

Position paper

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Gavi's role at the crossroads of climate change and immunisation



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Cover image: "It's difficult, but we'll find a way": a new vaccine against typhoid rolls out in a flood-devastated province of Pakistan.

[Read the full article](#) [Watch the video](#)

Credit: Gavi/2022/Asad Zaidi

Why climate change matters to Gavi

Climate change is a fundamental threat to human health for many reasons. One is that it poses major challenges to immunisation programmes and therefore puts at risk some of the major health gains achieved through increased access to life-saving vaccines in lower-income countries since the year 2000.

Rising temperatures and other changes in weather patterns are altering the geographic distributions of pathogens that spread vaccine-preventable infectious diseases. One study, published in 2022, found that 58% of pathogenic human diseases have at some point been aggravated by climate hazards (see figure 1).¹

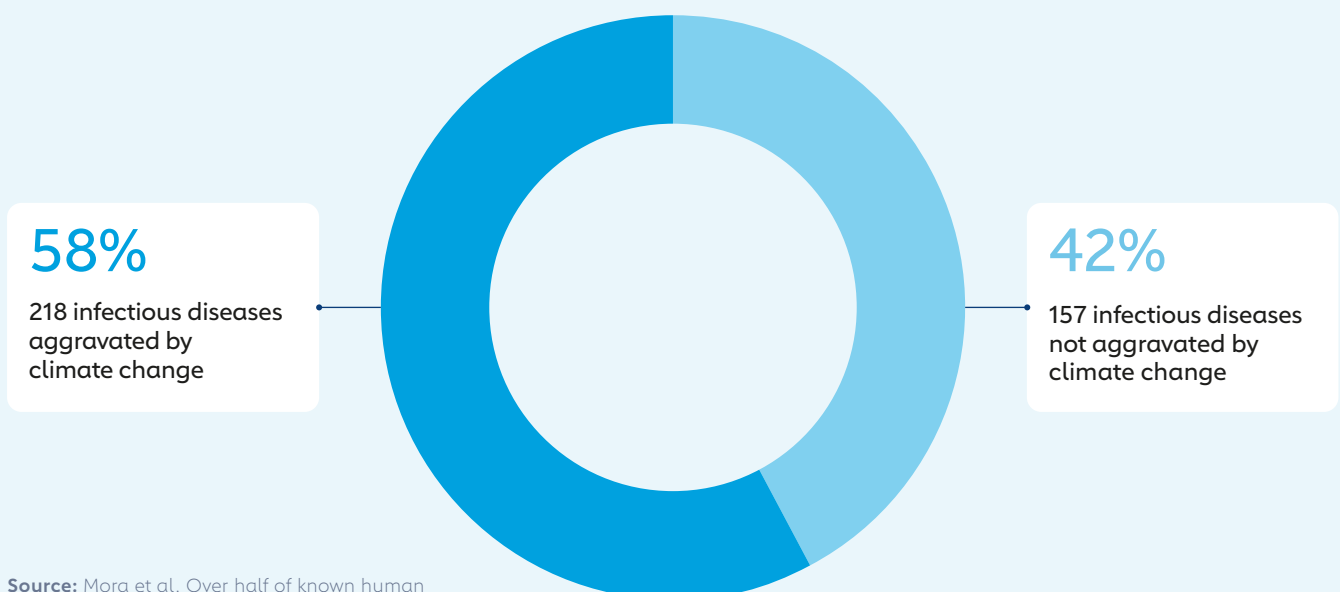
Higher temperatures can, for example, drive the spread of malaria in previously unaffected areas, while increased rainfall can provide more sites for mosquitoes to breed.² Researchers estimate that temperature increases will lead to increases in deaths from cholera, shigella and typhoid of 5%, 7% and 13% respectively by 2040.³

Elevated intensity and frequency of extreme weather events such as floods and droughts can cause increased disease outbreaks and impact immunisation programmes in a wide range of ways, including by disrupting supply chains, breaking the cold chain, damaging healthcare facilities and causing workforce shortages. Rainfall during the 2022 monsoon season in Pakistan, for example, was some [90% higher than normal](#), leading to floods and landslides that displaced 8 million people, killed around 1,700 and [severely disrupted](#) the country's immunisation programme.

