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COVERAGE AT A CROSSROADS

New directions for vitamin A supplementation programmes

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New directions for vitamin A supplementation programmes

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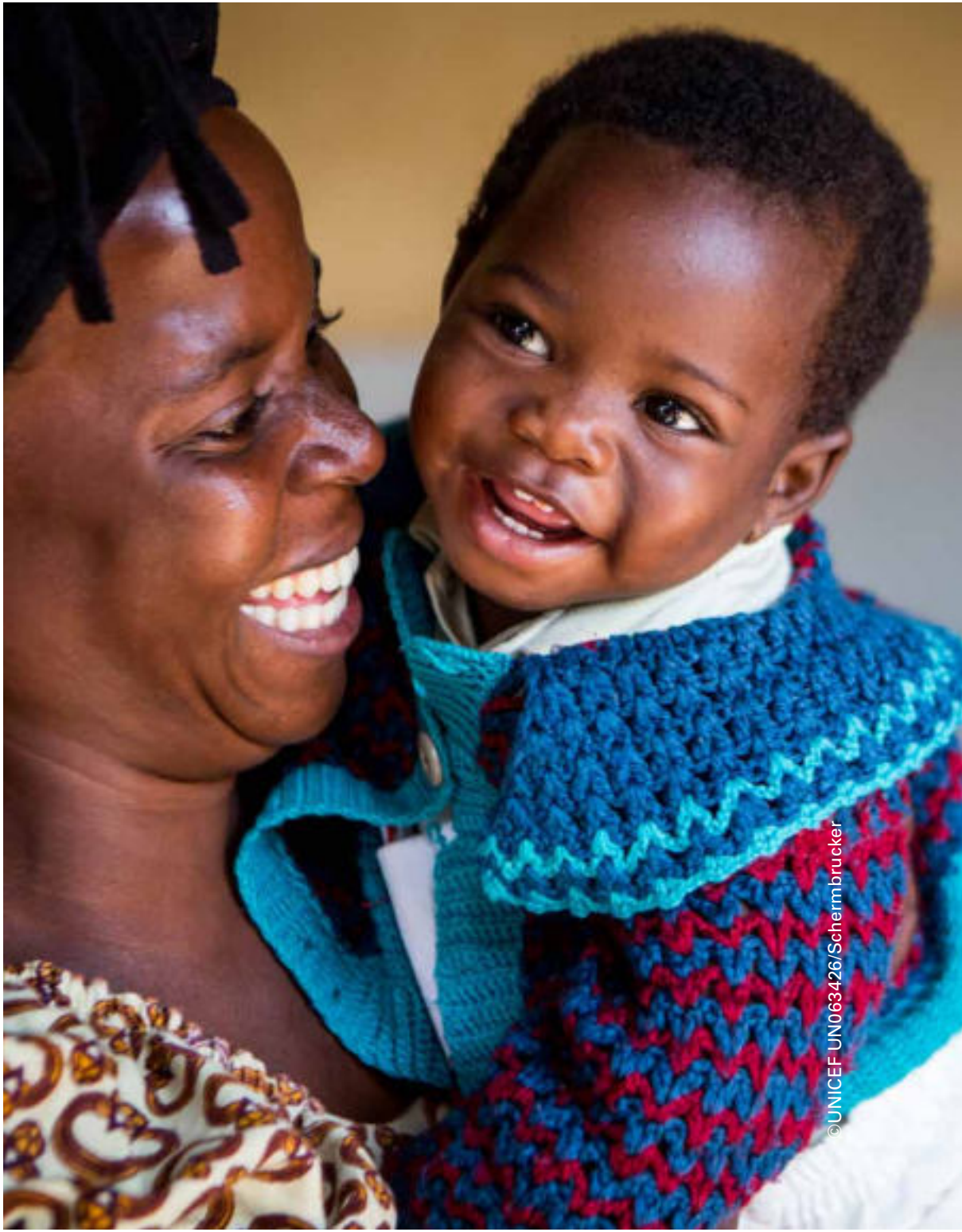
CONTENTS

ABBREVIATIONS

DHIS2	District Health Information System 2
DHS	Demographic and Health Survey
GAVA	Global Alliance for Vitamin A
GNI	Gross National Income
HMIS	Health Management Information System
LDC	Least Developed Country
LQAS	Lot Quality Assurance Sampling
SDG	Sustainable Development Goals
SIA	Supplementary Immunization Activity
SMS	Short Message Service
SUN	Scaling Up Nutrition
U5MR	Under-five mortality rate
UNICEF	United Nations Children's Fund
VAS	Vitamin A Supplementation



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FIGURES

FOREWORD

Like many of the world's best solutions, it's simple – and affordable. For as little as 2 cents a dose, vitamin A supplementation can boost immunity and provide life-saving protection to some of the world's most vulnerable children.

We have known for almost three decades that one dose of vitamin A every four to six months can dramatically reduce deaths in settings where vitamin A deficiency is prevalent and under-five mortality is high. Indeed, since 2000, the support of UNICEF and partners has allowed countries to deliver vitamin A supplements to millions of children, saving countless young lives and protecting generations of children from the consequences of vitamin A deficiency.

Yet today, vitamin A supplementation programmes are in crisis. This UNICEF report, *Coverage at a Crossroads: New directions for vitamin A supplementation programmes*, is an effort to sound the alarm.

Despite years of steady progress, global coverage of vitamin A supplementation programmes has dropped to a shocking six-year low, leaving more than one third of children in need unprotected from the devastating effects of vitamin A deficiency. There are also stark inequities in programme coverage, meaning that we are not always reaching the most vulnerable children.

Countries with the highest under-five mortality rates have seen their coverage drop by more than 50 per cent in recent years. Even within countries with high levels of coverage, some districts are being left behind – likely those most in need. Without a clear strategy to sustain vitamin A supplementation programmes, many countries risk losing ground on their hard-won progress, with dire and potentially fatal consequences for their youngest citizens.

Delivery has always been the greatest challenge of vitamin A supplementation programmes – and this is particularly true today. Polio immunization is phasing out as the world moves closer to the monumental achievement of polio eradication, leaving fewer opportunities for delivering vitamin A supplements through polio Supplemental Immunization Activities. Many countries that benefitted from this effective delivery platform are now struggling to deliver vitamin A supplements in the changing landscape. While Child Health and Nutrition Days are delivering vitamin A supplements in many places, in some countries these events have been co-financed using polio funding, which is now dwindling.

The sustainability of vitamin A supplementation programmes is also tenuous. There are substantial fluctuations in the coverage achieved in countries over time, owing to limited funding, but also to weak health systems and a lack of national planning and commitment.

Concerned with this changing programme environment, we call for an urgent and renewed global commitment to strengthening vitamin A supplementation programmes. To do this, we need to promote the integration of vitamin A supplementation within community platforms, such as routine immunization or outreach events that reach every child in need. We also need to strengthen national data systems, to pinpoint the places where coverage is lagging, and to expose and respond to the delivery barriers in those settings. With such efforts, we remain hopeful that we can continue and even strengthen the delivery of vitamin A supplements to improve child survival.

Building on the commitment of national governments and key partners, as well as improved linkages with routine health services and other efforts to reach children, we can expand the reach of this powerful, life-saving intervention.

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Vitamin A drops were given at a vaccination session during the National Lao Measles Vaccination Campaign in Lao People's Democratic Republic. © UNICEF/ UNI77085/Holmes

EXECUTIVE SUMMARY

Vitamin A supplementation saves lives. In settings where under-five mortality is high and vitamin A deficiency is a public health problem, two high-dose supplements of vitamin A per year, spaced four to six months apart, can strengthen children's immune systems and improve their chances of survival.

During much of early childhood – from 6 months to 5 years of age – two high doses of vitamin A every year can prevent blindness and hearing loss, boost children's immunity against diseases like measles and diarrhoea and provide critical protection against death. Like all forms of malnutrition, vitamin A deficiency is a marker of inequality. In countries where diets are lacking in vitamin A and infections and deaths are prevalent, supplementation programmes give vulnerable children a better chance to survive, develop and thrive.

Vitamin A supplementation (VAS) has been a cornerstone of early childhood nutrition programmes for more than two decades – and UNICEF has been a committed partner in this work since the beginning. Today, 82 countries have been prioritized for national-level VAS programmes.

Since the year 2000, global efforts to scale up VAS programmes have yielded dramatic improvements in coverage, contributing to the drop in global child mortality.[1-3] Global coverage of VAS peaked at 78 per cent in 2009, with more than 290 million children fully protected from the consequences of vitamin A deficiency.[4]

Yet today, new analysis of the most recent coverage data shows that VAS programmes are in crisis. Many countries are losing delivery platforms that they have relied on to successfully deliver vitamin A in the past. Others are constrained by weak health systems, which pose barriers to reaching the most vulnerable children, particularly in fragile contexts. Sustainability is also a problem, with many countries facing serious challenges in maintaining high coverage over the long term. Global coverage of VAS programmes is already slipping in this new landscape – and without a sharp change in course, millions of young lives will be left unprotected. As countries shift to new modes of delivery and make efforts to integrate VAS into routine health services, important challenges lie ahead.

A health worker administers a dose of vitamin A to a girl at a nutrition screening in Eritrea. © UNICEF/ UNI9445/Pirozzi

This UNICEF report shines a spotlight on this urgent situation. It reviews the global data on VAS and calls attention to the rapidly shifting global context, highlighting gaps in coverage and the barriers to reaching each and every child.

Chapter 1 describes an alarming global situation, where more than one third of children in need are not receiving the life-saving benefits of VAS. In 2016, only 64 per cent of children in need in priority countries were reached with two doses of vitamin A, leaving more than 140 million children behind.

Chapter 2 reviews current distribution platforms and describes how the successes of polio eradication and subsequent phase-out of polio Supplementary Immunization Activities – including their substantial financing – have created an uncertain future for VAS programmes.

Chapter 3 tackles the theme of equity, examining how global, regional and national estimates can mask startling disparities both within and between countries. Between 2015 and 2016, VAS coverage dropped by more than half in countries with the highest under-five mortality rates (U5MR) – the same countries where it is needed the most. Consequently, the number of children left unprotected more than tripled in high-mortality countries during this period, increasing from 19 million to 62 million.

Chapter 4 explores the determinants of sustainable VAS programmes, noting how political support, funding availability and partnerships can help countries achieve and maintain high supplementation coverage. The analysis shows that programme sustainability is fragile, with wide variability in the coverage levels achieved by individual countries over time.

Chapter 5 describes the monitoring challenges inherent in determining VAS coverage and describes how routine information systems, new technologies and better access to subnational data can improve programme performance.

It is not too late to re-chart the future of VAS programmes. But if we fail to act now, the many gains achieved over two decades of programming risk backsliding further, leaving millions of children vulnerable to preventable causes of death. As the world mobilizes towards the 2030 Agenda for Sustainable Development – and particularly the target of ending preventable deaths in children under age 5 – there has never been a better time to reprioritize this safe, cost-effective and evidence-based intervention.

Introduction

EVERY CHILD. EVERY DOSE. EVERY YEAR.

Carrots. Spinach. Papayas. Eggs. These nutritious foods are part of a healthy, diverse diet for children in many parts of the world. Unfortunately, even minimally diverse diets are still out of reach for more than two thirds of infants and young children in low- and middle-income countries.[1] In addition, nearly one third of children living in low- and middle-income countries suffer from vitamin A deficiency, which is likely the result of poor dietary diversity.[2] For children living in countries where vitamin A deficiency is a public health problem, VAS is a life-saving intervention, providing vital protection from blindness and decreasing their risk of dying from preventable causes such as measles and diarrhoea.[3]

VAS protects against the consequences of vitamin A deficiency, but it does not improve vitamin A status over the long term.[4] This means that in tandem with supplementation, greater efforts are needed to improve the quality of children's diets. Healthy diets include access to a diverse range of nutritious foods during early childhood – factors that are critical to improving vitamin A intake and ending deficiency over the long term. But until every child consumes adequate vitamin A as part of her or his regular diet, supplementation is critical to saving lives and advancing equity.

The global prevalence of vitamin A deficiency in children under age 5 has declined from about 39 per cent to about 30 per cent over the past two decades. However, progress has not been seen in South Asia and sub-Saharan Africa, where today, vitamin A deficiency still affects around 44 per cent and 48 per cent of children under age 5, respectively. More than 95 per cent of vitamin A-related measles and diarrhoea deaths occur in these regions – and VAS offers a powerful tool for preventing them.[5]

In settings where vitamin A deficiency is a public health problem, children must receive two adequately-spaced doses of vitamin A every single year, from the age of 6 months to 59 months, to be fully protected.[6] UNICEF currently tracks progress in 82 countries deemed priority for national-scale supplementation programmes, based on their indicators of vitamin A deficiency and mortality in the year 2000 (for a list of the priority countries, see Annex 2). Universal coverage – reaching every child with two doses every year – is the overarching goal of any VAS programme. When at least 80 per cent of targeted children are receiving two high-dose supplements of vitamin A, this is an indication of a strong country programme. For UNICEF, this metric is defined as 'high coverage' and used as a benchmark throughout this report.

There are a variety of platforms used in countries to deliver VAS. One of the most common strategies of the past decade has been to supplement children with vitamin A during polio Supplementary Immunization Activities (SIAs), which aim to reach children of a similar age on a similar delivery schedule. Many countries have successfully achieved high VAS coverage using this strategy in the past; however, as polio SIA events begin to scale back with the eradication of polio, the future of VAS is on shaky ground.

One dose of vitamin A costs just 2 cents – and with effective delivery and strong programmes, the cost of saving one child's life is low. Yet financing for VAS programmes remains a critical gap. Not only were polio SIAs an effective delivery platform, but they were also supported by billions of dollars in global financing, which cannot be matched by national governments alone.

National governments are also constrained in their decision-making on VAS due to the lack of national-level data on vitamin A status. In many countries, national data are only collected every 10 years or less frequently, meaning that national-level programmatic decisions – including those related to programme scale-up or scale-back – are being made in the absence of updated data on the burden of vitamin A deficiency.

Vitamin A supplementation boosts immunity and provides life-saving protection...

...but only when provided as recommended.

Today, VAS programmes are at a crossroads. The strategies that have worked to deliver VAS in the past have either been phased out or will not be sustainable moving forward. This puts VAS at a critical juncture – and we need to rethink its future by revamping delivery strategies, strengthening health systems, scaling up routine delivery, improving monitoring and securing sustainable financing.

This report reviews progress on VAS programmes since 2000, exploring current coverage, trends and strategies for delivering VAS to children. To determine if VAS programmes are achieving equity, the report looks at disparities within and between countries and in relation to U5MR. The report also explores programme sustainability, including how policies, financing and partnerships influence coverage consistency. The final chapter of the report reviews key monitoring and evaluation challenges, highlighting national efforts to improve the use of data for effective programmes.

VAS has averted millions of deaths globally, and even as U5MRs fall, it continues to offer protection to some of the most vulnerable children.[7] Important work lies ahead to refine strategies and strengthen programmes moving forward, and these efforts will yield important contributions to the Sustainable Development Goal (SDG) target of ending preventable deaths in children under age 5. With renewed vigour and a clear way forward, we can transform VAS programmes for the future.

1 TRACKING TWO-DOSE COVERAGE

In 2016, vitamin A two-dose coverage dropped to 64 per cent – a six year low.

Children with their mothers queue up during the UNICEF supported National Vitamin A Plus Campaign in Bangladesh. © UNICEF/UNI112506/ Kiron

Two-dose coverage: current status of vitamin A supplementation

TWO DROPS FOR SURVIVAL

Why is two-dose coverage important?

When children aged 6 months to 5 years in vitamin A-deficient communities are reached *regularly* with vitamin A supplements, fewer of them will die. One supplement per year is not enough: each child must receive two high-dose supplements – one every four to six months – to be fully protected each year. Together, these two vitamin A supplements offer powerful lifesaving protection: they can reduce child mortality by at least 12 per cent*.[1]

Universal VAS coverage for all children in need is the ultimate programme goal – and the best indicator of equity. UNICEF strives for at least 80 per cent coverage as a measure of strong and effective VAS programming.

* Depending on the statistical model used, the reduction in mortality may be as large as 24 per cent.

How is coverage tracked?

Globally, UNICEF tracks progress by reviewing administrative data from countries on VAS coverage in each semester (i.e., the first and second half) of the calendar year. Two-dose coverage is then defined as the lower coverage of the two semesters. This method assumes that children who received a dose in the semester with lower coverage also received a dose in the semester with higher coverage. Data are quality checked, and those adhering to a set of required criteria are included in the global database.

Estimates of coverage from population-based household surveys such as Demographic and Health Surveys (DHS) are sometimes used by other global assessments. These survey methods have important limitations, however, including the inability to generate annual two-dose coverage estimates for each country. Survey respondents could also confuse VAS with other interventions, such as the polio vaccine, which is also administered by drops.

Within countries, various tools are used to validate administrative coverage data and address reporting challenges (*see chapter 5: Monitoring and evaluation*).

What do the data tell us?

The latest estimates tell us that VAS coverage is in crisis. In 2016, 64 per cent of children in need in priority countries were reached with two doses of vitamin A – but more than 140 million children were left behind, leaving them vulnerable to disease and death.

