Gavi
The Vaccine Alliance

2016–2020
Mid-Term Review report

Published November 2018

Report contents

Welcome message from the Mid-Term Review host	1
Foreword by the Gavi Board Chair	2
Delivering on the '2016–2020 Investment Opportunity' goals	3
Immunising 300 million more children	4
Increasing co-financing and transition	8
Ensuring healthy vaccine markets	12
Immunisation's wider impact on development	15
Delivering beyond our goals	16
The future	18
List of figures	20

Dive deeper online

This report provides a high-level overview of Gavi's progress and challenges midway through the 2016–2020 reporting period. To better understand several key topics and themes, visit the Mid-Term Review website **http://gotlife.gavi.org** from 3 December.

http://gotlife.gavi.org/**collaboration**
http://gotlife.gavi.org/**demographics**
http://gotlife.gavi.org/**fragility**
http://gotlife.gavi.org/**gender**
http://gotlife.gavi.org/**health-systems**
http://gotlife.gavi.org/**market-shaping**
http://gotlife.gavi.org/**outbreaks**
http://gotlife.gavi.org/**sustainability**

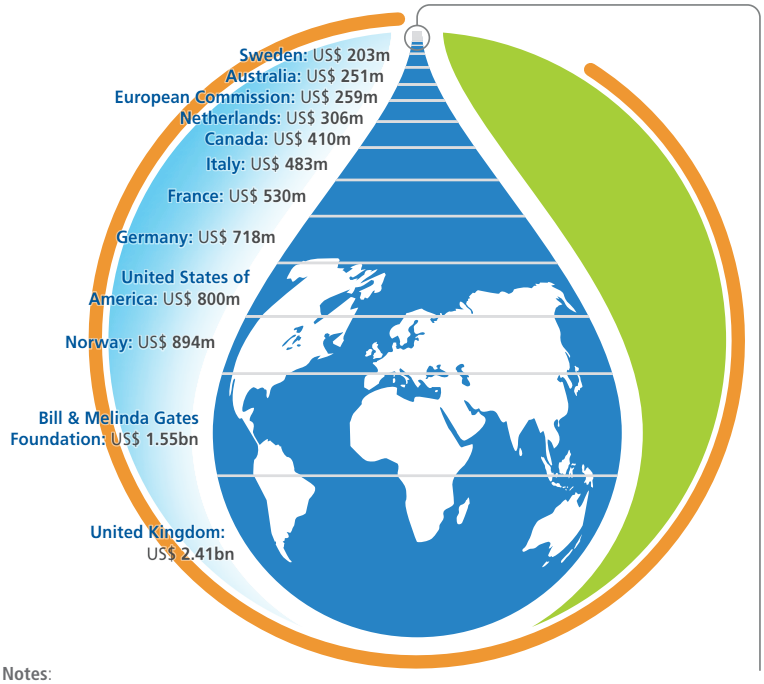
Prefix highlighted words in the report with **http://gotlife.gavi.org/** in a web browser for more detail.

In the PDF, each highlighted word is a clickable web link.

Update on progress towards our 2020 targets[a]

a – All results illustrated in these graphs, with the exception of the number of transitioning countries, use 2016–2017 data.
b – See footnote a on page 8.
c – See footnote b on page 8.

Figure 1: Donor commitments mobilised for 2016–2020



TOTAL DONOR CONTRIBUTIONS AND PLEDGES, 2016–2020

US$ 9.2 billion

≈90% OF ALL PLEDGES HAVE BEEN SIGNED/SECURED

Japan:	US$ 95m	South Africa:	US$ 4m
Spain:	US$ 54m	Girl Effect:	US$ 4m
Russian Federation:	US$ 32m	Unilever:	US$ 3m
Kingdom of Saudi Arabia:	US$ 23m	Other donors:	US$ 3m
Ireland:	US$ 18m	Sultanate of Oman:	US$ 3m
Lions Clubs International Foundation (LCIF):	US$ 15m	Brazil:	US$ 3m
Republic of Korea:	US$ 12m	LDS Charities:	US$ 2m
State of Qatar:	US$ 10m	Switzerland:	US$ 2m
India:	US$ 9m	International Federation of Pharmaceutical Wholesalers (IFPW):	US$ 2m
Comic Relief:	US$ 8m	ELMA Vaccines and Immunization Foundation:	US$ 2m
"la Caixa" Foundation:	US$ 7m	China Merchants Charitable Foundation:	US$ 2m
Red Nose Day Fund:	US$ 5m	Reckitt Benckiser Group:	US$ 1m
HH Sheikh Mohammed bin Zayed Al Nahyan:	US$ 5m	Alwaleed Philanthropies:	US$ 1m
China:	US$ 5m	Principality of Monaco:	US$ 0.7m
Luxembourg:	US$ 5m		

Notes:

Figures are as of 30 June 2018.

The United States made a four-year US$1 billion pledge for the period 2015-2018; contributions for the remaining two years of the current strategic cycle are subject to annual appropriations from Congress. Three other governments have not pledged for the whole period: the Principality of Monaco, the Republic of Korea and Switzerland.

Some commitments will be funded through proceeds from the International Finance Facility for Immunisation and the Advance Market Commitment.

Foreign exchange rates as of June 2018.

Welcome message from the Mid-Term Review host

It is my great pleasure to welcome you to Abu Dhabi for Gavi, the Vaccine Alliance's 2018 Mid-Term Review (MTR) meeting, which the United Arab Emirates (UAE) is proud to host. In the UAE, we believe strongly in the right of all children to be immunised, as well as the essential role vaccines play in ensuring that they have the best chance of growing up in a secure and prosperous environment. Childhood immunisation is key to protecting the next generation and should be central to every development programme. This is one of several reasons why we are so committed to working with the Alliance and are proud to be a partner in fulfilling its mission: to protect the lives of millions of the world's most vulnerable children. Since 2011, the UAE has contributed more than US$ 38 million to Gavi.

However, it is not just the Alliance's objectives that make it a unique partner for the UAE. The way that Gavi works towards achieving those goals aligns fully with our own approach to addressing global challenges. The continual drive for innovation and collaboration resonates with both the UAE's 2017–2021 Foreign Assistance Policy and its 2021 Vision. The latter marks our nation's Golden Jubilee and will emphasise the importance of addressing new challenges in an innovative way – requiring a deep examination of trends together with a proactive approach. It was with the same spirit of proactivity and innovation that the UAE became the first Middle Eastern donor to support the Alliance.

These qualities also drove us to become the first government to partner with Gavi's Innovation for Uptake, Scale and Equity in Immunisation (INFUSE) – a ground-breaking initiative that identifies tried and tested technology with real potential to transform vaccine delivery (see page 7). INFUSE is not just about technology, it also connects people, building innovation through collaboration. This capacity to bring together a diversity of partners – from the private sector and civil society, to governments and industry – is one of the core strengths of Gavi's business model.

By gathering stakeholders to reflect on Gavi's results midway through this reporting period, the MTR is yet another example of the collaborative spirit at the heart of the Alliance. It will allow us to explore in depth how partners can respond to the emerging challenges of this period, as well as lay the groundwork for the future.

It is highly appropriate that the UAE is hosting this meeting in the Year of Zayed – the 100-year anniversary of the birth of our country's founding father. The late Sheikh Zayed bin Sultan Al Nahyan demonstrated that investing in people's welfare, knowledge and capabilities produces great dividends for individuals, families and society as a whole. This echoes Gavi's own commitment to improving the lives of children in the world's poorest countries. It is only by working together that we can fully leverage the Alliance's potential and ensure that everyone can benefit from life-saving vaccines, no matter where they live.

HE Reem Al Hashimy
Minister of State for International Cooperation
United Arab Emirates

Gavi's public-private partnership

Gavi's achievements are more than the sum of its partners' collective commitment to the Alliance's mission: *saving children's lives and protecting people's health by increasing equitable use of vaccines in lower-income countries.*

Each partner brings its own unique area of expertise: the leadership of developing countries; the technical skills of research agencies, UNICEF, WHO and the World Bank; the production capabilities of the vaccine manufacturers; the know-how and support of the private sector, donor governments and the Bill & Melinda Gates Foundation; and the immunisation delivery and advocacy skills of civil society organisations.

Continuing to leverage the comparative advantages of Gavi's public-private partnership will be critical to addressing the challenges that have emerged in the current reporting period.

Foreword by the Gavi Board Chair

As we gather in Abu Dhabi, Gavi is celebrating a huge milestone in global health. The year 2018 marks the Alliance's 18-year anniversary – its coming-of-age and transition into maturity, as it were. In addition to this, the Alliance will also have helped the world's poorest countries to immunise more than 700 million children by the end of this year[a], thereby preventing over 10 million future deaths. This should serve as food for thought as we commence the Mid-Term Review (MTR) meeting to take stock of Gavi's progress against commitments made to donors at the 2015 pledging conference in Berlin.

On reading this report, the first thing that should become apparent is that the Alliance is making excellent progress and is very much on track to deliver on its promises. With more children being immunised with a wider range of vaccines than ever before, Gavi has much to be proud of. The Alliance's success in delivering on immunisation and saving lives is a strong part of achieving the Sustainable Development Goals (SDGs) related to healthcare and poverty. Coupled with the positive steps that Gavi has taken towards achieving its sustainability and market shaping goals, these results are already paying dividends. As you will see in this report, immunisation programmes have generated US$ 50 billion in future economic benefits for Gavi-supported countries since the start of the current reporting period. All of this serves as confirmation that the Alliance's unique public-private partnership model works, and that it works well.

Several aspects of the Gavi model have made this possible. Many are referenced in this short report, but I would particularly like to emphasise financial mechanisms like the Advance Market Commitment (AMC, see page 13) and the International Finance Facility for Immunisation (IFFIm, see insert), which quietly tick over in the background and yet underpin much of the Alliance's work. There are two other aspects of the model that deserve special mention – not just because they are relevant to the success of the MTR, but because they have broader, long-term implications for global health in general.

International Finance Facility for Immunisation

The International Finance Facility for Immunisation (IFFIm)[b], a pioneering global development finance tool launched by Gavi in 2006, uses pledges from donor governments to sell bonds on the capital markets around the world and finance immunisation programmes. Through its flexible structure, IFFIm allows Gavi to shift predictable donor funding through time – making resources quickly available when they are most needed.

Since its inception, IFFIm has attracted more than US$ 6.55 billion in sovereign pledges and provided approximately US$ 2.6 billion towards Gavi's efforts to accelerate vaccine delivery in many of the world's poorest countries. IFFIm's frontloading mechanism has allowed countries to vaccinate at least 80 million children with a third dose of diphtheria-tetanus-pertussis-containing vaccines, such as pentavalent, before the Alliance received the actual donor grants.

IFFIm has also been critical in ensuring timely and sufficient funding for Gavi's health system strengthening programmes as well as other strategic investments, such as vaccine stockpiles and campaigns.

The first concerns the extraordinary efforts made by Gavi-supported countries and the role they are playing in their own development. This is evident in a range of countries – from Lao People's Democratic Republic, which has embraced expansion and transition with such impressive enthusiasm, to Ethiopia, which is using innovation to generate demand for vaccination among its population. Even in highly fragile countries, such as the Democratic Republic of the Congo, governments are willing to shake things up in order to modernise and achieve progress.

Gavi's success in galvanising government support for country co-financing of vaccination programmes bears testament to this commitment. Countries are allocating record levels of domestic resources to immunisation – an achievement that simply would not have been possible without strong political commitment. Even the poorest countries are making efforts to invest in their own development. In what is arguably the clearest indication yet of the success of the Alliance's model, 16 countries are already fully self-financing their own immunisation programmes, with more countries preparing to take up the mantle. This marks a significant shift in the global health landscape and an important new chapter in Gavi's history.

The second part of the business model that warrants special attention is its focus on collaboration and cooperation. Both qualities have always been integral to the Alliance's mission, but they are becoming an increasingly critical part of the response to global health challenges in an ever-changing and uncertain world. By forming close partnerships to remove redundancy and increase efficiency and impact, and by leveraging the strengths of its individual members, Gavi shows that the whole really can be greater than the sum of its parts. In short, today's Alliance offers a glimpse of what a model development and global health organisation should look like tomorrow.

As Gavi moves forward and pushes on, these aspects of its model will help it to overcome and adapt to growing challenges – both existing and new. This puts the Alliance in a strong position not only to deliver on its promises and reach its 2020 targets, but also to contribute to global goals. Immunisation already has a wider role to play in meeting the SDGs for health and poverty. With developing countries so engaged and with partnership at the heart of Gavi's DNA, that role is likely to become increasingly central as the Alliance continues to do what it does best: learn, adapt and innovate to reach even more of the world's most vulnerable children.

