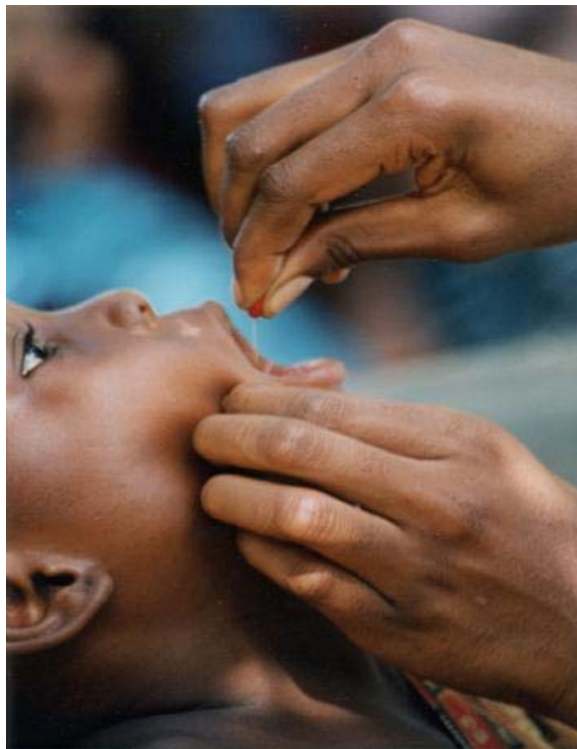


Vitamin A Supplementation: Progress for child survival



Working Paper prepared by
The Nutrition Section
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Vitamin A Supplementation: Progress for child survival
Working Paper, December 2005

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Abbreviations

CEE/CIS	Central and Eastern Europe, Commonwealth of Independent States and Baltic States
CIDA	Canadian International Development Agency
DHS	Demographic and Health Surveys
EAPRO	East Asia & Pacific Region
EPI	Expanded Programme on Immunization
MDGs	Millennium Development Goals
IVACG	International Vitamin A Consultative Group
MENA	Middle East & North Africa
MI	Micronutrient Initiative
MICS	Multiple Indicator Cluster Surveys
NID	National Immunization Day
ROSA	South Asia
SIA	Supplementary Immunization Activities
SOWC	The State of the World's Children
SSA	Sub-Saharan Africa
TACRO	The Americas & Caribbean
U5MR	Under-five mortality rate
UNICEF	United Nations Children's Fund
VAD	Vitamin A deficiency
VAS	Vitamin A supplementation
WHO	World Health Organization

Purpose

In September 2000, 189 United Nations Member States adopted the Millennium Development Goals (MDGs), setting clear, time-bound targets for making progress on the most pressing development issues. Goal #4 is about improving child survival. The target is to reduce by two-thirds the mortality rates among under-five children by 2015.

The purpose of this report is to provide an update on national efforts to ensure full protection to all children 6-59 months with preventative, bi-annual doses of vitamin A supplements in 103 target countries. The report focuses on preventative high-dose vitamin A supplementation (VAS) as this is one of the main strategies adopted by the international community and governments to improve vitamin A status, and improve child survival. VAS is recognized as a low-cost, highly effective means of improving the vitamin A status of children and other population groups, and the quickest intervention to implement at the national level – even though food based approaches such as food fortification and consumption of vitamin A-rich foods are also recognized as important strategies and increasingly feasible in many countries. Supplementation's proven impact on reducing child mortality has been well documented in the scientific literature and was most recently highlighted by the Lancet series on Child Survival. Thus, vitamin A programming is a pre-requisite for achieving MDG #4, particularly in countries with high under-five mortality and/or vitamin A deficiency (VAD).

In this report, progress is tracked using agreed-upon UNICEF indicators for VAS coverage. Coverage data are drawn from figures reported in UNICEF's State of the World's Children (SOWC) report for 1999 through 2003. Trends for the same period are also provided. Progress in vitamin A programming is also considered for the 60 priority Child Survival countries.

The report is timely as UNICEF and partners strategize on how best to push forth with the child survival agenda and accelerate progress towards the achievement of MDG #4. It serves as a 'score card' for countries and the international community on progress to date in scaling-up one of the most effective child survival interventions available, and a reference for where we need to go from here.

Why Ensuring High Coverage Matters

Vitamin A deficiency is a major contributor to young child mortality. Improving the vitamin A status of deficient children has been proven to enhance their resistance to disease and reduce all cause mortality by 23%¹. The elimination of VAD as a public health problem is therefore a central element of the child survival agenda.

The Lancet Child Survival series lists vitamin A supplementation among the top interventions with proven potential to reduce the number of preventable child deaths each year. Moreover, VAS has also been identified as one of the most cost-effective interventions for improving child survival. Experience over the last few decades

has shown that ensuring high VAS coverage for young children every 4-6 months in programme settings is both cost-effective and feasible. Therefore, ensuring high and sustainable coverage with vitamin A supplements on a bi-annual basis in the 103 target countries covered by this report is critical not only for the elimination of deficiency, but also to accelerate progress towards reducing young child deaths and hence achieving MDG #4.

Global burden of vitamin A deficiency

The World Health Organization (WHO) estimates that more than 4 million children under the age of five suffer from night blindness, a sign of severe deficiency. Far greater numbers of children show no external signs of VAD, but live with dangerously low vitamin A stores, leaving them vulnerable to infection and reduced immunity to fight common childhood diseases. Although many countries have not been able to assess the true level of deficiency due to technical and financial constraints, approximately 100 to 140 million children may be affected, most of whom live in South Asia and Sub-Saharan Africa.

¹ Beaton, et al. *Effectiveness of vitamin A supplementation in the control of young child morbidity and mortality in developing countries*. ACC/SCN State-of-the-Art Series, Nutrition Policy Paper No 13., 1993.

