Insight paper

April 2025 | gavi.org

How we fight disease outbreaks: first-hand accounts from the epidemic frontline

Contents

Cover image: In August 2020 during the COVID-19 pandemic, Gavi supported the Ghana Health Service by providing 2,343 vaccine fridges that were a significant component in vaccine storage during polio vaccination campaigns. Credit: ©UNICEF/ACQUAH

Executive summary

Barely a day goes by without news headlines about infectious disease outbreaks, from Ebola in Uganda and mpox in the Democratic Republic of the Congo, to H5N1 avian influenza and measles in the United States of America. The COVID-19 pandemic, which claimed more than 7 million lives, continues to cast a long shadow worldwide.

Researchers predict demographic, economic and environmental trends, including those related to climate change, will drive increases in the number of outbreaks in the coming decades.

Those who have been on the frontline of tackling past outbreaks have invaluable lessons for those confronting current and future outbreaks. This analysis paper summarises the insights shared by individuals from India, Guinea, Senegal and Uganda about how their countries have dealt with a wide range of infectious diseases.

These experts outlined the importance of:

- national response plans being in place before outbreaks occur and flexibility in implementing them;
- disease surveillance for early detection and containment;
- sufficient health workers trained in outbreak prevention and control;
- rapid mobilisation of human, material and financial resources at the start of outbreaks;
- public awareness campaigns led by influential public figures;
- the dissemination of prevention, control and case management guidelines;
- initial rapid financial support from local or regional authorities;
- local diagnosis, treatment and initial outbreak response;
- standardised patient management protocols;
- multidisciplinary patient management systems and healthcare teams;
- patient management systems that can handle simultaneous outbreaks;
- integrated strategies to combat vector-borne diseases with similar symptoms;
- globally agreed prioritisation of candidate vaccines;
- agreed trial platforms and pre-approved protocols to enable rapid clinical trials of candidate vaccines;
- the involvement of multiple branches of government and municipal bodies;
- improved coordination of international organisations and the involvement of only those with relevant expertise;
- care and support programmes for outbreak survivors; and
- planning on the basis that further outbreaks of most diseases will reoccur.

The paper also outlines some of the ways Gavi is working with partners and others to support countries to prepare for, prevent and respond to future infectious disease outbreaks.

These include support for: vaccine stockpiles; the International Coordinating Group (ICG) on Vaccine Provision; preventive campaigns; the Measles & Rubella Partnership Outbreak Response Fund; surveillance and diagnostics; fragility, emergencies and displaced populations; health system strengthening; and civil society organisations.

They also include global responses such as: the Day Zero Financing Facility for Pandemics (DZF); the First Response Fund (FRF); “The Big Catch-up”; a vaccine coalition; and the establishment of Gavi’s Global Health Security team.

1 Lessons in tackling outbreaks from those on the frontline

Even before the COVID-19 pandemic, the 21st century had witnessed a wave of major infectious disease outbreaks and epidemics.

The 2003 severe acute respiratory syndrome (SARS) outbreak, the 2009 swine flu pandemic, the 2012 Middle East respiratory syndrome coronavirus outbreak, the 2013–2016 Ebola epidemic in West Africa and the 2015 Zika epidemic spread across borders to cause significant morbidity and mortality in multiple countries.

Then, of course, came COVID-19. The largest pandemic in more than 100 years claimed more than 7 million lives, and triggered waves of economic and psychological devastation that left no country untouched.

It also caused delays in routine immunisation programmes and stretched health systems, which in turn helped drive an increase in other disease outbreaks.

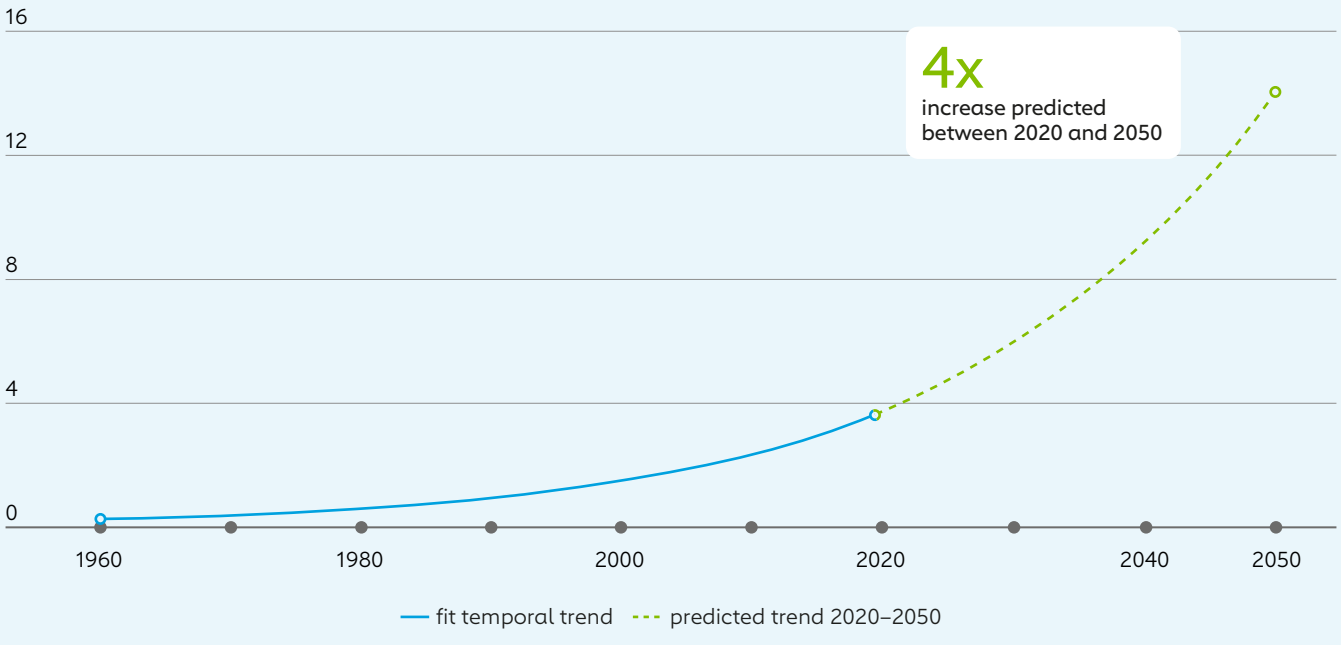
Requests for access to emergency vaccine stockpiles were approved for cholera, Ebola, meningococcal and yellow fever, as well as to the Measles & Rubella Outbreak Response Fund, 15 times in 2020 – fewer than in the years before – but then significantly increased in 2022–2024, with a record 44 requests approved in 2024.[1]

Data from the World Health Organization (WHO) released in September 2024 revealed reported cholera cases were 13% higher in 2023 than in 2022, with this trend continuing in 2024. Deaths from cholera rose 71% over the same period, caused primarily by lack of safe water and sanitation, frequently a result of conflict and displacement.

