


Urgent support mechanism: saving millions of COVID-19 vaccines from expiry in Africa

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ABSTRACT

Delivering COVID-19 vaccines with 4–6 weeks shelf life remains one of Africa's most pressing challenges. The Africa Centres for Disease Control and Prevention (Africa CDC) leadership recognised that COVID-19 vaccines donated to many African countries were at risk of expiry considering the short shelf life on delivery in the Member States and slow vaccine uptake rates. Thus, a streamlined rapid response system, the urgent support mechanism, was developed to assist countries accelerate COVID-19 vaccine uptake. We describe the achievements and lessons learnt during implementation of the urgent support mechanism in eight African countries. An Africa CDC team was rapidly deployed to meet with the Ministry of Health of each country alerted for COVID-19 vaccine expiry and identified national implementing partners to quickly develop operational work plans and strategies to scale up the urgent use of the vaccines. The time between the initiation of alerts to the start of the implementation was typically within 2 weeks. A total of approximately 2.5 million doses of vaccines, costing \$900 000, were prevented from expiration. The urgent support has also contributed to the increased COVID-19 vaccination coverage in the Member States from 16.1% at the initiation to 25.3% at the end of the urgent support. Some of the effective strategies used by the urgent support mechanism included coordination between Africa CDC and country vaccine task forces, establishment of vaccination centres, building the capacity of routine and surge health workforce, procurement and distribution of vaccine ancillaries, staff training, advocacy and sensitisation events, and use of trusted religious scriptures and community influencers to support public health messages. The urgent support mechanism demonstrated a highly optimised process and serves as a successful example for acceleration and integration of vaccination into different healthcare delivery points.

INTRODUCTION

COVID-19 vaccination has emerged as a critical life-saving intervention to mitigate

WHAT IS ALREADY KNOWN ON THIS TOPIC

- ⇒ Rapid advent and introduction of COVID-19 vaccines were critical in mitigating the impacts of COVID-19 globally.
- ⇒ COVID-19 vaccines donated to African countries were at risk of expiry due to short shelf life on delivery in the Member States and slow vaccine uptake rates.

WHAT THIS STUDY ADDS

- ⇒ Africa Centres for Disease Control and Prevention (Africa CDC) engaged the African Union Member States to increase the COVID-19 vaccine uptake by Member States dramatically.
- ⇒ The pivotal role of regional public health institutions such as Africa CDC in coordinating country action during health emergency response efforts.
- ⇒ Contribution of innovative vaccine deployment strategies in preventing vaccine expiry during health emergencies.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

- ⇒ The urgent support mechanism demonstrated the role of regional institutions, political commitment and strong leadership at all levels for optimised processes and serves as a successful example for the acceleration of vaccine uptake during health emergencies.

the impact of the COVID-19 pandemic by reducing its transmission, morbidity and mortality.^{1 2} Several deaths were averted through the rapid discovery, introduction and delivery of the COVID-19 vaccines, and global economies and livelihoods were maintained and restored. More importantly, the undue overwhelming burden on public health

systems was alleviated.³ However, COVID-19 vaccination programmes have been adversely affected by numerous multifaceted challenges, including vaccine expiration and wastage.^{4,5}

Given the urgency of the pandemic in its earlier phase, emergency use authorisation of COVID-19 vaccines was given, and many developing countries got vaccines donated that were near expiration dates.^{6,7} Cognisant of this, Africa CDC, WHO, UNICEF and GAVI issued a joint statement on basic requirements for vaccine donations to COVID-19 Vaccines Global Access (COVAX), Africa Vaccine Acquisition Trust (AVAT) and African countries.⁸ Once the supply issues of the COVID-19 vaccine were resolved, demand issues became a serious problem due to various reasons such as the then prevailed conspiracies, misinformation and limited public awareness leading to suboptimal COVID-19 vaccine uptake—contributing to the expiration of the vaccines in warehouses.⁹

During the introduction of COVID-19 vaccines in 2021, the African continent received the first batch of COVID-19 vaccines through the COVID-19 Vaccines Global Access, known as the COVAX facility,¹⁰ while many countries (including non-GAVI eligible countries) organised a direct purchase or received vaccines from other countries through bilateral negotiations and donations.¹¹ Limited access to infrastructure for delivering vaccines donated through the COVAX system within the shelf life of 4–6 weeks was one of Africa’s most pressing challenges, having only 102 million people (7.5%) of its population fully vaccinated across the continent in 2021.^{4,12}

To mitigate the challenges of the COVID-19 expiry among African countries before it could be given to the much-needed population at risk, Africa Centres for Disease Control and Prevention (Africa CDC), through its flagship programme, the Saving Lives and Livelihood,¹³

launched an urgent support mechanism to streamline and quickly assist countries uptake of these vaccines that were at risk of expiry. In this study, we describe the achievements and lessons learnt by implementation of the urgent support mechanism in eight African countries.