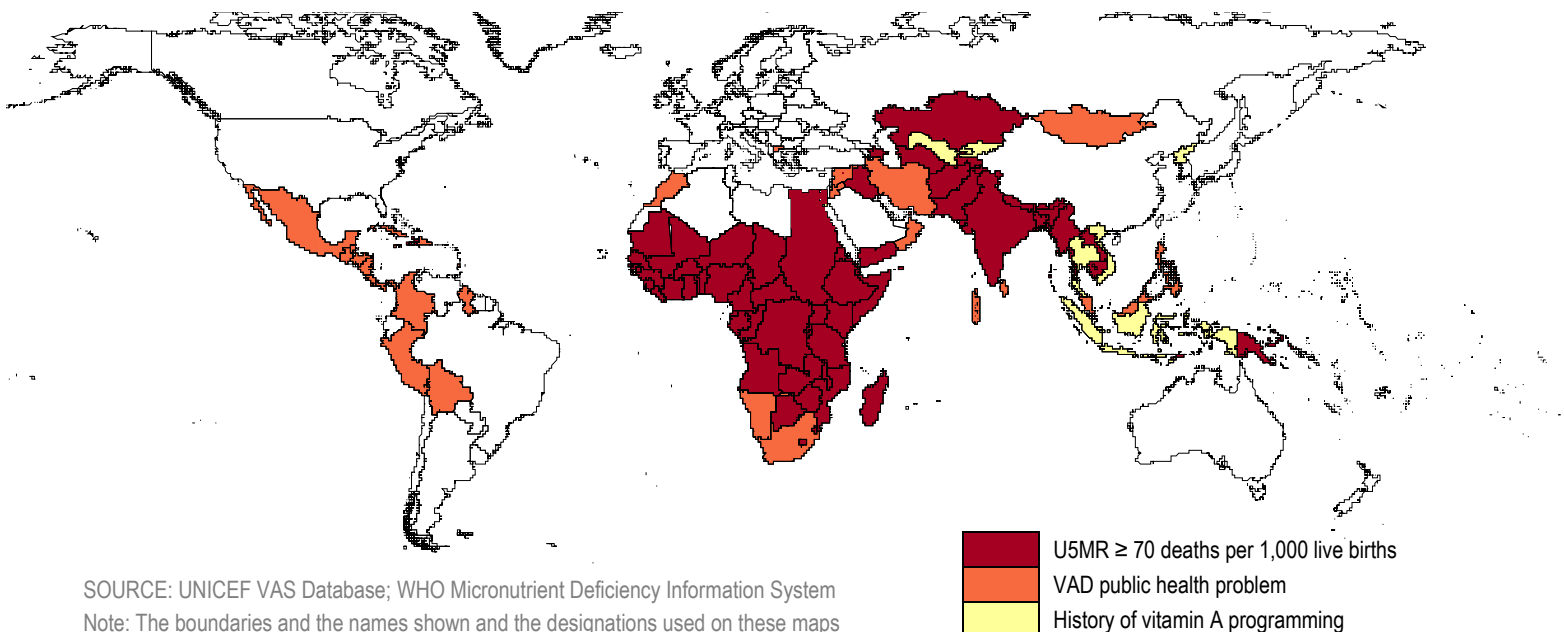
Defining Target Countries & Indicators

This report focuses on VAS in 103 countries (considered “target countries for VAS”) which meet at least one of the following criteria:

- **High under-five mortality rate (U5MR):** Supplementation with vitamin A is recommended in all countries where the U5MR exceeds 70 deaths per 1,000 live births, as this is the internationally-accepted proxy to indicate that VAD is a public health problem among children under five. Sixty-one countries in the developing world qualify as targets for VAS using 2004 U5MR estimates from SOWC.
- **VAD public health problem:** Deficiency also exists in countries with a relatively low U5MR. Thirty-five additional countries were identified as targets based on national-level estimates of clinical and sub-clinical deficiency from WHO’s Micronutrient Deficiency Information System.
- **History of programming:** Seven additional countries (the Democratic People’s Republic of Korea, Indonesia, Kyrgyzstan, the Occupied Palestinian Territory, Thailand, Uzbekistan and Vietnam) did not meet these criteria, but have recognized VAD as a problem and are committed to VA programmes. Significant reductions in U5MR and VAD have been achieved in some of these countries in part by ongoing supplementation efforts – some dating back more than 25 years.

Vitamin A supplementation – an imperative for child survival in South Asia and Sub-Saharan

Figure 1: Target countries for VAS



SOURCE: UNICEF VAS Database; WHO Micronutrient Deficiency Information System
Note: The boundaries and the names shown and the designations used on these maps do not imply official endorsement or acceptance by the United Nations

Table 1: Summary of target countries and current under-five programmes by region

UNICEF Region	Number of countries in UNICEF region	Number of target countries	Number of target countries with national or sub-national VAS programmes
CEE/CIS and Baltic States	20	7	4
East Asia/Pacific	27	15	14
Latin America/Caribbean	33	17	10
Middle East/North Africa	19	11	11
South Asia	8	8	8
Sub-Saharan Africa	46	45	44
TOTAL	153	103	91

SOURCE: UNICEF VAS Database

Coverage Indicators

In order to realize substantial gains in child survival, all children between the ages of six to 59 months in the target countries need to receive high dose vitamin A supplements every four to six months. While our goal is to reach all children, adequate coverage is defined as countries having reached $\geq 70\%$ of children on two occasions, 4-6 months apart. That is the minimum coverage required to have the same effect on reducing child disease and death on a population-basis that the large-scale supplementation trials achieved.