The situation is most alarming in West and Central Africa, where two-dose coverage was the lowest of all regions in 2016, reaching just more than half of children in need. South Asia and Eastern and Southern Africa followed with approximately two thirds of children reached. In East Asia and the Pacific, more than 80 per cent of children in priority countries were fully protected with the two requisite doses.

Today, more than one third of children in need are not receiving the life-saving benefits of vitamin A supplementation

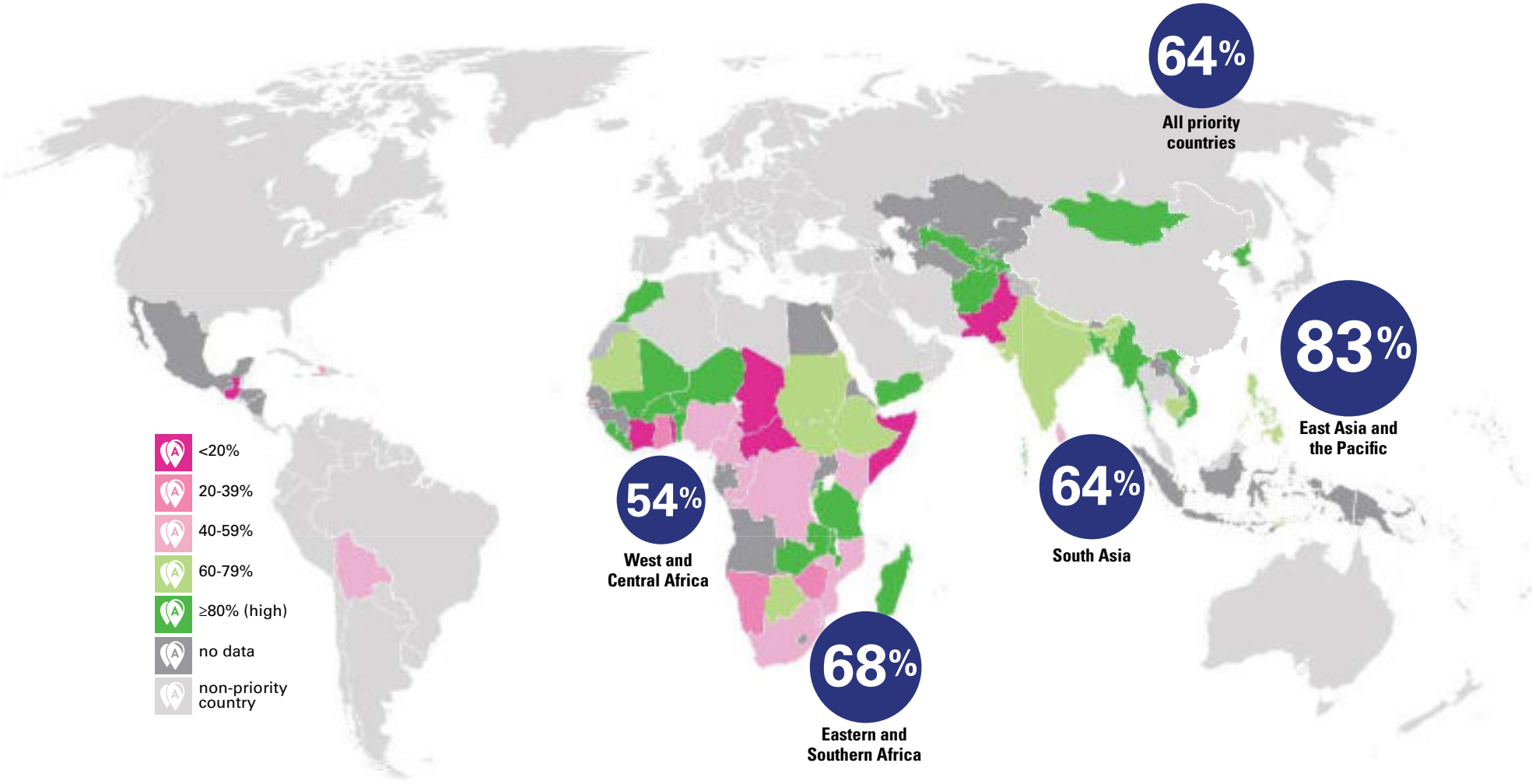


Figure 1.1. Vitamin A supplementation two-dose coverage, by country and region, 2016

Source: UNICEF global databases, 2018. Based on administrative reports from countries. For notes on the data see Annex 1.

Two-dose coverage: trends in vitamin A supplementation

EXPOSING THE CRACKS IN COVERAGE

Why does sustained coverage matter?

To be effective against disease and death, vitamin A supplements must be provided *continuously*. Two doses a year – every year – are needed until age 5 to keep children fully and continuously protected throughout early childhood.

Because VAS is required twice a year, some countries deliver it as part of biannual campaigns or events. While such events are effective at reaching targeted children, they require commitment, planning and funding and can thus be challenging to implement consistently. A lack of consistent financing or logistical challenges can result in reduced coverage, or even a missed round of delivery, denying coverage to all children.

What do the data tell us?

In all regions, coverage rates today are dramatically better than they were in 2000. However, slipping coverage is cause for concern. Trend analysis for two-dose coverage suggests that programmes were scaled up among priority countries between 2000 and 2016, with coverage peaking at 78 per cent in 2009 when 290 million children were fully protected.

Yet in 2016, global coverage reached a six-year low and two-dose coverage has not remained consistent across the years. Wide fluctuations in short time spans are apparent in a number of regions, particularly those with weak routine health systems, such as West and Central Africa, South Asia and Eastern and Southern Africa.

In East Asia and the Pacific, children in need have benefitted from high two-dose VAS coverage for more than a decade. Many priority countries in this region have strong health care systems and can reach children with vitamin A supplements every six months using an established and stable delivery platform.[2]

More than a decade of data show dramatic programme scale-up – yet alarming dips in coverage are leaving vulnerable young lives at risk

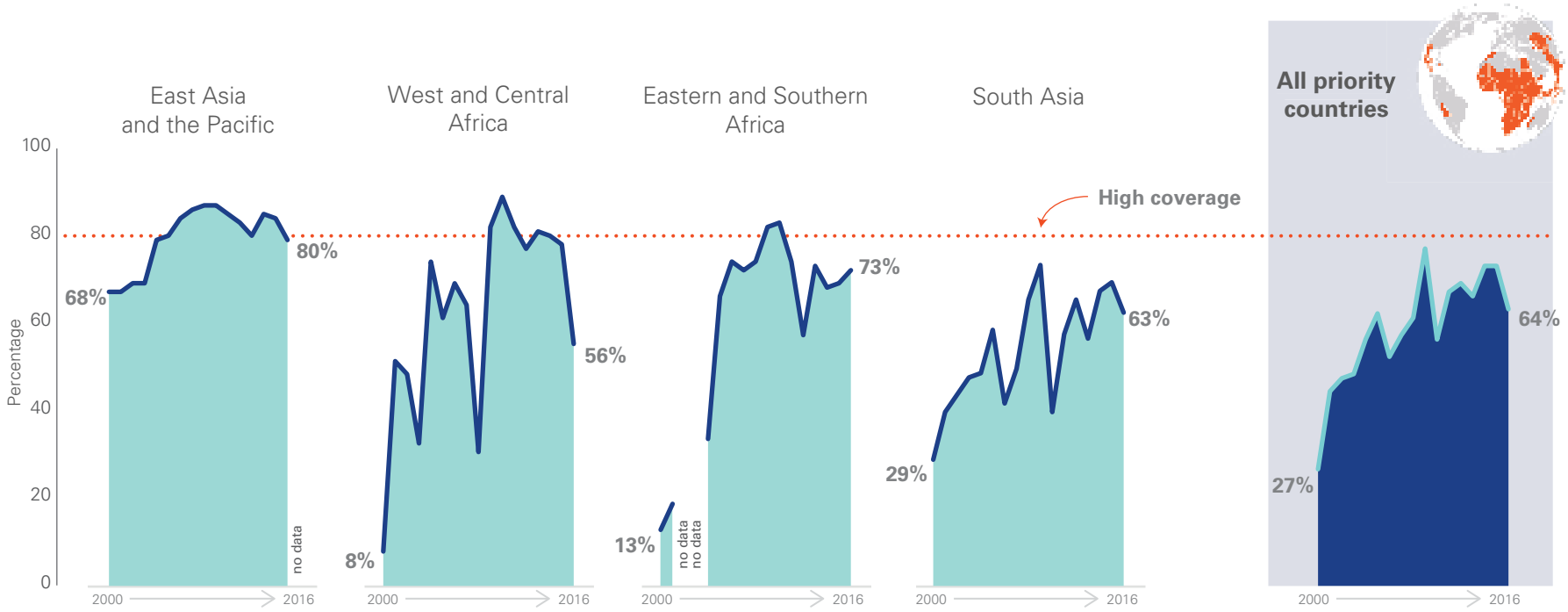


Figure 1.2. Trends in vitamin A supplementation two-dose coverage, by region, 2000–2016

Source: UNICEF global databases, 2018. Based on administrative reports from countries. For notes on the data see Annex 1.

Challenges in sustaining high coverage in some countries

LOSING GROUND WHERE IT MATTERS MOST

How do fluctuations in coverage impact children and what can we do about it?

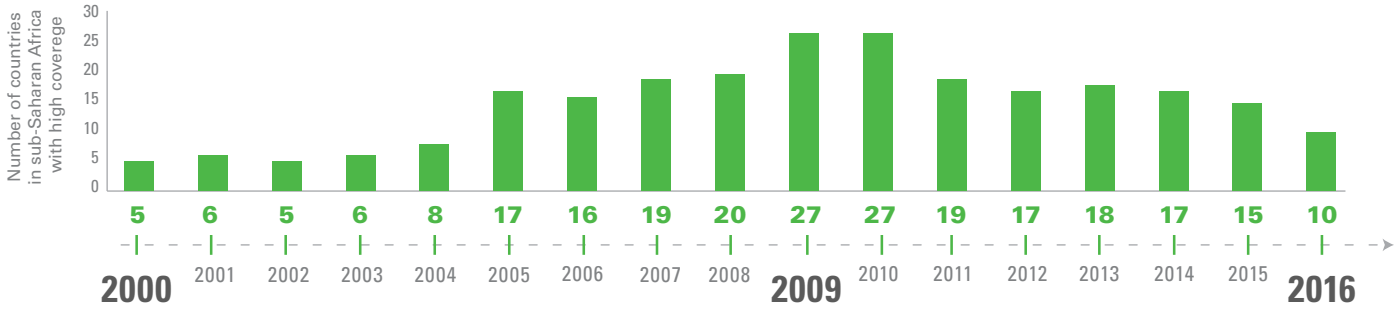
Fewer countries are achieving high two-dose coverage than in previous years, meaning children in these countries are more vulnerable to mortality. This shift is particularly worrisome in sub-Saharan Africa – the region with the highest U5MR, at 78 deaths per 1000 live births – where children are more likely to continue dying from preventable causes.[3]

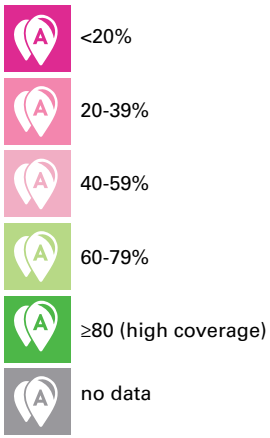
Declines in two-dose coverage are due in part to reduced financing for SIAs for polio, which had been a major delivery platform for VAS, particularly in West and Central Africa. This platform will continue to diminish as polio eradication goals are met, highlighting the importance of institutionalizing the delivery of VAS – either via biannual events or routine health services – to ensure continued coverage as country contexts shift.

What do the data tell us?

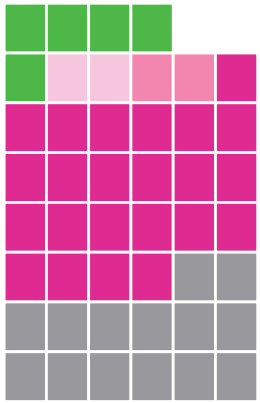
Trends in VAS coverage tell us that rapid and effective scale-up is possible – but countries need to be vigilant to maintain high coverage over time. Between 2000 and 2008, the number of countries in sub-Saharan Africa with high (≥80 per cent) two-dose coverage quadrupled, jumping from 5 to 20 countries during this time. The number of countries achieving high two-dose coverage continued to increase for a number of years thereafter, reaching a peak of 27 countries in 2009 and 2010. However, the number of countries with high coverage in this region has since dropped, and in 2016, only 10 countries still had high coverage – the lowest number since 2004. A similar trend is emerging at the global level.

Coverage is slipping in sub-Saharan Africa, the region with the highest under-five mortality rate in the world

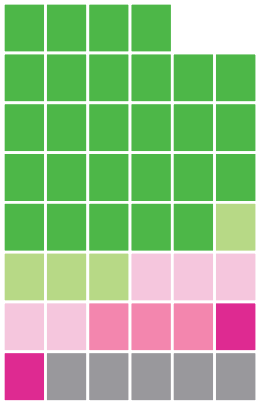




In 2000, only 5 countries had high two-dose coverage



In 2009, 27 countries had high two-dose coverage



In 2016, 10 countries had high two-dose coverage

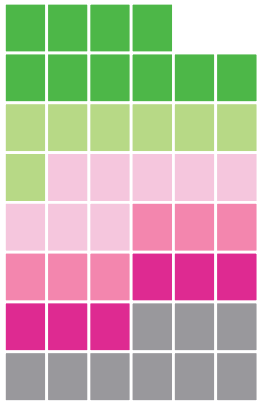


Figure 1.3. Number of countries in sub-Saharan Africa with high (≥80 per cent) vitamin A supplementation two-dose coverage, 2000-2016 (top, bar graph); and Trends in vitamin A supplementation two-dose coverage in sub-Saharan Africa, 2000, 2009, 2016 (bottom, blocks)

Source: UNICEF global databases, 2018. Based on administrative reports from countries. For notes on the data see Annex 1.

2 DELIVERY PLATFORMS

Delivery has always been the greatest challenge of vitamin A supplementation – and with the phase out of a key delivery platform, this is particularly true today.

A boy watches as a nurse snips open a vitamin A capsule at Matero Clinic in Zambia. © UNICEF/ UNI91596/Nesbitt

Platforms for delivering vitamin A supplements

THE SHIFTING LANDSCAPE OF DELIVERY

How do countries deliver vitamin A supplements?

VAS programmes often use existing health and nutrition delivery platforms to reach all children twice a year. To do this effectively, VAS has often been integrated into established events or campaigns – such as polio SIAs – which were well established in many countries by the time VAS was recognized as an important intervention in global efforts to reduce child mortality.

Polio SIA campaigns presented an ideal platform for delivering vitamin A supplements to children under age 5, and their timing and spacing is aligned with VAS guidelines.[1] In countries where polio SIAs were used only once a year, vitamin A supplements would be integrated into polio SIAs in one semester and an alternative platform would be used to deliver the second dose.

In the mid-2000s, many countries developed a twice-yearly campaign approach dedicated to VAS – such as Child Health Events or VAS-only campaigns. These often took place in countries where polio SIAs were no longer being conducted as the result of eradication efforts. Targeted VAS events rapidly increased the coverage of key child survival interventions, but greater efforts were needed to integrate event planning and implementation into health care systems.[2]

VAS has also been added to routine service delivery through health clinics and immunization outreach in some countries; however, there have been challenges in ensuring that children receive their first dose right at 6 months and that caretakers continue bringing children to receive VAS at a health facility once they are beyond immunization age. To address these bottlenecks, some countries have strengthened their service delivery platform to accommodate a 6-month health visit and have promoted the participation of children older than 1 year in clinic and outreach activities (*see page 29*).

Vitamin A supplements are available at most health clinics in priority countries, but this is usually not the primary platform used to reach children. While infrequent and thus not part of a strategy for regular vitamin A distribution, measles immunization campaigns have also been used to deliver VAS from time to time.

What do the data say?

An analysis of the primary delivery platform used in each semester between 2000 and 2016 in all 82 priority countries was conducted to investigate trends. At the global level, polio SIAs were the main delivery mechanism in the early 2000s, while Child Health Events top the list today. Data are lacking in most years for about 30 per cent of all semesters.

The findings indicate that as the availability of polio SIAs declined in some regions, Child Health Events – and more recently distribution through routine health system contacts – took on greater importance. Between 2000 and 2005, polio SIAs were one of the only VAS distribution mechanisms used in West and Central Africa, but as this platform initially phased out in the mid-2000s, planning and funding for Child Health Events helped fill the gap. As efforts to eradicate polio re-intensified in this region, SIAs gained renewed prominence for VAS distribution between 2009 and 2015 but then drastically decreased again in 2016 as eradication efforts near completion. While stakeholders knew this platform would disappear, along with its financing, planning for other delivery options was challenging in many settings. This is because the presence of polio SIAs, despite their many benefits, tends to disrupt planning for the more routine services into which VAS could be integrated.[3-4]

The sharp drop in coverage for West and Central Africa, discussed in chapter 1, highlights the need to plan for delivery platform changes, strengthen health systems and develop a renewed strategy for maintaining high VAS coverage for all children.

