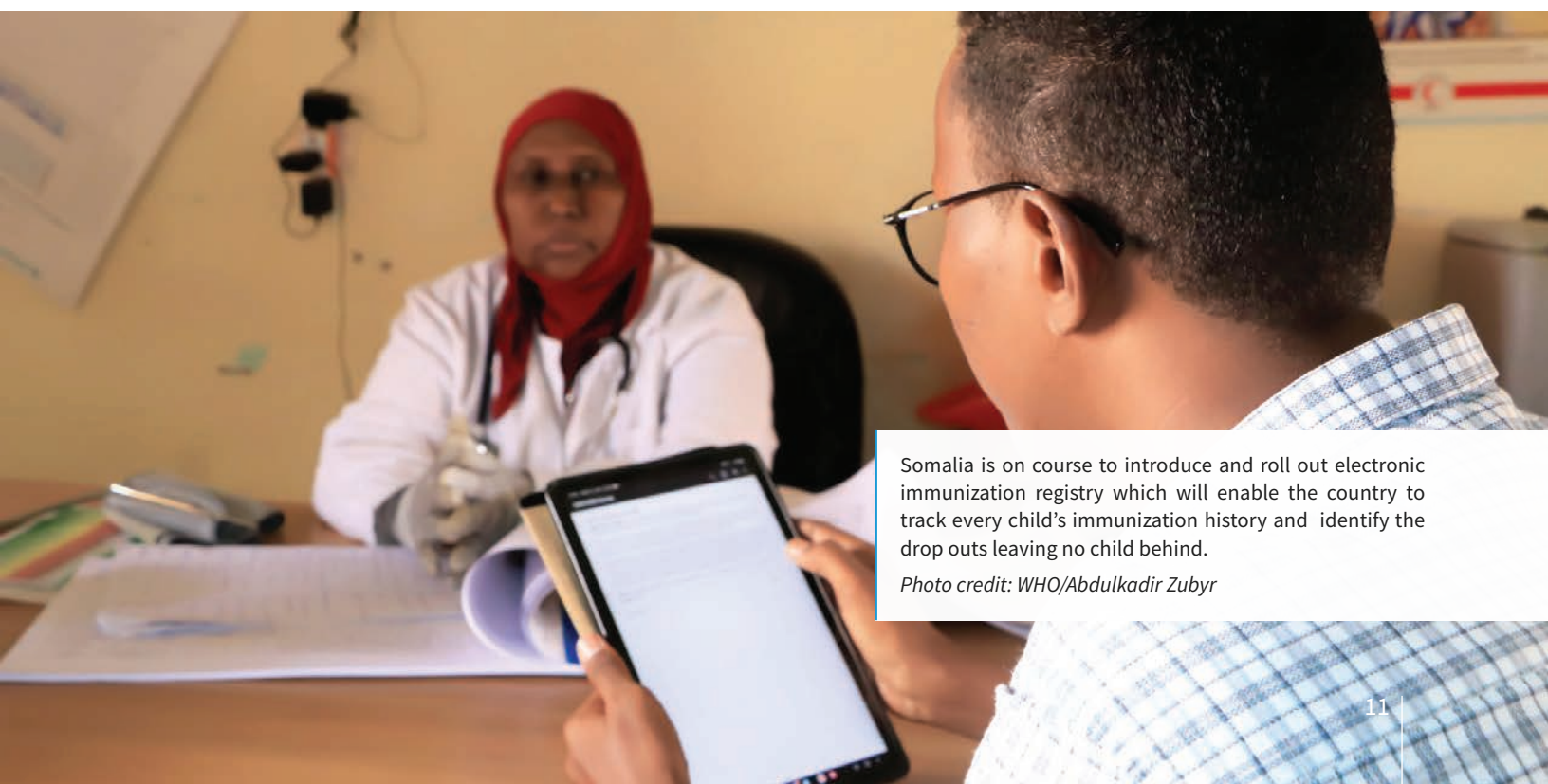
Surveys

In 2021, WHO supported the Somalia health ministry in planning and implementing a survey of coverage of vaccine-preventable diseases at health facilities using a questionnaire where the parents visiting the health facilities answered about the vaccination status of their children as well as collecting blood samples from the children younger than 5 years visiting the healthcare facilities. This survey was implemented jointly with a COVID 19 seroprevalence survey. At the national level, coverage based on response to questionnaire was 69.5% for Penta 1, 61.5% for Penta 3 and 71.8% for measles 1, with 55.5% having received all their vaccinations (Table 2).

Table 2. Vaccine coverage based on questionnaire Somalia, 2021

Location	No.	% of children covered							
		BCG	OPV 1	OPV3	Penta 1	Penta 3	IPV	Measles	Fully vaccinated
Country level	408	71.4	73.3	68.0	69.5	61.5	62.0	71.8	55.5
Banadir State	70	80.0	84.3	81.4	84.3	82.9	82.9	81.4	74.3
Galmudug State	31	55.4	51.4	44.6	48.6	29.1	39.2	54.1	25.7
Hirshabelle State	39	67.3	70.3	61.4	70.3	55.3	62.1	68.0	44.9
Jubaland State	46	71.3	73.1	66.9	69.0	66.9	66.9	77.4	64.9
Puntland State	54	55.7	53.3	47.8	51.2	46.9	46.9	53.3	45.7
Somaliland	98	85.4	87.2	83.3	86.0	72.7	69.3	85.0	61.7
Southwest State	70	67.1	71.7	65.8	59.6	54.2	55.3	67.6	51.2

BCG: bacille Calmette-Guérin vaccine; OPV: oral poliovirus vaccine; Penta: pentavalent vaccine; IPV: inactivated poliovirus vaccine.