Looking forward, researchers who analysed trends over the past 50 years have predicted the number of novel disease outbreaks will increase three-fold in coming decades. Another group of researchers focused on outbreaks caused by a group of high-consequence viral zoonotic pathogens, predicting a four-fold increase between 2020 and 2050.

Figure 1 Outbreaks caused by key zoonotic viruses, past and future

The annual number of reported outbreaks caused by filoviruses, SARS coronavirus 1, Machupo virus and Nipah virus from 1960–2019



Source: Meadows AJ et al., Historical trends demonstrate a pattern of increasingly frequent and severe spillover events of high-consequence zoonotic viruses. BMJ Global Health, 2023;8:e012026. Nov;8(11):e012026.

Credit: Gavi/2024/Nipah Dennis

A series of long-term demographic, economic and environmental trends help explain these gloomy forecasts. More people are crossing national borders, meaning an increased risk of pathogens travelling with them. Global air passenger journeys are predicted to increase from 5 billion in 2024 to around 8 billion in 2043. The world's population is both growing and continuing to concentrate in densely populated urban areas.

Then there are the numerous ways in which climate change is influencing the occurrence and distribution of pathogens. Changing weather patterns are leading disease vectors, such as mosquitoes, to carry diseases to previously unaffected regions.

Extreme weather events are increasing the frequency of floods and droughts, displacing populations and causing changes to the distribution of waterborne and vector-borne diseases.

Deforestation, increased demand for wildlife products and animal habitat loss have also driven increased human-animal interactions which, in turn, can increase the risk of emerging zoonotic diseases.

The burden of infectious disease outbreaks is huge, in terms of lives lost as well as in terms of broader health and economic impacts on individuals, families and the health workforce – which can be very stretched while managing disease outbreaks.

It also falls disproportionately on those in lower-income countries. There were some 16.2 million deaths from infectious diseases in 2021, of which 13.7 million occurred in low- and middle-income countries, according to WHO's Global Health Estimates (GHE) data repository.[2]

In the same year, some 151.2 million disability-adjusted life years (DALYs) were lost in the WHO African Region – almost a quarter (22.8%) of the global total of 661.8 million. That compares to 8.2% in all high-income countries combined.[3]

In February 2024, representatives of Gavi-eligible countries, Vaccine Alliance partners and civil society organisations (CSOs) met to discuss strategies and partnerships to tackle outbreaks and safeguard global health security at a side event of a meeting in Togo to discuss Gavi, the Vaccine Alliance's strategy for 2026–2030.

This analysis paper summarises the experiences shared by event attendees from India, Guinea, Senegal and Uganda about how their countries have dealt with a range of disease outbreaks and some of the valuable lessons learnt along the way. It goes on to outline some of the ways Gavi is working with Alliance and extended partners to invest in resilient health systems and support countries in their efforts to prepare for, prevent and respond to future infectious disease outbreaks.

2 Ebola and other outbreaks in Guinea since 2014

Gassim Cissé
Coordinator, Expanded Programme on Immunization (EPI), Guinea

The Republic of Guinea is one of several countries in West and Central Africa that have seen multiple and simultaneous outbreaks of various infectious diseases over the last ten years.

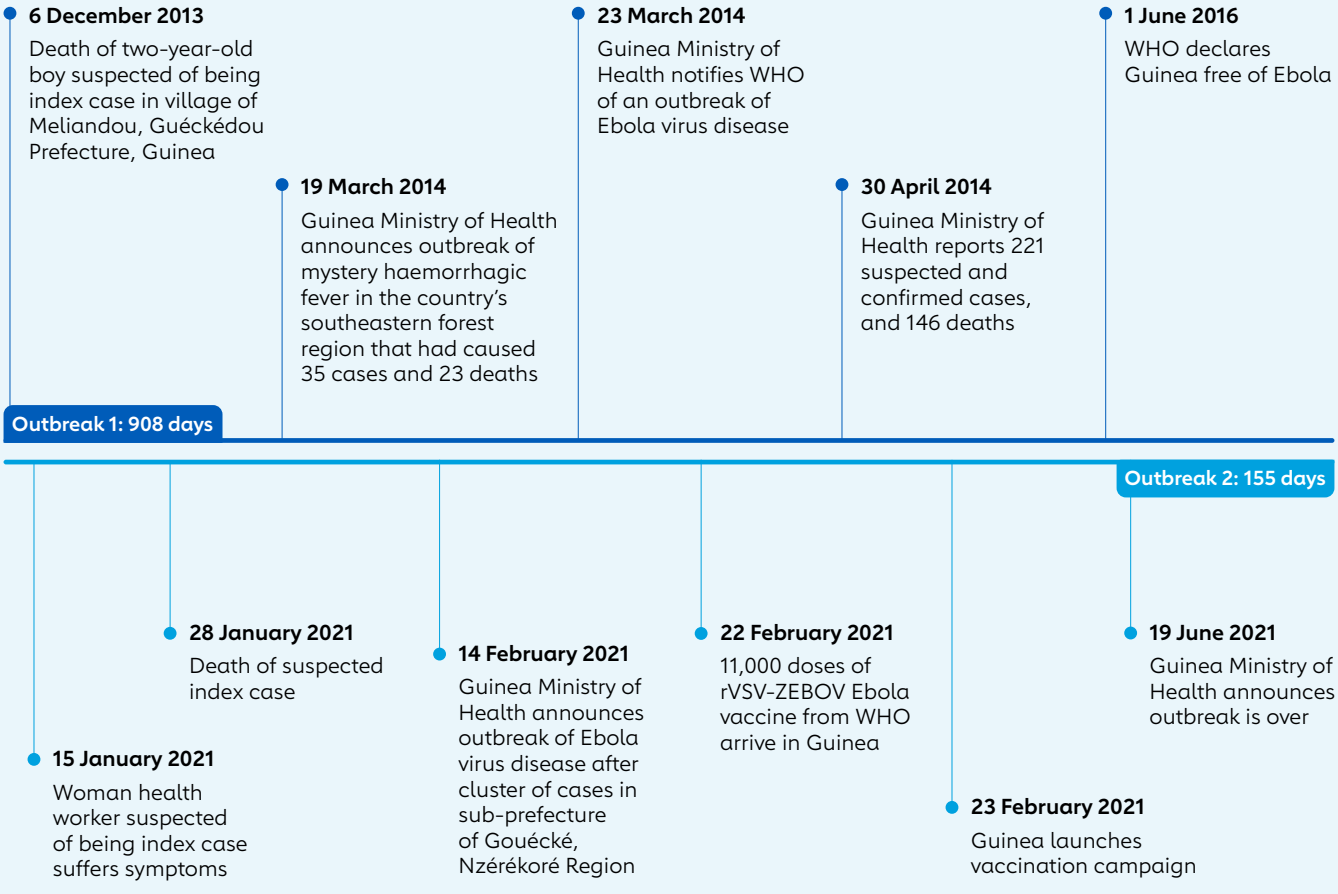
The 2014–2016 Ebola epidemic was the largest since the discovery of the virus in 1976, with more than 28,600 cases and more than 11,300 deaths. It began in Guinea, where there were 3,814 recorded cases and a mortality rate of 66.7%.