The indicator currently used by UNICEF to calculate SOWC VAS coverage estimates are based on the proportion (%) of children receiving at least one high dose supplement in the six months prior to publication. For the purposes of this report, the following summary indicators will be used to summarize coverage for the advised rounds of supplementation:

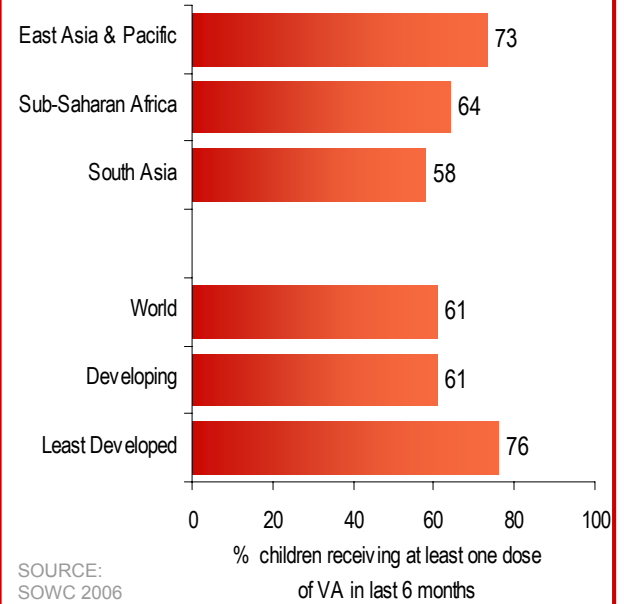
Adequate coverage	Countries reaching $\geq 70\%$ of children ages 6-59 months on TWO occasions, 4-6 months apart
Insufficient coverage	Countries reaching $\geq 70\%$ of children ages 6-59 months on ONE occasion
Poor coverage	Countries reaching $<70\%$ of children on any occasion

Vitamin A Supplementation Coverage

In 2003, approximately 160 million children received at least one high-dose supplement. Children in the poorest countries of the world benefited to the greatest extent, with 76% of children 6-59 months receiving at least one capsule in the last six months. At the global level, coverage with at least one dose climbed from 50% to 61% from 1999-2003. In spite of this increase, millions of children still remained unprotected by the requisite doses of vitamin A. UNICEF estimates that in 2003 alone, more than 200 million children were not fully protected by the necessary two annual, life-saving doses, with only 22 out of 103 target countries achieving adequate coverage.

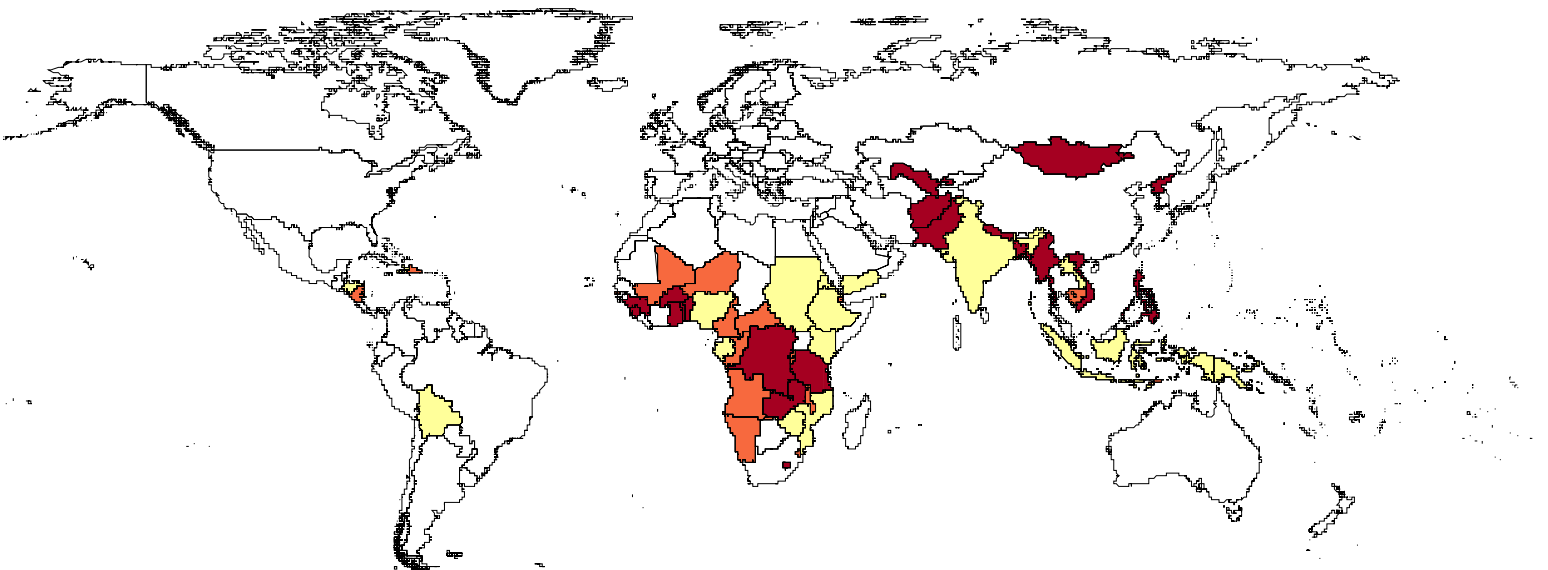
Least developed countries lead the way

Figure 2: VAS regional coverage (2003)



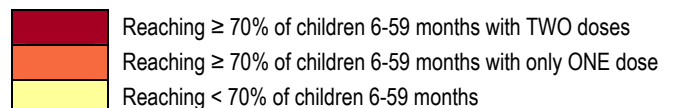
Twenty-two countries providing adequate protection to young children

Figure 3: VAS country-level coverage (2003)



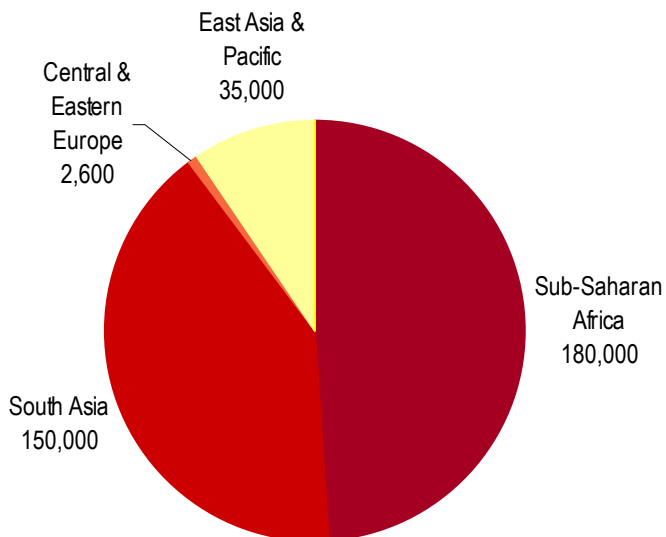
Source: UNICEF VAS Database

Note: The boundaries and the names shown and the designations used on these maps do not imply official endorsement or acceptance by the United Nations.