As demonstrated in the graph, countries are increasingly reporting routine health system contacts as their main delivery platform. This is an important step towards standardizing routine health service delivery.

The use of polio SIAs in West and Central Africa dropped by more than half – from 18 to 7 semesters – between 2015 and 2016

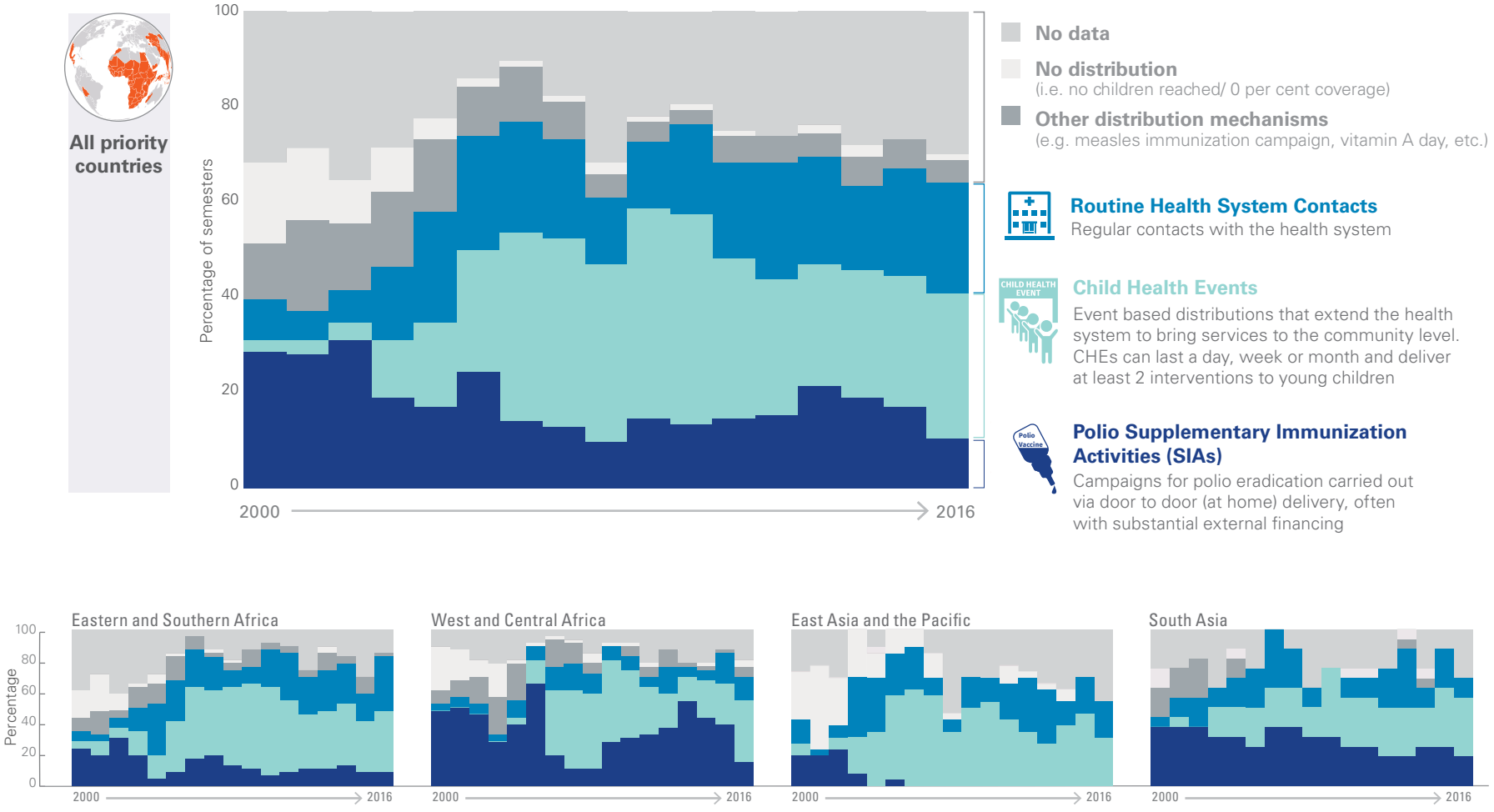


Figure 2.1. Trends in the percentage of primary distribution mechanisms used to deliver vitamin A supplements in each semester, all priority countries (top graph) and by region (bottom four graphs), 2000–2016

Source: UNICEF global databases, 2018. Based on administrative reports from countries. For notes on the data see Annex 1.

The effectiveness of delivery platforms

LEVERAGING PLATFORMS FOR PERFORMANCE

What factors determine the choice of delivery platform? And how does this impact coverage?

There are many reasons that governments select a specific delivery platform to reach children with vitamin A supplements and other public health and nutrition programmes. They may consider the target population, the frequency of contact required and the distance that families need to travel to receive services. Ultimately, however, the availability of financing sometimes becomes the deciding factor. Polio SIAs, as previously discussed, were heavily financed and therefore an attractive platform.

Vitamin A supplements can be successfully delivered through routine health services when delivery is well planned and financed. In some settings, however, vitamin A supplements are only delivered via routine health services because financing for the originally intended event-based mechanism is unavailable. This lack of planning in turn hinders the performance of routine health services.

A recent analysis found that door-to-door mechanisms of delivery achieved higher coverage than fixed delivery; however, with the engagement of well-informed communities, fixed-site delivery alternatives can also achieve high coverage.[5] Efforts are needed to ensure that older children (i.e., 1–5-year-olds) are not left behind in the transition between delivery platforms, especially during the transition towards routine delivery or integration with routine immunization. The ability to reach so many children depends on many factors, including adequate planning, financing and capacity; considering these factors is critical to success.[6]

What do the data say?

In order to investigate trends in the performance of delivery platforms (in achieving ≥80 per cent coverage), semester-level VAS coverage data were grouped by delivery platforms and presented here. Between 2000 and 2004, only 11 per cent of semesters during which VAS was delivered through **routine health system contacts** achieved high coverage. Today, this approach continues to be limited in reaching high VAS coverage at the global level: only 23 per cent of semesters achieved high coverage in the 2011–2016 period, but some regions are improving faster than others. In East Asia and the Pacific, the percentage of semesters reaching at least 80 per cent coverage increased more than six-fold from 9 to 56 per cent between the earliest (2000–2004) and the most recent (2011–2016) period. Moderate gains were seen for VAS delivery performance using routine health contacts in South Asia, but still less than half of all semesters reached at least 80 per cent coverage during the most recent period. In both regions of sub-Saharan Africa, routine health services rarely achieved high VAS coverage. Taken together, these data reveal that performance is improving; however, substantial work is still needed to strengthen routine health systems to make sure every child is reached.

Child Health Events saw an increase in the percentage of semesters reaching high VAS coverage during the 2005–2010 period at the global level, which dipped back down in the most recent period. Results were mixed across regions, with only East Asia and the Pacific demonstrating an increase in performance over time to a high of 84 per cent of semesters in the 2011–2016 period. In some regions, such as West and Central Africa and South Asia, the drop from the earliest time frame to the latest seems severe; however, estimates from the earliest period included only a handful of countries.

Regarding global trends in the performance of **polio SIAs**, the percentage of semesters reaching high VAS coverage has improved steadily over time. Since the 2005–2010 period, all countries using polio SIAs in South Asia have consistently reached the 80 per cent coverage mark. In contrast, the polio SIAs platform continues to fall short of 80 per cent VAS coverage in nearly one quarter of all semesters in Eastern and Southern Africa. However, as noted previously, the use of polio SIAs is low in this region and decreasing globally.

The performance of routine health contacts is improving, but we still have a long way to go

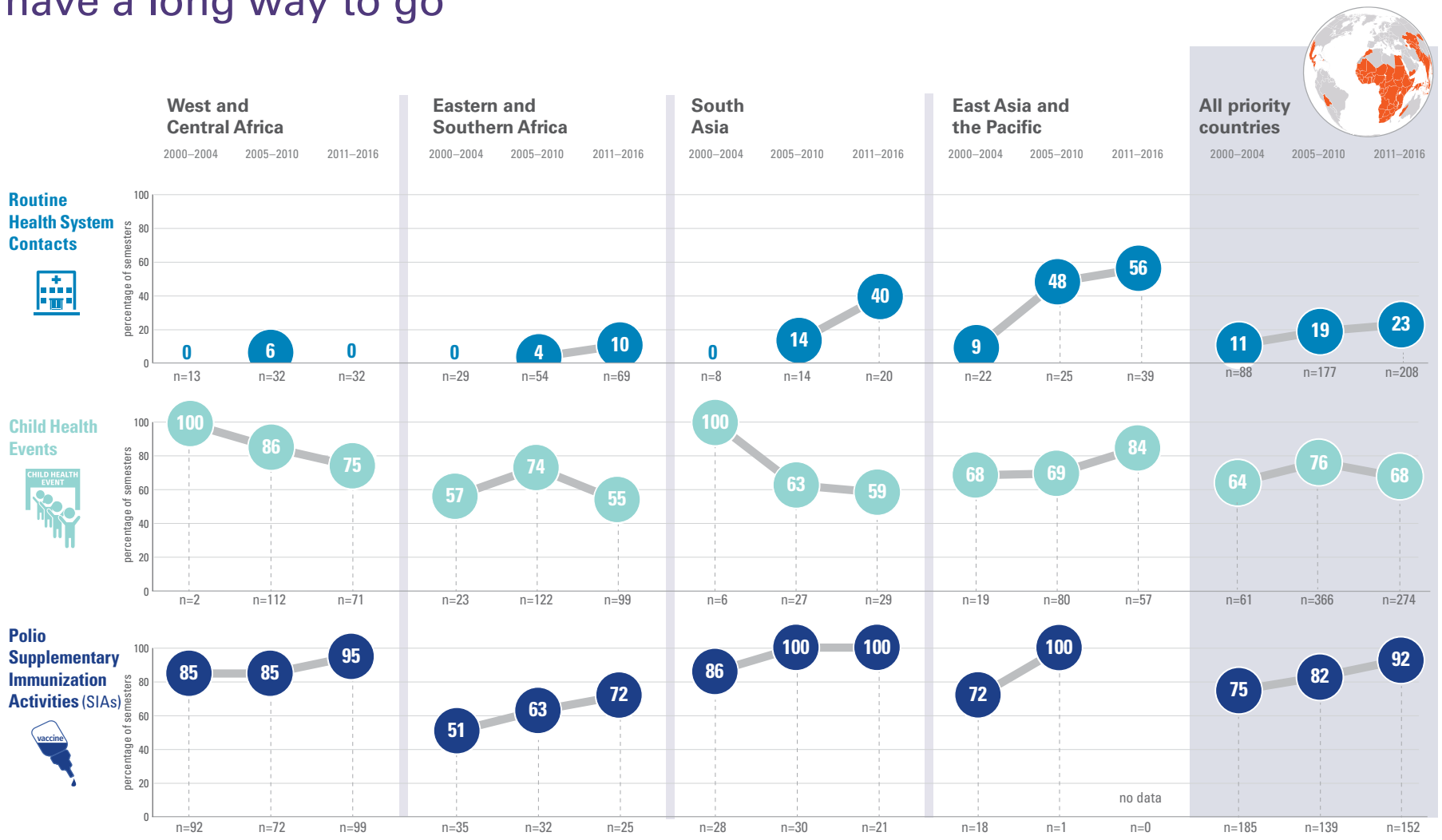


Figure 2.2. Trends in percentage of semesters reaching high (≥80 per cent) vitamin A supplementation coverage, by distribution mechanism and region, 2000–2004, 2005–2010 and 2011–2016

Source: UNICEF global databases, 2018. Based on administrative reports from countries. For notes on the data see Annex 1.

Tailoring delivery to meet needs

MAKING THE MOST OF EACH CONTACT

How does delivery vary by country?

Vitamin A delivery platforms – even those with the same name – can vary substantially from country to country. For example, some Child Health Events may deliver VAS through door-to-door distribution, although most events use fixed sites with community mobilization. Over time, country approaches also evolve to meet population needs, and some countries implement multiple platforms in different areas according to context. Sometimes, countries with strong routine systems and high rates of vaccination choose to reach children aged 6–11 months through routine health services, while using a different approach, such as Child Health Events, to reach children aged 12–59 months.

The importance of reaching children at 6 months has prompted many countries to develop a policy to implement a health contact point at this age through routine services. This contact is an opportunity to deliver a package of services to the mother and her infant at a critical time (*see box 2.1*).[7] Such an approach may reduce mortality by an additional ~2 per cent when children receive it at exactly 6 months of age, rather than awaiting a first dose during a campaign, and by an additional 1.6 per cent when it replaces delivery during the 9-months measles visit.[8]

What can be done to reach the most vulnerable?

Children are still being missed by delivery platforms in many countries. In a study of 28 countries in sub-Saharan Africa, only 66 per cent of children aged 12–23 months had ever received vitamin A, but 90 per cent had received the measles first dose, indicating that VAS coverage could be much higher.[9] Another analysis of 14 countries indicated that children who received a vitamin A capsule in the last six months had a much greater chance of being fully immunized than those who had not. This suggests that health contacts are used beneficially, but important inequities remain.[10]

Children missed with one intervention are often left behind by other interventions as well.[11] Mass distribution events are one way of reaching these vulnerable children, especially in settings with weak health infrastructure and where a large proportion of the population lives far from health facilities.

Child Health Events as a delivery platform have evolved over time and are increasingly being linked with the health system to provide a twice-yearly bridge to these populations with limited health facility access. This link with the health system – including planning, budgeting and policy – is the key to their effectiveness.

Evidence suggests that when too many interventions are added to one event, quality can suffer,[12] and care needs to be taken to avoid overburdening health workers.

What do the data say?

An analysis was conducted to determine the types of interventions most frequently delivered alongside VAS during Child Health Events and polio SIAs. While data collection methods have varied over time, these events have consistently delivered interventions to: (1) protect children (e.g., VAS or messages on breastfeeding and complementary feeding); (2) prevent children from becoming ill (e.g., immunizations or hand washing interventions); and (3) treat children who are ill (e.g., the provision of oral rehydration salts and zinc to treat diarrhoea).

From 2012–2016, deworming was the intervention delivered most commonly during events that also delivered vitamin A, followed by immunizations, behaviour change communication messages and screening for severe acute malnutrition. In all, 11 different interventions for young children and 7 for adults/households were reported to be co-delivered with vitamin A supplements among the 52 countries studied. This vast array of interventions suggests that countries are tailoring delivery to their epidemiology and priorities.

BOX 2.1

Reaching children at 6 months to boost coverage of key interventions

Several countries in West Africa – Cote d'Ivoire, Niger, Senegal, Sierra Leone – have successfully piloted a planned contact point within the health system at 6 months of age and are scaling it up to deliver VAS and other vital health and nutrition services. The 6-month contact offers important opportunities for saving lives, delivering VAS, improving infant and young child feeding practices, boosting immunization coverage and encouraging birth spacing.

In Sierra Leone, compared with the control group, children aged 6–11 months who benefitted from a 6-month contact received their vitamin A dose closer to the recommended age of 6–7 months. The 6-month contact also resulted in higher coverage of family planning counseling and infant and young child feeding counseling.[13] In Senegal, where short message service (SMS) reminder messages and phone calls were used to inform caretakers of the 6-month contact point, VAS coverage was significantly higher at 6 months of age compared with the control group.[14]

Events that deliver vitamin A also deliver other interventions important to the health of children and adults

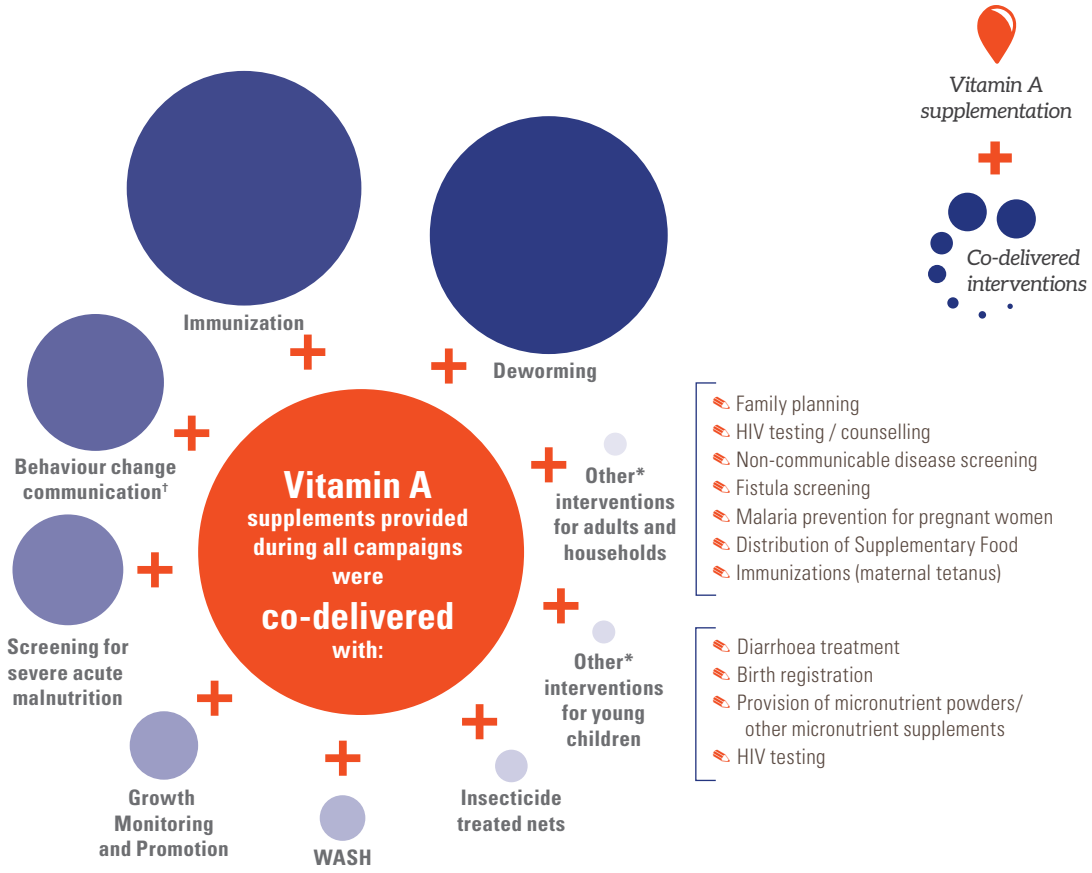


Figure 2.3. Interventions co-delivered alongside vitamin A supplementation during campaigns in priority countries, 2012–2016

Source : UNICEF global databases, 2018. Based on administrative reports from countries. Notes: †Including but not restricted to messages on general nutrition, infant and young child feeding and water, sanitation and hygiene. *The other interventions co-delivered in <10 per cent of campaigns are listed in brackets; circle size represents the percentage of campaigns during which the intervention was included; the vitamin A circle represents 100 per cent of campaigns. For more notes on the data see Annex 1.