Tackling the 2014–2016 outbreak proved to be particularly challenging for Guinea. In contrast to countries in equatorial Africa, it had not previously experienced an Ebola outbreak, and the country's healthcare infrastructure was ill prepared. Equipment and other resources were lacking. Health workers had no experience of diagnosing and managing Ebola virus disease (EVD) cases.

The outbreak caused fear and misunderstanding in communities. Neighbouring countries closed their borders. Guinea also had to deal with a number of other outbreaks during this period, including yellow fever, meningitis, measles and anthrax.

There was another Ebola outbreak in Guinea in 2021, this time with 16 confirmed cases, 7 probable cases and 12 deaths. The country also had to deal with multiple other simultaneous outbreaks, including Lassa fever in 2021–2023, yellow fever and COVID-19.

Figure 2 A tale of two Ebola outbreaks



There were also measles outbreaks during this period, and the country's first known case and death from Marburg virus disease – as well as other public health problems, including HIV, tuberculosis, tetanus, meningitis, malaria and cholera.

The country was, however, better prepared the second time around: the Ministry of Health announced the Ebola outbreak on 14 February 2021. National health authorities, with support from international partners, launched a swift, effective response based on a pre-existing national response plan informed by experience gained during 2014–2016.

Flexibility in implementing the response plan and in the allocation of financial resources in response to events during the outbreak also helped. Cases could be diagnosed and treated at local centres. Samples no longer had to be sent abroad for analysis. Many more health workers had been trained in infection prevention and control.

The involvement of a wider range of government ministries during the second epidemic made for a more effective response, as did the coordinating role of the President's Office.

There were lessons for international organisations too. The first time around, some organisations did not know how best to contribute, and there was a lack of coordination between partners. Organisations must have relevant expertise to provide effective outbreak response assistance. Some neighbouring countries that closed their borders had just as many cases as those that did not.

Clinical trials of Ebola vaccines had been successfully completed by the time of the second epidemic. Around 24,000 vaccine doses were shipped to Guinea, supporting the vaccination of 11,000 people who had come into contact with confirmed cases and others at high risk, including 2,800 frontline workers.

Vaccination began on 23 February, just nine days after the Ministry of Health's announcement. The outbreak was quickly contained and declared over on 19 June 2021.

Lessons learnt during the fight against Ebola also helped inform the response to the Lassa fever outbreak in Guinea during 2021–2023. A haemorrhagic fever laboratory was established, as well as a network of 24 sentinel surveillance sites. A national plan to contain Lassa fever was developed with functions assigned to Public Health Emergency Operations Centres.

Republic of Guinea

→ Ebola and other simultaneous outbreaks
→ 2014–2023

People affected, 2014–2016

Ebola (3,814 cases, 2544 deaths); yellow fever (113 cases, 4 deaths); meningitis (582 cases, 52 deaths); and anthrax (36 cases, 14 deaths).

People affected, 2020–2023

Ebola, 2021 (16 confirmed cases, 7 probable cases, 12 deaths); Lassa fever, 2021–2023 (30 cases); yellow fever (52 cases, 14 deaths); COVID-19 (38,267 cases, 467 deaths).

Key measures taken, 2020–2023

More health workers trained in infection prevention and control; 24,000 vaccine doses shipped, supporting vaccination of 11,000 people at high risk; rapid containment of outbreak; haemorrhagic fever laboratory established; 24 sentinel surveillance sites established; national plan to contain Lassa fever developed.

Key lessons learnt

Sufficient numbers of health workers must be trained in outbreak and infection prevention and control measures; health workers' previous outbreak experience can be key to improved response; national response plan must be in place before epidemics start; flexibility in implementing and funding the national response plan is needed; importance of local diagnosis and treatment; improved disease surveillance is key to outbreak detection and containment; involvement of a wider range of government departments makes for a more effective response; international organisations must have relevant expertise to contribute effectively and must coordinate their efforts; patient management systems should be designed, equipped and financed to deal with simultaneous outbreaks; improved emergency planning needed; standardised patient management protocols can help; specialist infectious tropical diseases services can be important; multidisciplinary patient management systems and healthcare teams are key; access to latest treatment is required; care and support programmes for outbreak survivors are important.

3 The 2023 chikungunya outbreak in Senegal

Dr Ousseynou Badiane
EPI Coordinator, Senegal Ministry of Health

Chikungunya virus is an arbovirus transmitted to people by mosquitoes. It causes high fever, headaches and severe joint pain that can persist for weeks or even months. There have been periodic sporadic cases and outbreaks in Senegal, most recently in 2009–2010, 2015 and 2023.

The first case of the most recent outbreak was reported on 20 January 2023, in the district of Kébémer in the Louga region. It was detected through the R4S network, Senegal's sentinel surveillance system. Health workers were rapidly warned to look out for chikungunya cases as part of enhanced surveillance measures. From July 2023, the epicentre of the chikungunya outbreak was in the east of the country, in the regions of Kédougou and Tambacounda.

The Gates Foundation has previously provided financial support to help establish Advanced Joint Coordination Units (known as UMCAs) in some of our regions to better manage responses to public health emergencies as part of the fight to eradicate malaria.

We activated the UMCA covering the regions of Kédougou and Tambacounda, which ultimately accounted for just under 90% of cases during the 2023 outbreak. This enabled the coordination and provision of additional logistical and financial support, and human resources. It also helped ensure that our response to the outbreak had no impact on routine immunisation in Senegal.

We were able to respond to the outbreak more rapidly because it was possible to mobilise financial support from regional authorities and local districts. This was in addition to national funding, which took longer to be approved.

Public information campaigns were also organised at local levels to inform people how best to protect themselves from mosquitoes. Local village alert committees were used to inform agencies of abnormal events so that they could be investigated rapidly.

The final chikungunya cases were reported on 14 December 2023 in Malem Hodar, in the region of Kaffrine, and in the town of Sédhiou, the capital of Sédhiou region. There were a total of 344 cases during the 2023 outbreak.

During the scientific review that was part of our outbreak response, we discovered that there is a recently developed vaccine against chikungunya. However, the experts on our National Immunisation Technical Advisory Group (NITAG) must assess whether such a vaccine could be used in Senegal, and develop guidance on whether it would be used before the mosquitoes are most active or during an outbreak.

This is not happening yet, as we do not have enough information about the vaccine. It was too early for the 2023 outbreak, but a chikungunya vaccine could play a future role.