Over 350,000 lives saved by VAS in 2003

Figure 4: Regional estimates of VAS impact (2003)



SOURCE: UNICEF VAS Database

NOTE: Fewer than 1,000 children's lives were saved by VAS in The Americas & Caribbean (240 saved) and the Middle East & North Africa (160 saved) in 2003.

While the progress may appear slow on a global scale, more than 2 million children's lives have been saved by this child survival intervention since the scale-up of vitamin A programmes starting around 1998. The full potential of vitamin A, however, is yet to be realized for many children in these countries. In 2003 alone, it is estimated that an additional one million children's lives could have been saved, particularly in South Asia and Sub-Saharan Africa, had all countries provided adequate VAS coverage (i.e., two rounds \geq 70% coverage, as recommended).

Canada's support for vitamin A supplementation

Progress in vitamin A supplementation has largely been possible as a result of generous support of the Government of Canada. Since the early 1990s, the Canadian International Development Agency (CIDA) has played a critical role in advocating and funding global efforts to support and accelerate vitamin A supplementation and child survival programmes.

With financial assistance from CIDA, the Micronutrient Initiative (MI), a non-profit, specialized technical agency with offices in Africa, Asia and headquartered in Canada, has donated close to four billion capsules to UNICEF since the inception of this partnership in 1997. During this period, the donated capsules have met nearly 100% of global vitamin A capsule needs, particularly in countries with high under-five mortality rates and/or a vitamin A deficiency. In addition to the contribution of capsules, grants from the Government of Canada have supported programme costs including freight, storage, quality assurance, advocacy and training.

CIDA and MI are part of a consortium of partners working towards the elimination of vitamin A deficiency, including: WHO, the International Vitamin A Consultative Group (IVACG), USAID and its Micronutrient Programme A2Z, various international non-governmental organizations such as Helen Keller International, World Vision, and others.

Over three billion life-saving vitamin A capsules donated since 1997

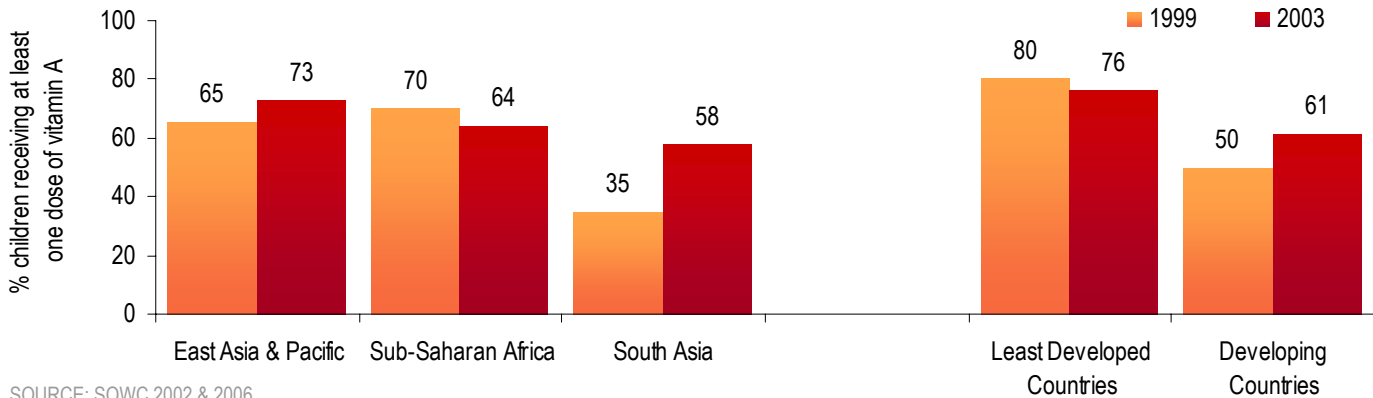
Table 2: CIDA capsule donations

Year	Number of capsules donated
1997/98	370 million
1999	460 million
2000	440 million
2001	530 million
2002	630 million
2003	330 million
2004	470 million
2005	520 million
Total	3.75 billion

SOURCE: UNICEF donor reports, 1998-2004

Supplementation coverage sustained despite challenges -- greatest gains in South Asia

Figure 5: VAS regional one-dose coverage (1999 and 2003)



SOURCE: SOWC 2002 & 2006

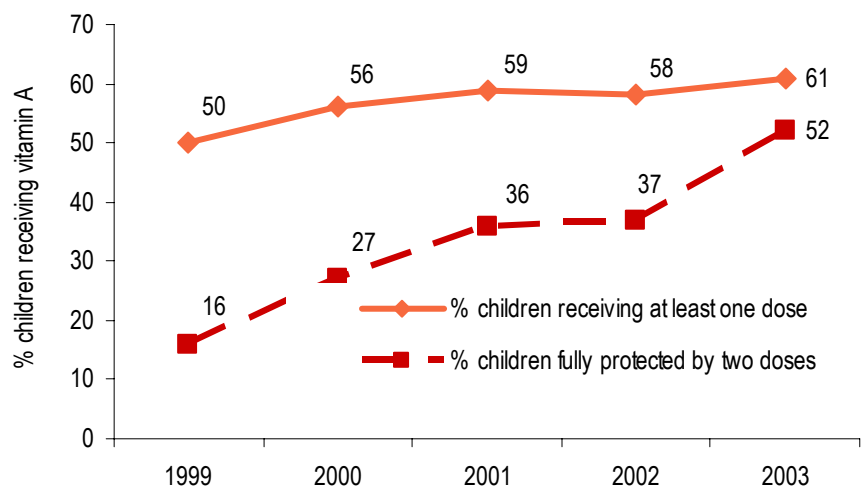
NOTE: see note on SOWC coverage on page 16; regional coverage estimates not reported for CEE/CIS, MENA or TAC as data were unavailable for greater than 50% of the region.