3 **EQUITY:** Reaching the most vulnerable

Coverage is declining in countries with the highest under-five mortality rates – the same places, where vitamin A supplementation programmes are needed the most.

A girl receives a vitamin A supplement in Kenya. © UNICEF/UNI115510/ Modola

Disparities between countries

UNMASKING THE INEQUITIES

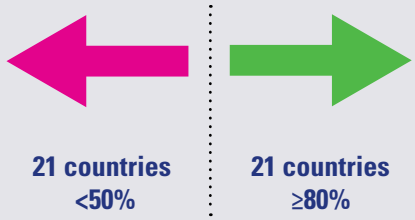
Do global and regional estimates tell the full story?

Global and regional averages paint an overall picture of the progress of VAS programmes – but they can also mask key inequities. Regional averages generated using country-level population weights can hide wide variations in coverage for individual countries. When the most populous countries in a region are performing well, the relative weight of these country figures can raise the aggregated regional estimate, masking the fact that several of the less populous countries in the same region have low coverage. In breaking down the regional averages it becomes clear that many countries need to strengthen delivery to achieve high two-dose coverage.

What do the data say?

The spread of VAS coverage among individual countries varies by region. In West and Central Africa, the regional average in 2016 was 54 per cent, but the coverage for individual countries spanned from 0 to 99 per cent. East Asia and the Pacific region has the least variability in coverage estimates across countries, with a population-weighted average of 83 per cent and a range of national coverage estimates spanning from 69 to 99 per cent. In Eastern and Southern Africa, the range spans from 9 to 98 per cent, and in South Asia from 0 to 99 per cent. The wide spread in South Asia is caused by one outlying country at 0 per cent, while in sub-Saharan Africa there are many countries with very low coverage.

In 2016, only 21 priority countries achieved high two-dose coverage, while the same number achieved two-dose coverage below 50 percent.



Regional averages can mask wide variations in country coverage

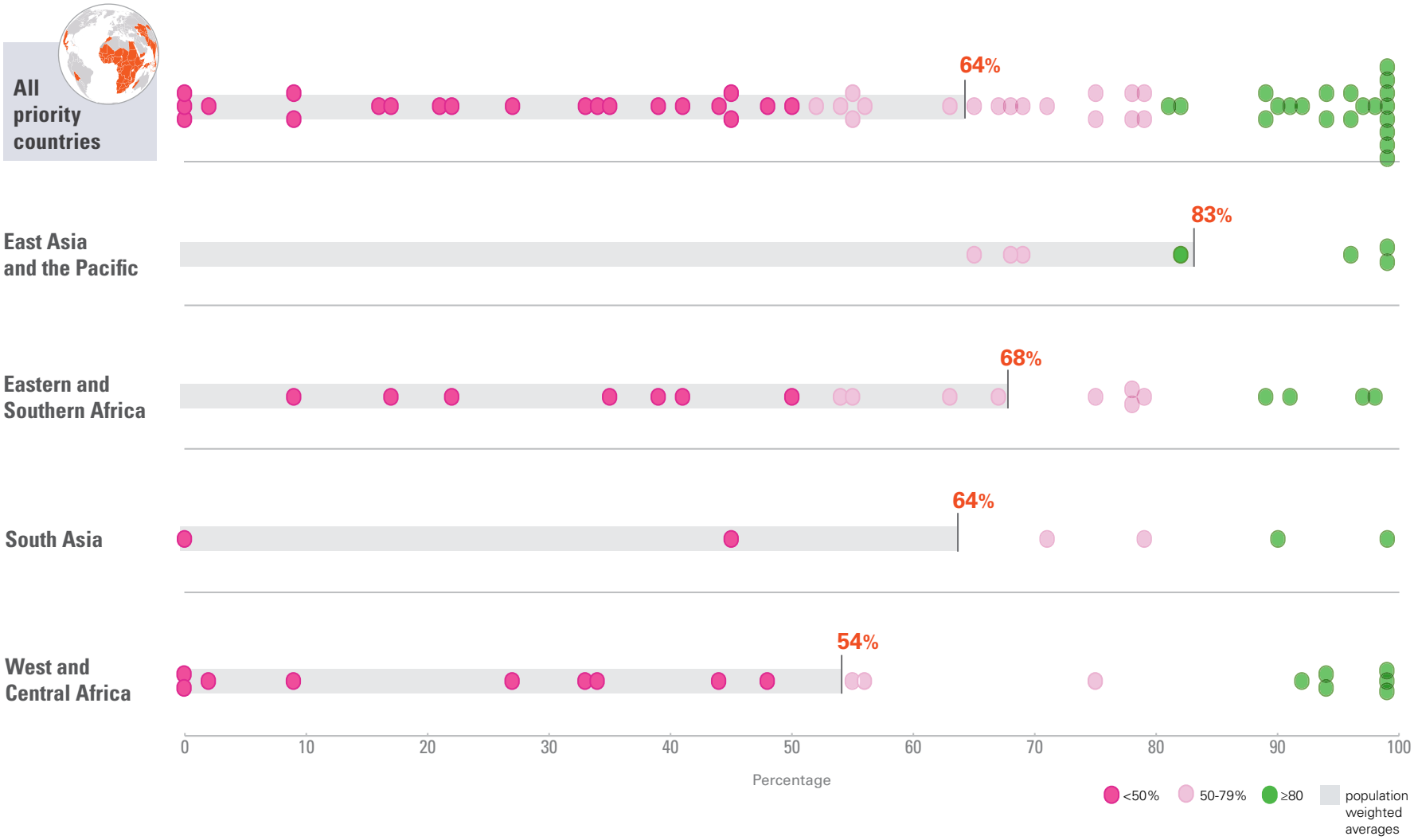


Figure 3.1. Vitamin A supplementation two-dose coverage, by country (dots) and region (bars), 2016

Source: UNICEF global databases, 2018. Based on administrative reports from countries. For notes on the data see Annex 1.

Disparities within countries

THE CHALLENGE OF REACHING EVERY DISTRICT

Are there coverage disparities within countries?

While national coverage estimates are useful for assessing overall programme performance, they can also obscure important disparities at the subnational level (i.e., within certain provinces, districts or communities). These disparities are related to both the need for and access to services. For example, the burden of disease is usually much higher in vulnerable, remote or fragile settings, putting these populations in greatest need of nutrition interventions. Yet these same communities also often face the greatest barriers to access. The result is that the most disadvantaged children may be missed by multiple child survival interventions.[1]

These inequities in access might translate to poorer outcomes for some. For example, a recent analysis suggests that U5MRs can vary widely across geographic areas within countries, with pockets of extremely high mortality even in countries that have made substantial progress on reducing their national U5MRs.[2]

High VAS coverage is evidence of strong programme implementation, which often means greater resources and capacity to collect and use subnational data. Programme managers may also be using subnational data to provide extra resources to target VAS distribution to areas in greatest need, resulting in higher overall coverage. While it is well established that coverage and need for high-dose VAS may vary within countries, the subnational data needed to assess equity are not always available. This lack of disaggregated data makes it difficult to identify areas of need, as well as areas of high coverage, which may offer important lessons, insights and good practices.

To target and reduce inequities within countries, it is important to assess the availability of subnational data (*see chapter 5*) and when available, use such disaggregated data to identify areas in need of programme strengthening and support.

What do the data say?

Countries achieving high coverage in a semester are better able to report subnational data than countries achieving low coverage.

Many countries achieving more than 80 per cent national coverage still report coverage gaps at subnational levels (i.e., areas where coverage is only 50–79 per cent and/or <50 per cent). As expected, when subnational data are analyzed, the percentage of areas with low coverage (noted here as <50 per cent) declines as national coverage increases. In countries with the highest national coverage (≥80 per cent), most subnational areas are also reporting higher than 80 per cent coverage.

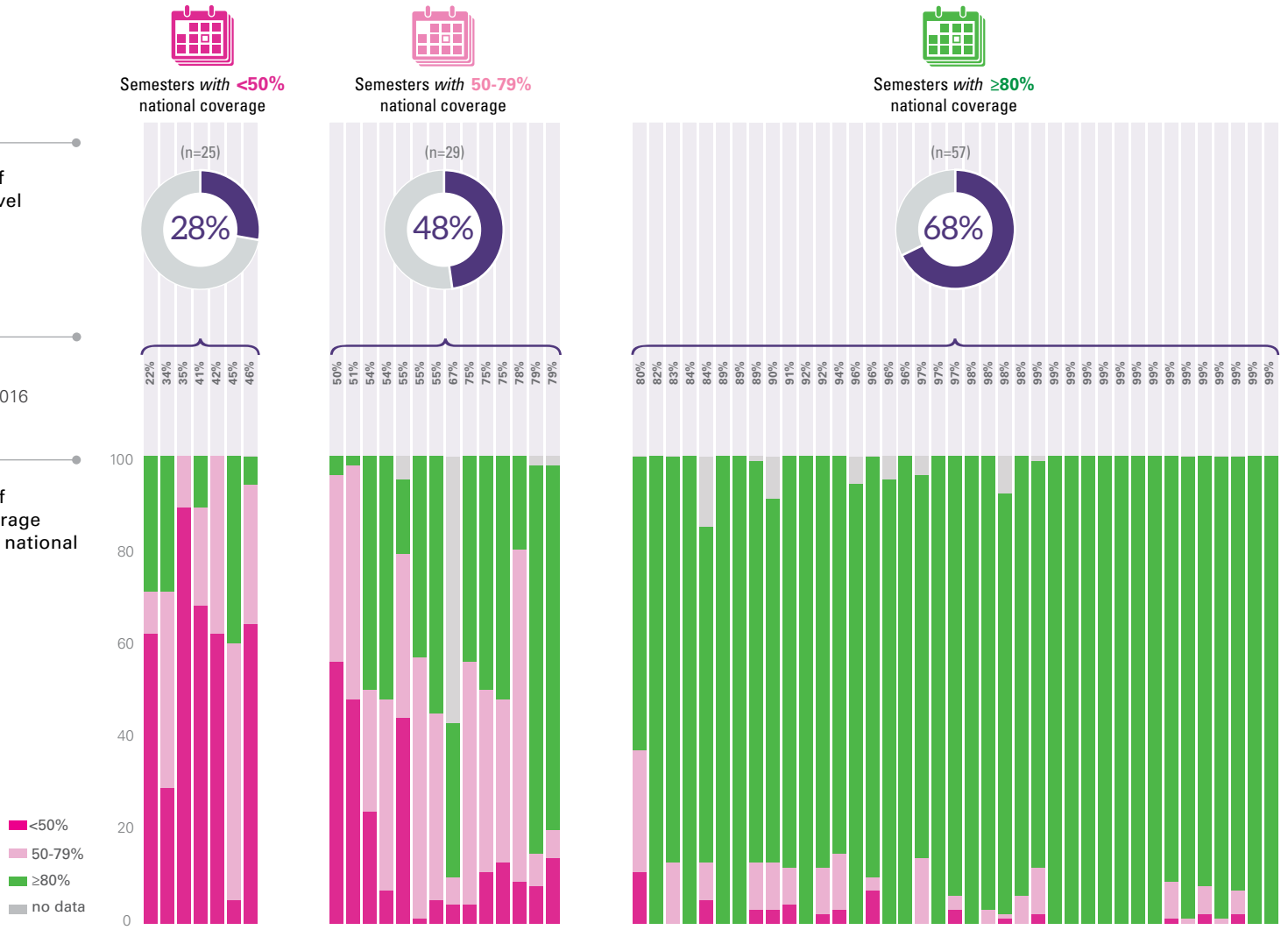
Almost all countries with very low national coverage (<50 per cent) report having at least some areas with greater than 80 per cent coverage. In fact, in one low coverage country, nearly half of districts had reached this level of achievement. As with the regional and global estimates, population size can hide coverage variations across different parts of the country, highlighting the importance of using subnational data to target those left behind. In countries where a few areas are achieving high coverage despite lower coverage elsewhere, there may be opportunities to share best practices and translate those learnings to improve performance in low-performing areas.

Most countries with high national vitamin A supplementation coverage have access to sub-national data

Figure 3.2a: Percentage of semesters with subnational-level data, by national coverage grouping, 2016

Semester-wise national vitamin A supplementation coverage among semesters with subnational data, 2016

Figure 3.2b: Percentage of subnational areas in each coverage category, by semester* and by national coverage grouping, 2016



Source: UNICEF global databases, 2018. Based on administrative reports from countries. For notes on the data see Annex 1.
*Note that each bar represents one semester in one country.

Disparities and child survival

LIVES LEFT BEHIND

Does VAS protect the children most at risk?

VAS programmes reduce mortality in populations suffering from vitamin A deficiency.[3] Many of the countries with the highest U5MRs are fragile contexts where health systems are weak, meaning that children have an even greater need for the life-saving protection of VAS. In these contexts, children are dying from preventable infections, and VAS can help safeguard their bodies against illness and strengthen their resilience.

Historically, VAS programmes have been very effective at reaching vulnerable populations by delivering vitamin A supplements through campaign-based events such as polio SIAs. However, this success is in jeopardy as polio SIAs campaigns scale back and health systems that are already fragile may be tasked with the additional burden of delivering VAS. As countries transition to new modes of delivery it will be important to closely track coverage using under-five mortality as an indicator of greatest need.

What do the data say?

Countries were grouped by their most recent (2016) U5MR to determine trends in VAS coverage in countries with the highest need. As seen in Figure 3.3, between 2009 and 2016, countries with U5MRs at or above 70 deaths per 1,000 live births have consistently achieved two-dose coverage above or in line with lower U5MR countries. However, between 2015 and 2016, the coverage achieved in countries with higher U5MRs more than halved – dropping from above 80 per cent to approximately 40 per cent. This sharp decline in coverage left 62 million children without life-saving vitamin A protection in the countries where it was needed. Indeed, the number of children left behind in high U5MR countries in 2016 was more than triple the 19 million that went unprotected in 2015.

A deeper look at data in the most recent years in Figure 3.4 shows that the decrease in coverage is even more pronounced in countries with the highest U5MR of all (≥100 deaths per 1,000 live births). Conversely, in countries with lower U5MRs (e.g., 40–69 as well as <40 deaths per 1,000 live births), two-dose coverage has remained stable or has marginally improved. This trend holds true when looking at the number of countries achieving different categories of two-dose coverage as well as the average coverage (unweighted) achieved by all countries in those mortality categories.

The recent decline in two-dose coverage among these high mortality countries coincides with the phase-out of polio SIAs, which intensified during this period. This, and other factors including inadequate financing for two rounds of VAS without strengthening routine health service delivery, contributed to a coverage decline in high mortality countries. In other cases, a transition to routine delivery for both semesters was initiated without sufficient planning, leading to gaps in coverage.

The sharp coverage decline in the places of greatest need leaves vulnerable children at risk

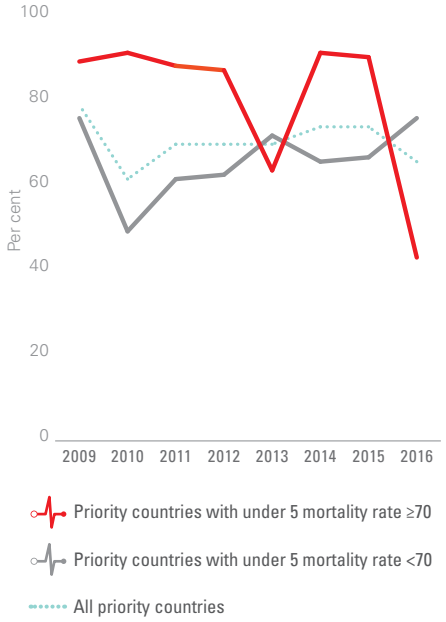


Figure 3.3: Trends in vitamin A supplementation two-dose coverage, by U5MR, 2009–20166

Source: UNICEF global databases, 2018. Based on administrative reports from countries. For notes on the data see Annex 1.