The health impacts of climate change fall disproportionately on [people in certain countries and locations](#) within them, primarily because of either a lack of resources to support resilience against them, or for reasons of geography and climate. Within those nations that are hardest hit are population groups that are particularly vulnerable, including children, women and refugees. Children who do not receive any essential routine vaccines or who miss some of their doses are particularly impacted, as they are often part of marginalised communities that are most affected by emergencies caused by weather-related hazards. By exacerbating existing inequalities, changing climates make Gavi's efforts to prioritise the vulnerable both more challenging and important.

Figure 1 **Diseases affected by climate change hazards**

Human diseases affected by climate change as a proportion of all reported infectious diseases



Source: Mora et al. Over half of known human pathogenic diseases can be aggravated by climate change. *Nat Clim Chang*, 2022, 12, 869–875.

How Gavi currently addresses climate change

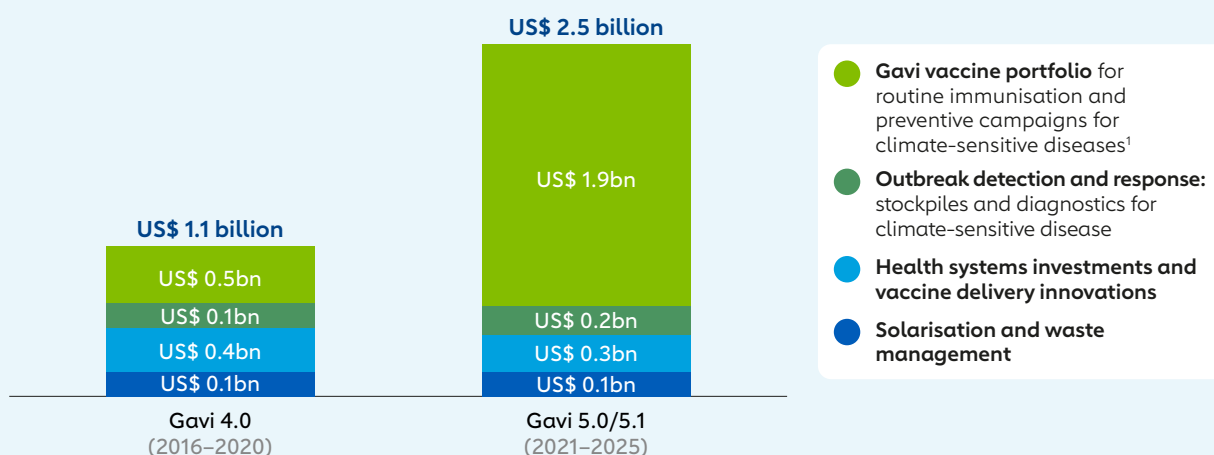
The United Nations Intergovernmental Panel on Climate Change (IPCC) identifies immunisation as an effective climate adaptation tool. There are multiple vaccines that protect against climate-sensitive diseases, including cholera, dengue, Japanese encephalitis, malaria, meningitis A, typhoid and yellow fever.

These vaccines reduce the risk of severe illness, hospitalisation and death from climate-sensitive infectious diseases, lessen the threat of disease outbreaks and ease the strain on health systems. Investing in them helps communities and health infrastructures build resilience against the impacts of climate change.

From 2016–2025 (Gavi's 4.0 and 5.0/5.1 strategic periods), Gavi investments that are helping countries adapt to the effects of climate change include US\$ 2.4 billion for routine immunisation and preventive vaccination campaigns against climate-sensitive diseases.⁴ The Vaccine Alliance is also providing US\$ 42 million to improve diagnostics capacity and US\$ 275 million for vaccine stockpiles for climate-sensitive, outbreak-prone diseases during this period (see figure 2).

Figure 2 Gavi support that helps countries adapt to climate change, 2016–2025

Gavi support that both benefits Gavi's core mission and helps countries adapt to climate change during the Gavi 4.0 and Gavi 5.0/5.1 strategic periods



Note: 1. Including vaccine introduction grants (VIGs) and operational support for campaigns (Ops) for climate sensitive diseases – for simplification purposes, they have been attributed to the vaccine portfolio bucket.