Even as VAS country programmes have faced challenges to sustain progress, globally coverage levels increased between 1999 and 2003. Highest coverage has consistently been reached in the least developed countries where annual coverage of at least one dose exceeded 70% every year since 1999 and where a few countries far surpassed this threshold and achieved adequate coverage: Bangladesh, Nepal and Niger reliably reach over 80% of children with two doses on an annual basis.

Worldwide, efforts to ensure that children receive the necessary two annual doses have been stepped up. In 1999, only 16% of children in the 103 target countries were protected with the requisite two annual doses (Figure 6). By 2003, the proportion of children fully protected with vitamin A climbed to 52% - representing a three-fold increase from 1999 levels.

Three-fold increase in children fully protected

Figure 6: Global one-dose and two-dose coverage trends (1999-2003)



SOURCE: SOWC 2002-2006; UNICEF VAS Database

Regional Report Cards

- ✓ **East Asia & Pacific (EAPRO):** VAS has been carried out in some EAPRO countries, such as Indonesia, the Philippines and Viet Nam for decades. Of the 15 EAPRO target countries, only Malaysia does not have VAS but relies on food-based strategies. Since 2000, regional coverage with at least one dose has surpassed 70%. Vitamin A-fortified foods are available in the Philippines and Malaysia, with some progress towards fortification in the Democratic People's Republic of Korea, Indonesia, Thailand and Vietnam.
- ✓ **Sub-Saharan Africa (SSA):** Forty-one of the 45 SSA target countries supplement all children 6-59 months. Three countries – Botswana, Cape Verde and South Africa – have targeted efforts. The fourth – Mauritius – employs a food-based strategy. Regional coverage has exceeded 70% every year except 2003, when an interruption in Nigeria's supplementation influenced the drop to 64%. More than half of countries report some progress towards supporting food fortification as a complementary strategy.
- ✓ **South Asia (ROSA):** All eight countries in this region have national VAS programmes, although the age groups targeted for VAS vary in both India and Sri Lanka. While regional coverage remains relatively low, the increase in coverage from 35% to 58% from 1999-2003 translates into an additional 35 million children reached. ROSA is also progressing in the scale-up of *ghee* and other oil fortification.
- ✓ **Middle East & North Africa (MENA):** Vitamin A strategies in MENA rely primarily on supplementation through Expanded Programme on Immunization (EPI) contacts, with a long-term focus on food fortification. In many of the countries facing emergencies, supplements are distributed with the measles vaccine. Vitamin A and D-fortified oil distributed through food aid is also helping to meet the needs of target groups.
- ✓ **Central & Eastern Europe (CEE/CIS):** Programmes in CEE/CIS are in their infancy, as VAD is just being identified as a public health problem in a few countries. VAS has been adopted as a short-term strategy as opportunities for food fortification are simultaneously being explored. Uzbekistan launched the first programme in CEE/CIS, reaching greater than 90% of under-fives in 2003.
- ✓ **The Americas & Caribbean (TACRO):** The food industry is relatively well-developed and centralized in this region, making large-scale food fortification a feasible strategy. Sugar fortification exists in Guatemala, Honduras and Nicaragua, with several countries planning similar efforts. VAS is carried out to a limited extent in TACRO, primarily through routine EPI contacts.

Disparities in coverage

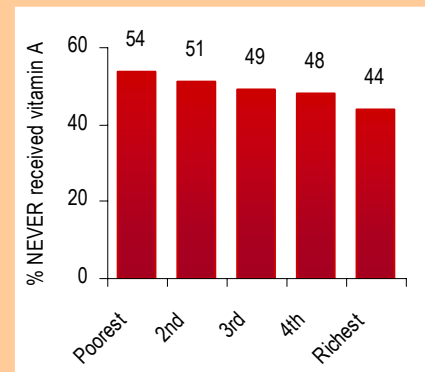
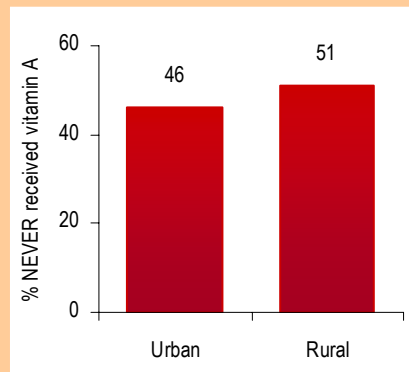
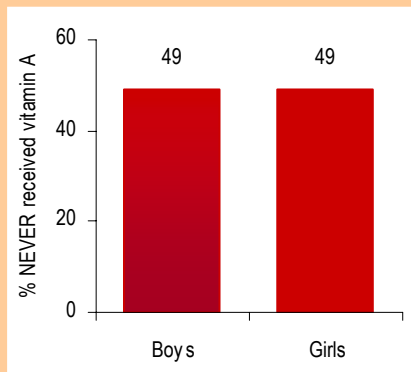
Global coverage figures for 2003 indicate that approximately 61% of children between the ages of 6-59 months received at least one dose of vitamin A. However, summary coverage estimates often mask problems in reaching the most disadvantaged children and those most in need of the life-saving protection of vitamin A supplements. UNICEF's Multiple Indicator Cluster Surveys (MICS), conducted every five years, allow the organization to monitor progress of many child survival interventions. Although MICS do not provide accurate assessments of supplementation coverage since they are rarely conducted immediately following vitamin A distribution, introducing problems of maternal recall – they are useful to explore any systematic differences in which children were reached.