Senegal

→ Chikungunya outbreak
→ 2023

People affected

344 cases.

Key measures taken

Reinforced surveillance; rapid use of regional and local funding and other resources; activation of the Advanced Joint Coordination Unit (UMCA) covering the regions of Kédougou and Tambacounda; public awareness campaigns; deployment of local village alert committees.

Key lessons learnt

Sentinel surveillance systems have an important role in early detection; an integrated strategy is needed in the fight against vector-borne diseases with similar symptoms; initial outbreak response should be local; rapid mobilisation of national human and financial resources is important for effective outbreak response; response planning must take into account that outbreaks are cyclical and will reoccur.

4 The 2022 Ebola virus disease outbreak in Uganda

There have been eight Ebola virus disease (EVD) outbreaks in the Republic of Uganda since 2000. The biggest occurred in 2000 (425 cases, 224 deaths), 2007 (131 cases, 42 deaths) and 2022. Five of the outbreaks involved cases of the Sudan ebolavirus, while the others involved the Bundibugyo and Zaire ebolavirus species.

The first cases in the 2022 outbreak were undetected in the community. There were 19 probable Ebola deaths during August and September in Madudu (the outbreak epicentre) and Kiruma – both in Mubende District.

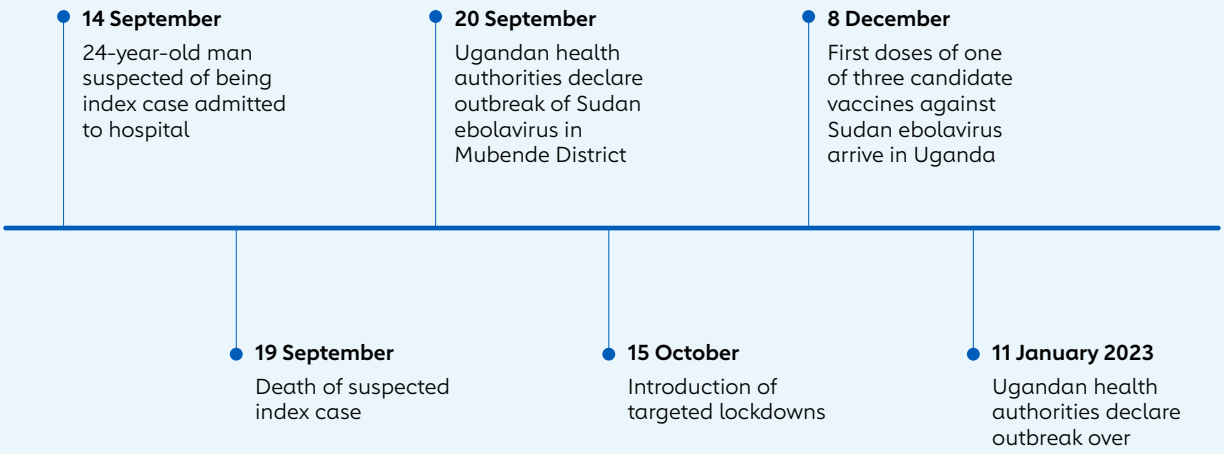
The first confirmed case was a man who was admitted to hospital on 14 September. The case was confirmed as Sudan ebolavirus by the Uganda Virus Research Institute on 19 September. The Ministry of Health declared an Ebola outbreak the following day.

The risks associated with cases and their contacts travelling, especially to the Ugandan capital, Kampala, were rapidly identified.

On 15 October, targeted local lockdowns were introduced in Mubende and Kassanda, a neighbouring district, to try to limit the spread of disease. Enhanced surveillance efforts were introduced, building on existing expertise and experience of epidemic control. The early identification and isolation of case contacts played an important role in breaking the cycle of transmission.

Credit: Gavi/2019/Frederique Tissandier

Figure 3 The 2022 Ebola virus disease outbreak in Uganda



All contacts of confirmed cases were placed on a no-fly list maintained by the Ministry of Internal Affairs and circulated to border immigration officials. The list was updated every 72 hours by the Ministry of Health. This helped prevent the outbreak spreading beyond Uganda's borders.

The National Task Force was managed by the President's Office. A national response plan was developed and implemented. Institutional structures activated to help cope with COVID-19, such as the Incident Management Team and the Emergency Management Centres, were redirected to deal with the Ebola outbreak.

There are still no approved vaccines or treatments for Sudan ebolavirus. The Ministry of Health and WHO co-sponsored a trial, led by Makerere University Lung Institute in Kampala, of three candidate vaccines that were then the subject of research. This involved contacts of confirmed cases who consented to being vaccinated either immediately or after 21 days – a form of a trial design known as ring vaccination.

By 17 December, more than 5,200 doses of the three investigational vaccines had arrived in Uganda. Seven teams, each with 14 members, were trained to run the trial. WHO also supported the development of a therapeutics trial protocol.

The outbreak was declared over on 11 January 2023, following 40 days during which no new cases had been detected. Overall, there were 142 cases and 55 deaths during the outbreak.

Republic of Uganda

→ Ebola outbreak caused by Sudan ebolavirus
→ 2022

People affected
142 cases, 55 deaths.

Key measures taken
Targeted local lockdowns; enhanced surveillance; early identification and isolation of case contacts; distribution and regular update of no-fly list; repurposing of COVID-19 systems; and launch of Sudan ebolavirus vaccine trial.

Key lessons learnt
Improved surveillance needed; partners must coordinate more effectively and determine more rapidly which will take the lead on different aspects of intervention; resources should be available at outbreak start; need for globally agreed prioritisation of candidate vaccines for rare diseases; need for agreed trial platforms and simple protocols pre-approved by institutional review boards in at-risk countries to enable rapid clinical trials of candidate vaccines from investigational reserves during outbreaks.

5 Dengue in India

Dengue fever is a viral disease caused by dengue virus, which is transmitted to humans when they are bitten by infected mosquitoes.

India ranks among the world's top 30 most highly endemic countries for dengue. Reported cases in India rose from 101,000 in 2018 to an unprecedented 233,000 in 2022; however, the dengue case fatality rate declined in the country from 3.3% in 1996 to 0.3% in 2014. It has been kept below 1% since 2008.

There is an annual upsurge in dengue cases in India during July–November following the monsoon, or rainy season, when mosquitoes breed. All four dengue virus serotypes (DENV-1, DENV-2, DENV-3 and DENV-4) have been reported in India; DENV-2 is responsible for most cases. Infection with one of the four serotypes conveys lifetime immunity, but only to that serotype. What was previously a primarily urban disease is now frequently also reported in rural areas.