IMPLEMENTATION STRATEGY

Africa CDC in partnership with the Mastercard Foundation agreed with African Field Epidemiology Network Limited (AFENET) to perform the following activities under the urgent support mechanism including risk communication and community engagement, increase vaccination capacity through COVID-19 vaccination centres (CVCs) and increase capacity for in-country support (figure 1).

Africa CDC generated a validated alert on vaccines at risk of expiration to be eligible for support through the urgent support mechanism. Four criteria were used to determine the urgency of support needed by Member States: large quantities of vaccines about to expire in a short period, reported adverse events following immunisation, low COVID-19 vaccination coverage and Member States with significant delay in initiating any COVID-19 response measures.

Once established, urgent Country Support Plans (CSPs) were developed and approved for the identified Member States using an iterative but quick bottom-up approach. Subsequently, a team was deployed to meet with the Ministry of Health and identify national implementing partners to develop a micro plan and strategy for using the vaccines and targets. Participating entities included vaccination departments and National Public Health Institutes or equivalent of the countries collaborating closely with the Africa CDC country engagement

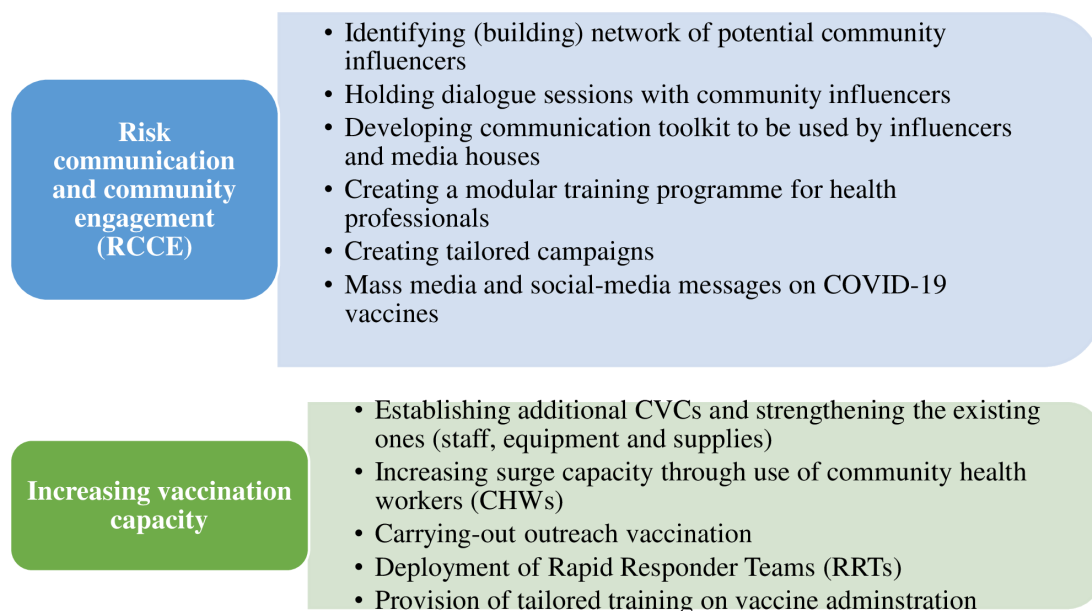


Figure 1 Activities implemented through the Africa Centres for Disease Control and Prevention’s (Africa CDC’s) urgent support mechanism.

work-stream of the initiative and the overall programme coordination mechanisms.

Interim local implementing partners were selected based on the recommendations of the country but also on Africa CDC's previous experience working with the candidate partners. Partners that did not have previous working experience with Africa CDC were required to undergo a due diligence check. The selected implementing partners signed a contract with AFENET which is the organisation working as a grant (fund) manager on behalf of Africa CDC. The time between the initiation of alerts and the implementation was typically within 2 weeks, and the urgent support was implemented from December 2021 to March 2022. Overall programme monitoring was provided by Africa CDC country engagement work-stream through a task force set up in Addis Ababa with initially daily check-ins with the implementing

partners but subsequently adjusted as needed. An interim programme data collection system was instituted to enable the team to use real-time data to monitor the implementation progress and conduct timely programme course corrections to achieve the objectives. A team member was assigned to monitor the implementation and collect data weekly through a priority-defined key performance indicators (table 1).