Based on a review of vitamin A supplementation coverage data gathered through MICS in 26 of the 103 VAS target countries, there is no evidence of differential coverage between boys and girls. However, slight differences in coverage exist between children living in urban and rural areas. Rural children were 5% more likely to have NEVER received a vitamin A supplement than their counterparts in urban areas. A similar pattern appeared for wealth: children from poorer families were more likely NEVER to have received vitamin A as compared to children from wealthier families.

MICS were carried out in one quarter of supplementation target countries in 2000 and 2001, at which point the vast majority of vitamin A programmes were relying on campaign-based delivery strategies. Campaigns are well known to be great equalizers in health care, reaching the majority of children across all subgroups. That there is evidence of disparities with campaign approaches indicates that even these strategies can fail to reach some of the rural poor.

Children in poor rural areas are more likely to be missed by supplementation

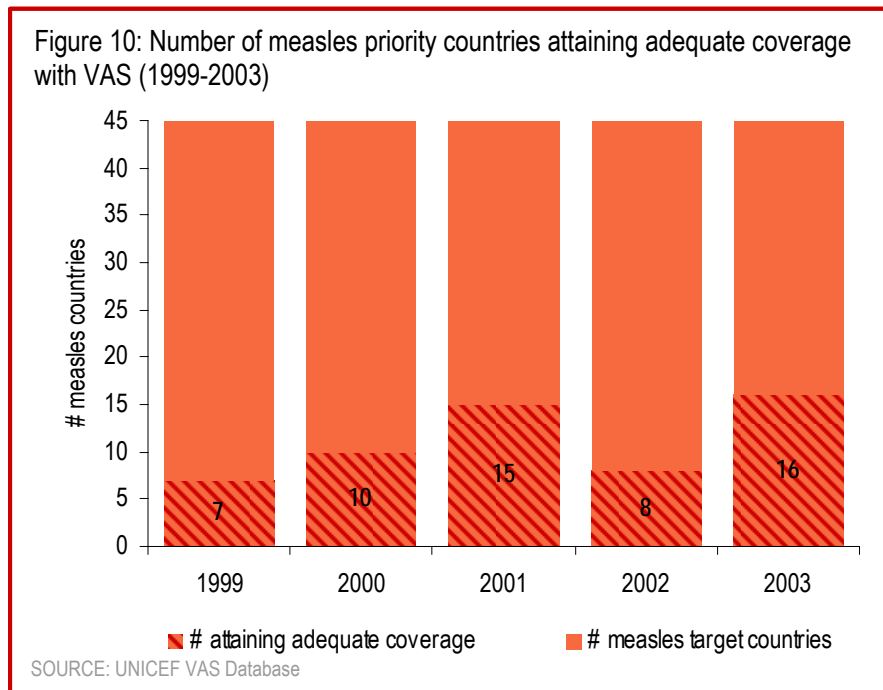
Figures 7, 8 & 9: Children NEVER reached by VAS



SOURCE: Based on data from selected MICS for 26 developing countries.

Vitamin A and Measles

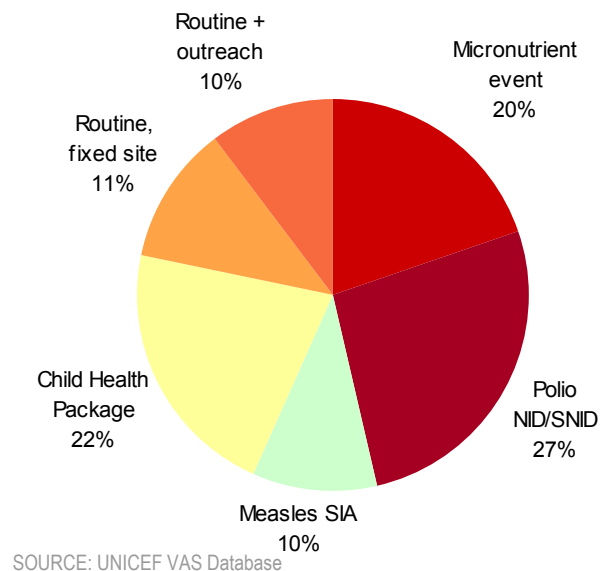
It is well-established that VAD is a risk factor for children with measles. Treating children with high-dose supplements during the course of a measles episode can reduce measles-related deaths and complications by about 50% and is therefore the standard of care for managing measles. Opportunities currently exist to co-administer high-dose vitamin A with the measles vaccine to infants at around 9 months of age. For many infants at risk of VAD, the measles contact is often the first opportunity to receive a vitamin A supplement. Given the global push to reduce measles deaths, UNICEF and WHO have identified 45 priority countries in which almost 95% of measles deaths occur – all of which are VAS target countries. In fact, recent measles Supplementary Immunization Activities (SIA) including the delivery of vitamin A supplements have been able to reach close to 80% of targeted children with VAS (Figure 12). Partly as a result of this joint delivery strategy, the number of measles priority countries achieving adequate VAS coverage has more than doubled from 7 to 16 countries since 1999 (Figure 10).



Supplementation Delivery Strategies

One of the greatest challenges for vitamin A programmes has been to find sustainable mechanisms for delivery. Supplementation was effectively linked to polio National Immunization Days (NIDs) by two-thirds of countries in 1999; despite concerns about the phasing out of polio campaigns, this remained the most prominent strategy in 2003. As the polio eradication goal is gradually achieved and NIDs are less of an option in some places, countries are seizing on opportunities to administer VAS with a more diverse set of delivery opportunities.