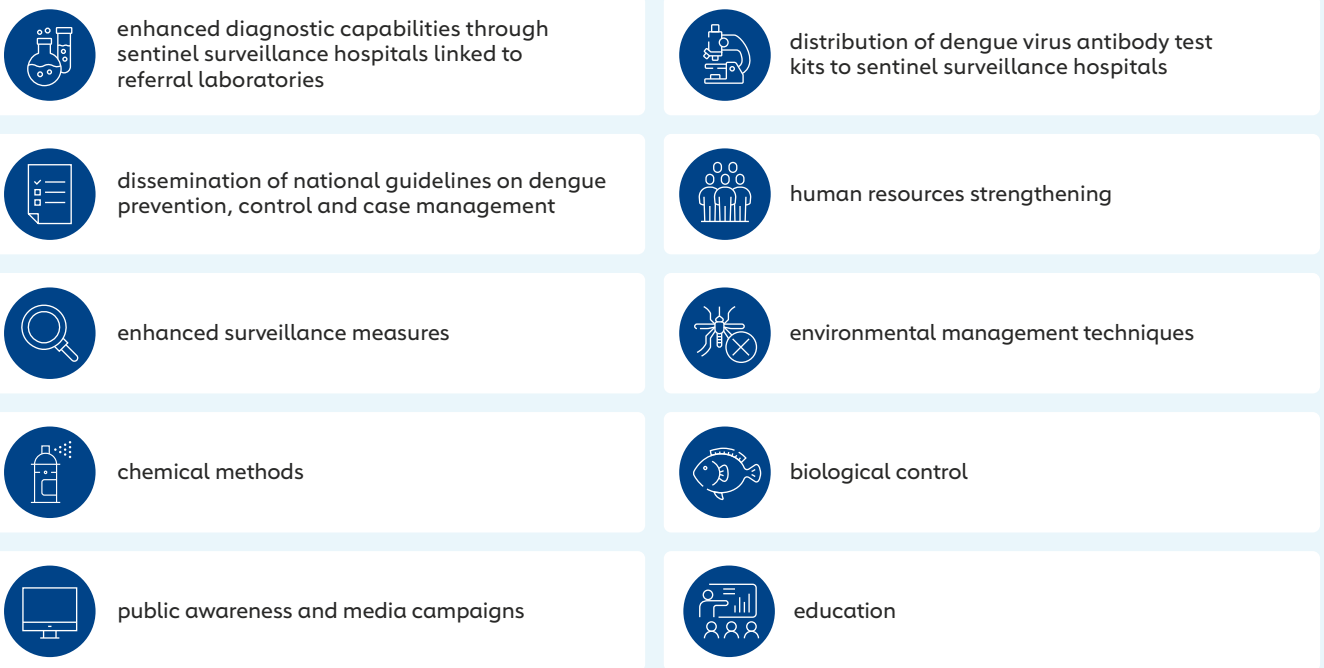
The authorities in India deploy a wide range of interventions in response to dengue outbreaks. These include enhancing diagnostic capabilities through the establishment of sentinel surveillance hospitals linked to key referral laboratories, and through the distribution of MAC-ELISA test kits (which detect dengue virus antibodies) to these hospitals.

They also disseminate national guidelines on dengue prevention, control and case management. To help drive implementation of the guidelines during dengue outbreaks and upsurges, the authorities also provide human resources strengthening and capacity building for programme managers.

Disease surveillance measures are also enhanced. Volunteers are recruited to check for and eliminate mosquito breeding sites during periods of peak transmission. Mosquito control methods include: environmental management techniques (e.g. reduction of interactions between humans and mosquitoes); chemical methods (e.g. insecticide spraying); biochemical approaches (e.g. use of insect growth regulators); and biological control, through adding to large water bodies fish species that eat mosquito larvae.

India also deploys a range of social mobilisation, public awareness and education-based measures. Awareness-raising activities are organised on National Dengue Day every year on 16 May, highlighting the importance of pre-monsoon preventive approaches. Roadside billboards, and advertising in newspapers and electronic media, are used in these campaigns.

Figure 4 **How India deals with dengue outbreaks**



Credit: Gavi/2023/Rakesh Kumar

Members of the public are encouraged to check water tanks and other potential mosquito breeding sites in their homes weekly during mosquito breeding season. Senior ministers, politicians and influential community figures take the lead in awareness campaigns.

Multiple national government departments – including the Ministries of Urban Development, Rural Development and Panchayati Raj (which deal with decentralisation) – and local self-government bodies (e.g. health, education and transport) share public information about dengue.

Municipal and civic bodies are tasked with checking that public buildings, including schools, are free of mosquito breeding sites; as well as carrying out repairs to prevent leaks that could lead to water accumulation and mosquito breeding. Excess water storage is discouraged for the same reason.

India

→ dengue fever outbreaks

People affected

Numbers rising in recent years, with an unprecedented 233,000 cases in 2022.

Key measures taken

Enhanced diagnostics and disease surveillance; distribution of test kits; dissemination of prevention, control and case management guidelines; human resources strengthening and capacity building; volunteers recruited to check and eliminate mosquito breeding sites; insecticide spraying, use of insect growth regulators, addition of mosquito larvae-eating fish to large water bodies; public awareness campaigns led by politicians and influential community figures; members of the public asked to check potential mosquito breeding sites; involvement of multiple branches of national government and municipal bodies.

6 How Gavi is supporting efforts to prepare for and tackle outbreaks

Preparing for and tackling infectious disease outbreaks, epidemics and pandemics is expensive. Not taking such measures is, however, even more costly.

Beyond the direct health impacts, outbreaks disrupt routine immunisation programmes and the delivery of broader health services. Other costs of failing to prepare for outbreaks include long-term mental health burdens, loss of educational opportunities, unemployment, social stigma and potentially huge economic losses.

The direct and indirect worldwide costs of the approximately 18.7 million cases of chikungunya reported in 110 countries between 2011 and 2020 has been estimated at close to US$ 50 billion, while the global bill for the SARS pandemic in Asia came to approximately US$ 52 billion.

Gavi works with a wide variety of stakeholders in both the public and private sectors to prevent, prepare for and respond to infectious disease outbreaks, at both country and global levels.

Country-level interventions and solutions

Vaccine stockpiles

The best-case scenario is preventing outbreaks before they take hold in the first place through interventions such as routine immunisation, preventive vaccination campaigns, health system strengthening and training health workers. It also makes sense to prepare in ways that minimise the impacts of outbreaks when they do occur. The maintenance and then rapid deployment of emergency vaccine stockpiles provide key ways to limit the spread of disease and protect affected communities.

The International Coordinating Group (ICG) on Vaccine Provision (see below) manages the allocation of emergency vaccine supplies, funded by Gavi, during major outbreaks.

During the 2026–2030 period, Gavi plans to invest US$ 454 million in Ebola, meningococcal, oral cholera and yellow fever vaccines, as well as measles/measles-rubella outbreak response vaccination. This will provide capacity to respond to at least 150 outbreaks.

In June 2024, Gavi announced plans to establish a global stockpile of mpox and hepatitis E vaccines once certain conditions are met (see "Gavi's response to mpox", below).