In countries with the highest child mortality, two-dose coverage is in crisis

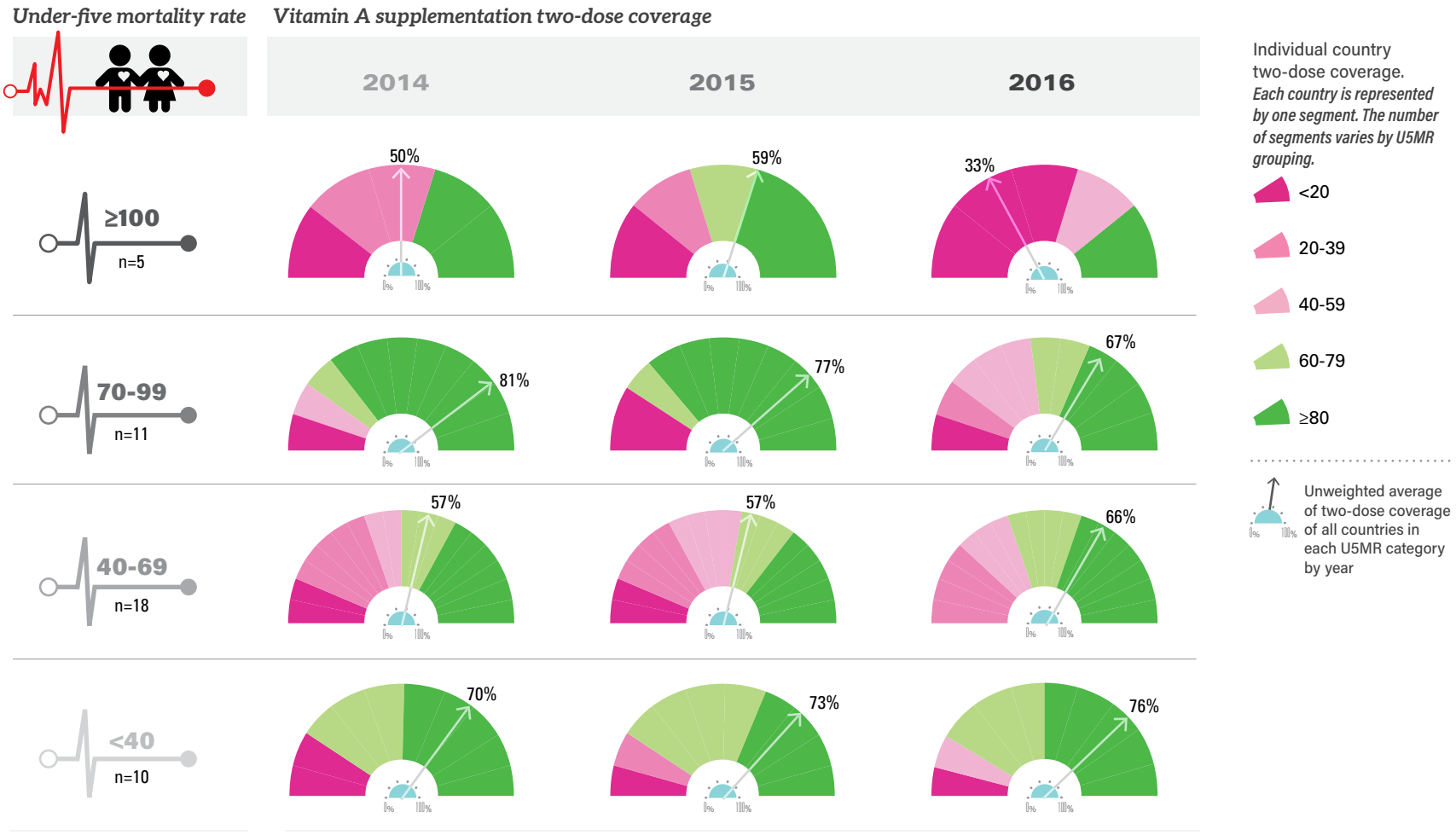


Figure 3.4. Trends in vitamin A supplementation two-dose coverage by country (semi-circle segments) and average (white arrow indicator), by 2016 U5MR (per 1,000 live births), 2014–2016

Source: UNICEF global databases, 2018. Based on administrative reports from countries. For notes on the data see Annex 1.

4 SUSTAINABILITY

National policies, financing and global partnerships have helped some countries achieve high VAS coverage – but more work is needed to make programmes sustainable.

This figure adapted from work by Schell et al[1] and Luke et al[2].

A couple brings in their child for a measles vaccination and for vitamin A drops, at the 'Posyandu' (integrated health post) in Indonesia. ©UNICEF/UNI45722/Estey

Determinants of programme sustainability (1)

PRIORITIZING VITAMIN A SUPPLEMENTATION PROGRAMMES WITH POLITICAL SUPPORT

What are the external factors for programme success?

Sustainability is a core objective of public health programmes. For VAS programmes, sustainability means that coverage levels remain consistently high over time, even as funding sources and delivery platforms shift, change or cease.

Assessing the sustainability of public health programmes is complex, but in general, research has identified nine important factors: (1) political support; (2) funding stability; (3) partnerships; (4) impact on health attitudes and behaviours; (5) human resource and financial capacity; (6) monitoring and evaluation; (7) programme adaptations; (8) communications with stakeholders and beneficiaries; and (9) strategic planning.[1-2] Factors 1–4 are primarily external forces while factors 5–9 are influenced from within the programme itself.

This chapter explores the sustainability of VAS programmes in the context of political support, funding stability and partnerships, given that these factors can be most readily assessed using global data collection systems. It ends with a picture of sustainability that likely reflects all of these elements – evaluating the consistency in coverage achieved as a marker of sustainability, over the time-frame of 2012–2016.

How does political support impact sustainability?

Policies, strategies and plans of action are markers of political support for an issue and are often a pre-requisite for domestic financing. While alone they are not sufficient, they demonstrate a country's commitment to solving a public health problem over the long term. Policies, strategies and action plans are the result of country planning processes and often signal that the issue or intervention is a national priority.

What do the data say?

Almost all VAS priority countries (89 per cent) report having a policy, strategy or plan of action in place for the delivery of VAS. This is encouraging; however, it should be noted that in many countries, the policies being reported were developed to integrate VAS into polio SIAs campaigns. As polio SIAs phase out in many countries, it will be necessary to develop new strategies and policies for the delivery of VAS. Efforts are already underway in some countries to modify policies to integrate VAS into routine immunization services, particularly in sub-Saharan Africa.[3-4]

89%

of governments have a policy, strategy or plan of action on vitamin A supplementation*

*For notes on the data see Annex 1.

Determinants of programme sustainability (2)

SUPPORTING VITAMIN A SUPPLEMENTATION PROGRAMMES WITH STABLE FUNDING

How does financing impact sustainability?

A government contribution to financing VAS programmes demonstrates political commitment and paves the way for continued implementation. While it is common for countries to finance the salaries of health workers, other programme costs are often covered by donors. Donor funding does not necessarily mean the programme is undervalued; however, domestic contributions demonstrate government priorities and mark the programme as worthy of investment. Indeed, in some ways, the budget document is the best reflection of national policy priorities.

What do the data say?

Globally, about half of priority countries make contributions to their VAS programmes, beyond the salaries of government workers. Contributions vary by region, with West and Central Africa reporting the lowest proportion of countries contributing, and South Asia and East Asia and the Pacific the highest.

These results mirror to some extent the gross national income (GNI) per capita of these regions, suggesting that countries with greater resources will in turn contribute more to VAS programmes*. However, the GNI per capita in VAS priority countries in East Asia and the Pacific is much higher than that of any of the other three regions.

*An analysis that included only vitamin A priority countries for each region indicated that GNI per capita was: $2,778 in East Asia and the Pacific, $1,611 in South Asia, $1,534 in Eastern and Southern Africa and $1,471 in West and Central Africa.

Did did government provide funding for vitamin A supplementation?

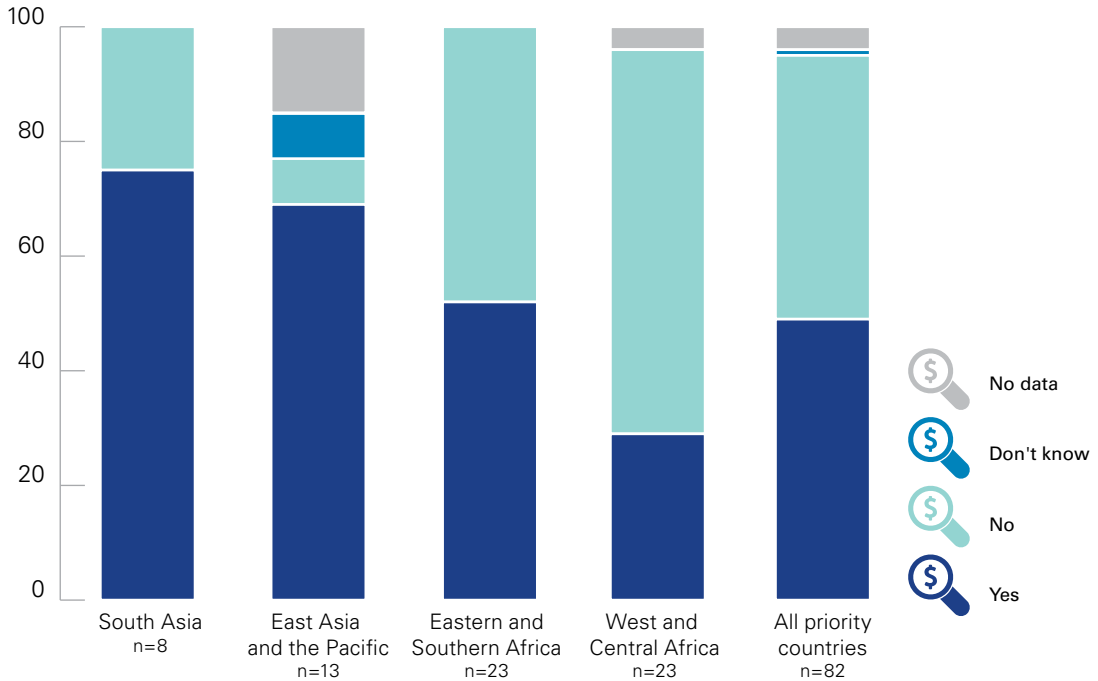


Figure 4.1. Government contribution to financing for national vitamin A supplementation programmes, by region, in 2016

Source: UNICEF global databases, 2018. Based on administrative reports from countries. For notes on the data see Annex 1.:

Determinants of programme sustainability (3)

STRENGTHENING VITAMIN A SUPPLEMENTATION PROGRAMMES WITH EFFECTIVE PARTNERSHIPS

How do partnerships impact sustainability?

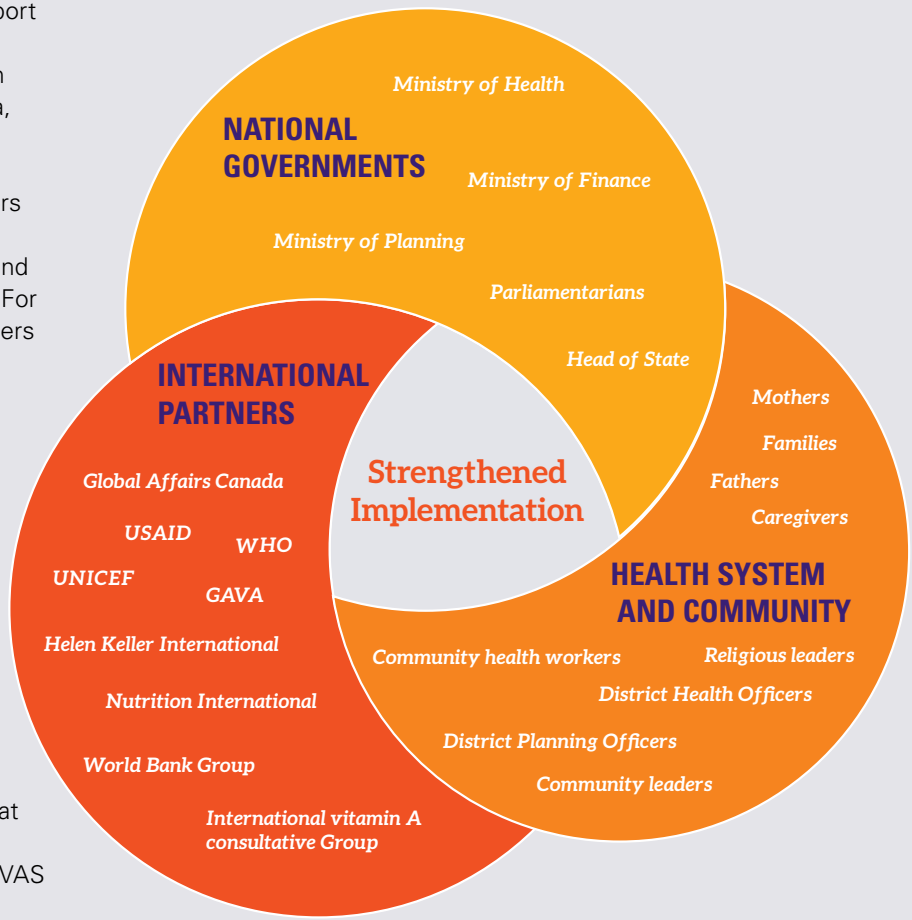
Partnerships are valuable at both global and national levels because they can leverage expertise and financing, allowing different partners to contribute their strengths to support implementation and reach every child. The SDG agenda specifically recognizes the value of global partnerships in Goal 17, which focuses on strengthening implementation through multi-stakeholder partnerships, as well as building capacity, and improving data, accountability, and financing.[5]

At the national level, there is often a mix of partners from the nutrition and health sectors working together to support the government in implementing VAS, including donors, technical partners and civil society organizations. In some contexts, multi-stakeholder and multi-sectoral partnerships have been critical for ensuring VAS is delivered sustainably. For example, the integration of VAS into polio SIAs and routine immunization requires partners to work across government sectors or divisions within the Ministry of Health.

At the global level, the Scaling Up Nutrition (SUN) movement and the Global Nutrition Cluster both work with national governments and partners to improve nutrition, including through support for VAS programmes. Specifically, on vitamin A, the Global Alliance for Vitamin A (GAVA) is a forum for sharing information and coordinating VAS-related policy. GAVA brings together organizations, policy makers and programme implementers to share lessons learned and develop policies and tools to improve VAS programmes. GAVA was preceded by many other global partnerships, including the International Vitamin A Consultative Group, which was established in May 1975 and operated through a network of policy makers, programme administrators, and scientists interested in resolving the problem of vitamin A deficiency.[6]

There have also been other global partnerships, beyond those focused on vitamin A, that have played a key role in scaling up VAS programmes. Financing leveraged through the Global Polio Eradication Initiative, for example, has been instrumental in achieving high VAS coverage in many countries.

Key partners for VAS programmes



BOX 4.1

CAPSULE DONATION PROGRAMME

The Government of Canada's global capsule donation programme, implemented through Nutrition International, formerly known as Micronutrient Initiative, and UNICEF, is a key global partnership contributing to the sustainability of VAS programmes. Over the course of two decades, the programme has delivered 9 billion vitamin A capsules to children in need.[7] Nutrition International and UNICEF share the joint objective of supporting country-driven plans to increase and sustain VAS coverage in countries with populations of children under age 5 who are at risk of increased morbidity and mortality due to vitamin A deficiency. The donation programme ensures an adequate supply of vitamin A capsules to eligible countries for administration through preventive, treatment and emergency distribution programmes organized by national governments, UNICEF and other agencies. The value of the programme's approach is that countries can make plans to deliver VAS knowing they have a consistent supply of quality-assured capsules, and this has been critical to facilitating global scale up.

The provision of a donated supply does not interrupt or displace country plans to self-procure future supply. Nutrition International and UNICEF also work to build capacity within governments to plan, budget for and ultimately procure their own vitamin A capsules. As seen in figure 4.2, the donation programme previously accounted for the vast majority of vitamin A capsules delivered to children globally; however this proportion has steadily decreased through time as more countries begin to fully or partially procure their own supply. A nationally-procured VAS supply is a hallmark of sustainable VAS programmes, and Nutrition International and UNICEF are committed to continuing to support countries in achieving this objective.