Dr Ngozi Okonjo-Iweala
Gavi Board Chair

a – As of 31 December 2017, countries had immunised 692 million children with Gavi support through routine systems since 2000. By mid-2018, this figure was estimated to have exceeded 700 million.

b – For more information, visit https://www.gavi.org/investing/innovative-financing/iffim/

Delivering on the '2016–2020 Investment Opportunity' goals

At the 2015 pledging conference in Berlin, donors committed an unprecedented US$ 7.5 billion to support Gavi's "2016–2020 Investment Opportunity". The scale of funding reflected both the Alliance's track record of delivering results and the level of ambition behind its 2016–2020 goals.

Midway through the period, Gavi is on course to deliver on the commitments made in Berlin. For each of the Investment Opportunity goals, the Alliance is well placed to meet its 2020 targets, with more children being immunised with more vaccines than ever before. However, Gavi must make faster progress in finding and immunising the final 20% of children who are still missing out on basic vaccines, especially those in fragile settings.

> "Immunisation is, put simply, about saving lives."
>
> **Amir Aman**
> Minister of Health, Ethiopia

2016–2020 Investment Opportunity goals

- **immunise 300 million** more children and **save 5–6 million lives**
- **transition 20 countries**[a] out of Gavi support to fully fund their immunisation programmes
- **ensure healthy vaccine markets**, with manufacturers supplying vaccines at affordable prices
- **generate US$ 80–100 billion** in economic benefits in Gavi-supported countries

In 2016 and 2017, developing countries immunised record numbers of children with Gavi-supported vaccines. At the same time, the Alliance's sustainability model has contributed to increased levels of domestic resource mobilisation for immunisation, with 16 countries already having transitioned out of Gavi support to fully fund their own vaccine programmes. The Alliance's market shaping activities continue to lay the foundations for this progress by creating a more stable and diverse vaccine market.

With more than 100 introductions and campaigns conducted since 2016, the historic inequity in access to vaccines between low- and high-income countries, which Gavi was set up to address, has continued to diminish. Coverage rates in Gavi-supported countries for vaccines against the two biggest killers of children – pneumococcal disease and rotavirus diarrhoea – are now approaching global levels.

While coverage with three doses of diphtheria-tetanus-pertussis-containing vaccine (DTP3) in Gavi-supported countries has improved from the Alliance's 2015 baseline, progress is not accelerating as desired. Indeed, between 2016 and 2017, DTP3 coverage levelled off. This trend is especially acute in fragile countries, where challenges facing health systems limit provision of even the most basic immunisation services. While national coverage rates in non-fragile countries have risen, pockets of underimmunised children remain. Most live in hard-to-reach places beyond the reach of health services, such as urban slums or remote rural areas. To accelerate progress, the Alliance has adopted more country-centric, targeted approaches.

Growing fragility is one of several shifts in the global landscape which have exacerbated the challenges facing Gavi in this period. Since the start of 2016, more than 100 conflicts have seen 25.4 million refugees flee their countries. Climate change and natural disasters are also combining to displace communities and disrupt systems. Added to which, many countries are undergoing significant demographic and socioeconomic changes, such as rapid urbanisation, that contribute to large-scale population movements. These trends not only complicate the Alliance's efforts to reach the underimmunised, but also pose a threat to global health security.

The United Nations' 2015 Sustainable Development Goals have also reshaped the wider development context in which Gavi works. They require more effective partnerships and collaboration between global health organisations. These qualities have long been part of the Alliance's DNA, and efforts to strengthen collaboration beyond Gavi's traditional partners have gathered pace in this period.

Now in its 18th year, the Alliance's business model is built on a perpetual cycle of innovating-learning-adapting. New approaches introduced in each five-year strategy have enhanced Gavi's efficiency and performance, accelerating its overall impact. Since the Alliance was established in 2000, the world's poorest countries have immunised over 700 million[b] children with Gavi support, averting more than 10 million future deaths. As it comes of age, Gavi continues to learn and adapt to ensure it stays on course to achieve its Investment Opportunity commitments. This report describes the Alliance's progress to date in delivering on the Berlin 2020 goals, adjusting to its remaining challenges and setting out a vision for the future.

a – In "The 2016-2020 Investment Opportunity", Gavi set a goal of 22 countries transitioning out of support by 2020. Since this document's publication, Ghana has again become eligible for Alliance support, while the Ukraine is not considered as transitioning in this period. The latter is due to the country choosing not to receive any support in the 2011–2015 period, not being included in the co-financing policy and not being eligible for post-transition engagement.

b – As of 31 December 2017, countries had immunised 692 million children with Gavi support through routine systems since 2000. By mid-2018, this figure was estimated to have exceeded 700 million.

Immunising 300 million more children

Ensuring the world's poorest countries have access to the same range of childhood vaccines as families in wealthy countries was a founding objective of the Alliance. With vaccination protecting more children than ever, Gavi is on track to achieve its 2020 goal to help countries immunise an additional 300 million children through routine immunisation, averting 5–6 million future deaths.

Since the 2015 Berlin replenishment conference, the coverage rate for three doses of diphtheria-tetanus-pertussis (DTP3) vaccine in Gavi-supported countries has risen one percentage point, but efforts to reach the final 20% of underimmunised children are making slower progress than expected, particularly in fragile countries.

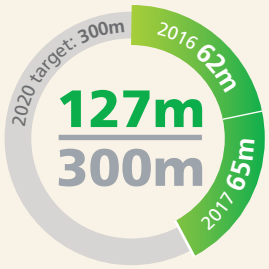
In response, the Alliance has adopted a range of new approaches. These include helping countries target places or populations with disproportionately low coverage rates or the highest numbers of underimmunised children; and channelling most health system strengthening (HSS) grants into several strategic focus areas, such as data, supply chain, demand promotion, and the management and coordination of immunisation programmes.

Progress to date

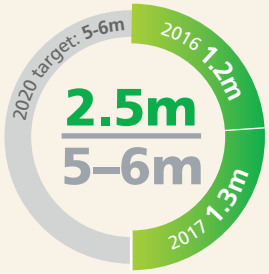
- Children immunised and future deaths averted: 42% of 2020 targets achieved by the end of 2017.
- Geographic equity: the proportion of districts in Gavi-supported countries where third-dose pentavalent vaccine coverage is equal to or above 80% has risen 5 percentage points in this period.
- Targeted support: all new HSS grants developed through country-level dialogue in 2016 and 2017 targeted subnational areas with particularly low coverage and/or high concentrations of underimmunised children.

Remaining challenges

- While the DTP3 coverage rate for Gavi-supported countries is up one percentage point on the 2015 baseline, progress has not been as rapid as hoped.
- Rises in immunisation coverage in fragile Gavi-supported countries have levelled off since 2012.
- Overall, coverage rates have increased in non-fragile Gavi-supported countries, but there are still pockets of underimmunised children and places with lower than average DTP3 coverage rates.



Number of additional children immunised with Gavi support (millions)



Number of additional future deaths averted (millions)

2020 goals on track

After just two years, the Alliance is almost halfway towards reaching its five-year targets. In 2016 and 2017, countries vaccinated 127 million additional children through Gavi-supported routine immunisation programmes – in most cases, with more than one vaccine. This will not only help to avert 2.5 million future deaths, but will also prevent the loss of 105 million years due to disability or premature death. In addition, the Alliance has vaccinated approximately 200 million people through campaigns in this period.

Gavi has supported 109 vaccine introductions and campaigns since January 2016. However, there have been some delays, caused by multiple factors – mainly a lack of country readiness and supply shortages of several vaccines (see page 14). Closer collaboration and information-sharing between partners will be critical to getting country introductions back on track.

The Alliance is not only immunising more children than ever before but it is doing so with an ever-wider range of vaccines. This is significantly increasing the breadth of protection against infectious disease in developing countries. Average coverage for the last dose of nine Gavi-funded vaccines has increased from the 2015 baseline figure of 30% to 41% in 2017. At the same time, the proportion of districts where third-dose pentavalent vaccine coverage is equal to or above 80% has increased by 5 percentage points from 2015.

Today, routine immunisation schedules in many Gavi-supported countries deliver the same range of life-saving vaccines that families in high-income countries have access to – one of our Alliance's founding goals. When Gavi was established in 2000, the Alliance supported vaccines preventing just three diseases (*Haemophilus influenzae* type b, hepatitis B and yellow fever); with the Board's approval of a new support window for typhoid conjugate vaccine in 2017, this number has now risen to 18[a] diseases.

Increased coverage with pneumococcal and rotavirus vaccine

The Alliance is continuing to progress its goal of introducing pneumococcal and rotavirus vaccines to all Gavi-supported countries, critical vaccines which provide protection against pneumonia and diarrhoea – the world's biggest child killer diseases. Most countries' routine immunisation programmes now include both vaccines. Coverage rates are on a par with global figures and are set to rise once India, home to the world's largest birth cohort, completes its ongoing national roll out. However, supply constraints will hamper the efforts of some governments to introduce rotavirus vaccine in 2018/2019 (see page 14).

Accelerated country demand for HPV vaccine

By the end of 2017, Gavi-supported human papillomavirus (HPV) vaccination programmes had protected 1.5 million girls from the primary cause of cervical cancer. With 15 countries already approved for national introductions, this number is projected to rise to 25 million girls.

Revisions to Gavi's HPV vaccine support in 2016 led to an exponential increase in the number of country applications. This revision allows countries to request funding for national HPV introductions without first conducting demonstration programmes. However, the sudden rise in country demand is outpacing supply, jeopardising Gavi's 2020 goal of immunising 40 million girls. The Alliance is working simultaneously with countries to help adjust the timing of their introductions and with manufacturers to scale up production capacity (see page 14).

a – Gavi supports pentavalent vaccine (protecting against five diseases: diphtheria, tetanus, pertussis, hepatitis B, *Haemophilus influenzae* type b), pneumococcal vaccine, rotavirus vaccine, human papillomavirus vaccine, inactivated polio vaccine, Japanese encephalitis vaccine, measles and measles-rubella vaccines, meningitis A vaccine, the multivalent meningitis vaccine stockpile, the Ebola vaccine stockpile, oral cholera vaccine, typhoid conjugate vaccine, yellow fever vaccine.

Figure 2: **Status of forecasted costs and projected future deaths averted, by vaccine[a]**

	Expenditure (US$ millions)			Number immunised (millions)			Deaths averted		
	2016–2020	2016–2017[b]	2018–2020[b]	2016–2020	2016–2017[c]	2018–2020[c]	2016–2020	2016–2017[c]	2018–2020[c]
Pneumococcal	2,789	964	1.411	190	67	126	c. 600,000	190,000	c. 340,000
Pentavalent	1,294	278	277	300	126	195	c. 3,000,000	1,500,000	c. 2,300,000
Rotavirus	955	223	549	150	40	126	c. 200,000	28,000	c. 80,000
Human papillomavirus (HPV)	347	23	332	30	1	33	c. 600,000	18,000	c. 650,000
Measles 2nd dose and measles-rubella[d,e]	343	196	153	500	184	334	c. 700,000	320,000	c. 530,000
Yellow fever[d]	288	41	226	150	17	48	c. 300,000	130,000	c. 250,000
Typhoid	241	-	84	50	-	-	c. 20,000	-	-
Cholera[f]	89	52	45	-	-	-	-	-	-
Meningitis A[d]	85	44	94	100	50	105	c. 60,000	40,000	c. 130,000
Japanese encephalitis[d]	52	8	9	70	37	20	c. 8,000	13,000	c. 11,000
Total	**US$ 6,484[e]**	**US$ 1,829[e]**	**US$ 3,180[e]**				**5–6 million[e]**	**2.2 million[e]**	**c. 4 million[e]**
	As forecast in 2015 Investment Opportunity			As projected in 2015 Investment Opportunity			As projected in 2015 Investment Opportunity		

All values are rounded.

Note: The actual and forecast expenditure for routine and campaign immunisation has been less than forecast in 2015; this reduction is largely due to market shaping that has reduced vaccine prices and better management of vaccine stocks which has reduced the volume of vaccines required by countries. In other cases, there have been issues of country readiness for vaccine introductions. Cost savings have enabled Gavi to contribute to emerging challenges including the international response to Ebola, polio, measles and yellow fever outbreaks.

a – The information in this table only covers vaccines included in Gavi's "2016–2020 Investment Case" and does not reflect other types of Gavi support.

b – Expenditure data is sourced from the Gavi financial update of November 2017. The 2016 values are actual expenditure; 2017–2020 values are forecasted expenditures.

c – Numbers immunised and deaths averted are derived from estimates produced by the Vaccine Impact Modelling Consortium (July 2018 update).

d – Includes estimates from both campaigns and routine immunisation strategies. 2017 data for campaigns is based on forecasts, as reporting on numbers immunised through campaigns was not complete as of October 2018.

e – Excludes standalone measles campaigns.

f – Numbers immunised and deaths averted have not been calculated for cholera stockpile.