The International Coordinating Group (ICG) on Vaccine Provision

When outbreaks occur, the spread of disease can be limited by timely vaccination. Sometimes, however, countries do not routinely use the relevant vaccine – so they require access to emergency vaccine stockpiles.

The ICG was set up in 1997 following major outbreaks of meningitis in Africa, to ensure that limited emergency supplies of vaccines and antibiotics get to where they are most needed. It is composed of four partners: the International Federation of Red Cross and Red Crescent Societies (IFRC); Médecins Sans Frontières (MSF); United Nations Children's Fund (UNICEF) and the World Health Organization (WHO).

The ICG manages the global emergency stockpiles of licensed vaccines against cholera, Ebola virus disease (EVD), meningitis and yellow fever. It works with partners, donors and manufacturers to determine appropriate stockpile sizes and composition with the aim of making sure adequate stocks are accessible for emergency response.

Credit: Gavi/2024/Armend Nimani

Gavi provides financial support for ICG stockpiles and their delivery to affected communities. While all countries can access vaccines from these stockpiles during outbreaks, Gavi-eligible countries receive them free of cost and get financial support for campaign implementation.

Preventive campaigns

Preventive vaccination campaigns are another core means of reducing both the chances of infectious disease outbreaks and their severity. These non-routine, targeted campaigns can be offered to populations in affected regions or high-risk subgroups such as health workers.

Gavi funds preventive vaccination campaigns for a range of diseases. Since 2014, for example, it has supported the global oral cholera vaccine (OCV) stockpile, which has an emergency component managed by the ICG, and a preventive vaccination programme focused on endemic areas known as 'cholera hotspots'.

The Alliance provides support for preventive vaccination campaigns, alongside routine immunisation, for vaccines including: human papillomavirus (HPV) vaccine; measles and rubella vaccines; meningitis A vaccine and multivalent meningococcal conjugate vaccine (MMCV); typhoid conjugate vaccine (TCV); and yellow fever vaccine.

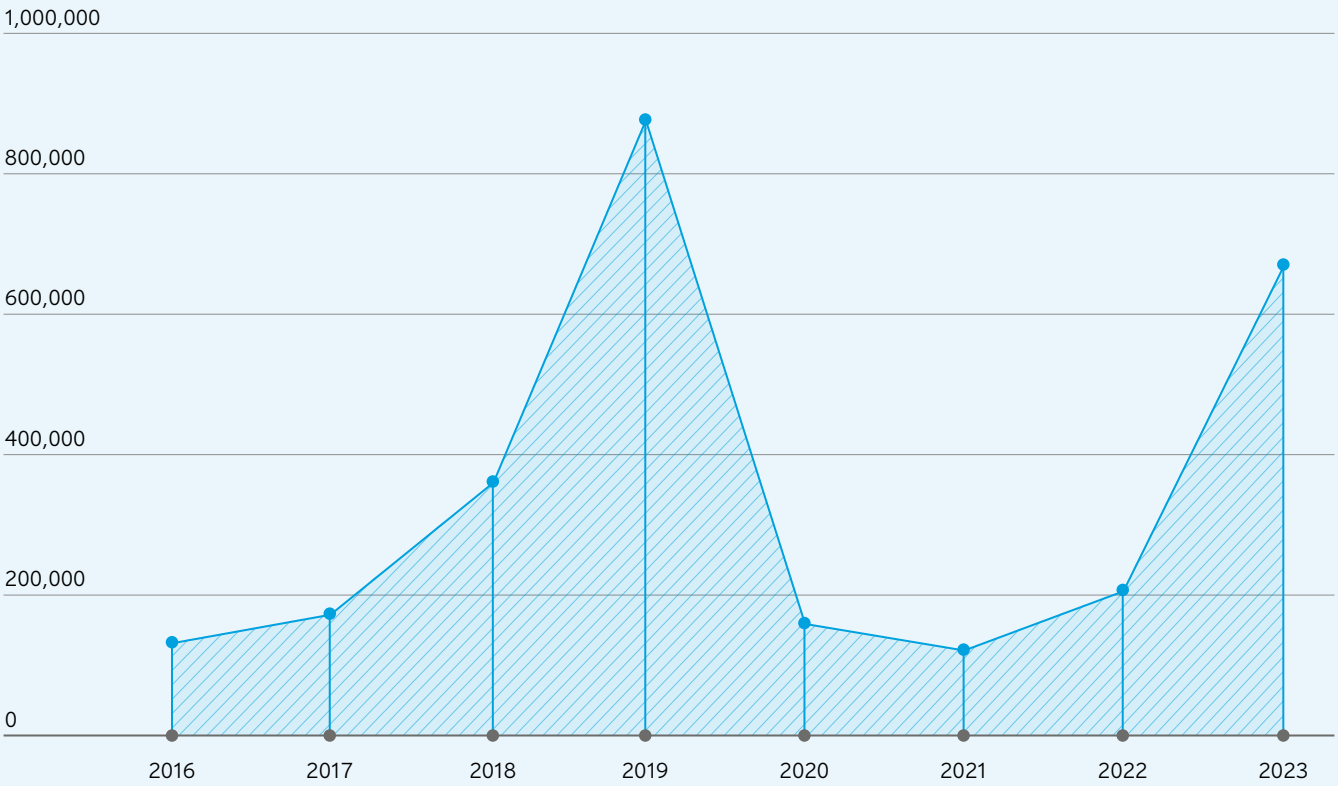
In June 2024, Gavi began funding preventive Ebola vaccination for health and other frontline workers who would be first to encounter or respond to new epidemics in countries most at risk of outbreaks.

Measles & Rubella Partnership Outbreak Response Fund

Estimated measles cases increased worldwide by 18% in 2022 to about 9 million, and estimated deaths were up 43% to 136,000. During that year, 37 countries experienced large, disruptive measles outbreaks, compared with 22 countries the previous year. Coverage with a first dose of measles-containing vaccine (MCV1) fell by 1 percentage point to 78% between 2022 and 2023 in Gavi-supported countries.

Figure 5 **The growing global burden of measles**

Annual reported cases of measles worldwide, 2016–2023



Source: WHO/UNICEF Joint Reporting Form on Immunization (JRF)

Although second-dose coverage increased from 64% to 66% in 2023, these levels are far short of those needed to prevent outbreaks, avert unnecessary deaths and achieve elimination goals.

At the end of 2023, 19 countries, mostly in the WHO African Region, still did not include a rubella-containing vaccine as part of their routine immunisation programmes.

Significant progress has, however, been made since the launch of the Measles & Rubella Partnership (M&RP) in 2001.[4] Gavi has been funding the M&RP Outbreak Response Fund since 2015. During its 2021–2025 strategic period, the Alliance expects to provide US$ 943 million to support countries in combatting measles and rubella through routine immunisation, preventive campaigns and outbreak response. In May 2024, Gavi launched its largest-ever measles and rubella vaccination drive in Africa, with the goal of reaching up to 100 million children across 20 countries through catch-up and follow-up campaigns.