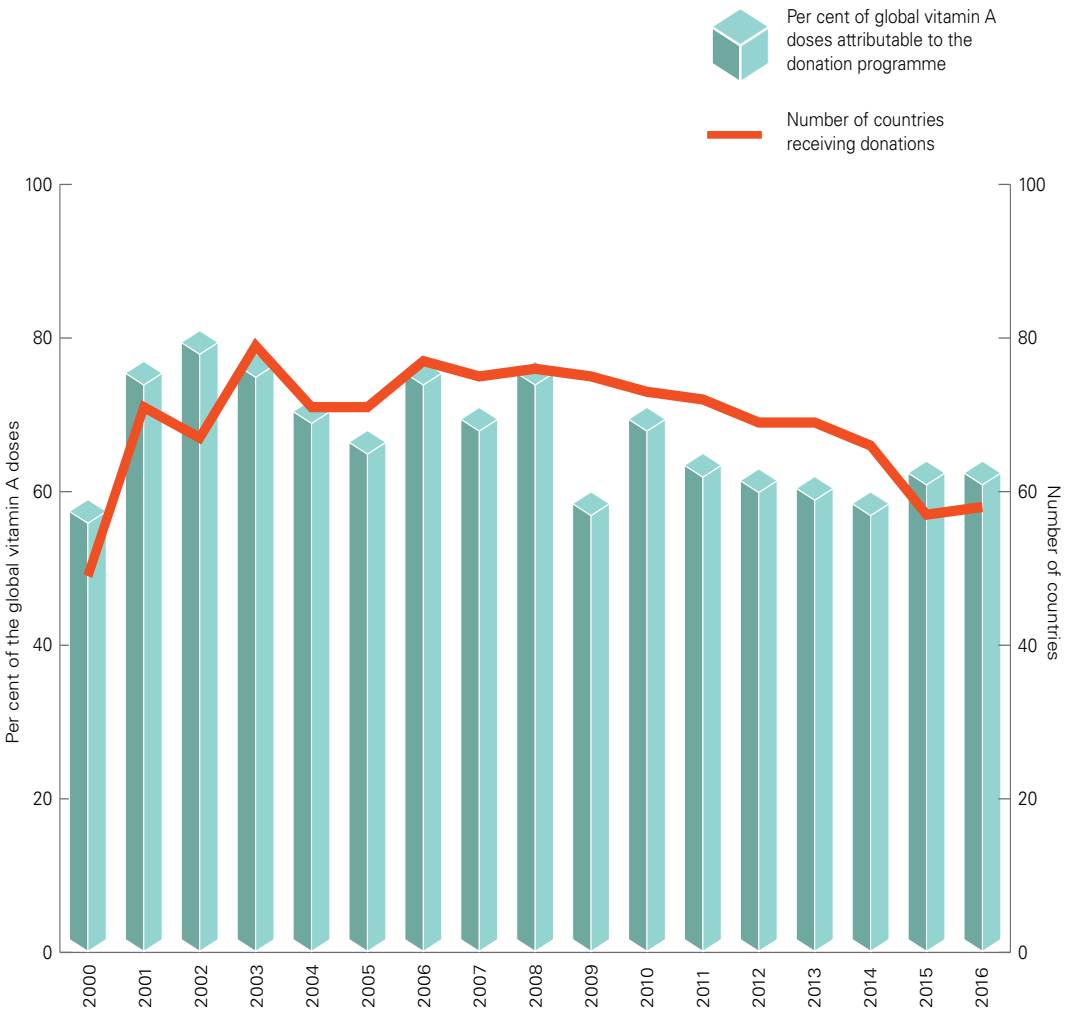


Figure 4.2. Trend in the percentage of global doses of vitamin A attributable to the global vitamin A capsule donation programme (green bars) and the number of countries receiving vitamin A capsule donations (red line), 2000-2016

Source: Vitamin A capsule donation programme annual reports. For notes on the data see Annex 1.

Determinants of programme sustainability (4)

THE PERFORMANCE OF VITAMIN A SUPPLEMENTATION PROGRAMMES AS A MARKER OF SUSTAINABILITY

What is the link between sustainability and consistent implementation?

Consistently high VAS coverage is a reflection of a sustainable VAS programme – and as discussed in this chapter, sustainability is influenced by public support, stable funding, effective partnerships, and other factors.

Delivering VAS consistently over time has been a persistent challenge for many countries. As described in chapter 2, changes in national and international policies and financing for VAS programmes have often resulted in coverage gaps between years. In other cases, sustainable coverage may be threatened by a breakdown in discussions across different government sectors (e.g., between nutrition and immunization), which results in a lost opportunity.

Yet, consistent coverage is achievable. Some public health programmes for which global coverage is generated annually see very few changes. Immunization coverage, for instance, has remained stable across regions for the last five years with only incremental shifts, except in the context of humanitarian situations or health emergencies.[8] VAS programmes can learn from these experiences and make improving sustainability a key programme priority moving forward.

What do the data say?

The map to the right categorizes countries based on the number of semesters between 2012 and 2016 that have achieved at least 80 per cent coverage while the pie charts summarize the percentage of countries in each category by region.

Less than one third of priority countries were able to achieve high coverage in at least 8 of the previous 10 semesters, suggesting that programme sustainability is fragile. In Eastern and Southern Africa, this figure is lowest at 13 per cent, while it is highest in South Asia at 50 per cent.

Coverage variability highlights the need to ensure that VAS programmes are a part of the broader health systems approach and well-integrated into the planning, financing and delivery of health and nutrition services. This does not preclude VAS outreach from health facilities, which is still needed in many places to reach all children; however, it does highlight the need to thoughtfully link outreach to systems, such as through community health workers or the Reaching Every District approach to immunization, which addresses obstacles to immunization coverage with better planning and monitoring. Furthermore, efforts to better inform families and communities can result in sustained higher coverage, even with access at fixed delivery sites.[9]

Globally, less than a third of countries consistently achieve high coverage

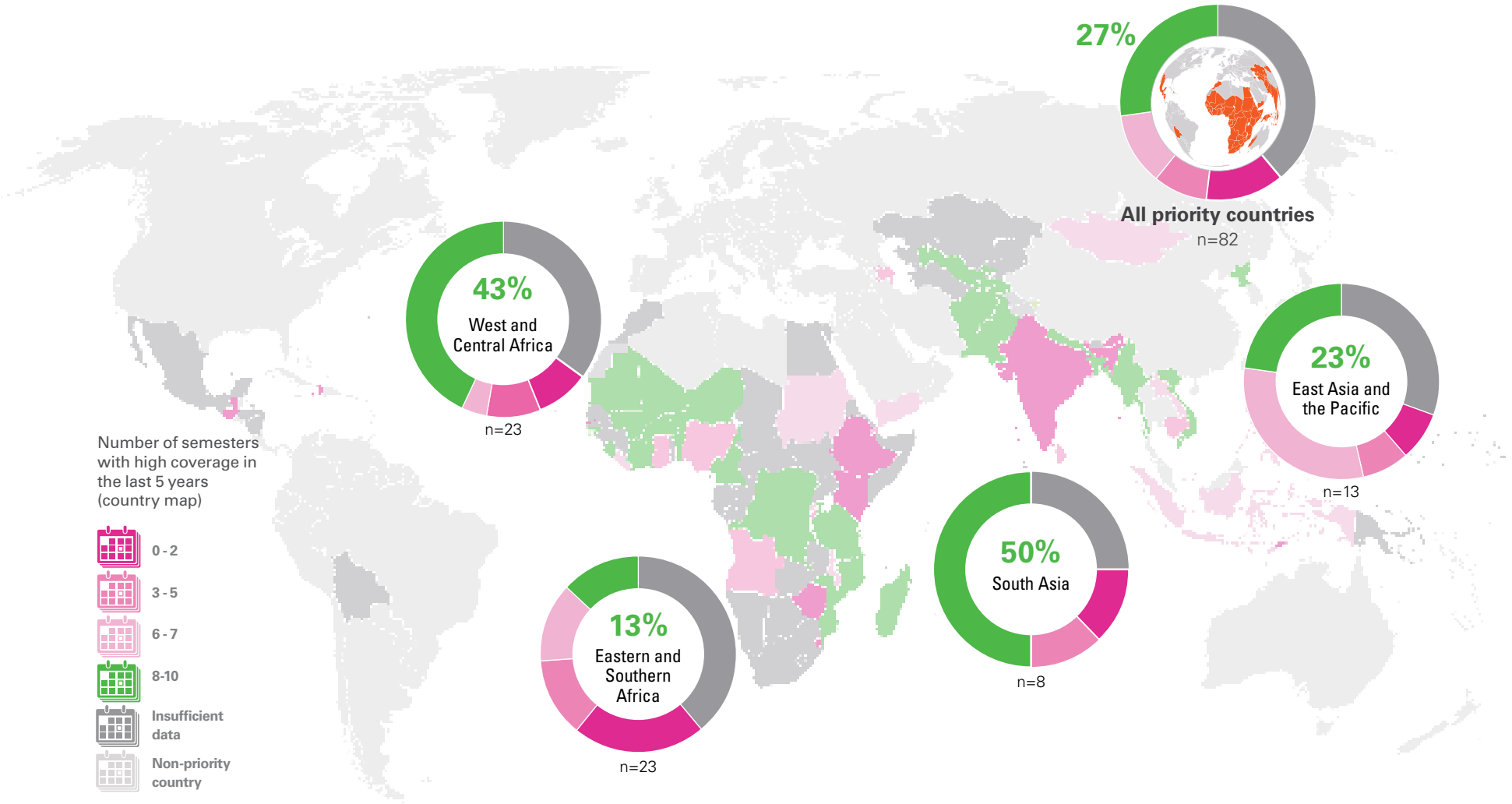


Figure 4.3. Number of semesters with high (≥80 per cent) coverage, by country (map) and percentage of countries in each coverage consistency category, by region (pie charts), 2012–2016

Source: UNICEF global databases, 2018. Based on administrative reports from countries. For notes on the data see Annex 1.

5 MONITORING AND EVALUATION

Strong monitoring systems drive programme performance and help ensure that vitamin A supplements reach every child in need.

Government community case management supervisor reviews patient reports and checks health supplies during a visit to rural health-care volunteer in Myanmar. ©UNICEF/ UNI136053/Dean

Considerations for vitamin A supplementation programme monitoring

THE COVERAGE TRACKING CHALLENGE

How are VAS coverage data collected?

Monitoring a VAS programme at national and subnational levels helps support day-to-day management of activities and is critical for evaluating whether the programme has met its objectives. Strong monitoring also fosters programme sustainability, as discussed in the previous chapter.

As noted in chapter 1, VAS coverage can be monitored using two types of data: (1) administrative data; and (2) survey data. Administrative data are collected by tracking the provision of commodities or services to end users, typically at the point of distribution. For example, health facilities may use registers to record the number of children who received VAS as part of a routine health visit. Similarly, during event-based VAS distribution, tally sheets are often used to record the number of children who received VAS.

Survey data, on the other hand, are collected by asking a sample of individuals to recall if they received a particular service or commodity during a specific time period. Large-scale multi-topic household surveys, such as DHS, ask if the child received a vitamin A supplement in the past six months. Post-event coverage surveys, conducted soon after a distribution event, ask if the child received a vitamin A supplement during a specific event (e.g., a recent Child Health Event) and can help verify coverage reported from administrative sources.

What are the challenges of effective VAS coverage monitoring?

There are a number of challenges to effective coverage monitoring at country level, owing to the nature of VAS recommendations (e.g., frequency of dosage) and the reality of delivery on the ground (e.g., many countries use multiple delivery platforms). Some of these challenges include:

Tracking the full protection of each child: A child is considered to be fully protected in a calendar year if he or she receives two doses of vitamin A no more than four to six months apart. To track full protection for an individual child, an administrative record linked to an individual child – such as a register equipped to collect data about timing of doses given to each individual child as well as a child health card or booklet – would be necessary. While most countries have incorporated VAS into their registers, they do not capture timing of doses given to individual children. With regard to child health cards/booklets, these records sometimes lack space to note all doses and dates of receipt. Even when space is available, the cards are generally not filled in consistently or completely. Because of these inconsistencies, countries track the percentage of children who received one dose of vitamin A in each semester of the calendar year, instead of the percentage of children who were fully protected. If child-linked data were available from registers, or if health cards/booklets were completed more accurately and consistently in the future, it might be possible to draw on these more complete administrative records to report on the percentage of children who received two appropriately-spaced doses of vitamin A each year.

Multiple sources of data within a semester: Many countries use multiple delivery mechanisms for VAS concurrently (such as delivery during routine health visits and polio SIAs), with potentially different methods of data collection and reporting. For example, registers are often used to record the receipt of VAS during routine health visits while tally sheets are used to track the receipt of VAS during a polio SIAs campaign. These multiple data sources and reporting systems make it difficult to track an individual child's supplementation status and may result in inaccurate coverage estimates.

Discrepancies between household survey and administrative coverage estimates: While most countries report on semester-wise VAS coverage annually using administrative data, VAS coverage estimates can also be generated from major household surveys such as the DHS.[1] The drawback of these household survey programmes is that they report on a different indicator (coverage in the last six months), and therefore the reported estimates generally do not align with any given semester. This lack of alignment is exacerbated when delivery platforms vary between semesters or when multiple distribution mechanisms are being used in different parts of the country, during the same semester. Household survey estimates are also available too infrequently (every three to five years) to support the programme management needs of most countries. While administrative data are not without challenges, they are the most appropriate for programme management purposes. Other types of surveys can be used to validate administrative data for targeted support and improved programme management (discussed on page 52).

How can we do better?

Despite the challenges with administrative coverage data described above, improving the quality and strengthening the use of these data is the way forward for stronger health systems and improved programmes.

Improving the quality of coverage estimates from administrative sources could be supported by:

Better use of child health cards and booklets: Using child health booklets/cards to consistently record the date of each dose of vitamin A given through routine health system contacts and during distribution events.

Reporting completeness: Ensuring that all distribution sites and districts submit regular reports; and if not already part of national routine information systems, advocate for the inclusion of vitamin A coverage indicators.

Adequate human resources and regular staff training: Ensuring distribution sites, especially during intensive events, are sufficiently staffed to allow for effective distribution and reporting.

Expanded use of technology: Moving towards electronic-based data collection to reduce errors and improve the completeness and timeliness of reports; and using technology to help countries track individual children, thereby improving the accuracy of two-dose coverage estimates.

Consensus and clarity on denominators: Discussing and agreeing with VAS partners on which population source to use as the denominator for coverage reporting; remaining transparent about any related challenges; and reviewing denominators periodically in case revision is required (e.g., when switching from one delivery platform to another).

Strengthening the use of routine information systems

A PATH TO IMPROVED PROGRAMME PERFORMANCE

How do routine information systems support VAS programmes?

Routine information systems regularly collect administrative data at various levels to meet predictable reporting and programme management needs. One of the most common routine information systems is a national health management information system (HMIS), which is used to track health and nutrition indicators. Using a subset of indicators selected by the Ministry of Health, the HMIS tracks programme performance and progress towards national goals. Related logistic and supply information from health and nutrition programmes may also be tracked in a separate but complementary routine information system that should be used in conjunction with HMIS data for optimal VAS programme management.

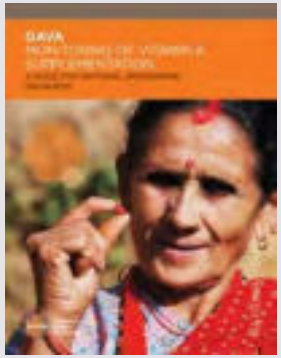
The systematic collection and use of data on coverage of VAS programmes through a routine information system such as an HMIS helps to regularly assess programme performance and inform improvements. It also signals national ownership of the VAS programme and its data.

VAS coverage indicators included in a routine information system are often broken down by age group and delivery platform. Other indicators, such as those on stock and human resource availability and coordination group meetings, should also be tracked at district and national levels. GAVA has published guides to support national and district programme managers in developing simplified monitoring plans for VAS programmes, and to facilitate the improved use of data for programme decision-making.[2-3]

Many countries are moving towards electronic data systems to better track routine information. One example of this is District Health Information System 2 (DHIS2), an open source software used in more than 60 countries around the world.[4] The DHIS2 software platform is used for reporting, analysing and disseminating data, with the possibility of creating data dashboards and other visualizations. Mobile technology can make electronic data available immediately to programme managers, allowing problems to be addressed as they arise (*see box 5.1 on Burundi*). These technologies can be applied to VAS monitoring only if VAS programme indicators are incorporated into the routine reporting system, and ideally capture event-linked distributions as well as delivery through routine health system contacts.

What do the data say?

Most countries are using routine systems to monitor VAS programmes, offering important opportunities for improving programme performance. In 2016, more than 80 per cent of priority countries reported using routine information systems to report on the percentage of children aged 6–59 months receiving VAS. As noted previously, routine data can also be useful for programme planning; however, it is unclear from the available data whether countries are using this information for national planning, or whether it is simply being captured but never used.[5]



GAVA: Monitoring of Vitamin A Supplementation

© UNICEF/J.G.UWAMAHORO

BOX 5.1

Burundi's use of SMS technology for real-time data to improve VAS programme performance

Burundi uses Child Health Days to deliver vitamin A supplements twice annually. Using SMS technology supported by UNICEF, Burundi has addressed important challenges around supply monitoring, delayed reporting, denominator data and difficulties ascertaining the number of missed children. SMS technology allowed service providers to send programme data using their personal phones to a RapidPro server from which programme managers could track programme implementation in real time. The RapidPro system provides an overview of how services are being used, helps prevent stock shortages and provides a database for prioritizing and organizing activities. The system provides a mechanism for tracking distribution events and helps managers respond to problems as they occur.[6]

In 2016, more than

80%

of countries reported using routine information systems to monitor their vitamin A supplementation programmes*

For notes on the data see Annex 1.