TAILORED APPROACH

United Republic of Tanzania: focus on finding the missing children

Challenge: with Alliance support, the United Republic of Tanzania has increased its DTP3 coverage rate from 79% in 2000 to 97% in 2017. With the 2018 introduction of both the HPV and inactivated polio vaccines, the national immunisation programme now includes the full package of core Gavi-supported vaccines.

However, in 2017, more than 60,000 children did not receive the full course of DTP vaccine. Most of these children are out of sight and unregistered with health workers, living in hard-to-reach or underserved areas.

Adapting: with the Government's attention focused on the challenge of identifying and reaching the "invisible" children, Gavi has provided HSS support and technical assistance to develop and scale up a national electronic immunisation registry system. By 2019, this will enable clinics to track every child from birth through their full vaccination schedule. The system will help Tanzania to vaccinate all its children, now and in the future.

South Sudan: focus on safeguarding healthcare services

Challenge: in 2017, due to continuing civil conflict South Sudan's national immunisation coverage slumped to 26%.

Adapting: Gavi's new policy on fragility, emergencies and refugees (see page 16), approved in 2017, has allowed South Sudan to receive more vaccine doses and immunise a wider age range with pentavalent and inactivated polio vaccines. In addition, the Government has reprogrammed its HSS grant to focus on maintaining immunisation as part of a package of basic healthcare services in conflict-affected areas of South Sudan, as well as to rebuild services in stable parts of the country.

The HSS funding supports the formation of community partnerships and platforms, involving more than 700 schools and 32 radio stations. It also allows around 2,500 community mobilisers to make house-to-house visits, delivering vaccines to more than 700,000 people. Despite this initiative, South Sudan's immunisation programme continues to face immense challenges.

Coverage & equity: fragile vs non-fragile countries

In this reporting period, routine immunisation coverage with DTP3 has increased by one percentage point, with over 1.2 million more children receiving a full course of basic vaccines in 2017 than in 2015. Today, routine immunisation in Gavi-supported countries needs to reach over 3 million more children than it did in 2010 – equivalent to the birth cohort of Ethiopia – just to maintain a steady level of coverage.

Average coverage figures also mask underlying discrepancies between fragile and non-fragile countries. While average coverage in non-fragile Gavi-supported countries has increased by four percentage points over the past four years, rates in fragile countries have stagnated at 72% since 2012. Given the acute problems and rapid population growth that characterise these countries, simply maintaining coverage is a real challenge.

This is not to say that non-fragile countries are without their own challenges. High national coverage rates often hide pockets of underimmunised children or populations with disproportionately low coverage rates. Typically, these people live "under the radar" in poorly served communities, such as remote rural areas or urban slums.

Reaching the final 20% of children missing out on a full course of basic vaccines has proved challenging and progress has been slower than the Alliance would have wished. Gavi is therefore adapting its business model to provide more country-centric and focused technical support. In addition to launching the Partners' Engagement Framework (PEF), the Alliance has developed a range of transformative approaches through several strategic focus areas (SFAs).

Gender barriers to immunisation coverage

Immunisation is one of the most equitable health interventions, with similar average coverage rates for boys and girls. However, low education and socioeconomic status and young age can undermine a mother's ability to access vaccination for her child. Addressing these forms of gender-related barriers and empowering women to improve their status within families and the wider community is critical to increasing immunisation coverage. Gavi encourages countries to target obstacles that undermine the ability of female caregivers to take children to be vaccinated.

In the 2017–2018 period, the Secretariat intensified efforts to strengthen the role of gender in Gavi's processes. Alliance programme guidance now gives clear examples of gender-related barriers and measures that governments should consider in their HSS proposals, such as ensuring trained female health workers are deployed where cultural barriers prevent women from communicating with male vaccinators. All six new HSS proposals recommended for approval in 2017–18 identified gendered barriers, proposed interventions and assigned budget for activities to tackle them.

Since 2016 Gavi has launched a number of initiatives aimed at removing gender-related barriers. For instance, a new US$ 10 million private partnership with the non-profit organisation, Girl Effect[b], is helping to challenge cultural barriers that are preventing access to HPV vaccination in Ethiopia, Malawi and Rwanda. The joint initiative uses brands rooted in local culture to encourage girls and their communities to advocate for HPV vaccination.

By calling for innovations to help identify underimmunised children, Gavi's INFUSE platform is addressing gender equality issues, such as the lack of gender-disaggregated data, the need to empower girls and mothers and the challenge of reaching the most marginalised children – often girls.

b – Girl Effect's investment in the partnership of US$ 4 million in funding and the equivalent of US$ 1 million in brand equity were matched by the Government of the Netherlands under the Gavi Matching Fund.

More targeted health system strengthening

Gavi's HSS support is a key component of strategies to help countries reach the unreached. Since the Alliance first offered HSS support over a decade ago, it has evolved to prioritise health system improvements that more directly impact immunisation programmes. To ensure grants target the final 20%, Gavi is focusing HSS support in this period on communities with the largest number of underimmunised children.

All 10 countries approved for HSS grants through the Country Engagement Framework in 2016 and 2017 earmarked part of their funding for subnational areas with low coverage and/or high concentrations of underimmunised children. Zimbabwe's HSS support, for example, will focus on 20 districts with low coverage rates and hard-to-reach areas, as well as addressing vaccine hesitancy among members of the Apostolic Church.

In prioritising the unreached, Gavi is simultaneously building a platform for equitable primary healthcare (PHC). This is because communities not receiving immunisation are likely to also be missing out on other health services. By extending vaccination to these places and people, the Alliance is laying the foundations – service delivery, supply chains, data systems – for delivering PHC services.

While it is premature to assess the impact of Gavi's new HSS approach, grant performance frameworks are helping to monitor results, allowing the Alliance to make real-time adjustments. Increasingly, reporting is based on sub-national indicators. Kenya's 2017 HSS grant reporting framework, for example, includes county-level indicators for monitoring the proportion of health facilities that provide timely administrative data and the level of civil society organisation (CSO) involvement.

> **"Together we can create a 'new normal' for girls, where they're equipped for a healthy future – for themselves and generations to come."**
>
> **Maria Eitel**
> Chair, Girl Effect

Strategic focus areas

The Alliance has identified a number of SFAs, each critical to increasing coverage and laying foundations for sustainable systems. These include data; supply chain; demand promotion; and in-country leadership, management and coordination of immunisation programmes. Since 2016, over 60% of Gavi's HSS funding has targeted one or more SFAs. This is in marked contrast to the past, when over half of all HSS grants supported service delivery, much of which was used for recurrent operational costs.

Approximately 10% of all Alliance HSS funding now goes to CSOs, critical partners in demand promotion. In addition to HSS, Gavi provides specific grants to facilitate closer collaboration between CSOs and governments.

In order to maximise impact, SFAs are often complemented by cross-cutting initiatives. Gavi's new cold chain equipment optimisation platform (see page 12) is expected to provide countries with over 62,000 environmentally-sound, modern vaccine storage devices between 2017 and 2020. Of these, 25% are destined for previously unequipped primary healthcare facilities, thus helping to extend immunisation services. The Expanded Programme on Immunization (EPI) leadership, management and coordination initiative, rolled out in 2016, now operates in more than 30 countries.

Early signs across Gavi's portfolio of support are encouraging. All countries that underwent an effective vaccine management assessment in 2017 showed improvements over the previous one. Similarly, average data quality has improved for Gavi-supported countries in the past two years.

Country-centric partner support: PEF

Introduced in 2016, PEF brings a country-centric, bottom-up approach to technical assistance (TA), helping the Alliance to better leverage partners' comparative strengths and to increase accountability. PEF has already shifted the focus of TA resources, with almost 60% of funding allocated to country-level partners in 2018.

In a relatively short time, PEF has also successfully expanded the range of technical expertise available to countries. Many of the current 54 expanded partners offer skillsets outside the scope of traditional Alliance members. In Madagascar, Cardno brings fiduciary risk control as well as helping to build capacity; the Civil Society Human and Institutional Development Programme (CHIP) trains women living in remote communities in Pakistan as health workers.

All PEF partners are required to report on progress biannually, ensuring accountability to countries as well as other stakeholders. Funding allocated to each partner, together with reporting on deliverables, are all made public. Such transparency has contributed to a better understanding of the challenges facing countries.

While this approach has led to more tailored support to countries, the Alliance is now working to ensure that the quality of TA provided by partners can be measured against immunisation coverage and equity outcomes.

Strengthening country capacity

Gavi's new country-centric approach relies on countries' ability to design and implement effective grants. However, some countries have limited capacity to identify and manage investments for improving immunisation coverage and equity. In such cases, for example in conflict-stricken Somalia and South Sudan, the Alliance is exploring partnerships with humanitarian organisations. Elsewhere, as in the case of Chad and the Democratic Republic of the Congo (DRC), the Alliance is helping to strengthen the management capabilities of EPI teams.

To improve HSS grant proposals, Gavi has increased country-level technical assistance and introduced an iterative process based on country-led dialogue. It has also launched an initiative on leadership, management and coordination which includes embedding management partners in EPI programmes and providing management training for EPI teams. Furthermore, the Alliance is working to ensure that its technical support focuses more explicitly on building country capacity.

Balancing risk and speed of implementation

In this period, Gavi has significantly scaled up its ability to manage fiduciary risk by increasing the number of audits and adopting new tools, such as programme capacity assessments. However, on average, it is now taking over a year to disburse HSS grants after they are approved, with particularly long delays in high-risk countries. Moreover, two-thirds of grants are channelled through partners to manage fiduciary risk, potentially undermining sustainability goals.

Efforts to strengthen country capacity should help address this challenge. The Alliance has introduced a hybrid approach in several countries, whereby the low-risk components of grants are disbursed to the government and high-risk portions to partners.

Collaboration to maximise impact

Addressing countries' health system challenges will require significantly more funding than Gavi alone can deliver. On average, HSS support amounts to less than US$ 5 million per country per year. In addition, the Alliance has limited influence over several factors that determine the strength of immunisation programmes, such as public financial management and health worker recruitment.

These realities serve to underline the increasing importance of aligning Gavi financing with other major funders of health systems, such as the Global Fund and the World Bank. In the DRC, Gavi is already jointly financing supply chain and data strengthening initiatives with both funding agencies. Collaboration between Gavi, the Global Fund and other health agencies will be further enhanced under the "Global Action Plan for Healthy Lives and Well-being for All".

Private sector innovation

Gavi continues to leverage private sector investments and expertise to provide innovative solutions that have the potential to transform the way immunisation services are delivered in countries.

Adapting cutting-edge technology available in the private sector is one way in which Gavi is helping to expand immunisation access. The Alliance is working with Silicon Valley start-up, Zipline, in Rwanda to use drones to deliver essential health products to hard-to-reach health centres. The concept is being taken up by other countries in West Africa. In 2018, Gavi also partnered with Orange to use mobile technology in Côte d'Ivoire to educate parents about the importance of vaccines and send reminders about vaccination sessions. The initiative is supported by the Bill & Melinda Gates Foundation under the Gavi Matching Fund.[c]

Other partnerships seek to address demand generation and supply chain challenges. In 2017, Gavi and Unilever's Lifebuoy brand jointly initiated a programme in India to promote immunisation and handwashing with soap, two of the most cost-effective interventions in public health. The programme is supported by the Government of the Netherlands through the Gavi Matching Fund. Gavi is also working with the International Federation of Pharmaceutical Wholesalers to establish a supply chain Centre of Excellence at the University of Rwanda. This collaboration has led to a new training and mentorship programme for supply chain managers in Benin, the DRC, Pakistan, Rwanda and Uganda. By the end of 2017, over 70 supply chain executives from 15 countries had graduated from these courses.

Launched at Davos in 2016, Gavi's Innovation for Uptake, Scale and Equity in Immunisation (INFUSE[d]) works to identify proven innovations with the potential to improve coverage and equity in immunisation. Promising innovations or "pacesetters" are selected and links are forged between in-country implementers and potential investors and partners with the necessary expertise to take these initiatives to scale.