The urgent support mechanism was implemented in eight Member States (Cameroon, Kenya, Lesotho, Liberia, Sierra Leone, South Sudan, Tanzania and Zambia). Implementing partners were subcontracted for each Member State and Africa CDC provided an approved activity request form outlining each country's partner, activities and budget. AFENET was expected to share monthly reports (prepared with Africa CDC) and quarterly progress reports with the Mastercard Foundation

Table 1 Key performance indicators (KPIs) used to monitor the implementation of urgent support

KPI	Measure
Risk communication and community engagement	
Number of community leaders (key influencers) engaged to share supportive messaging on COVID-19 vaccination.	Count of community leaders including traditional and religious leaders engaged.
Number of social media posts to inform about COVID-19 vaccination posted.	Count of posts on social media platforms including Facebook, Twitter, Instagram, WhatsApp groups and official websites.
Number of flyers that inform about COVID-19 vaccination distributed among the public.	Count of posters bearing the branding of the SLL programme and messages informing the public about COVID-19 vaccination.
Number of live community radio/TV discussions held to inform about COVID-19 vaccination.	Count of live community radio/TV discussions held by experts to inform about COVID-19 vaccination.
COVID-19 vaccination centres (CVCs)	
Average monthly COVID-19 vaccination coverage in the SLL project areas 6 months prior to commencement of the SLL urgent support.	These data enable us determine by how much the SLL urgent support project should have increased vaccination coverage in targeted areas/locations (ie, outcome of interest).
Total number of people targeted for COVID-19 vaccination in all the project intervention areas.	A count of persons targeted for vaccination during the SLL urgent support period (ie, during the 3-month period).
Total number of COVID-19 vaccine doses transported by SLL project and received at the CVCs (<i>Disaggregated by vaccine type</i>).	Sum of all vaccines received at the SLL-supported CVCs during the SLL urgent support period (ie, during the 3-month period).
First dose: Total number of people vaccinated against COVID-19 over the SLL urgent support implementation period with first dose.	First dose only—Total number of first doses for all vaccine types. Includes J&J.
Second dose: Total number of people vaccinated against COVID-19 over the SLL urgent support implementation period with second dose.	Second dose only—Total number of second doses for all vaccine types. Excludes J&J.
Total number of COVID-19 vaccine doses administered	Sum of first dose+second dose+J&J: Vaccine doses used during the SLL urgent support implementation period.
Total number of persons vaccinated against COVID-19	Sum of persons who have been fully vaccinated, ie, have received first dose+second dose for two-dose regime vaccines) plus those that have received a J&J vaccine.
Total number of COVID-19 vaccine doses wasted (<i>Disaggregated by vaccine type</i>)	Sum of all vaccine types wasted. Wastage defined as: vial breakage during transportation, pilferage, expiry, etc.
Number of ancillary products for COVID-19 vaccines (PPE, syringes, needles, sanitiser, sterile wipes, swabs, cotton, plasters, and medical waste disposal) purchased.	Count of ancillary products for COVID-19 vaccines purchased.
Number of ancillary products for COVID-19 vaccines distributed.	Count of ancillary products for COVID-19 vaccines received at CVCs.
Number of new CVCs set up and functional (ie, administering vaccine doses).	Count of new CVC sites (fixed and mobile teams) set up and functional (ie, administering COVID-19 vaccine doses).
Number of existing CVCs in the MS with low vaccine uptake strengthened.	Count of existing CVCs in the Member States with low vaccine uptake supported with either cold chain equipment, vaccine supplies, or CHWs, etc.
Number of CHWs trained to support existing CVCs.	Count of CHWs trained to support existing CVCs as either as vaccinators, data managers, or infection prevention and control staff.
CHWs, community health workers; MS, Member States; PPE, personal protective equipment.	