Subnational data for better coverage and programming

TOWARDS STRONGER VITAMIN A SUPPLEMENTATION PROGRAMMES

How can subnational data improve programme management?

As discussed in chapter 3, subnational administrative data (e.g., data collected at the district or health post level) should be used regularly to inform programme management. These data can help identify barriers specific to different areas of the country, such as stock-outs of capsules or other key supplies, poor resource mobilization, or a lack of interest among beneficiaries.

Data can also be collected by post-event coverage surveys and used to review and verify VAS coverage estimates from administrative sources. They can also be used to collect additional information related to behaviours and beliefs, which can then support programme planning. There is no need to do post-event surveys regularly; rather such surveys should be focused on problem areas where coverage may have been particularly low or high, with the aim of verifying coverage, and identifying appropriate solutions or learning for other districts, where needed.

Post-event surveys can generate coverage estimates that are free from some of the limitations of estimates based on administrative data. In contrast to administrative coverage estimates, post-event surveys do not require an accurate total population estimate to serve as the denominator. This is important because subnational population estimates are often far from accurate.

What do the data say?

Many countries have subnational data in addition to national coverage estimates, and these data can be used to guide improvements in programme performance. In 2016, out of 111 semesters with accepted national coverage estimates, 60 semesters (just over half) had subnational estimates. Most of these estimates were at the district level, as well as some at the sub-district or health post level. As reporting moves to the lowest levels, greater detail becomes available, which can be leveraged to identify specific areas in need of support.

In 2016, 13 countries, or 16 per cent of VAS programme priority countries, reported using post-event coverage surveys to validate coverage of VAS – information that can now be used to improve programme performance (*see Box 5.2*).

More than half of all coverage data can be traced back to the district level or lower

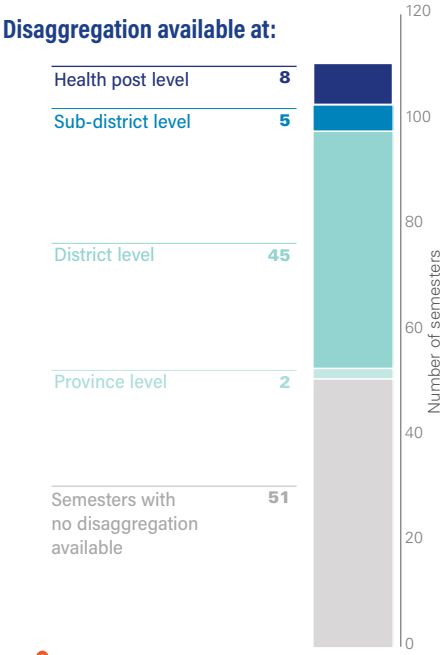


Figure 5.1. Number of semesters with accepted vitamin A supplementation coverage estimates, by available level of subnational disaggregation, 2016

Source: UNICEF global databases, 2018. Based on administrative reports from countries. For notes on the data see Annex 1.

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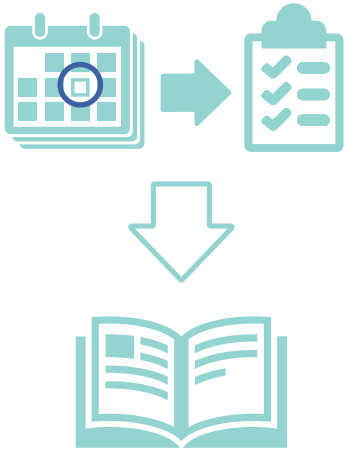
BOX 5.2

Post-event surveys to validate coverage and improve programmes in Benin

Benin is using a Lot Quality Assurance Sampling (LQAS) approach to conduct post-event coverage surveys. LQAS can be used to identify areas within a district that are meeting a certain benchmark of coverage (e.g., 80 per cent) and those that fall below a lower threshold (e.g., 50 per cent).

In Benin, LQAS was used to verify VAS coverage following a polio SIAs campaign, and also to collect broader programme information. Using LQAS, the survey was conducted in 19 communes and results were compared with the reported administrative coverage. The survey revealed that while coverage was relatively high among older children, it was often lower than 80 per cent in children aged 6–11 months. The survey also included questions on knowledge and attitudes of the beneficiaries, namely about advantages of VAS, reasons for attending or not attending the VAS days, and barriers to taking vitamin A supplements. Questions were also directed to health staff concerning preparedness, logistics and supply.

The survey revealed that there was a low level of awareness among caregivers on the importance of VAS. As Benin is transitioning to a new distribution mechanism for VAS, this critical information allowed programme managers to design a new communications and social mobilization strategy to increase demand for this service. In this way, the supplemental monitoring information provided by the survey also offered a great deal of insight to guide programme strengthening.[7]



16%

of countries reported using post-event coverage surveys to monitor their VAS programmes in 2016

For notes on the data see Annex 1.

CONCLUSION AND WAY FORWARD

Aber Beatrice, photographed in the restaurant that her mother owns in South Sudan. ©UNICEF/UNI203950/ Everett

CONCLUSION AND WAY FORWARD

Our challenge, their future

A world without vitamin A deficiency is possible. Yet until nutritious diets are a reality for every child, VAS is a powerful solution for saving lives.

Since 2000, the dramatic scale-up of VAS programmes has protected millions of children from the devastating consequences of vitamin A deficiency. This success has been bolstered by effective delivery platforms, key partnerships and financing, and knowledge of what works.

Yet as this report has shown, progress in reaching all targeted children has halted and risks backsliding. Global coverage of VAS has reached a six-year low of 64 per cent – and if the situation continues, the children most in need will face dire consequences.

Inequity is increasing, and countries with the highest rates of under-five mortality have seen alarming drops in coverage – from above 80 per cent to around 40 per cent – in the past three years. These inequities in places of greatest need are leaving 62 million vulnerable children unprotected. Sustainability is also tenuous; although policies and some national financing are in place, delivery mechanisms are unstable and almost three quarters of countries have failed to achieve consistently high coverage of VAS during the past five years.

Anything less than full protection with two VAS doses each year leaves children vulnerable. With so much at stake, we must commit to transforming VAS programmes for the future.

What do we need to do?

Advocate for the power of VAS – Only two doses of vitamin A per year can protect children from death; we cannot let this critical life-saving intervention drop off the agendas of national governments, partners or the broader global community.

Track and protect every child – We need to know which children are receiving VAS and whether they are fully protected each year. To do this, greater efforts are needed to strengthen routine information systems, collect and use subnational data and track individual children. Having this information in real time is important so that data can immediately be used to improve programming – and new technologies are available to support these efforts.

Foster stronger health systems – The delivery of key services through routine health contacts remains essential and we need to guarantee that VAS is included in efforts to bring these services to the most vulnerable. VAS also needs to be better integrated within immunization programmes, and with the delivery of other interventions, such as those provided by community health and nutrition workers.

Share and expand knowledge – Spurred in part by the disappearance of polio SIAs, some countries are already embarking on new ways of delivering vitamin A supplements, including by integrating their delivery within other public health programmes. We need to support these countries to succeed and then help to share their stories with others, so that all children in need benefit from strong VAS programmes that reach every child.

Commit to improving diets – VAS saves lives in the face of vitamin A deficiency; but it does not impact vitamin A status in the long term. Protecting, promoting and supporting breastfeeding in the first two years of life, improving the quality of complementary foods, feeding and hygiene practices, diversifying diets and reducing infections must therefore remain a priority so that vitamin A deficiency can be sustainably eliminated. Until then, VAS programmes and efforts to improve nutrition must go hand in hand.

A girl receives a dose of vitamin A at a basic health centre in Pakistan. ©UNICEF/UN048391/ Pirozzi

VAS for every child in need – without compromise

With financing, political will and the data to support decision-making, we can break down the barriers to reaching every child in need and safeguard VAS programmes for the future.

The world has also changed. Not all 82 countries that were deemed priority based on their indicators in the year 2000 still require national-level VAS programmes today. Mortality has dropped in many places and routine systems and services are stronger in some settings. In 2018, UNICEF will revise the list of priority countries to reflect the current reality and to re-focus VAS efforts towards countries where it is needed most.

With renewed commitment and a clear way forward, the path towards sustainable VAS programmes at scale is within reach.

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Annex 1

NOTES ON THE DATA

OUTLINE

A. General notes

A.1 Indicator definitions for vitamin A supplementation coverage

A.1.1 Indicator definitions for the global database (administrative data)

Semester 1 coverage (January to June): Percentage of children aged 6–59 months who received an age-appropriate dose of vitamin A in semester 1 through the main distribution mechanism*

$$\frac{\textit{Number of children aged 6–59 months who received an age-appropriate dose of vitamin A through the main distribution mechanism* in semester 1}}{\textit{Total population of children aged 6–59 months}}$$

Semester 2 coverage (July to December): Percentage of children aged 6–59 months who received an age-appropriate dose of vitamin A in semester 2 through the main distribution mechanism*

$$\frac{\textit{Number of children aged 6–59 months who received an age-appropriate dose of vitamin A through the main distribution mechanism* in semester 2}}{\textit{Total population of children aged 6–59 months}}$$

Two-dose coverage
An estimate of the percentage of children aged 6–59 months who received two doses of VAS spaced about four to six months apart in a calendar year. The semester which achieved the lower coverage between semester 1 and semester 2 is used (e.g., if semester 1 is 98 per cent and semester 2 is 50 per cent, the two-dose coverage is 50 per cent). In cases where more than eight months has occurred between the event in semester 1 and semester 2, the two-dose coverage is listed as 0 per cent.

No data
Data points (semester and/or two-dose coverage) are labeled as 'no data' in cases where 1) no data was received from a country for a particular year, 2) data was received but not approved because it did not meet the set criteria for inclusion in the global VAS database (see "Notes on the Data" at <https://data.unicef.org/vitamin-a-deficiency/>), or 3) there were only data for one of the two annual semesters (i.e., the other semester did not have any data or did not have an approved coverage estimate), in which case the two-dose coverage is listed as 'no data'.

A.1.2 Other indicator definitions (survey-based data)

VAS coverage in the past six months: The percentage of children aged 6–59 months who received a dose of vitamin A in the six months before their survey interview date.

$$\frac{\textit{Number of children aged 6–59 months whose caregiver reported they received a dose of vitamin A in the previous six months}}{\textit{Total number of children aged 6–59 months surveyed}}$$

This indicator is typically used in large multi-topic household surveys such as the Demographic and Health Surveys (DHS).

VAS coverage in a specific event
The percentage of children aged 6–59 months who received a dose of vitamin A in the specific event asked about in the survey.

$$\frac{\textit{Number of children aged 6–59 months whose caregiver reported they received a dose of vitamin A in the specific event}}{\textit{Total number of children aged 6–59 months surveyed}}$$

This indicator is typically used in household surveys implemented very soon after an event (e.g., within four to six weeks of a Child Health Event) with a main purpose of assessing coverage as well as collecting other information related to the specific event. In most cases these are subnational in scale but can also be nationally representative and can be compared with the semester-wise data from administrative estimates.

A.2 Major sources of administrative coverage estimates

Country-level VAS coverage estimates are generally derived from the following two in-country sources:

Tally sheets are generally used to record doses delivered during outreach or campaign-style events such as Child Health Events, polio SIAs and Measles SIAs. The tally sheets capture the total number of doses delivered to children during an event. Tallies from each distribution/event

* In many countries, prophylactic vitamin A supplements for children aged 6–59 months old are given out using more than one distribution mechanism throughout the country in any given semester. In order not to double count, only one distribution mechanism, the one which reached the most children, is reported on for each semester. For additional information, including how estimates are generated when different geographic areas use different distribution mechanisms, see 'Notes on the Data' at: <https://data.unicef.org/topic/nutrition/vitamin-a-deficiency/>.

site are summed up to provide the total number reached at the national level. This numerator of children reached at an event is then divided by a population estimate for children aged 6-59 months that has been agreed upon by national stakeholders in the VAS programme and can include sources such as the latest census plus population growth rate, EPI programme estimates, etc.

Health management information system (HMIS) reports in general capture the total number of supplements delivered through routine health system contacts – that is, the doses delivered to children when they go to a health centre to receive well-child visit services such as vaccinations. These data are generally rolled up to the central level together with information on vaccines or essential drugs. This numerator of children reached in each semester is then divided by a population estimate for children aged 6-59 months that has been agreed upon by national stakeholders in the VAS programme and can include sources such as the latest census plus population growth rate, EPI programme estimates, etc. In cases where the HMIS is also used to collect information about VAS distribution during campaigns, reports from this system can be also be used to report on campaign coverage.

A.3 UNICEF global VAS coverage database (used in this report)

UNICEF reports on VAS coverage for children aged 6–59 months for a set of 82 priority countries for national-level VAS programmes; priority was based on an assessment of U5MR and vitamin A deficiency data from the late 1990s and early 2000s.

The database contains data for each of the 82 priority countries for every calendar year on the indicators of:

1. coverage in semester 1;
2. coverage in semester 2; and
3. two-dose coverage.

The only viable sources of data for the global database are the administrative estimates of semester-wise coverage. Survey-based data are either not aligned with the database indicator definition (VAS survey coverage estimates for the past six months) or not available frequently enough at the national level (VAS survey coverage estimates of a specific event).

UNICEF New York headquarters collects, reviews and finalizes the VAS coverage estimates using a standardized reporting form shared with the UNICEF country offices for the 82 VAS priority countries each year. UNICEF country focal points work with national partners to fill out the reporting forms and respond to questions for clarification. In cases where quality or other criteria are not met or insufficient information exists to approve the estimate, a record of "no data"may be entered.**

A.4 Population weighted global and regional estimates

All regional and global population weighted estimates were weighted using the annual population by age interpolated datasets from the United Nations Department of Economic and Social Affairs, Population Division (UNPD) (United Nations, 2017).

Population weighted averages for any given region were generated by (a) multiplying the coverage for each country with available data by the number of children aged under 5 year olds in that country; (b) summing all of the country-specific products; and (c) dividing the sum of the products by the total population of children aged under 5 year olds in all countries with data.

Population coverage, or the share of the population for which an estimate is available in the UNICEF global database, was calculated by dividing the population of children aged under 5 year olds in countries with data by the total population of children aged under 5 year-olds in **priority countries**[***] in each respective region. The standard used for minimum population coverage was 50 per cent.

B. Notes on individual graphics

B.1 Notes on figures

Figure 1.1. Vitamin A supplementation two-dose coverage, by country and region, 2016

Individual country two-dose coverage estimates are presented for countries with final approved estimates for the UNICEF global database which have been endorsed for public use by local counterparts. Regional and global aggregates are based on the 57 VAS priority countries with a two-dose coverage estimate in the UNICEF global database for 2016 as of December 2017, covering 88 per cent of the total priority country population. Regional aggregates are population-weighted and presented only when population coverage of 50 per cent was met or exceeded.

The number of unprotected children in VAS priority countries in 2016 – 141 million – was calculated by applying the VAS coverage rate for all priority countries (64%) to the total number of 6-59 month old children in all 82 VAS priority countries. The number of VAS priority countries will likely reduce in the coming years following an assessment of current VAS programme needs. However, an analysis on the number of unprotected children in 2016 using the potential reduced VAS priority country list resulted in a very similar figure for unprotected children.

These maps are stylized and not to scale, and do not reflect a position by UNICEF on the legal status of any country or territory or the delimitation of any frontiers. The dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. The final boundary between Sudan and South Sudan has not yet been determined. The final status of Abyei area has not yet been determined.

Figure 1.2. Trends in vitamin A supplementation two-dose coverage, by region, 2000–2016

Trend analyses are population weighted. The trend analysis for all priority countries is based on 20 countries with available data for each year from 2000 through 2016, and accounts for 63 per cent of the under-five population in 2000 and 59 per cent in 2016.

Regional analyses are similarly based on a subset of countries with available data for each year shown. Regional estimates represent data from countries covering at least 50 per cent of the under-five population in priority countries in that region. In some cases, selected years are left out of the series to accommodate a populous country(ies) missing data for one or two years. This affected Eastern and Southern Africa in 2002 and 2003, and East Asia and the Pacific in 2016, and is represented as breaks in the line/area.

For South Asia, the analysis is based on four countries with available data for each year from 2000 through 2016, and accounts for 97 per cent of the under-five population in 2000 and 96 per cent in 2016 in that region.

For East Asia and the Pacific, the analysis is based on

** See 'Notes on the Data' at: <https://data.unicef.org/topic/nutrition/vitamin-a-deficiency/>.

*** Regional and global averages only represent priority countries. For example, as China is not a priority country for a national VAS programme, there are no national-level VAS coverage estimates and China is therefore not included in the East Asia and the Pacific or the 'All Priority Countries' population coverage assessments.

five countries with available data for every year from 2000 through 2015 (2016 missing data from one of the five countries, hence 2016 estimate not shown), and accounts for 81 per cent of the under-five population in 2000 and 81 per cent in 2015 in that region.

For Eastern and Southern Africa, the analysis is based on eight countries with available data for almost every year from 2000 through 2016 (2002 and 2003 missing data from four of the eight countries, hence 2002 and 2003 estimates not shown), and accounts for 58 per cent of the under-five population in 2000 and 57 per cent in 2015 in that region.