Surveillance and diagnostic support

Effective infectious disease surveillance enables rapid outbreak detection and response, as well as helping guide prevention efforts through the characterisation of disease transmission patterns. It allows the timely release of vaccine stockpiles, maximising their impact and reducing the risks of outbreaks becoming epidemics and pandemics.

The systematic collection, analysis, interpretation and dissemination of information about disease occurrence can help reduce both the unnecessary use of stockpiled vaccines and the risk of disruption to routine immunisation. It can also inform national disease control efforts and help shape effective vaccination strategies.

Gavi supports surveillance activities, such as investment in digital health information systems and laboratory networks in some countries as part of its funding for health system strengthening (HSS). And it funds the procurement of diagnostics for six priority diseases – cholera, measles, meningococcal meningitis, rubella, typhoid and yellow fever – while working to shape the markets for those diagnostics.

Gavi also funds technical assistance in countries to support the integration of these diagnostics into national and regional surveillance systems. In the case of yellow fever, Gavi support for improved diagnostics in 22 countries in Africa's 'yellow fever belt' has helped significantly reduce average times from the onset of symptoms to confirmatory test results; and save tens of millions of dollars in spending by averting unnecessary outbreak responses.

The Alliance is aiming to increase the effectiveness of oral cholera vaccine (OCV) campaigns – and national resources for cholera prevention and control – by increasing both the geographical range and frequency of rapid diagnostic testing of suspected cholera cases. Improved diagnostic capabilities will reduce reliance on clinical judgement of suspected cases and enable better targeting of interventions.

Fragility, emergencies and displaced populations

Fragile environments, insecurity, conflict and emergencies make it challenging for some population groups, including displaced communities, to access routine immunisation services, leaving them unprotected against vaccine-preventable diseases.

These circumstances – whether caused, for example, by conflict, volatile political situations, macroeconomic instability or climate change – also pose challenges for Gavi's vision of achieving equity in immunisation and reaching the 'zero-dose' children who have not received any routine vaccine.

To address this, Gavi adopted a Fragility, Emergencies and Displaced Populations Policy in June 2022. This enables the Alliance to prioritise countries affected by chronic fragility and acute emergencies, and those hosting large numbers of displaced people, with flexible, differentiated support to maintain and strengthen immunisation coverage.

This tailored approach can help identify and reach zero-dose children and missed communities with immunisation and other essential services.

Support for health system strengthening and civil society organisations

Gavi has adopted an ambitious strategy for 2026–2030, aiming to help countries immunise over 500 million children, saving 8–9 million lives, and extend routine immunisation programmes to reach more missed communities, and zero-dose and under-immunised children. Delivering these goals will require preventing, preparing for and responding to outbreaks through health systems that are often stretched and face critical capacity gaps.

Gavi first introduced HSS support in 2006 and has scaled up funding for it ever since. A proposed new Gavi Health Systems Strategy, discussed by the Gavi Board in December 2024, seeks to provide a clear framework to guide its health systems investments to increase the equity and sustainability of immunisation programmes.

This includes a commitment to strengthen the capacity of countries to prepare for and manage potential threats, including novel or re-emerging disease outbreaks. The Alliance will do this through support in areas such as cold chain equipment, digital health data systems and workforce training. At international, national and local levels, CSOs play vital roles in outbreak detection, prevention, preparedness and response. Gavi supports this work by requiring countries to allocate at least 10% of certain grant funding (including HSS) for activities undertaken by CSO partners.

Global-level solutions

Day Zero Financing Facility for Pandemics

One of the key lessons of the COVID-19 pandemic was that delayed access to financing can leave lower-income countries at the back of the queue for vaccines. COVAX, established in April 2020 and jointly led by Gavi and partners, helped avert millions of deaths in lower-income countries. However, only US$ 400 million of the US$ 2.4 billion pledged to COVAX had been received by end 2020, leaving it unable to achieve its goal of ensuring equitable access to COVID-19 vaccines.

A simulation carried out by the G20 Joint Health Financing Task Force found that in the event of another COVID-19-type pandemic, the ability to access sufficient contingent funds in under 30 days could reduce deaths by up to 74% and economic costs by 95%.[5]

That's why, in December 2023, the Gavi Board approved proposals to establish a Day Zero Financing Facility for Pandemics (DZF). This Facility is being developed as a suite of instruments that can provide surge financing for rapid vaccine responses and help achieve greater equity in outcomes for the countries that Gavi supports during future public health emergencies. The aim is to establish up to US$ 2.5 billion in surge financing capacity by 2030.

First Response Fund

A critical component of DZF is the First Response Fund (FRF). Also agreed by the Gavi Board in December 2023, the FRF will provide up to US$ 500 million to Gavi-eligible countries in the early days of a pandemic or major health emergency.

There are a number of existing organisations, collaborations and mechanisms that provide international financing for pandemic preparedness, prevention and response.

FRF differs from these in a number of key ways:

- It is fully funded from launch to save the vital weeks and months that would otherwise be needed to mobilise new donor pledges, sign grant agreements and collect cash;
- It is able to respond rapidly with initial disbursements expected within five days for amounts below US$ 50 million; and
- Its financing is designed to be 'at-risk', enabling, for example, agreement of advance purchase commitments for vaccines that are yet to receive full regulatory approvals.

The inaugural use of FRF came on 18 September 2024, with the announcement of Gavi's signing of an advance purchase agreement with vaccine company Bavarian Nordic for 500,000 mpox vaccine doses for African countries.

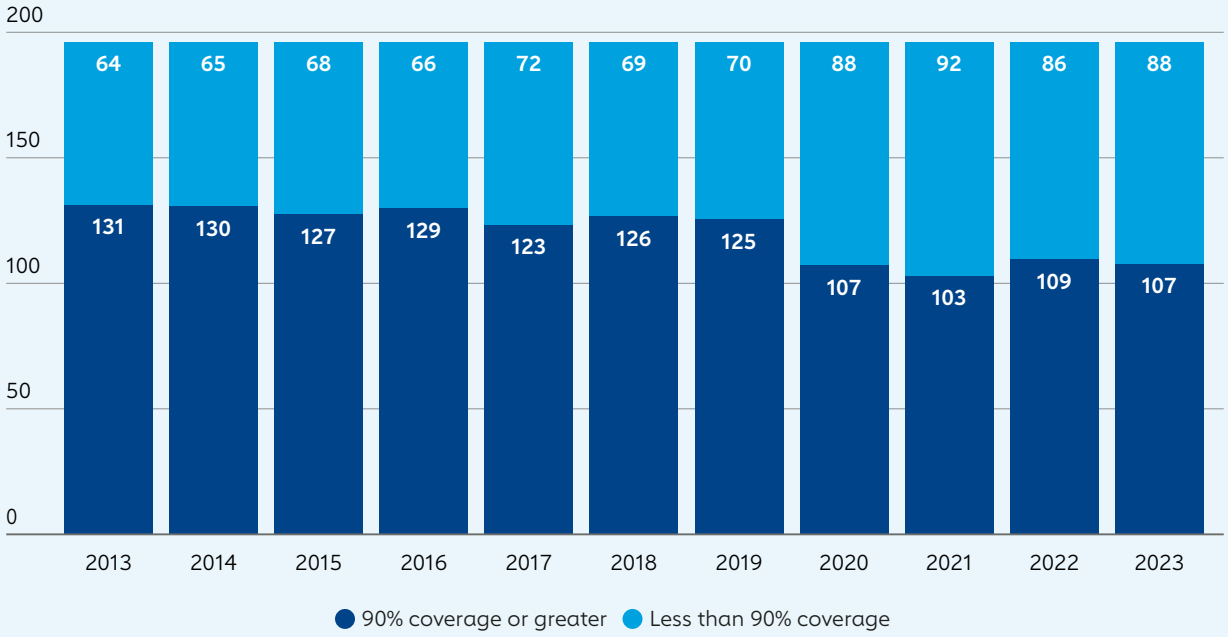
"The Big Catch-up"