Somalia is on course to introduce and roll out electronic immunization registry which will enable the country to track every child's immunization history and identify the drop outs leaving no child behind.

Photo credit: WHO/Abdulkadir Zubyr

The results of the serosurvey showed that 89.1% of the sample had immunity against measles and 76.4% against rubella (Table 3). It is important to highlight that in Somalia the rubella vaccine is not part of routine immunization schedule so immunity is likely as a result of contracting the disease. In children younger than 5 years, 78.0% had immunity to measles and 39.1% to rubella.

Variable	Measles (IUs)		Rubella (IUs)	
	%	No.	%	No.
<i>Location</i>				
All	89.1	2308	76.4	2371
Banadir State	93.7	372	79.3	391
Galmudug State	92.5	167	79.5	167
Hirshabelle State	88.2	259	79.4	259
Jubaland State	83.3	192	79.0	192
Puntland State	90.1	310	79.2	314
Somaliland	89.0	712	72.5	752
Southwest State	87.4	296	74.5	296
<i>Sex</i>				
Female	90.3	1118	75.3	1155
Male	88.0	1190	77.4	1216
<i>Age, in years</i>				
< 5	78.0	313	39.1	318
5–14	88.1	643	75.6	654
15–29	94.1	628	93.3	646
30–49	96.4	396	94.9	413
≥ 50	97.0	267	93.4	277

Based on findings of the serosurvey, Somalia is planning to introduce the measles and rubella vaccines in the coming month.

After the integrated campaign (measles, OPV, bundled with micronutrient supplement and deworming tablets) in November 2022, WHO supported implementation of a post-campaign coverage survey (Table 4) and an EPI survey (Table 5) during February 2023 by engaging a third party.

Table 4. Post-campaign coverage survey, Somalia, 2022

Variable	No surveyed	Coverage, %
Oral polio vaccine	19240	85.2
Measles	18037	86.4
Vitamin A capsule	17402	76.8
Albendazole tablet (deworming)	13758	61.1

Table 5. Routine immunization coverage in children aged 12–23 months, Somalia, 2022

Vaccine	%	Number surveyed
BCG	74.1	4921
Penta 1	73.4	4894
OPV 1	79.3	5323
Penta 2	61.6	3898
OPV 2	64.9	4691
Penta 3	52.8	3536
OPV 3	52.3	3524
IPV 1	70.8	4691
IPV	48.5	3167
MCV 1	65.0	4346

BCG: bacille Calmette-Guérin vaccine; Penta: pentavalent vaccine; OPV: oral poliovirus vaccine; IPV: inactivated poliovirus vaccine; TT: tetanus toxoid vaccine; MCV1 : measles containing vaccine 1

Findings showed coverage ranges increased compared with the previous surveys and estimations in many parts of the country, with certain states and populations with lower coverage levels. IDP/ Refugee populations and urban populations had achieved the highest levels of coverage, while nomadic and rural populations had the lower levels of vaccination among those surveyed. Variations in coverage between genders were small.

Lessons learnt



During COVID 19 pandemic, many lessons have been learnt. Despite having a fragile healthcare system, by end of 2022, the country was able to fully vaccinate 41.7% of its population. The country also learnt that by integrating services, more children can be reached out and be vaccinated especially amongst those un-immunized or under-immunized. By engaging with the communities and bringing services close to where the communities live, better and tangible results can be achieved.

Moving forward



The country needs to maintain and sustain the gains made in 2021, 2022 and 2023 in the childhood immunization programme. While preventing the backslide in routine immunization coverage would be the key moving forward, more concerted efforts should be made to address vaccine inequity. Reaching out to those unreached children with life-saving vaccines will be fundamental for building an equitable health system where no child will be left behind.



Ms Marian Mohamed Hussein, State Minister of Health vaccinating a child during an integrated immunization campaign for COVID-19, polio and measles on 7 September 2022 in Mogadishu.

Photo credit: WHO/Ismail Taxta

Further reading

- Increasing coverage of COVID-19 vaccines in a fragile and conflict-affected setting: lessons for building resilient immunization services. Case Study. Mogadishu: WHO Somalia; 2023 (<https://www.emro.who.int/images/stories/somalia/strengthening-public-health-systems-case-study-august-4-2023.pdf>)
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Acknowledgement

We thank our donors and partners who have supported the work of WHO to catch up routine childhood immunization after the COVID-19 pandemic. WHO has worked across the three levels of the Organization – headquarters, regional office and country office – to scale up routine childhood immunization with a eye to building a resilient immunization delivery system in the country. Other specialized agencies of the United Nations system and implementing partners provided support to WHO in this journey. We deeply acknowledge the following multilateral and bilateral donors of WHO to support its work in Somalia in routine childhood immunization as well as COVID-19 vaccination campaigns:



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“

WHO and our partners are working to extend the benefits of vaccines to everyone, everywhere, at any age. The Immunization Agenda 2030 aims for a world where everyone fully benefits from vaccines for better health. Despite the COVID-19 pandemic, conflicts and climatic shocks displacing large number of children and women in Somalia in 2022, thousands of infants were vaccinated with routine vaccines in the country. In addition, more than 3 million children received measles-containing vaccine through campaigns. This success story demonstrates the value of WHO’s work in a fragile setting in bringing life-saving immunization services close to the people. ”

Dr Ahmed Al-Mandhari
WHO Regional Director for the Eastern Mediterranean

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