One INFUSE pacesetter, Nexleaf Analytics, is building a platform that will help countries make evidence-based decisions about the purchase and maintenance of vaccine fridges. Google.org and Elma Philanthropies are supporting the initiative both with their expertise and financial contributions – doubled through the Gavi Matching Fund – allowing for the platform's expansion to Kenya, Mozambique, Senegal and Tanzania.

Google.org is also supporting Nexleaf in optimising a data analysis tool for monitoring temperatures of vaccine storage devices. Preliminary data from Kenya showed that data collected through the Nexleaf temperature sensors allowed health ministry technicians to take proactive steps to correct errors. This has resulted in increased uptime by 30% and reduced heat and cold exposure by 78% and 60% respectively.

To date, INFUSE has built up a network of over 40 leaders from across both public and private sectors to guide investments, as well as a community of innovators.

c – The Gavi Matching Fund is a funding mechanism that doubles financial and in-kind contributions from private sector donors. Supported by the Bill & Melinda Gates Foundation and the Government of the Netherlands, as of 30 June 2018, the Gavi Matching Fund had available funds totalling US$ 86 million for the 2016–2020 period.

d – In September 2018, INFUSE had available funding of US$ 21 million thanks to contributions from the Government of Canada and the United Arab Emirates.

Increasing co-financing and transition

Empowering countries to take ownership of their vaccination programmes is a core component of the Gavi business model.

At the midway point of the current reporting period, Gavi-supported countries are allocating an ever-greater proportion of their domestic resources to vaccination. Of the 20 countries[a] due to transition out of Alliance support by 2020, 16 are already fully self-financing their vaccine programmes. Of these, eight have done so for more than a year, while maintaining their immunisation coverage rates.

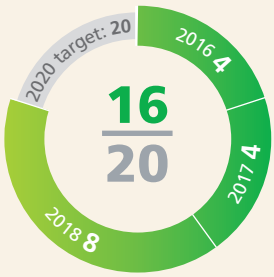
A number of transitioning countries still need to address shortcomings in their immunisation programmes in order to continue improving their children's health. For instance, some countries have yet to introduce several life-saving vaccines into their routine schedules. Five countries – Angola, the Congo, Nigeria, Papua New Guinea and Timor-Leste – face more deep-rooted obstacles to achieving higher coverage rates. The Alliance is addressing these challenges through more systematic post-transition engagement and by developing tailored plans for the five "high-risk" countries.

Progress

- Gavi-supported countries have increased the amount of domestic resources allocated to immunisation.
- Of 16 countries that have transitioned, 8 have continued to fully self-finance their vaccines and maintain coverage rates for over a year. It is too soon to assess the progress of the other 8 countries, but the early signs are positive.
- By the end of 2018, 16 transitioned countries will be fully self-financing 33 vaccine programmes.

Challenges

- Despite maintaining high immunisation coverage, some transitioned countries face programmatic challenges.
- Several countries are transitioning without having introduced critical vaccines into their routine programmes.
- Five countries – Angola, the Congo, Nigeria, Papua New Guinea, Timor-Leste – face deep-rooted, systemic obstacles to achieving higher coverage rates.



Countries transitioned out of Gavi support[a]

Percentage of countries meeting their co-financing commitments[b]

Countries' increased financial commitment

In the first half of this period, the Alliance's sustainability model has spurred record levels of domestic resource mobilisation for immunisation. All Gavi-supported countries – even those with a long way to go before transition – are co-financing their vaccine costs[b]. In 2016–2017, countries contributed US$ 271 million in co-financing – more than twice the amount during the first two years of the last reporting period. Furthermore, since 2016, countries have paid an additional US$ 265 million towards the cost of fully self-financing their vaccine programmes. With co-financing payments currently representing 35% of all Gavi funding for vaccine programmes[c], the Alliance is set to meet its commitment that country contributions will account for approximately 15% of overall Gavi financing in the 2016–2020 period.

Reflecting the Alliance's wider impact, the rise in co-financing is paralleled by governments' growing overall investment in immunisation – up 10% in 2017 from 2016. More countries are now using domestic resources to fund immunisation programmes historically supported by donors. Since the introduction of Gavi's co-financing requirement in 2008, country contributions per child towards both Gavi-supported and independently-introduced vaccines have increased ten-fold (from US$ 0.50 to almost US$ 5), while contributions from both non-transitioning and transitioned countries multiplied six-fold.

a – In 'The 2016-2020 Investment Opportunity', Gavi set a goal of 22 countries graduating out of support by 2020. Since the document's publication, Ghana has again become eligible for Alliance support, while the Ukraine is not considered as transitioning in this period. The latter is due to the country choosing not to receive any support in the 2011–2015 period, not being included in the co-financing policy and not being eligible for post-transition engagement.

b – In the current reporting period, only countries facing exceptional circumstances have failed to meet their co-financing requirements: Guinea, Liberia and Sierra Leone during the Ebola outbreak; Yemen and South Sudan during their civil conflicts. The three West African countries and Yemen (through the World Bank) have since resumed payments.

c –Includes co-financing and self-financing contributions to the cost of Gavi-supported vaccines by countries (eligible and transitioned), including India.

Transitioning countries on track

The Alliance is on track to fulfil its promise to donors regarding transitioning countries. By January 2018, 16 countries across south-east Asia, Africa, eastern Europe and Latin America were fully self-financing their immunisation programmes, just four short of the 2020 target.

The first eight countries to transition – Bhutan, Guyana, Honduras, Indonesia, Kiribati, Mongolia, Republic of Moldova and Sri Lanka – have now been fully funding their vaccines and sustaining coverage rates for more than a year. More time is required to assess the performance of another eight recently transitioned countries, although early results are encouraging. By December 2018, all 16 countries will be fully self-financing a total of 33 vaccine programmes.

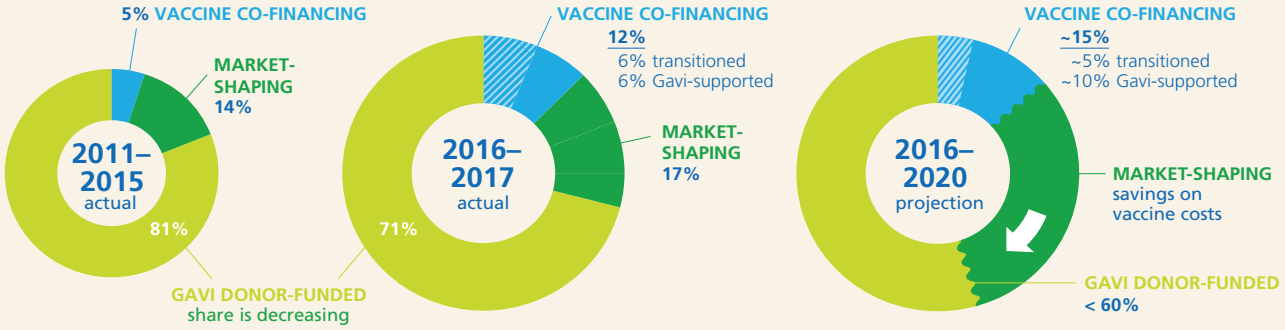
Above and beyond their self-financed vaccine programmes, several of these countries have successfully introduced new vaccines with a one-time investment from Gavi specifically designed to help transitioned countries. This catalytic funding has enabled Armenia, Bolivia, Georgia, Guyana, Honduras, Republic of Moldova and Sri Lanka to add the human papillomavirus (HPV) vaccine to their routine schedules – signalling their governments' willingness to invest in both immunisation and in the health of women and girls.

> **"Transition has not only brought us the opportunity to introduce new vaccines, but the opportunity to make these programmes sustainable into the future."**
>
> **Dr Edna Yolani Batres**
> Former Secretary of State at the Bureau of Health in Honduras

All transitioned countries have upped their budgetary allocations for vaccines. Spending in both Honduras and Georgia, for example, has risen ten-fold over six years. Prior to transitioning, Honduras spent US$ 0.70 per child on Gavi-supported vaccines; post-transition in 2016, this figure rose to US$ 19. Similarly, Georgia's investment per child increased from US$ 1.70 to US$ 20.80.

Sri Lanka's post-transition record provides a lesson in best practice for all transitioning and transitioned countries. Its 95% immunisation coverage rate is the product of political commitment, clear priority-setting and efficient management. After transitioning in 2016, the Government took advantage of Gavi's one-off grant and added HPV vaccine to its routine schedule. Two years on, Sri Lanka is already fully funding its HPV programme.

Figure 3: **Projected impact of dynamic resource mobilisation model on donor share of total financing**



Update on 20 countries due to transition by 2020

More than one year without Gavi support:

- Bhutan
- Guyana
- Honduras
- Indonesia
- Kiribati
- Mongolia
- Republic of Moldova
- Sri Lanka

Less than one year without Gavi support:

- Angola
- Armenia
- Azerbaijan
- Bolivia
- the Congo[a]
- Cuba
- Georgia
- Timor-Leste

a – The Republic of the Congo's 2017 GNI fell below Gavi's eligibility level. In November 2018, the Gavi Board will discuss whether to make the Congo eligible for support again.

Preparing to transition:

- Nicaragua
- Papua New Guinea
- Uzbekistan
- Vietnam

Transitioned before 2010

- Albania
- Bosnia and Herzegovina
- China
- Turkmenistan

Access to affordable vaccine prices

Securing access to affordable vaccine prices post-transition is essential to the long-term sustainability of immunisation programmes. Since 2016, each transitioned country has continued to procure vaccines no longer supported by Gavi at the same price previously available through the Alliance – or even lower. This is due to commitments made by manufacturers in 2015, which offered transitioned countries access to prices similar to those Gavi pays for pentavalent, pneumococcal, rotavirus and HPV vaccines for a period of 5–10 years.

While it is important to emphasise that the Alliance can only advocate for, not broker, favourable prices, transitioned countries also benefit from the Alliance's long-term focus on building healthy vaccine markets (see page 14). For example, increased competition in the pentavalent vaccine market, driven by Gavi's market shaping activities, means all countries can benefit from record low prices through their own procurement process rather than relying on price commitments.

While 15 of the 20 countries transitioning in this period are sustaining coverage rates with three doses of diphtheria-tetanus-pertussis vaccine, they still need to fill programmatic gaps in their immunisation systems. Of the other five, Angola, the Congo, Papua New Guinea and Timor-Leste face more systemic obstacles to improving coverage and equity. The Plurinational State of Bolivia faces slightly different challenges, predominantly related to issues with reliable data.

Gaps in immunisation programmes

In terms of coverage rates and level of financial commitment, 15 of the countries transitioning in 2016–2020 are performing strongly. However, some are experiencing programmatic shortcomings, such as insufficient institutional capacity or a lack of clear strategies for reaching pockets of underimmunised children. In both Indonesia and the Republic of Moldova, for example, coverage rates remain below 90%.

Elsewhere, national immunisation programmes have not introduced several key WHO-recommended and Gavi-supported vaccines into their routine schedules. This is particularly the case in parts of Asia, where many children are missing out on rotavirus, pneumococcal and HPV vaccines.

Post-transition engagement

In response, the Alliance is not only continuing its focus on building financial sustainability but is also adapting its approach to address both programmatic shortcomings and the need to introduce new vaccines. With this objective in mind, in 2017 the Board committed to systematic engagement with countries post-transition, allocating US$ 30 million through to 2020 to ensure their progress does not slip back.

Like an insurance policy, this funding will only be used to mitigate serious programmatic risks. It is designed to strengthen countries' institutional capacity, improve demand forecasting and procurement systems, catalyse the modernisation of cold chains, reach the unreached and respond to anti-vaccine movements.

Similarly, to reduce the risk that countries transition without critical vaccines in their routine programmes, Gavi now allows governments to apply for new vaccine support at any stage during the transitioning process.

South-to-South collaboration

Gavi is encouraging transitioned and transitioning countries to share challenges and best practice solutions through peer-to-peer networking initiatives.

Learning Network for Countries in Transition

A group of 15 countries, including those classified as high risk by the Board, are sharing their experiences through the Learning Network for Countries in Transition, a peer-to-peer support platform set up by Gavi and the Bill & Melinda Gates Foundation (BMGF) in 2017. Member countries help each other to overcome common obstacles along the road to sustainable immunisation.

Twinning partnership

WHO and UNICEF are supporting a pioneering "twinning" partnership between Sri Lanka and Timor-Leste with Gavi funding. By establishing a mentoring relationship between the two countries, Timor-Leste's health professionals are learning from Sri Lankan peers.