Gavi supports countries in other ways that contribute to climate adaptation, such as through health system strengthening (HSS) and vaccine delivery innovations. Examples include: early warning systems and health surveillance; rapid response teams for climate-driven health emergencies; improving vaccine delivery; and cold chain systems and wider health infrastructure strengthening. In a report due for publication at the 30th Conference of the Parties (COP30) of the UN Framework Convention on Climate Change (UNFCCC) in Brazil, researchers calculated that Gavi is providing US\$ 2.6 billion worth of broader health investments with climate relevance during 2019–2025, of which US\$ 614.6 million is contributing to climate change adaptation.⁵

Gavi also delivers flexible, timely support to maintain and strengthen immunisation coverage in countries affected by fragility and emergencies, including those linked to climate change, through its [Fragility, Emergencies and Displaced Populations Policy](#). This enabled the provision of US\$ 6.1 million in surge funding in response to the interruption of immunisation in Pakistan following the 2022 floods, for example.

Through the [Zero-Dose Immunization Programme](#) (ZIP), Gavi supports children in displaced communities, and fragile and conflict settings in [11 countries in the Horn of Africa and the Sahel](#) through adaptive, responsive immunisation service delivery, including in response to the impacts of changing climatic conditions.

Gavi's approach going forward

Gavi plans to increase spending on routine immunisation and emergency stockpiles against climate-sensitive diseases to around US\$ 2.2 billion during its 2026–2030 strategic period (Gavi 6.0). This includes funding for vaccines against cholera, Japanese encephalitis, malaria, meningitis A, typhoid and yellow fever, as well as US\$ 7 million for the introduction of a new vaccine against dengue (see figure 3).

The Vaccine Alliance is working to improve its response to future emergencies including climate-induced outbreaks. It will aim to embed immunisation as a core component of humanitarian health responses and strengthen collaboration with other humanitarian actors. Plans are under way for the [Gavi Resilience Mechanism](#) – a new funding tool designed to respond rapidly to unforeseen country needs such as outbreaks and emergencies, including those related to climate change, that are not covered by existing support mechanisms.

Gavi is committed to the principle that it is for countries to decide how their financial resources are allocated. It also believes that the lives of the vulnerable populations it serves will be best protected and improved if:

national health and immunisation systems are designed to be climate-resilient;

countries work closely with funders such as multinational development banks that focus on strengthening health infrastructure through climate-resilient facilities; and

immunisation is integrated into national climate and health adaptation plans to reduce the impacts of climate-sensitive diseases, lower demand on health systems and improve resilience against health-related climate emergencies.

Mitigation

The Vaccine Alliance is funding efforts to reduce greenhouse gas emissions. It has, for example, supported the installation of more than 41,000 solar-driven fridges since 2017, providing countries with the potential to avert 15,300 tonnes of CO₂ emissions annually.

It is providing US\$ 28 million towards the [solar-powered electrification](#) of more than 1,300 health facilities in Zambia, Ethiopia, Pakistan and Uganda, and US\$ 11.6 million for climate-friendly healthcare waste management technologies, in partnership with the Global Fund and UNICEF.

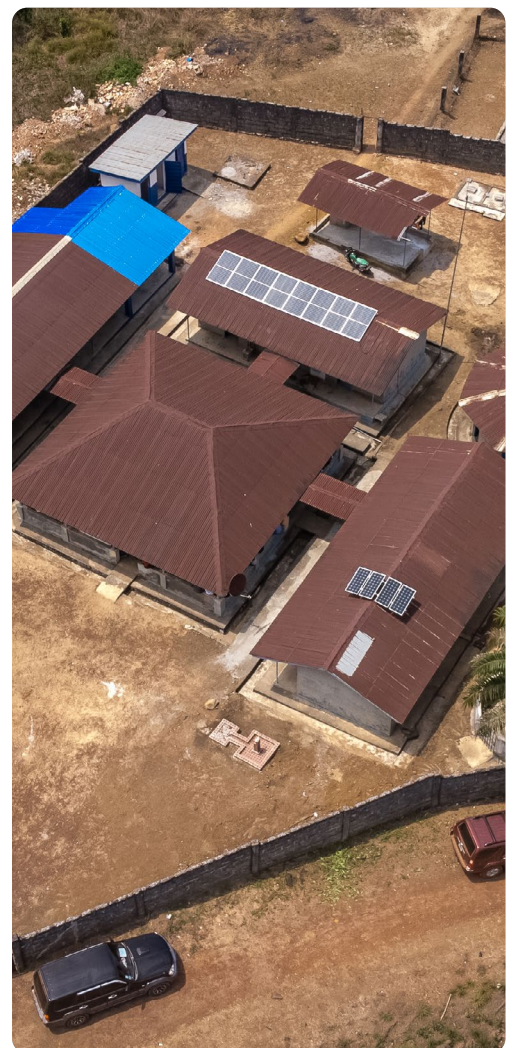
Gavi will continue to support mitigation efforts through:

further investments in cold chain solarisation and waste management;

advocating for emissions reductions in immunisation supply chains across the Alliance; and

encouraging the use of multi-dose vaccine vials, combination vaccines and heat-stable vaccines.

While supporting these broader climate mitigation efforts, the Gavi Secretariat has more control over the greenhouse gas emissions it is directly responsible for. In 2024, it generated 280 tonnes CO₂ equivalent (tCO₂e) from electricity use at its offices in Geneva and Washington, and 4,737 tCO₂e from travel by employees and consultants. That is equivalent to the average CO₂ emissions of 672 homes in the United States of America per year.



Credit: Power Africa, Tolu Jethro Bade, Envizage Concepts

Figure 3

Gavi planned investments in vaccines against climate-sensitive diseases, 2026–2030

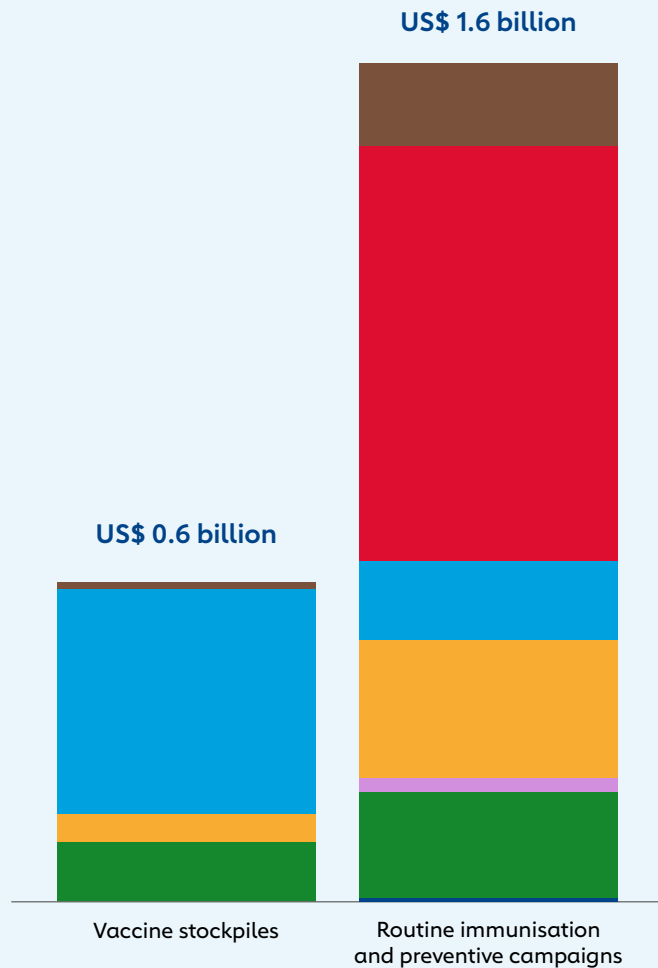
Gavi planned support for routine immunisation, preventive campaigns and stockpiles of vaccines against seven climate-sensitive diseases during the 2026–2030 strategic period (Gavi 6.0)

Meningococcal A Yellow fever

Typhoid conjugate vaccine Dengue

Japanese encephalitis Malaria

Oral cholera vaccine (OCV)



References

1. Mora et al. Over half of known human pathogenic diseases can be aggravated by climate change. *Nat Clim Chang*, 2022, 12, 869–875.
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3. Dalberg analysis, 2023.
4. Including vaccine introduction and operational costs grants. From Report to the Gavi Programme and Policy Committee (PPC), 15–16 May 2024.
5. Protecting Our Future: An Investment Framework for Quantifying the Climate Adaptation Benefits of Health and Immunisation Investments, Camber Collective, 2025.