Table 2 Vaccines averted from expiration and costs maintained through urgent support in eight African countries

Country	Total number of near-expiration vaccine doses at the baseline	Total number of near-expiration vaccine doses administered	Proportion of vaccines averted from expiry	Cost of expiration averted vaccines (US\$)	Major urgent support provided
Cameroon	23001	22979	99.9%	8272.44	Targeted personnel were contracted and trained to effectively administer vaccines and manage data, IT equipment, TA on data entry, reporting and monitoring
Lesotho	701820	295096	42.0%	106234.6	Trained HCWs, IEC materials were procured to raise COVID-19 vaccination awareness, COVID-19 messages through the national TV and radio stations
Liberia	131123	61540	46.9%	22154.4	Set up additional CVCs, trained and deployed staff, provided supplies and PPE equipment, RCCE activities, provided IEC materials, aired COVID-19 messages in TV and radio spots
Kenya	283822	230599	81.2%	83015.64	Outreach centres and mass campaigns, trained community health workers, door-to-door sensitisation
Sierra Leone	357603	320433	89.6%	115355.9	Set up additional CVCs, trained HCWs, engaged faith-based organisations, used IEC materials
South Sudan	972956	937750	96.4%	337590	Set up additional CVCs, trained HCWs, RCCE, engaged higher officials and prominent individuals
Tanzania	109901	109901	100%	39564.36	Set up additional CVCs, trained HCWs, social media messages, call centre messages, advocacy meetings
Zambia	549182	528060	96.1%	190101.6	Targeted community radio/TV discussions, mass sensitisation events, targeted community leaders or key influencer's engagement
Total	3129408	2506358	80.1%	902288.9	

CVCs, COVID-19 vaccination centres; HCW, healthcare worker; IEC, Information, Education and Counseling; PPE, personal protective equipment; RCCE, risk communication and community engagement; TA, technical assistance.

(donor). As part of the ongoing continuous monitoring and assurance over the Saving Lives and Livelihood Programme, Deloitte was contracted to review activities implemented under the urgent support mechanism by the fund manager (AFENET) and the partners in eight Member States. The review was in line with the need to continuously update the programme's risk management approach and framework.

KEY ACHIEVEMENTS

Urgent supports provided

Several activities were implemented through the Africa CDC urgent support initiative (table 2), thereby increasing the vaccine uptake and reducing the number of expired vaccines. In Zambia, a total of 549 182 COVID-19 vaccine doses were with a short shelf life and 528 060 doses of the vaccines (96.1%) were administered before their expiry. This was achieved by expanding CVCs and implementing targeted community radio/TV discussions, in-person sensitisation events on COVID-19 vaccination, and engaging community leaders or key influencers to share supportive messages on COVID-19 vaccination.

In Cameroon, 23 001 COVID-19 vaccine doses were near expiry and urgent support mechanism administered 22 979 of the vaccines (99.9%) through implementation of several activities such as establishment of CVCs and provision of training to the healthcare workers (HCWs) on effective vaccine administration, and engagement of

communities leaders. In Liberia, 61 540 COVID-19 doses (46.9%) were administered by the urgent support mechanism, out of the 131 123 near-expiry vaccine doses. The mechanism supported setting up of CVCs, provision of personal protective equipment (PPE) materials and ancillary supplies, distributed IEC materials, and trained and deployed HCWs to support RCCE and vaccine administration.

In Tanzania, the urgent support administered 109,901 COVID-19 vaccine doses (100.0%) by strengthening CVCs, provision of training for CHWs on RCCE approach and COVID-19 vaccination, conducting induction and advocacy meetings with representatives from medical professional bodies and national religious leaders. In South Sudan, the urgent support administered 937 750 COVID-19 vaccine doses (96.4%) and distributed ancillary consumables. This was achieved by training and deploying staff and implementation of RCCE activities including distribution of IEC materials, and engaging the country-specific leaderships, the urgent support mechanism has conducted state and county level launches featuring prominent women, community leaders and senior government officials to address women and create more vaccine demand.

In Lesotho, the urgent support administered 295 096 (42.0%) COVID-19 vaccine doses. To achieve this, staff were trained and deployed; IEC materials were produced and distributed and COVID-19 messages were