Tailored plans for "high-risk" countries

Four other countries transitioning in this period – Angola, the Congo, Papua New Guinea and Timor-Leste – share more deep-rooted issues. All entered Gavi's final transition phase following rapid economic growth driven by high commodity prices. Each still has relatively low immunisation rates that are not improving. This means they are faced with the task of making long-term improvements to their immunisation programmes while their economies remain vulnerable to short-term downturns. This will require developing the right institutions and systems as well as enhancing leadership and programme skills.

Recognising the need for special measures, the Board has classified each of the four countries as "high-risk" and has requested specific country strategies. Consistent with the Alliance's overall shift toward country-tailored programmes, customised plans are now in place for all four countries, as well as Nigeria (see insert). Gavi is supporting implementation of the plans, which focus on strengthening service delivery in districts with low coverage rates, increasing health worker capacity and modernising supply chains.

Strong political commitment

Gavi's experience in working with high-risk countries has underlined the need for strong political commitment to lay financial and programmatic foundations for sustainable immunisation systems. In this period, intensified dialogue, particularly with finance ministers, has translated into countries allocating more domestic resources to immunisation and meeting their co-financing obligations. It has also facilitated earlier planning for a sustainable transition out of Gavi support.

Since the start of the period, the Alliance has made 14 high-level visits to transitioning and transitioned countries to meet with political leaders and other key decision-makers. Last April, Board Chair Dr Ngozi Okonjo-Iweala, CEO Dr Seth Berkley and Bill Gates, co-Chair of the BMGF, capitalised on the World Bank Spring meeting to meet finance ministers from eight Gavi-supported countries to discuss domestic funding for immunisation and transition. The Alliance has also led numerous technical missions to monitor progress and address challenges as they arise.

Preparing for the next wave of transitioning countries

The first wave of transitioning countries has provided some valuable lessons that are already helping the Alliance better prepare countries for transition post-2020. Filling programmatic gaps is not a fast process. Advocating for stronger political commitment, addressing key bottlenecks and preparing countries to maintain hard-earned gains all take time. This means countries must develop comprehensive transition plans long before they enter the final stages of Gavi support.

The Alliance's health system and immunisation strengthening framework (HSIS) now ensures that long-term programmatic sustainability is a key consideration when it comes to applying for Gavi support. This means that health system strengthening grants are now designed to complement transition plans and safeguard immunisation performance.

http://gotlife.gavi.org/twinning

Sri Lanka and Timor-Leste team up for sustainable immunisation

Expanding collaboration on health financing

Gavi is sharing its health financing and transitioning lessons learned through ever closer collaboration with several key partners, such as the World Bank and the Global Fund. For instance, the Alliance is supporting the World Bank's development of health system financing assessments to ensure transition plans for Gavi-supported countries take into account the broader health financing context. These assessments are also discussed with the Global Fund. Gavi is collaborating with the same two organisations on joint capacity building in countries' health and finance ministries.

In the short term, these initiatives will streamline coordination, thus reducing the risk of duplication, lowering the burden on limited country resources and ensuring efficient use of funding. In the long term, they will help reinforce the sustainability of both national immunisation programmes and the health sector.

Applying lessons learned to middle-income countries

In the current and next period, an increasing number of lower-middle-income countries are crossing the Gavi eligibility threshold, requiring them to start fully self-funding their vaccine programmes.

Poorer middle-income and lower-income countries that receive Gavi support are performing better in terms of coverage and equity, vaccine introductions and supply chain performance than middle-income countries that have never received Gavi support – even though the latter, richer group of countries allocates twice the budget to routine immunisation per child. This shows that lessons from Gavi's approach to increasing domestic financing can be used to improve immunisation performance and introduce new vaccines in those middle-income countries that have not benefitted from Alliance support.

> "Collaboration avoids duplication in resource allocation. It means more people have greater access to health facilities and a better quality of care."
>
> **Dr Issa Ouedraogo**
> Director, Expanded Programme for Immunization, Burkina Faso

TAILORED APPROACH

Angola: strong political commitment

Challenge: just as Angola was transitioning out of Gavi support in 2017, a drop in the global price of oil delivered a serious blow to the country's health investment ambitions. Moreover, the country's efforts to reduce one of the largest populations of underimmunised children in the world have been hampered by a severe shortage of qualified health personnel and weak infrastructure and institutions. Many of the "missing" children live in urban slums, beyond the reach of vaccine supply chains.

Adapting: Gavi's country-tailored plan, approved in 2018, builds on strong political commitment to improving immunisation and primary health care. This has seen Angola switch from being a "recurrent defaulter" to fully self-financing all previously Gavi-supported vaccines. A US$ 110 million World Bank loan will help to strengthen maternal and child health.

The Alliance's plan incorporates an advocacy strategy and the development of new partnerships to strengthen health worker capacity. It also leverages World Bank lending to support the Government's ambitious urban strategy. Gavi will make a one-off investment to modernise supply chains in urban districts with the largest concentrations of underimmunised children. The Government is investing in the recruitment of more health workers.

Nigeria: exceptional extension of support

Challenge: Nigeria is home to more underimmunised children than any other country. There are also large inequities in immunisation, with coverage in different states ranging from less than 10% to 80%. In light of these challenges, coupled with economic difficulties and multiple epidemics, the Board determined in 2018 that Nigeria could not transition as planned by 2021. To do so would jeopardise its immunisation programme, which in turn would have consequences not only for Nigeria's children but also the wider region by increasing the risk of disease outbreaks.

Adapting: Gavi has approved an exceptional extension of support for Nigeria until 2028 to tackle these challenges. The support is based on a tailored transition plan as well as the fulfilment of a series of domestic commitments. Over the next 10 years, Nigeria has pledged to invest almost US$ 2 billion in vaccine programmes. This will be in addition to Gavi investments of US$ 1 billion over the same period.

The Nigerian Government aims to double pentavalent vaccine coverage from 42% in 2016 to 84% by 2028. It has underlined its commitment to sustainability by making timely co-financing payments and gradually raising its health budget. This investment will be closely linked to Nigeria's accountability framework and reviewed annually.

Ensuring healthy vaccine markets

Building healthy vaccine markets is critical to the long-term success of the Gavi mission. It enables manufacturers to produce the right vaccines and immunisation products in quantities and at prices that are appropriate and sustainable for developing countries. These activities allow donor investments to go further while maximising the Alliance's impact. By creating a stable marketplace, Gavi also encourages the entry of new vaccine manufacturers.

In 2015, Gavi made a commitment to ensure a sufficient supply of quality vaccines at affordable prices for developing countries – generating over US$ 1.3 billion of savings in 2016–2020.

Halfway through this reporting period, the Alliance is making strong progress towards its ambitious market shaping goals.

However, supply issues have continued to make it difficult to meet demand, forcing some countries to delay critical vaccine introductions. The exit of one manufacturer from the pentavalent vaccine market illustrates the risky combination of market over-supply, high levels of competition and falling vaccine prices. This is an expected part of market development, but one that needs to be carefully and transparently managed.

Progress to date

- Market shaping activities generated US$ 764 million in cost savings through 2017.
- 50% of the 2020 target of six vaccine markets showing moderate or high healthy market dynamics.
- The weighted average cost of immunising a child with a full course of pentavalent, pneumococcal and rotavirus vaccines reduced by 17%.

Remaining challenges

- Supply issues in several vaccine markets are causing some countries to delay their vaccine introductions.
- Pressure to reduce prices can lead to diminishing economic viability for manufacturers.
- Continuing to provide manufacturers with long-term demand predictability and related information to support production planning and investment.

Weighted average price of fully immunising a child with pentavalent, pneumococcal and rotavirus vaccines

Number of vaccine markets classified as having moderate or high healthy market dynamics

Market shaping goals

Since 2016, Gavi's market shaping strategy has broadened the supply base, secured sustainable and affordable prices of suitable products, and improved overall market dynamics.

Cost savings generated through market shaping activities amounted to US$ 764 million in 2016–2017[a]. By the end of 2017, the Alliance was halfway towards achieving its 2020 target of 6 vaccine markets showing moderate or high healthy market dynamics and three quarters of the way towards reaching its target of 11 vaccine markets demonstrating sufficient and uninterrupted supply of appropriate vaccines.

The number of manufacturers supplying critical vaccines increased from 16 to 17, the latest addition a biopharmaceutical company based in the Republic of Korea. Eubiologics produces the Euvichol oral cholera vaccine (OCV), which now accounts for more than 40% of doses available through the OCV global stockpile. In 2017, Eubiologics also developed a new, improved plastic tube OCV presentation – one of five new products with improved characteristics procured by Gavi since 2015. The Alliance is halfway towards achieving its 2020 target of 10 new improved vaccine products.

Alliance efforts to make sure vaccine prices are sustainable and affordable for lower-income countries are making steady progress.

The cost of immunising a child with a full course of pentavalent, pneumococcal and rotavirus vaccines dropped by 17%, from US$ 20 in 2015 to US$ 16.63 in 2017. This was largely due to a reduction in the weighted average price per dose of pentavalent vaccine, which fell to US$ 0.88 in 2017 – a 43% drop from 2016.

Cold chain equipment

In 2016, Gavi expanded its market shaping activities to cover supply chain equipment. The cold chain equipment optimisation platform (CCEOP) uses the same innovative approach to shape a market by building demand for, and supply of, affordable and environmentally-sound new technologies which improve the effectiveness of immunisation supply chain systems. This will help to safeguard the Alliance's and countries' investments in vaccines over the long term.

To date, 41 prequalified devices have been made available through the platform while 12,000 state-of-the-art fridges have been delivered with CCEOP support to help countries modernise their cold chains. CCEOP also funds the introduction of the first ever "Grade A" vaccine carrier, designed to reduce the risk of vaccines freezing during transportation and storage; this device achieved WHO Performance Quality and Safety certification in 2017. The price of these new technologies is starting to come down, particularly for high-volume orders, but more work is needed to ensure that the products and associated services are affordable and sustainable, and that the supplier base remains broad and competitive.

a – Compared with 2010 prices.

Advance Market Commitment for pneumococcal vaccine

Pneumococcal vaccine protects against a primary cause of pneumonia – *streptococcus pneumoniae* – one of the biggest killers of young children. If pneumococcal vaccine coverage in low-income countries today rivals that in high-income countries, it is largely as a result of the Advance Market Commitment (AMC),[b] an innovative funding mechanism launched a decade ago and rooted in Gavi's market shaping activities. An independent 2015 evaluation[c] identified the AMC's supply arrangements as a critical factor in encouraging vaccine manufacturers to expand their capacity to produce safe, effective vaccines at 2% of the public price in the United States of America.

Historically, it took at least a decade for children in the world's poorest countries to gain access to new vaccines available to children in high-income countries. Through the AMC, combined with Alliance advocacy, low-income countries have been able to introduce the pneumococcal vaccine less than 12 months after it was prequalified by WHO. So far close to 60 Gavi-supported countries have rolled out the vaccine, but there is more work to do before the AMC comes to an end in December 2020. There are still some countries with high burdens of pneumococcal disease that need to introduce the vaccine. This will create greater long-term pull in the market, which, in turn, will increase competition and choice for the future.

By accelerating access to the pneumococcal vaccine, the Alliance is also contributing to the fight against antimicrobial resistance. A study published in 2016[d] estimated that universal coverage with the vaccine could prevent 11.4 million days of antibiotic use per year in children under-five.

The AMC is building a healthier market for the pneumococcal vaccine. However, while it has achieved most of its goals in this regard, such as increasing supply and lowering prices, the AMC has yet to create a more competitive market through an increased number of suppliers. In 2017, a new manufacturer registered with the AMC and other candidates moved towards licensure and prequalification, but delays to market continue due to the complexity of developing and manufacturing the vaccine.

On the upside, two current suppliers have increased their capacity and the latest tender procured a newly prequalified pneumococcal vaccine in a four-dose presentation. The recent drop in price for pneumococcal vaccine – down to US$ 2.95 per dose – will save an estimated US$ 53 million by 2027.

b – Six donors have committed US$ 1.5 billion in funds to the AMC: Italy, the United Kingdom, Canada, the Russian Federation, Norway and The Bill & Melinda Gates Foundation. For more information about the AMC, visit https://www.gavi.org/investing/innovative-financing/pneumococcal-amc/.

c – Source: *Outcomes and impact evaluation for the pilot Advance Market Commitment*, The Boston Consulting Group, 2015 (https://www.gavi.org/results/evaluations/pneumococcal-amc-outcomes-and-impact-evaluation/; date accessed 1 November 2018).

d – Laxminarayan R, Matsoso P, Pant S et al. Access to effective antimicrobials: a worldwide challenge. *The Lancet*, 2016, 387(10014):168–175.