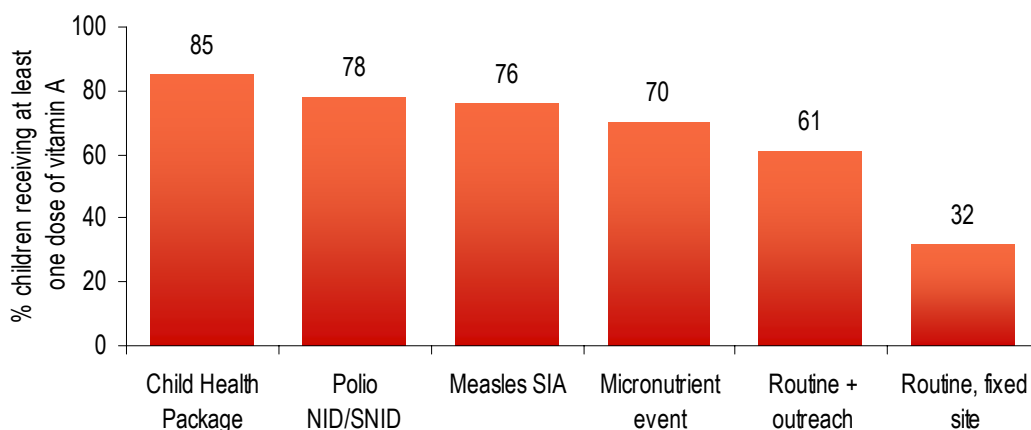
Figure 11: Vitamin A delivery strategies (2003)



Meanwhile, efforts to integrate VAS into routine EPI services continue. Overall coverage achieved through routine services has remained low due to poor access and utilization of services and an inability to reach older children. For this reason, until coverage of routine EPI services can reach over 70% of children 6-59 months on a regular basis, regular outreach and pulse events are needed to protect children from the life-threatening effects of VAD. Figure 12 shows that packaging vitamin A with other interventions such as de-worming and bed-net distribution and in outreach efforts initiated by other programmes has continuously achieved the highest coverage rates.

Opportunistic approach key to delivering vitamin A supplementation

Figure 12: Mean one-dose coverage by distribution strategy (2003)



SOURCE: UNICEF VAS Database

Vitamin A Plus: Distributing supplements as part of a child health package

Since its initial linkage with immunization in the 1990s, supplementation has almost always been delivered in combination with other health services such as measles, polio, anti-helminthics, and insecticide-treated bed nets. Such joint initiatives have resulted in strong partnerships between programmes at the national level, and also among donors. As NIDs are phased out, several countries are building on these successful partnerships to sustain and enhance supplementation programme.

Health packages for under-fives – termed “Child Health Days” or “Preschooler’s Week” in some countries – involve the integrated delivery of two or more child survival interventions. While such events require a significant amount of planning, strong logistical support and effective pooling of donor resources, they consistently reach the vast majority of children. Some programmes have even cited greater government ownership of VAS with its inclusion in a child health package.

The table below summarizes child health packages carried out in recent years. Since data were collected, there has been a concerted effort to build on these successful experiences. For example, in Sub-Saharan Africa, child health packages are currently the strategic focus for countries phasing-out of NIDs, and many countries are considering the addition of vitamin A plus de-worming and insecticide-treated bed nets to existing strategies.

Table 3: Components of child health packages in recent years

Country	Under-five VA	Post partum VAS	Information, Education, Communication	Deworming	Insecticide-treated mosquito nets	Immunization	Ivermectin treatment (onchocerciasis)	Iron supplementation (low birth weight infants)
Angola	X		X	X	X	X		
Bangladesh*	X		X	X				
Democratic Republic of the Congo	X		X	X				
Ethiopia	X		X	X	X	X		
Ghana	X		X	X				
Korea, Dem. Rep.	X		X	X				
Indonesia	X		X	X	X	X		X
Madagascar	X	X	X	X				
Malawi	X		X	X				
Myanmar	X		X	X				
Nepal	X		X	X				
Nigeria	X	X	X				X	
Philippines*	X		X	X	X	X		X
Rwanda	X		X	X	X			
Tanzania	X		X	X				
Uganda	X	X	X	X				
Uzbekistan	X	X	X	X				
Zambia	X		X	X	X	X		

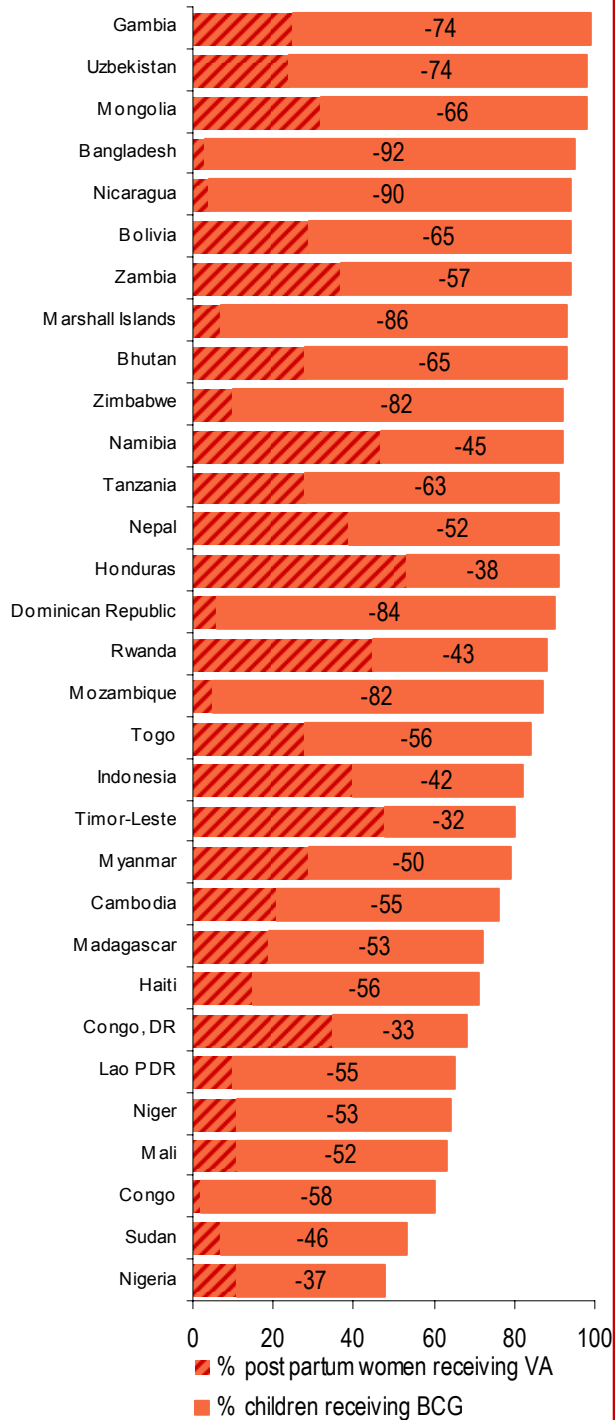
SOURCE: UNICEF VAS Database

*NOTE: Bangladesh plans to pilot the inclusion of birth registration in upcoming child health packages. Mosquito net distribution in the Philippines is limited to remote areas where malaria is endemic; IEC focuses on infant & young child feeding and the promotion/testing of iodized salt.