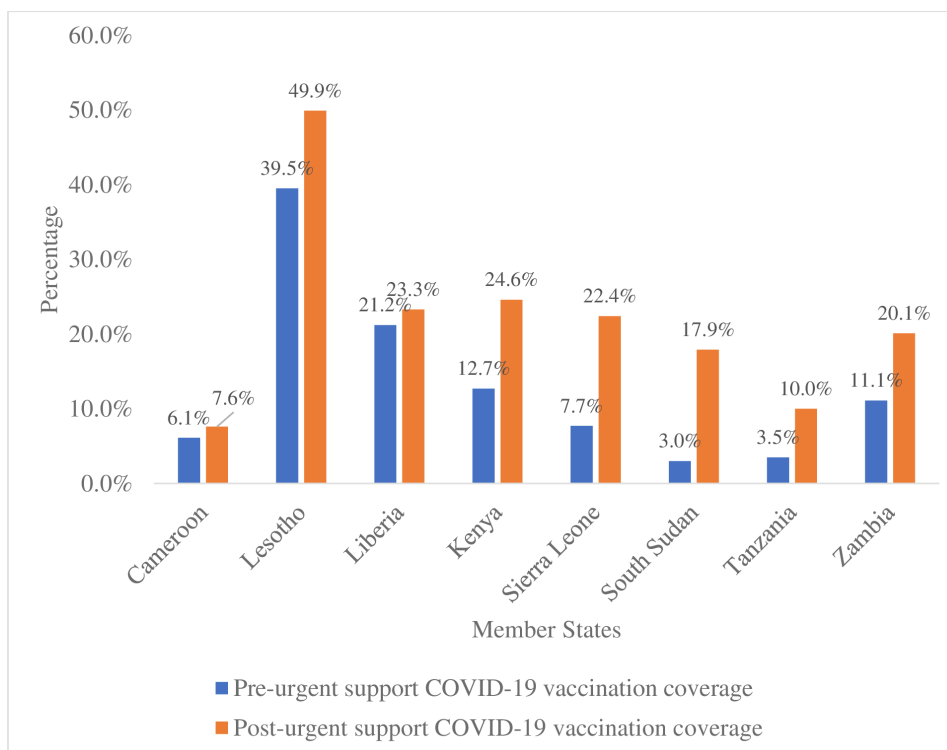


Figure 2 Pre-post urgent support COVID-19 vaccination coverage in the Member States.

broadcasted through the national TV and radio stations. In Kenya, 230 599 (81.2%) COVID-19 near expiry vaccine doses were administered through implementation of mass vaccination in outreach sites, conducting social mobilisation campaigns and door-to-door sensitisation on COVID-19 vaccination. In Sierra Leone, the urgent support administered 320 433 (89.6%) COVID-19 near to expiry vaccine doses by training and deploying HCWs, engaging faith-based organisations, and producing and distributing IEC materials.

IMPACTS OF THE URGENT SUPPORT MECHANISM

Overall, eight African countries were supported by urgent support from December 2021 to March 2022 and more than 2.5 million doses of near-to-expiry COVID-19 vaccines, worth \$900 000, were prevented from expiring (table 2). The overall coverage of COVID-19 vaccination in the Member States following the urgent support period increased from 16.1% to 25.3% (figure 2). Targeted risk communication and community engagement in generating demand among the population, including countering negative perceptions of the vaccine, workforce training, distribution of health messages and IEC materials, and logistics support has been provided to multiple countries under this support mechanism. The urgent support mechanism has also enhanced the coordination and collaboration capacity of Africa CDC and the Member States during health emergencies.

LESSONS LEARNED AND IMPLICATIONS

The global COVID-19 pandemic jeopardised the health, security and livelihoods of people across the world, particularly in communities in developing nations that are stricken by poverty and lack of economic opportunity.^{14 15} Global inequities in access to COVID-19 vaccines, diagnostics and therapeutics have prompted a huge push to use available COVID-19 vaccines in Africa.¹² The short shelf life of COVID-19 vaccines was a major challenge for many countries, putting pressure on programme managers to distribute and implement vaccination activities without taking time to do the necessary elaborate and cascading preparations for such decentralised mass vaccination efforts.⁴ The Africa CDC urgent support mechanism enhanced the COVID-19 vaccines uptake through innovative strategies such as establishment of CVCs, use of trusted voices, implementation of outreach campaigns, door-to-door sensitisation and dissemination of health messages in mainstream media and social media, thereby preventing millions of COVID-19 vaccines from expiry and potentially saving lives of millions.