For West and Central Africa, the analysis is based on seven countries with available data for each year from 2000 through 2016, and accounts for 67 per cent of the under-five population in 2000 and 68 per cent in 2016 in that region.

Figure 1.3. Number of countries in sub-Saharan Africa with high (≥80 per cent) vitamin A supplementation two-dose coverage, 2000-2016 (top, bar graph); and Trends in vitamin A supplementation two-dose coverage in sub-Saharan Africa, 2000, 2009, 2016 (bottom, blocks)

Analysis is based on data from the 46 countries in sub-Saharan Africa. All data presented are related to country counts only. Population weights have not been used. In the three figures at the bottom, each block represents one country.

Figure 2.1. Trends in the percentage of primary distribution mechanisms used to deliver vitamin A supplements in each semester, all priority countries (top graph) and by region (bottom four graphs), 2000–2016

Analysis is based on data from all 82 countries designated as vitamin A priority countries. Two semesters of data were assessed for each country in each year and thus 164 data points are included in each year.

The definitions for Routine Health System Contacts, Child Health Events and polio SIAs are on the legend of the graph itself. 'No distribution' refers to a semester when coverage was confirmed to be 0 per cent, meaning that no prophylactic vitamin A was delivered to the target group. 'No data' refers to a semester when information was not available related to vitamin A supplementation and/or mechanisms for its delivery and/or when reported data were not accepted into the global database. 'Other distribution mechanisms' includes vitamin A campaigns, Measles SIAs and any other campaigns or events not mentioned above (e.g., tetanus toxoid immunization campaigns).

Figure 2.2. Trends in percentage of semesters reaching high (≥80 per cent) vitamin A supplementation coverage, by distribution mechanism and region, 2000–2004, 2005–2010 and 2011–2016

Analysis is based on data from 78 priority countries with approved semester-wise coverage estimates between 2000 and 2016 which used one of the following three distribution mechanisms: (i) routine health system contacts; (ii) child health events; and (iii) polio SIAs.

A total of 1,642 semesters of data were available for these three distribution mechanisms. In countries where multiple distributions were used in a single semester, the primary distribution mechanism (that which reached the most children) was used for the purposes of this analysis. However, there were eight semesters where two distributions mechanisms/performance measures were used (two data points per semester/country). In these exception semesters, two delivery mechanisms were implemented in distinct areas of a country and thus separate performance measurements could be assessed. Therefore, a total of 1,650 distinct data points were included in this analysis. Unweighted averages for the percentage of semesters achieving at least 80 per cent coverage were then generated for each year grouping of 2000–2004; 2005–2010; and 2011–2016 for each delivery mechanism and region.

Figure 2.3. Interventions co-delivered alongside vitamin A supplementation during campaigns in priority countries, 2012–2016

Analysis is based on 387 Child Health Events and Polio SIAs conducted in 52 priority countries from 2012 to 2016. The co-delivered interventions were reported on using a list of standardized categories which country teams indicated were or were not included, as well as information from a space for specifying other co-delivered interventions. Circle size represents the percentage of campaigns during which the intervention was included; the size of the circle for vitamin A refers to 100 per cent of campaigns. Interventions appearing in less than 10 per cent of campaigns are listed to the side of the graphic under the headings of (i) other interventions for young children and (ii) other interventions for adults and households.

Figure 3.1. Vitamin A supplementation two-dose coverage, by country (dots) and region (bars), 2016

Analysis is based on 57 VAS priority countries with a two-dose coverage estimate for 2016, covering 82 per cent of the total priority country population. Each circle represents the rate for an individual country; in cases where rates are exactly the same, circles were made to partially overlap to show the number of countries at each rate. Regional averages are population weighted and only represent priority countries within regions.

Figure 3.2a. Percentage of semesters with subnational-level data, by national coverage grouping, 2016

Analysis is based on 111 semesters from 58 countries in 2016 with an accepted national coverage estimate. These 111 semesters were categorized into three groups of national-level coverage achievement (<50 per cent; 50–79 per cent; and ≥80 per cent). Availability of subnational VAS estimates is based on reporting by country teams against a question regarding coverage achieved in each subnational area.

Figure 3.2b. Percentage of subnational areas in each coverage category, by semester* and by national coverage grouping, 2016

Analysis is based on 60 semesters from 35 counties in 2016 with accepted national coverage estimates and subnational VAS estimates. The percentage of subnational areas falling within each of four categories of <50 per cent; 50–79 per cent; ≥80 per cent; or no data, is presented in stacked bar graphs at the bottom of the page.

Figure 3.3: Trends in vitamin A supplementation two-dose coverage, by U5MR, 2009–2016

Trend analyses are population-weighted. The trend analysis for all priority countries is based on a subset of 34 countries with available data for each year from 2009 through 2016, and accounts for 74 per cent of the under-five population in 2009 and 73 per cent in 2016.

Countries were then grouped by their 2016 U5MR (found at https://data.unicef.org/resources/levels-trends-child-mortality/) These 33 countries were split into two groups based on their U5MR in 2016. One group for countries with a U5MR of ≥70 deaths per 1,000 live births, and one group with a U5MR of <70.

Of the 26 VAS priority countries with a U5MR ≥70 in 2016, 13 countries had accepted two-dose VAS coverage estimates for all eight years, accounting for 79 per cent of the under-five population in these countries in 2016. Of the 56 VAS priority countries with a U5MR <70 in 2016, 20 countries had accepted two-dose VAS coverage estimates for all eight years representing 68 per cent of the under-five population in these countries in 2016.

Figure 3.4: Trends in vitamin A supplementation two-dose coverage by country (semi-circle segments) and average (white arrow indicator), by 2016 U5MR, 2014–2016

Analysis is based on 44 countries with accepted two-dose VAS coverage estimates for each of the following years: 2014, 2015 and 2016. Countries were then grouped by their 2016 U5MR (found at https://data.unicef.org/resources/levels-trends-child-mortality/) Of the 6 VAS priority countries with a U5MR ≥100, 5 countries had accepted two-dose VAS coverage estimates for all three years, and thus were included in this analysis. Of the 20 VAS priority countries with a U5MR between 70 and 99, 11 countries had accepted two-dose VAS coverage estimates for all three years and among the 30 countries with a U5MR between 40 and 69, 18 countries had accepted two-dose coverage estimates for all 3 years. Among the 26 VAS priority countries with a U5MR <40, 10 countries had accepted two-dose VAS coverage estimates for all three years.

To create the semi-circle segment graphic, the country two-dose VAS coverage estimates in each year were split into five categories: <20 per cent; 20–39 per cent; 40–59 per cent; 60–79 per cent; and ≥80 per cent. The semi-circles presented are split into equal segments based on the number of countries in each U5MR category (e.g., the semi-circles in the top row are split into five equal segments, while the semi-circle in the bottom row is split into 10 equal segments). Each segment represents the two-dose VAS coverage of one individual country in any particular year. The segments are ordered from lowest to highest. Unweighted averages for two-dose VAS coverage were calculated for each U5MR-year group and are presented as white arrows within each semi-circle).

Figure 4.1: Government contribution to financing for national vitamin A supplementation programmes, by region, in 2016

Analysis is based on reporting by UNICEF staff in 82 priority countries responding to the question 'Did the government provide funding for any of the following interventions (besides salaries) in 2016?'

Figure 4.2: Trend in the percentage of global doses of vitamin A attributable to the global vitamin A capsule donation programme (green bars) and the number of countries receiving vitamin A capsule donations (red line), 2000-2016

Analysis is based on the number of vitamin A supplement doses provided globally in each year between 2000 and 2016 (data from the UNICEF global VAS database) and the number of vitamin A supplement doses that are estimated to be attributable to the Nutrition International and UNICEF joint vitamin A capsule (VAC) donation programme in the same years (the calculation on attributable is conducted by collecting detailed information each year from each country on stocks available in-country each year, those provided by the donation programme, those provided by other sources, and the number of children reached in each calendar year). These two figures are divided to determine the percentage of global vitamin A doses attributable to the donation programme. The red line above the bar graph represents the number of countries that received a donation through the joint programme in each year.

Figure 4.3. Number of semesters with high (≥80 per cent) coverage, by country (map) and percentage of countries in each coverage consistency category, by region (pie charts), 2012-2016

Analysis is based on semester-wise coverage estimates for each of the 82 vitamin A priority countries from 2012 through 2016 (10 semesters per country). Countries with less than eight semesters of accepted data were classified as 'insufficient data' and graphed with a dark grey. The remainder of the countries were classified as either: green (achieving ≥ 80 per cent coverage in at least 8 of the past 10 semesters); light pink (achieving ≥80 per cent coverage in 6–7 of the past 10 semesters); medium pink (achieving ≥80 per cent coverage in 3–5 of the past 10 semesters); or dark pink (achieving ≥80 per cent coverage in 0–2 of the past 10 semesters). Regional and global pie charts were then developed by using the number of countries in each category (e.g., of the eight countries in South Asia, four countries (50 per cent) were green; one country (12.5 per cent) was medium pink; one country (12.5 per cent) was dark pink; and two countries were dark grey (had insufficient data)).

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Figure 5.1: Number of semesters with accepted vitamin A supplementation coverage estimates, by available level of subnational disaggregation, 2016

Analysis is based on additional information reported by countries for the 2016 VAS coverage review. Countries provided details related to coverage by subnational areas for each of two semesters in 2016. Only semesters where a national coverage estimate was accepted into the database are included in this analysis. In total, there were 111 semesters from 57 countries in 2016 with an accepted national coverage estimate included in this analysis. Semesters with an accepted national coverage estimate but for which disaggregated data were not reported or for which reported disaggregated data were not cleared/finalized were labelled as semesters with no disaggregation available. In total there were 53 semesters for which a national coverage estimate was not available/not finalized, and these country-semester pairs were not included in this analysis.

B.2 Notes on infographics

Page 40: Infographic on per cent of countries with a policy, strategy or plan of action on vitamin A supplementation

Analysis is based on reporting by UNICEF staff in 82 priority countries for the year 2016 responding to the question 'Does the government have a policy, strategy or plan of action on vitamin A supplementation in children 6–59 months of age?'

Page 51: Infographic on per cent of countries using routine information systems to monitor vitamin A supplementation programmes

Analysis is based on reporting by UNICEF staff in 82 priority countries for the year 2016 responding to the question 'Which of the following indicators were monitored in national information systems (e.g., health management information system, DHIS2)' for 'children aged 6–59 months receiving vitamin A supplementation'.

Page 53: Infographic on per cent of countries using post event surveys in their programmes

Analysis is based on reporting by UNICEF staff in 82 priority countries for the year 2016 responding to the question 'Was a specific post-event coverage assessment (such as a post-event coverage survey [PECS], a lot quality assurance sampling [LQAS] survey, a SMART survey, or others) implemented to examine vitamin A supplementation (VAS) coverage in Semester 1 (or 2)?'.

Annex 2

REGIONAL CLASSIFICATIONS

EASTERN AND SOUTHERN AFRICA

Angola; Botswana; Burundi; Comoros; Djibouti; Eritrea; Ethiopia; Kenya; Lesotho; Madagascar; Malawi; Mauritius; *Mozambique; Namibia; Rwanda;* Seychelles; *Somalia; South Africa; South Sudan; Sudan; Swaziland; Uganda; United Republic of Tanzania; Zambia; Zimbabwe*

WEST AND CENTRAL AFRICA

Benin; Burkina Faso; Cabo Verde; *Cameroon; Central African Republic; Chad; Congo; Côte d'Ivoire; Democratic Republic of the Congo; Equatorial Guinea; Gabon; Gambia; Ghana; Guinea; Guinea-Bissau; Liberia; Mali; Mauritania; Niger; Nigeria; Sao Tome and Principe; Senegal; Sierra Leone; Togo*

MIDDLE EAST AND NORTH AFRICA

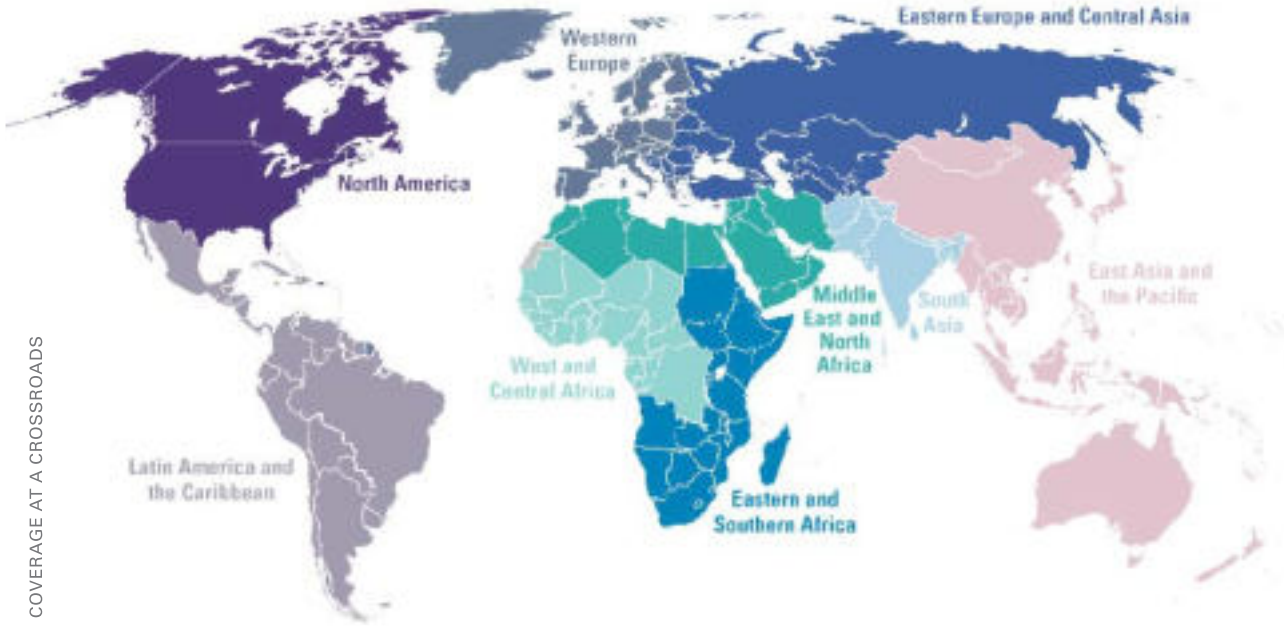
Algeria; Bahrain; *Egypt;* Iran (Islamic Republic of); Iraq; Israel; Jordan; Kuwait; Lebanon; Libya; *Morocco;* Oman; Qatar; Saudi Arabia; State of Palestine; Syrian Arab Republic; Tunisia; United Arab Emirates; *Yemen*

SOUTH ASIA

Afghanistan; Bangladesh; Bhutan; India; Maldives; Nepal; Pakistan; Sri Lanka

EAST ASIA AND THE PACIFIC

Australia; Brunei Darussalam; *Cambodia;* China; Cook Islands; *Democratic People's Republic of Korea;* Fiji; *Indonesia;* Japan; *Kiribati; Lao People's Democratic Republic;* Malaysia; *Marshall Islands; Micronesia (Federated States of); Mongolia; Myanmar;* Nauru; New Zealand; Niue; Palau; *Papua New Guinea; Philippines;* Republic of Korea; Samoa; Singapore; Solomon Islands; Thailand; *Timor-Leste;* Tokelau; Tonga; Tuvalu; Vanuatu; *Viet Nam*



LATIN AMERICA AND THE CARIBBEAN

Anguilla; Antigua and Barbuda; Argentina; Bahamas; Barbados; Belize; *Bolivia (Plurinational State of);* Brazil; British Virgin Islands; Chile; Colombia; Costa Rica; Cuba; Dominica; Dominican Republic; Ecuador; El Salvador; Grenada; *Guatemala;* Guyana; *Haiti; Honduras;* Jamaica; *Mexico;* Montserrat; *Nicaragua;* Panama; Paraguay; Peru; Saint Kitts and Nevis; Saint Lucia; Saint Vincent and the Grenadines; Suriname; Trinidad and Tobago; Turks and Caicos Islands; Uruguay; Venezuela (Bolivarian Republic of)

NORTH AMERICA

Canada; United States

EASTERN EUROPE AND CENTRAL ASIA

Albania; Armenia; *Azerbaijan;* Belarus; Bosnia and Herzegovina; Bulgaria; Croatia; Georgia; *Kazakhstan; Kyrgyzstan;* Montenegro; Republic of Moldova; Romania; Russian Federation; Serbia; *Tajikistan;* The former Yugoslav Republic of Macedonia; Turkey; *Turkmenistan;* Ukraine; *Uzbekistan*

WESTERN EUROPE

Andorra; Austria; Belgium; Cyprus; Czechia; Denmark; Estonia; Finland; France; Germany; Greece; Holy See; Hungary; Iceland; Ireland; Italy; Latvia; Liechtenstein; Lithuania; Luxembourg; Malta; Monaco; Netherlands; Norway; Poland; Portugal; San Marino; Slovakia; Slovenia; Spain; Sweden; Switzerland; United Kingdom

Note: Countries in Italics are the 82 priority countries for national level vitamin A supplementation programmes used in this report and designated as priority based on an assessment of U5MR and vitamin deficiency data from the late 1990's and early 2000's

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