TAILORED APPROACH

Yellow fever vaccine: increasing production to meet growing need

The recent rise in the number of outbreaks has highlighted a global shortage in the supply of yellow fever vaccine. Historically, low prices coupled with the lack of uptake by countries in routine immunisation programmes provided manufacturers with little incentive to invest in upgrading their production facilities for yellow fever vaccines.

Supply shortages meant that the Democratic Republic of the Congo had to resort to fractional dosing to bring its 2016 epidemic under control, giving people one fifth of the usual vaccine dose. Thanks to close collaboration between Alliance partners and manufacturers over the last five years to increase investment and production capacity, by 2017 supply was adequate to meet demand for the first time in several years.

Yellow fever vaccine production has quadrupled to around 120 million doses per year since Gavi's inception in 2000. In the absence of major outbreaks, this should suffice to meet demand for routine vaccination, mass campaigns and the maintenance of a global stockpile. However, with alarmingly low levels of routine coverage in many at-risk countries and fragile supply, the situation remains precarious. Gavi meets regularly with the four manufacturers of yellow fever vaccine to exchange demand and supply forecasts as well as address production risks.

Oral cholera vaccine: breaking the cycle of low demand and supply

The Alliance started supporting the oral cholera vaccine (OCV) stockpile in 2014. At the time, only two manufacturers were producing prequalified cholera vaccines, one of which was both expensive and unsuitable for use in Gavi-supported countries. Demand and supply were low, and the global stockpile provided just 300,000 doses. By funding OCV procurement, Gavi has helped to improve the situation.

Technology transfers from the International Vaccine Institute (IVI) to manufacturers in several Asian countries were key to the development of new products. There are now two suppliers in the OCV market as well as improved products at lower prices. In 2016, Eubiologics entered the market with its first licensed vaccine, Euvichol, thanks to the efforts of IVI, WHO, the Bill & Melinda Gates Foundation (BMGF) and other Alliance partners. From 2016 to the start of 2018, the number of OCV doses provided annually through the global stockpile increased from 3.7 million to 17 million.

Supply challenges

Despite these positive trends, supply shortages are hampering the introduction of several vaccines. In some cases, these are caused by Gavi's efforts to increase country demand; in others, manufacturers may be allocating existing supply to higher priced markets. This highlights the ongoing importance of incentives, as well as detailed long-term planning and exchange of information among relevant Alliance partners to ensure that each vaccine market works effectively.

Human papillomavirus vaccine

In 2016, to accelerate uptake of human papillomavirus (HPV) vaccine in Gavi-supported countries, the Board approved a shift from pilot projects to national introductions covering multi-age cohorts. The resulting surge in demand was dramatic. Despite close coordination with the primary supplier, production capacity did not keep pace with demand, resulting in shortages and introduction delays that risk undermining the Alliance's goal of immunising 40 million girls by 2020. Gavi and its partners are working closely with both current and potential future manufacturers to scale up supply.

Inactivated polio vaccine

The global switch to inactivated polio vaccine (IPV) has also led to an accelerated roll-out and similar supply problems. The vaccine's price increased substantially after manufacturers' investments to scale up production brought unexpected challenges. These production issues have delayed vaccine introductions and interrupted IPV programmes in many Gavi-supported countries.

The Alliance is committed to improving the health of the IPV market and is working closely with its Global Polio Eradication Initiative partners, including UNICEF's Supply Division, to ensure that high-risk countries continue to receive sufficient doses and to help some countries adopt fractional dosing. Alliance partners have also helped to roll out the vaccine in lower-risk countries as supply has become available.

Gavi joined efforts to improve the IPV supply situation in 2014. With manufacturers' investments starting to yield positive results and global demand estimates now shared more regularly, the situation has started to improve. Of the 30 countries that experienced delays or stock-outs, 26 have now introduced IPV. Of the remaining four, Guinea-Bissau, Malawi and Mongolia plan to introduce the vaccine in late 2018 followed by Zimbabwe in 2019. A turning point is expected in 2020, when new manufacturers enter into the market.

Rotavirus vaccine

Recently, two of Gavi's main rotavirus vaccine manufacturers have faced independent and unrelated issues that threaten supply of a vaccine which protects children from diarrhoeal disease – another major child killer in developing countries.

One manufacturer, whose supply meets 90% of demand from Gavi-supported countries, reported technical challenges, including a slower than expected ramp-up of manufacturing capacity. While the company is working to fix the problem, it is unlikely to be able to support Gavi's scheduled rotavirus vaccine introductions in nine countries in 2018/2019. The other manufacturer announced plans to reduce, and possibly withdraw, its supply of rotavirus vaccine to Gavi-supported countries. In the short term, only two thirds of the doses committed for 2018/2019 to four such countries will be supplied.

Gavi, its partners and countries have been left with little time to mitigate the risk of up to half-a-million children missing out on rotavirus vaccine. Alliance partners are urgently working with alternative suppliers, underlining the importance of Gavi support for two new manufacturers entering the market after receiving WHO prequalification in 2018.

Balancing supply and price: pentavalent vaccine

Gavi works to improve the health of vaccine markets by promoting innovation, affordability and supply continuity. Demand predictability and long-term financing have encouraged many manufacturers, especially in developing countries, to invest in vaccine development, increasing the number of suppliers and improving affordability. However, one of the Alliance's most striking success stories also illustrates the difficulties that can arise when attempting to balance market health and price.

The pentavalent vaccine market has retained its moderate healthy market dynamics rating from the previous year. However, one manufacturer left the market because of competition and prices diminishing to a level that was not sustainable for its cost structure. Such exits in certain market conditions are to be expected, as part of market development, but this example highlights the need for Gavi to continue its efforts to ensure information about demand, supply and price is communicated transparently and consistently to all stakeholders.

Healthy vaccine markets

In the interest of achieving appropriate supply and healthy market dynamics, price cannot be the only consideration in the procurement of vaccines. Gavi's market shaping activities aim to balance supply with demand as well as secure sustainable, affordable vaccine prices for appropriate products that meet country preferences – all in a marketplace that is competitive and fosters innovation.

A healthy market is one in which supply is consistent, timely and reliable, regulatory processes are efficient and potential risks for individual suppliers are minimised. It also requires that manufacturers have the resources, information and incentives they need to compete in the market, while customers assess cost beyond price per unit and product innovation is encouraged. To gauge the health of vaccine markets, Gavi, UNICEF and the BMGF introduced the healthy market framework in 2016.

Recognising that individual vaccine markets are at varying stages of development and face different challenges, Gavi has developed tailored approaches and goals for each of the vaccines it supports. In 2017, three of the six markets that are subject to the Alliance's 2020 healthy markets target showed moderate dynamics. To achieve this ambitious target, Gavi and partners will need to address critical supply challenges, particularly in the HPV, IPV and rotavirus vaccine markets, by collaborating closely with manufacturers and potential new market entrants.

Not all markets are expected to achieve healthy dynamics by 2020. These include markets for vaccines against diseases that are mainly limited to Gavi-supported countries, such as meningococcal A and Japanese encephalitis, and markets for cholera and meningitis vaccines where demand is unpredictable because it is tied to disease outbreaks.

As part of Alliance efforts to achieve its coverage and equity goals through product innovation and new technologies, the Gavi Secretariat, WHO, BMGF, UNICEF and PATH have jointly developed the Vaccine Innovation Prioritization Strategy (VIPS). VIPS identifies priority innovations (non-vaccine specific) to guide the work of manufacturers and other partners, as well as ensuring that vaccines and other immunisation products meet the needs of developing countries.

Immunisation's wider impact on development

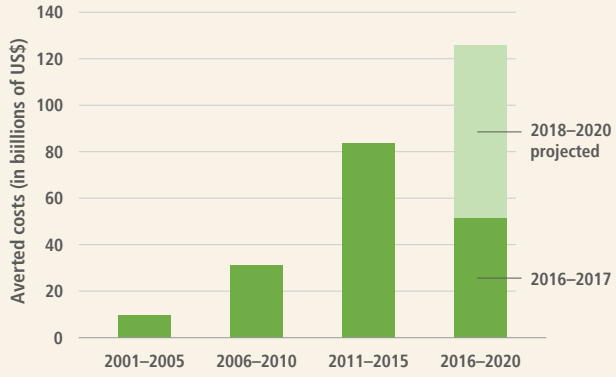
In addition to preventing disease and saving lives, the full extent of the value of vaccines stretches far beyond health with broader impacts on global development. By reaching millions of children with a wide range of life-saving vaccines, the Alliance has made strong progress towards its 2020 goal of delivering US$ 80–100 billion in economic benefits.

In the 2016–2017 period, Gavi-supported vaccines helped to generate future economic benefits valued at more than US$ 50 billion.[a] Much of this total results from averting productivity loss. By preventing premature death and disability, vaccination keeps children healthier. Healthy children are able to go to school and grow up to become productive adults, significantly boosting a country's gross national Income (GNI). Gavi-supported vaccines have averted an estimated 2.5 million deaths in the past two-and-a-half years and prevented the loss of 105 million years due to disability or premature death.[b]

The economic value of vaccines also accrues from significantly lower healthcare, treatment and transportation costs, as well as ensuring parents do not need to stay at home to care for sick children.

This is the virtuous cycle of vaccination, with both short- and long-term benefits that accrue across an individual's lifetime. By targeting infections with the highest burden of disease on developing countries – such as pneumonia, diarrhoea, measles and cancer – Gavi's vaccine support has delivered a steady increase in economic benefits throughout its 18-year existence. In 2017 alone, this figure amounted to US$ 29 billion.[c]

Figure 4: **Estimated economic benefits from Gavi-supported vaccinations by strategic period**



Notes: includes estimated averted costs of illness (treatment costs, transport costs, lost caregiver wages, productivity losses due to disability and death) due to Gavi-supported vaccination against 10 vaccine-preventable diseases (hepatitis B, *Haemophilus influenzae* type b, HPV, Japanese encephalitis, measles, meningitis A, rotavirus, rubella, pneumococcal disease and yellow fever). Averted costs of illness for 2018–2020 are based on projected estimates of immunisation coverage.

a – Constenla, et al. Estimating the economic impact of vaccinations in 73 resource-constrained countries, 2001–2030. Update of findings published in Ozawa S, Clark S, Portnoy A, et al. Return on investment from childhood immunization in low- and middle-income countries, 2011–2020. *Health Affairs*, 2016, 35(2):199–207 by the International Vaccine Access Centre, Johns Hopkins University using Vaccine Impact Modelling Consortium estimates of vaccine health impacts.

b – Vaccine Impact Modelling Consortium estimates.

c – Constenla, et al. Estimating the economic impact of vaccinations in 73 resource-constrained countries, 2001–2030. Update of findings published in Ozawa S, Clark S, Portnoy A, et al. Return on investment from childhood immunization in low- and middle-income countries, 2011–2020. *Health Affairs*, 2016, 35(2):199–207 by the International Vaccine Access Centre, Johns Hopkins University using Vaccine Impact Modelling Consortium estimates of vaccine health impacts.

d – See http://www.worldbank.org/en/topic/macroeconomics/publication/2014-2015-west-africa-ebola-crisis-impact-update, accessed 1 November 2018.

Economic benefits due to Gavi-supported vaccines

Economic cost of disease outbreaks

The added value of vaccination is particularly evident in low-income countries whose often-fragile economies are especially vulnerable to the socioeconomic impact of disease outbreaks. In 2014, the region of West Africa paid a heavy price in both human lives and reduced gross domestic product (GDP), when the devastating Ebola outbreak swept through Guinea, Liberia and Sierra Leone.

According to World Bank 2014 projections, the Ebola outbreak caused cumulative GDP losses totalling US$ 2.8 billion in 2015 (US$ 600 million for Guinea, US$ 300 million for Liberia, and US$ 1.9 billion for Sierra Leone). The outbreak undermined private sector growth, agricultural production and cross-border trade, reducing GDP per capita by an average of US$ 125 in the three countries.[d] The added Ebola-related and health expenditures not only increased fiscal deficits but also led to budget deficits estimated at 9.4% of GDP in Guinea, 8.5% in Liberia and 4.8% in Sierra Leone.

Such figures underline the importance of Gavi's current focus on developing more holistic strategies to mitigate both disease outbreaks and the resulting economic impact (see page 16).

Added benefits for universal health coverage

With basic childhood vaccines reaching an estimated 65 million children annually in Gavi-supported countries, immunisation has a critical role to play in achieving universal health coverage (UHC) by 2030 – part of the third Sustainable Development Goal.