Africa CDC's strong leadership and coordination commitment has contributed to increased vaccine uptake in the selected Member States and thus saved million doses of vaccines from expiry. The Africa CDC rapidly assessed the magnitude of near expiry COVID-19 vaccines in the Member States, designed a bottom-up approach to plan and implemented urgent support activities, mobilised resources and contracted implementing partners to execute as planned and monitored systematically. This aligns with other proactive governmental interventions documented in different Member States and organisations, including Tanzania,¹⁶

GAVI¹⁷ and WHO Liberia.¹⁸ WHO supports that political commitment and strong leadership at all levels are crucial to producing positive results. It should be noted that effective coordination and sufficient funding to support operational costs are pivotal to the success of the COVID-19 vaccination programme.¹⁹

The role of leadership in promoting confidence in the effectiveness and safety of vaccines and their ability to procure and distribute them efficiently and equitably has been evidenced in the leadership actions during the urgent support. This was essential to the success of the urgent support and to the emergence of more resilient societies after the crisis.²⁰ Moreover, adequate high-level political commitment and engagement in the respective countries to promote COVID-19 vaccination had shown an observable impact in Ghana.²¹ Many critical preparatory steps cannot be missed to attain high-quality coverage.²²⁻²⁴ Experts also argue that introducing new vaccines requires substantial additional planning and organisational complexity to ensure optimal vaccine delivery, posing a wide range of challenges to often overstretched and underfunded healthcare systems across all components of the vaccine supply chain.²⁵

The urgent support mechanism also highly demonstrated the role of awareness campaigns that sensitised many faith-based organisation leaders and their followers on the efficacy and safety of the vaccines. Religious-based organisations were made aware of the COVID-19 vaccination programme and encouraged their congregations to get vaccines and protect themselves against the COVID-19 disease. Although negotiating public health partnerships with religious-based institutions has always been challenging, experiences from the strategic engagement with religious organisations to promote uptake of COVID-19 vaccination, especially among the vulnerable and marginalised communities increased COVID-19 vaccine uptake in India²⁶ by building confidence for the vaccination programme. In addition, it is demonstrated that, the need for community-engaged COVID-19 vaccine messaging which reflects the nuances of the COVID-19 vaccine and pandemic without oversimplifying information is also highlighted in a study conducted among different communities including the Haitian-Creole community, the Cape Verdean community, the Latino community and the Black Christian Faith community.²⁷

Through urgent support, Africa CDC has also demonstrated remarkable support to the Member States health workforce development through training and capacity building. The concise urgent support training programmes targeted to capacitate the health workforce have spotlighted the increased vaccine uptake in different participating countries including Lesotho. Multiple evidence from different settings including Ethiopia,²⁸ WHO²⁹ and Ghana²¹ have supported that provision of continuous, timely and practical training to HCWs increased the uptake of COVID-19 vaccines. Similarly, Africa CDC's logistics support to the Member States through the urgent support mechanism had contributed to an increased vaccine uptake and thus had saved millions of vaccines from expiry. Accordingly, multiple Member States have developed and strengthened supply

chain strategies to receive, store, distribute and manage COVID-19 vaccines and their ancillary products during and after the project period. According to World Bank, for example, financing is helping the country to purchase vaccines, manage supply chains and logistics for storage and handling, and provide health workers personal protective equipment (PPE). In Nepal, World Bank financing helped strengthen the health system and procure diagnostic tests, laboratory equipment and therapeutics.³⁰

CHALLENGES

Challenges that harboured the successful implementation of the urgent support were noted, particularly vaccine apathy compounded by traditional and cultural practices. Moreover, other competing health priorities in some Member States, considerable general population hesitancy to COVID-19 vaccine and some Member States slow adoption to engage with Africa CDC were parts of the limitations recorded during the project period. Member States' capacity was limited in terms of timely responding to infodemics. These challenges further demonstrate the need to invest in the overall strengthening of health systems to respond to emergencies of a similar scale. Moreover, the increased vaccination coverage in the Member States after the urgent support might not be the sole impact of the intervention.

CONCLUSIONS

Africa CDC's urgent support mechanism to countries to avert the expiry of COVID-19 vaccines demonstrated a highly optimised process and serves as a successful example of the continental agency's role in coordinating Member State's action during health emergencies. In addition, Member States have gained valuable experiences deploying multiple COVID-19 vaccination delivery mechanisms, which will inform future response efforts. High-level political commitment, inclusion of local non-governmental organizations (NGOs) and faith-based organisations including integration of COVID-19 vaccination within routine healthcare programmes were critical success factors for the urgent support mechanism. The implementation lessons underscore the need for innovative vaccination strategies such as urgent support mechanisms in intensifying deployment, improving vaccine coverage and efficiencies during health emergencies. Proper coordination is required between national, regional and global actors to enhance planning and avert vaccine expiry during health emergencies.

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Competing interests None declared.

Patient consent for publication Not applicable.

Ethics approval Not applicable.

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