The COVID-19 pandemic caused declines in childhood vaccination rates in over 100 countries and helped drive increased outbreaks of diphtheria, measles, polio and yellow fever. These were the result of overburdened health services; disruptions to imports and exports of immunisation supplies; and lockdowns and travel restrictions. Ongoing conflicts, the climate crisis and vaccine hesitancy also contributed to declining coverage rates.

Credit: Gavi/2024/Mohamed Abdihakim Ali

Figure 6 **The impact of the COVID-19 pandemic on childhood vaccination**

Number of countries achieving 90% coverage of DTP3, 2013–2023



The percentage of children receiving a third dose of diphtheria, tetanus and pertussis-containing vaccine (DTP3) is often used to measure the overall health system strength to deliver infant vaccination and has a global target of 90% as set by the Immunization Agenda 2030. **In 2023, 107 countries achieved at least 90% coverage of DTP3**, down from 125 countries in 2019.

Source: WHO/UNICEF Estimates of National Immunization Coverage (WUENIC), 2023 revision (published in July 2024)

In April 2023, Gavi joined forces with WHO, UNICEF, the Gates Foundation and others to launch "The Big Catch-up" to reverse the declines in childhood vaccination caused by the pandemic, as well as strengthen primary health care services.

Later that year, Gavi announced initial funding of US$ 290 million for the plan and subsequently allocated nearly 200 million vaccine doses to 35 lower-income countries, demonstrating the ability to pivot to outbreak response when necessary.

A vaccine coalition

During the second half of 2020, it became increasingly apparent that gaps in delivery systems and mechanisms threatened to undermine the successful roll-out of COVID-19 vaccines in lower-income countries. This led to COVAX taking on a growing role in supporting in-country delivery and ultimately to the establishment of the COVID-19 Vaccine Delivery Partnership (CoVDP) by Gavi, WHO and UNICEF in January 2022.

Another key lesson of the COVID-19 pandemic was that Vaccine Alliance partners and other organisations must be ready to collaborate more effectively to ensure the delivery of vaccines in response to major future outbreaks. The best way to achieve this is the establishment of a coalition of stakeholders to ensure that the funding, systems, tools and people are ready to deliver vaccines effectively and equitably from the outset of any future outbreak, pandemic or other emergency.

While this coalition is intended to be designed primarily with preparedness in mind, it must also have the capacity to redirect resources to response efforts when outbreaks occur. In December 2023, the Gavi Board approved up to US$ 22 million to support the establishment of a coalition of vaccine partners.

Gavi's Global Health Security team

Vaccines are critical for the prevention of, and response to, outbreaks, epidemics and pandemics. As such, they are critical to the maintenance of global health security. This was demonstrated during 2020–2021 by the greater ability of countries with strong immunisation programmes to implement effective vaccine responses to the COVID-19 pandemic.

In support of its commitment to strengthen its partnerships with other organisations and stakeholders working on improved pandemic prevention, preparedness and response (PPPR) and health security at global, regional and national levels, in January 2024 Gavi established a new Global Health Security team to coordinate its efforts in this vital area.

Its role complements the work of the Vaccine Programmes team, which oversees and manages Gavi's vaccine programmes and stockpile support.

Credit: Gavi/2022/Asad Zaidi

Gavi's response to mpox

Gavi has been monitoring mpox since 2022. In June 2024, the Gavi Board approved plans to establish a global stockpile of mpox vaccines.

On 13 August 2024, the Africa Centres for Disease Control and Prevention (Africa CDC) declared the mpox outbreak in the Democratic Republic of the Congo (DRC) and other countries in Africa to be a Public Health Emergency of Continental Security (PHECS). The following day, WHO declared it was a public health emergency of international concern (PHEIC). More than 29,000 cases and more than 800 deaths were reported between the start of the year and mid-September.

Immediately after the PHEIC declaration, Gavi made a formal declaration that the upsurge in mpox cases was a regional emergency, meaning it could deploy more flexible, streamlined approaches to enable the repurposing of available funds for vaccine response; adopt a 'no-regrets' approach to risk; and waive the formal independent review process for new vaccine introductions and campaigns.

In September 2024, Gavi responded rapidly to the mpox emergency by announcing an advance purchase agreement to purchase 500,000 mpox vaccine doses for African countries. The deal saw the first use of the First Response Fund, a new financial mechanism created by Gavi in June 2024 to make money rapidly available to purchase vaccines in health emergencies.

Gavi has reprogrammed funds and unlocked emergency funding to help affected countries begin preparations for vaccine roll-out, such as health worker training and community engagement.

The Alliance is also working with the DRC government, Africa CDC, WHO, UNICEF and others to design vaccination strategies based on the known available supply of dose donations.

Gavi is also offering Africa CDC and other partners information on the complex technical, legal, regulatory and logistical considerations involved in mounting rapid vaccination campaigns with donated doses, using the expertise and experience gained during the COVID-19 pandemic.

References

1. https://www.gavi.org/news/document-library/2026-2030-gavi-investment-opportunity
2. Global Health Estimates 2021: Deaths by Cause, Age, Sex, by Country and by Region, 2000–2021. Geneva, World Health Organization; 2024.
3. Global Health Estimates 2021: Disease burden by Cause, Age, Sex, by Country and by Region, 2000–2021. Geneva, World Health Organization; 2024.
4. Known as the Measles and Rubella Initiative until 2023
5. https://www.gavi.org/news/document-library/11a-day-zero-financing-facility-first-response-fund-pdf

facebook.com/gavi

@gavi / @gavi_fr / @vaccines

@gavialliance

linkedin.com/company/gavi

youtube.com/gavialliance