In its most basic form, routine immunisation reaches more than 90% of the world's children and brings the vast majority of families into contact with the primary health system up to five times during the first year of life. This equates to at least 300 million contacts – more than any other health intervention. It also ranks among the most equitable interventions and disproportionately benefits the most marginalised populations.

By reaching these communities with life-saving vaccines, the Alliance is also helping to support the extension of service delivery, supply chains, data systems and other critical health systems building blocks – each used to deliver a range of primary healthcare services, including antenatal care, family planning and basic sanitation. These activities help form the foundations for establishing UHC.

Delivering beyond our goals

Since 2016, Gavi has worked hard with its partners to respond to new challenges and evolving threats to health around the world. This has meant going beyond the original commitments made in Berlin.

New fragility policy

Gavi's new policy on fragility, emergencies and refugees, approved in June 2017, allows the Alliance to respond more quickly and flexibly to the immunisation needs of countries with fragile settings. The policy allows host countries to request additional support for immunising a wide range of age groups among refugee populations with vaccines that are not always part of Gavi's standard portfolio. It also enables the Alliance to work more directly with partners and civil society organisations operating in affected areas to address these complex challenges.

Flexible support for Syria

The civil conflict in Syria and the resulting lack of economic data have made it difficult to determine whether or not the country is eligible for Gavi support. In spite of this uncertainty, in December 2017 the Board approved exceptional support of up to US$ 25 million annually for the 2017–2018 period to help procure vaccines and cold chain equipment. With millions of people lacking access to even the most basic healthcare, the Alliance's involvement was aligned with the overall humanitarian response to Syria's health crisis (coordinated by WHO, UNICEF, other United Nations agencies and civil society partners). The goal is to deliver critical assistance in the face of significant operational constraints, security issues and funding challenges.

Despite the ongoing conflict, estimated coverage rates across all vaccines improved in 2017: basic immunisation rates rose to 48%, up from 42% in 2016. Gavi support has also helped to control outbreaks of polio and measles, as well as strengthen health service delivery. By the end of 2018, more than 200 health facilities will have received modern cold chain equipment, including both solar-powered and electrical refrigerators.

The latest World Bank figures (July 2018) classify Syria as a low-income country, with a per capita gross national income of less than US$ 995. This means Syria will become Gavi-eligible in 2019.

Integrated approach to prevention of disease outbreaks

Recognising the need for integrated solutions to the prevention of disease outbreaks, Gavi is working to find ways to combine routine immunisation and preventative campaigns with investments in stockpiles for selected vaccines.

The Alliance has adopted this comprehensive approach to combat one of the most important causes of death in children**.** With **measles** vaccine coverage stagnating across Gavi-supported countries, the Alliance is applying a three-pronged approach involving strengthened routine programmes, campaigns in at-risk countries and outbreak response. The majority of Gavi's support for measles vaccine is now provided through the combined measles and rubella vaccine, which provides protection against both measles and congenital rubella syndrome. In 2016, global measles deaths fell below 100,000 for the first time.

Gavi is preventing seasonal epidemics of **meningitis**, which threatens more than 500 million people who live in Africa's "meningitis belt", through a similar holistic response. Since the beginning of 2016, the Alliance has supported nine campaigns to combat recurring outbreaks of the most common strain of meningitis (meningitis A) within the main at-risk countries; this support has helped countries immunise approximately 280 million people. To ensure long-term protection, Gavi is also stepping up efforts to increase routine immunisation with the meningitis A vaccine. Since 2016, eight countries have added this vaccine to their national schedules. With epidemics from other meningococcal strains, particularly meningitis C, on the rise, the Alliance continues to work with its partners to monitor the prevalence of different strains. Since 2016, Gavi has funded 18 emergency campaigns through the global stockpile for multivalent meningitis vaccines. It is also considering support for routine immunisation with these vaccines.

Given the rising risk of **yellow fever** outbreaks, the Alliance is working closely with its partners to support implementation of the WHO Global Strategy to Eliminate Yellow Fever Epidemics (EYE). In line with Gavi's integrated approach, the strategy focuses on the need for long-term preventive measures.

Although progress has been made since the end of 2016, action is still needed in several key areas. These include coordination and management of global supply and country planning, surveillance and diagnostics, and increased coverage with routine immunisation programmes. The second Annual EYE Partners' Meeting in September 2018 highlighted each of these areas as key challenges. As a first step, an action plan is being developed, drawing on technical guidance from several working groups.

Over the past two-and-a-half years, the proportion of Gavi funding allocated to immunisation campaigns has increased. While campaigns are essential to control outbreaks, they should be used to complement and strengthen, rather than substitute for, long-term investments in routine immunisation. Prevention of disease outbreaks through strong routine vaccination not only protects people from unnecessary suffering, it is also cost-effective, reducing the risk of unanticipated and disastrous financial burdens to the often-fragile economies of low-income countries. The Alliance is taking steps to mitigate the risk of over-reliance on campaigns, which tends to shift valuable resources away from routine immunisation. This includes rebalancing incentives between campaigns and routine immunisation through targeted, country-tailored approaches.

Immunisation of Rohingya refugees in Bangladesh

Challenge: In 2017, more than 700,000 Rohingyas fled Myanmar's Rakhine State following violence to take shelter in Cox's Bazar refugee camps in Bangladesh. With limited access to clean water and sanitation, the risk of outbreaks of diseases like cholera was significant.

Adapting: With Gavi funding, the Government of Bangladesh together with Alliance partners and aid agencies were able to vaccinate Rohingya refugees and the surrounding population with 900,000 doses of oral cholera vaccine from the global stockpile, thereby preventing a major outbreak. Soon after, an outbreak of diphtheria with at least 5,000 suspected cases highlighted the need for further interventions to help protect the vulnerable population against other diseases. Under the new policy on fragility, emergencies and refugees, Gavi was able to fund the provision of vaccines, including measles-rubella, pneumococcal, inactivated polio and pentavalent, to all children in the camps.

Accelerating development of a new Ebola vaccine

In addition to its long-standing support for three vaccine stockpiles – multivalent meningitis, oral cholera and yellow fever – the Alliance has leveraged its market shaping experience to fast-track the availability of the new Ebola vaccine to avoid future epidemics.

During the devastating 2014 Ebola outbreak in West Africa, Gavi committed up to US$ 300 million to incentivise manufacturers to further develop candidate vaccines by guaranteeing a market for a licensed product. An additional US$ 90 million was made available, both to support Ebola-affected countries in introducing the vaccine and to rebuild health systems and restore immunisation services.

In 2016, Gavi announced an Advance Purchase Commitment with Merck, providing US$ 5 million towards the procurement of an Ebola vaccine once licensed, prequalified and recommended by WHO. As part of this commitment, Merck agreed to create and store a stockpile of 300,000 doses of the experimental vaccine for use in case of an outbreak while licensure was being pursued. The Democratic Republic of the Congo became the first country to use this new vaccine in response to two Ebola outbreaks which occurred in May and August 2018.

As well as accelerating the development of an Ebola vaccine to prevent a repeat of the West African epidemic, Gavi has worked closely with partners and civil society since 2016 to rebuild immunisation systems in Guinea, Liberia and Sierra Leone. Many health workers died in the outbreak and it became difficult to mobilise communities to attend vaccination sessions. The Alliance has supported governments of all three countries to train more primary healthcare workers to administer vaccines and has provided transport and health system strengthening (HSS) grants to get immunisation systems back on their feet. Already, data is starting to show signs of an improvement in vaccination rates in some of the affected countries which witnessed a sharp drop in coverage in the immediate aftermath of the epidemic.

Extended support for polio eradication

Since 2013, the Alliance has played a critical role in assisting poor countries to introduce the inactivated polio vaccine (IPV), a critical component of the Polio Endgame. This work has been carried out in collaboration with the Global Polio Eradication Initiative (GPEI).

The extension of the timeline for polio eradication to 2021, at the earliest, places a significant burden on GPEI funds. In June 2018, the Board decided to extend Alliance support for IPV by drawing on core Gavi funding for 2019 and 2020. While this decision was made on an exceptional basis, the Alliance is currently evaluating its continued support for IPV beyond 2020.

Gavi and GPEI are exploring how to better coordinate efforts to improve routine immunisation coverage in the poorest-performing districts of priority countries. This will include leveraging GPEI's expertise in microplanning, monitoring and surveillance, as well as harmonising efforts to increase national ownership and accountability of immunisation programmes.

Strategic partnership with India

In a bid to target one of the largest populations of underimmunised children in the world, Gavi and India embarked on a new partnership in 2016. The initiative will help accelerate the Government's ambitious immunisation agenda to introduce new vaccines and increase the proportion of fully immunised children in India to over 90%. Under the agreement, Gavi will provide funding up to US$ 500 million between 2016 and 2021 – prior to India transitioning out of Alliance support.

In addition to facilitating one of the fastest and most ambitious introductions of new vaccines, this funding will also support HSS in provinces with particularly low coverage rates. The increase in the Government's contributions to fully self-financed, Gavi-supported vaccine programmes (from US$ 83 million in 2016 to US$ 114 million in 2017) reflects India's commitment and is part of a substantially larger national investment in immunisation.

India's nationwide roll-out of rotavirus vaccine is progressing well, while five states have introduced pneumococcal vaccine. It is estimated that these two vaccines alone could avert more than 50,000 child deaths and generate over US$ 2.6 billion in economic benefits every year.[a] In 2017, the country also launched the world's largest campaign against measles-rubella, aiming to vaccinate over 400 million children in two years. This will move India closer to eliminating measles and controlling rubella.

India has used Gavi's HSS support to roll out the Electronic Vaccine Intelligence Network[b] system (eVin), which allows supply chain data to be collected from remote facilities. The project is one of the largest ever scale-ups of a vaccine logistics and cold chain monitoring system. EVin has enabled real-time monitoring of vaccine delivery and temperatures across 12 states and more than 11,000 primary health centres.

"We cannot achieve health for all without vaccines for all."

Dr Tedros Adhanom Ghebreyesus
Director-General, WHO

http://gotlife.gavi.org/ebola

The race to develop an Ebola vaccine

a – Constenla, D. *Estimating the economic impact of Hib, PCV and RV vaccines in India: a national- and state-level analysis.* Technical report. International Vaccine Access Center, Johns Hopkins Bloomberg School of Public Health. Baltimore, 2014.

b – eVin includes Logistimo, an open source forecasting, optimisation and transport orchestration software built on machine learning and user-centred design to improve the efficiency of supply chains. As a 2017 INFUSE pacesetter, Logistimo – together with another pacesetter, Nexleaf – is transforming immunisation supply chains by allowing data to be collected from remote facilities in areas with low or no network connectivity.

The future

The road to 2020

Today's children are better protected against infectious disease than at any point in history. Coverage rates are at an all-time high, while the breadth of protection afforded by the range of vaccines available to the world's poorest countries is wider than it has ever been. This means Gavi is on track to meet its Berlin commitments of immunising an additional 300 million children and preventing 5–6 million future deaths by 2020.

The Alliance is also on course to achieve its transition goals, with 16 countries now fully self-financing their immunisation programmes. Vaccine prices continue to come down thanks to Gavi's market shaping activities, while half of the six target vaccine markets are enjoying healthy dynamics. As a result, vaccination programmes in Gavi-supported countries have already led to US$ 50 billion in future economic benefits since 2016.

However, in order to further its mission and to reach the remaining 20% of children who are still missing out on basic vaccines, the Alliance must keep learning from its experiences and continue to adapt its model accordingly.

Whether driven by conflict, economic downturn or the consequences of climate change, the impact of changes in the global health landscape on the Alliance's mission is the same: the last to be reached are also the most difficult to find and represent the hardest challenge of all. Over the next decade, increasing fragility could pose even greater threats to Gavi's mandate. In response, the Alliance is exploring new solutions, such as prioritising support to countries with the largest numbers of underimmunised children and investing in alternative ways of collecting quality data so coverage and equity estimates are less reliant on five-yearly national household surveys.

Gavi continues to learn from its experience of building sustainable immunisation programmes. For example, based on lessons learned from the first 16 countries to transition in this period, Gavi has implemented measures to fill programmatic gaps. By taking a more systematic approach to post-transition engagement or by adopting tailored plans for "high-risk countries", it is possible to help governments to continue to raise immunisation coverage. Likewise, by preparing countries earlier, it should be possible to lessen the impact of similar issues on the next wave of transitioning countries.

The Alliance's market shaping activities also face new challenges in this period, as recent supply issues with several Gavi-supported vaccines have illustrated. Through the timely introduction of a range of prequalified vaccines by new manufacturers – either entering the market or about to do so – the Alliance continues to adapt to these unpredictable changes to supply. To continue meeting country demand for new vaccines, Gavi is actively seeking new ways to mitigate the impact of supply gaps.

New global health priorities

Since 2015, the Alliance has also had to adapt to the emergence of new global health priorities. These are partly driven by changes in the leadership of the G7 and G20 countries, as well as the switch from a global health agenda driven by the Millennium Development Goals to one guided by the Sustainable Development Goals (SDGs). The latter have brought an increased focus on international cooperation and action by all countries – not just the poorest.

While Gavi's core work remains focused on accelerating access to immunisation, its success has long been rooted in forging efficient and effective partnerships. This part of the Alliance's DNA will help address increasingly multifaceted challenges – threats to global health security, outbreak response and epidemic preparedness, antimicrobial resistance and medical impoverishment.

Gavi is uniquely positioned to contribute to achieving universal health coverage (UHC). Extending the reach of routine immunisation depends on resilient supply chains, efficient cold storage facilities, trained healthcare staff, robust data monitoring and disease surveillance, reliable healthcare records and more. Each helps create a platform for other health interventions, such as neonatal and maternal healthcare, nutritional supplements and malaria prevention measures. By reaching more people than any other health intervention, even in the most challenging of settings, childhood immunisation is already providing foundations for building UHC. In finding ways to prioritise those who are the last to be reached, Gavi is filling in the gaps – from the outside in.

In light of its broader role within the new SDG landscape, Gavi is building deeper and wider collaboration with partners, including other global health and civil society organisations and the private sector. By signing up to the "Global Action Plan for Healthy Lives and Well-being for All", the Alliance has committed to the three principles of Align, Accelerate and Account. Each aims to avoid duplication and inefficiency among global health partners sharing similar goals. Several of the 11 signatories are core partners in the Alliance – UNICEF, WHO and the World Bank – while Gavi is already cooperating with the Global Fund and the Global Financing Facility (GFF) to coordinate country-level engagement and investments.

Figure 5:
18 years of accelerating access to vaccines

2000–2005

Beyond 2020

Looking towards Gavi's next strategic period, there is still much work to be done. Even though 70% of WHO-recommended vaccine launches for Gavi-supported countries will have already taken place by 2020, many more are needed. The Alliance also needs to continue its efforts to improve coverage and equity through more resilient health systems.

In future, the increased level of collaboration and adaptation that is helping Gavi achieve its current goals will become ever more mission-critical – not just because the "one size fits all" approach will not work for all remaining Gavi-eligible countries, but also because the global trends that drive many of today's challenges are likely to remain for some time.

Climate change, population growth, migration and urbanisation are all inexorable realities. For organisations like Gavi this is a huge concern. It has long been known that the fifth child will be the last to be reached, and the most difficult – especially given the rise in fragility.

In 2000, most people in extreme poverty were concentrated in low-income countries; by 2025, the majority will live in middle-income countries, which are not eligible for Gavi funding. This will place a growing proportion of the most vulnerable people beyond the Alliance's help. Furthermore, while the number of disease outbreaks has multiplied more than three-fold in recent decades[a], this could pale in comparison with the repercussions of more people migrating to urban settings. High population density, the prevalence of urban slums and the sheer number of mega-cities – those with populations exceeding 10 million – will all raise the security risk of global epidemics. The Alliance needs to consider how its business model should adapt to this geopolitical environment for the final decade of SDGs.

a – Smith KF, Goldberg M, Rosenthal S et al. Global rise in human infectious disease outbreaks. *Journal of the Royal Society Interface*, 2014, 11(101): 20140950.

All of this provides much food for thought as the Alliance plans for its next strategic period. Even though there are more children living in the world than ever before, under-five mortality rates have reached a record low. Yet while these achievements are worthy of celebration, they should not be a cause for complacency. There is a long road ahead.

The task of securing adequate funding to reach all children in Gavi-supported countries with all core vaccines in the Alliance's portfolio, at affordable, competitive prices, as well as ensuring the systems are in place to deliver them, is not without challenges. Fortunately, the Alliance model has the skills and assets to meet them. From its innovation and private sector partnerships to market shaping and smart, catalytic investments in countries, Gavi can turn these challenges into opportunities. In doing so, it will continue to help millions of the most vulnerable people – those who are least able to afford to protect themselves from illness, disability and death – and thereby disrupt the vicious cycle of poverty.

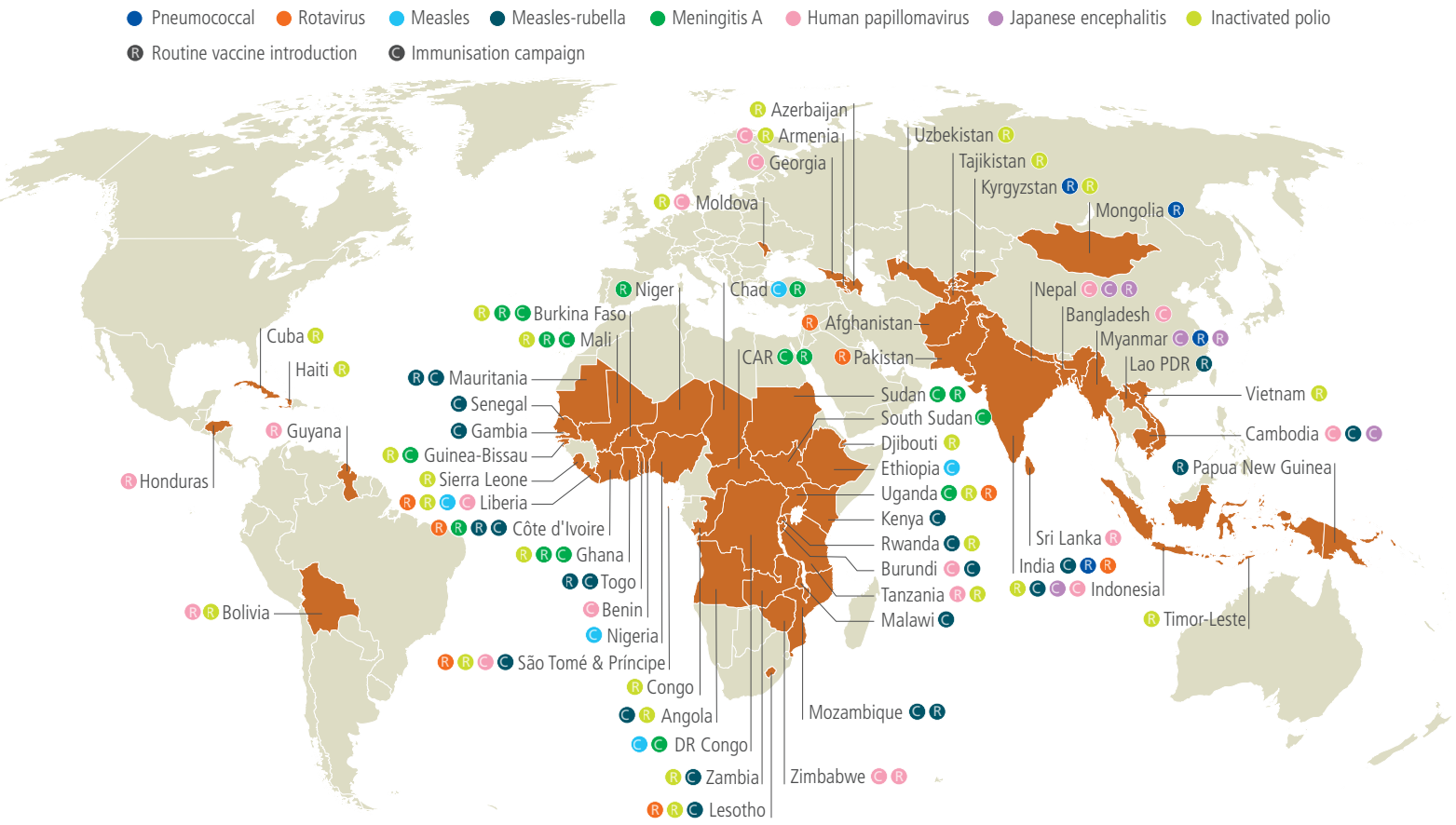
This is a responsibility that drives Gavi's work and will help make the third SDG's ambitions a reality. Together with its partners, the Alliance is ready to continue to take bold steps along the path set out in Berlin.

b – As of 31 December 2017, countries had immunised 692 million children with Gavi support through routine systems since 2000. By mid-2018, this figure was estimated to have exceeded 700 million.

List of figures

Figure 1: Donor commitments mobilised for 2016-2020 B
Figure 2: Status of forecasted costs and projected future deaths averted, by vaccine 5
Figure 3: Projected impact of dynamic resource mobilisation model on donor share of total financing 9
Figure 4: Estimated economic benefits from Gavi-supported vaccinations by strategic period 15
Figure 5: 18 years of accelerating access to vaccines 18
Figure 6: Vaccine introductions and campaigns, 1 January 2016 – 1 September 2018 20

Figure 6: Vaccine introductions and campaigns, 1 January 2016 – 1 September 2018



The Vaccine Alliance is funded by

Donor governments and the European Commission

Australia
Brazil
Canada
China
Denmark
European Commission
France
Germany
India
Ireland
Italy
Japan
Kingdom of Saudi Arabia
Luxembourg
Netherlands
Norway
Principality of Monaco
Republic of Korea
Russian Federation
South Africa
Spain
State of Qatar
Sultanate of Oman
Sweden
Switzerland
United Kingdom
United States of America

Foundations, organisations, and corporations

Alwaleed Philanthropies
Bill & Melinda Gates Foundation
His Highness Sheikh Mohammed bin Zayed Al Nahyan
OPEC Fund for International Development (OFID)
Absolute Return for Kids
Anglo American plc
The Children's Investment Fund Foundation
China Merchants Group
Comic Relief
Deutsche Post DHL
Dutch Postcode Lottery
ELMA Vaccines and Immunization Foundation
Girl Effect
Google.org
Gulf Youth Alliance
International Federation of Pharmaceutical Wholesalers (IFPW)
JP Morgan
"la Caixa" Foundation
LDS Charities
Lions Clubs International Foundation (LCIF)
Majid Al Futtaim
Orange
Philips
RB
Red Nose Day Fund
Unilever
UPS
Vodafone

Notes

The figures presented in this report are based on the latest official data and projections as of 1 October 2018 and are subject to change based on updated or revised data.

The data presented in this report are from many sources, including official UN/WHO statistics, country administrative data collated by UN agencies and Gavi, internal Gavi data sets, as well as mathematical modelling exercises carried out by academic institutions. For more detailed information, please see:
https://www.gavi.org/results/measuring/2016-2020-indicators/

The term lives saved is used throughout this document to denote the impact of Gavi investments in terms of future deaths averted through the prevention of death due to infectious diseases in childhood, as well as death due to cancer in adulthood. Immunisation averts deaths over the lifetimes of vaccinated children by providing immunological protection from a young age. Some vaccines, such as human papillomavirus vaccine, prevent deaths due to cancer decades in the future, through protection conferred at the time of immunisation.

Photo credits

Front: Gavi/Doune Porter
Page 1: Gavi/Olivier Asselin
Page 2: Gavi/Oscar Seijkens
Page 3: Gavi/Evelyn Hockstein
Page 5: Gavi/Hervé Lequeux, UNICEF/Maoungou Minguiel
Page 11: Monaco Red Cross/Marine Ronzi, Gavi/Adrian Brooks
Page 13: Gavi/Olivier Asselin, WHO
Page 17: Gavi/Pascal Barollier
Page 18: Gavi/Jiro Ose
Page 19: Gavi/Bart Verweij, Gavi/Riccardo Gangale
Back: Gavi/Tony Noel

Gavi core partners

unicef
World Health Organization
THE WORLD BANK IBRD • IDA | WORLD BANK GROUP
BILL & MELINDA GATES foundation

Gavi
The Vaccine Alliance

2016–2020
Mid-Term Review report

18 years supporting immunisation

700 million immunised

10 million lives saved

To see the faces behind these results, visit Gavi's "Vaccine Heroes" photo exhibit at the Mid-Term Review meeting in Abu Dhabi in December 2018, or learn more at https://www.gavi.org/vaccine-heroes/

Global Health Campus
Chemin du Pommier 40
1218 Grand-Saconnex
Geneva, Switzerland

Tel: +41 22 909 65 00
Fax: +41 22 909 65 50
info@gavi.org

www.gavi.org

facebook.com/gavi
@gavi / @gavi_fr / @vaccines
linkedin.com/company/gavi
instagram.com/gavialliance
youtube.com/gavialliance