Post Partum Supplementation

Post partum VAS: missed opportunities for mother and child

Figure 13: Post partum VAS vs. BCG coverage (2003)



SOURCE: UNICEF VAS Database; SOWC 2006
 Labels indicate the gap between BCG and post partum coverage.

Infants are born with stores of vitamin A sufficient only for the first few days of life. While those with healthy, well-nourished mothers can build up their stores through breastfeeding, infants born to deficient mothers do not receive sufficient vitamin A in breast milk to protect them from deficiency. UNICEF and WHO recommend VAS for women in the immediate post partum period living in the target countries, coupled with exclusive breastfeeding, so that all infants receive the necessary immune-boosting protection of vitamin A in the first six months of life. Currently opportunities exist to administer supplements to women at delivery and at the BCG/DTP contact.

Post partum VAS has lagged behind programming for young children. Programmes exist in only two-thirds of target countries and most are limited in scope. In 2003, only six countries (Burkina Faso, Djibouti, Egypt, Honduras, Micronesia and Viet Nam) surpassed 50% coverage. Figure 13 illustrates the gap between current levels of BCG coverage, which hover around 80% in most countries, and post partum VAS coverage. This clearly represents a missed opportunity to restore vitamin A stores of deficient mothers and also to reinforce messages about the importance of early and exclusive breastfeeding for child survival.

Programme Sustainability

Donor support of VAS programmes has been critical to the success achieved so far. However, additional resources will be needed if progress is to be sustained and accelerated. Governments also need to assume responsibility and ownership of VAS programmes, and indicate this by dedicating budgets to them. Currently only one-third of target countries contribute to VAS through national budgets – primarily for operational expenses. Only a subset of countries (Table 4) propose to cover either the full or partial costs of supplements. Follow-through on these pledges for all children in these countries would have an annual approximate value of \$6.5 million.

Poverty reduction strategies or sector-wide reform present opportunities to increase national

commitments towards sustain programming. Advocacy efforts have achieved significant progress in this area.

Table 5 lists the 26 countries including vitamin A in their poverty reduction strategies or sector-wide plans.

Table 4: Approximate values if countries included procurement in national budgets as proposed

Country	Description of proposed contribution	Approximate value †
Bangladesh	Plans to purchase supplements & cover operational costs through Health, Nutrition & Population Sector Program.	\$622,000
Cambodia	Funds to be allocated for partial procurement & for operational costs.	\$51,900
India	Funds to be allocated for procurement of syrup from local manufacturers.	\$4,330,000
Indonesia	Districts expected to cover 80% of supplement costs; some unable to obtain local government support or to access funds in a timely manner.	\$619,000
Jordan	Government has secured all capsules needed for 2006 distributions.	\$26,400
Mongolia	Plans to cover 30% of the VAS budget in 2006, 60% in 2007, 90% in 2008 and the full costs of programming by 2009.	\$9,600
Pakistan	Funding allocated to Nutrition Wing for operational costs & to purchase capsules for post partum VAS.	\$94,600
Philippines	Funds to be allocated for the purchase of all vitamin A capsules.	\$355,000
South Africa	Department of Health has budgeted for 2006 capsules, with each province ordering from government tenders.	\$189,000
Thailand	Provincial Health Offices encouraged to pay for capsules, although adherence has not been evaluated.	\$181,000

Approximate dollar values based two doses at \$0.02/dose and 2004 population estimates for children 6-59 months (SOWC 2006); estimate for Pakistan reflects one post partum dose and estimated births for 2004 (SOWC 2006)
SOURCE: UNICEF VAS Database

Table 5: Countries including VAS in Poverty Reduction Strategies or Sector-Wide Approaches

Region	VAS Target Countries
SUB-SAHARAN AFRICA	Benin, Burkina Faso†, Cameroon, Ethiopia, Gambia, Ghana*, Guinea, Madagascar, Malawi, Mauritania, Mozambique, Niger, Sierra Leone, Sao Tome & Principe, Tanzania†, Uganda, Zambia†
SOUTH ASIA	Bangladesh†, Pakistan, Sri Lanka
EAST ASIA/PACIFIC	Cambodia†, Lao People's Democratic Republic, Timor Leste
LATIN AMERICA/CARIBBEAN	Bolivia, Honduras, Nicaragua

† Indicates countries that propose to fund supplementation through poverty reduction programmes; * Vitamin A is included in SWAP
SOURCE: World Bank (www.worldbank.org), as of October 2005 and UNICEF VAS Database

High Impact Countries

The Lancet series on child survival – Where and why are 10 million children dying every year? – identified 42 countries in which 90% of child deaths occur. This number was recently increased to 60 priority countries after updating earlier mortality estimates and including a number of large, populous countries. Significant global progress could be made towards achieving MDG #4 if programmes were scaled-up in these high impact countries.

Table 6 illustrates that the vast majority of high impact countries are implementing VAS programmes for children 6-59 months, in accordance with UNICEF/WHO recommendations. Several countries have also made some progress towards the fortification of staple foods with vitamin A. However, in order for high impact countries to achieve the same reductions in child mortality that were seen in the large-scale supplementation trials, more children need to be reached. Currently, less than half of high impact countries are attaining adequate coverage.

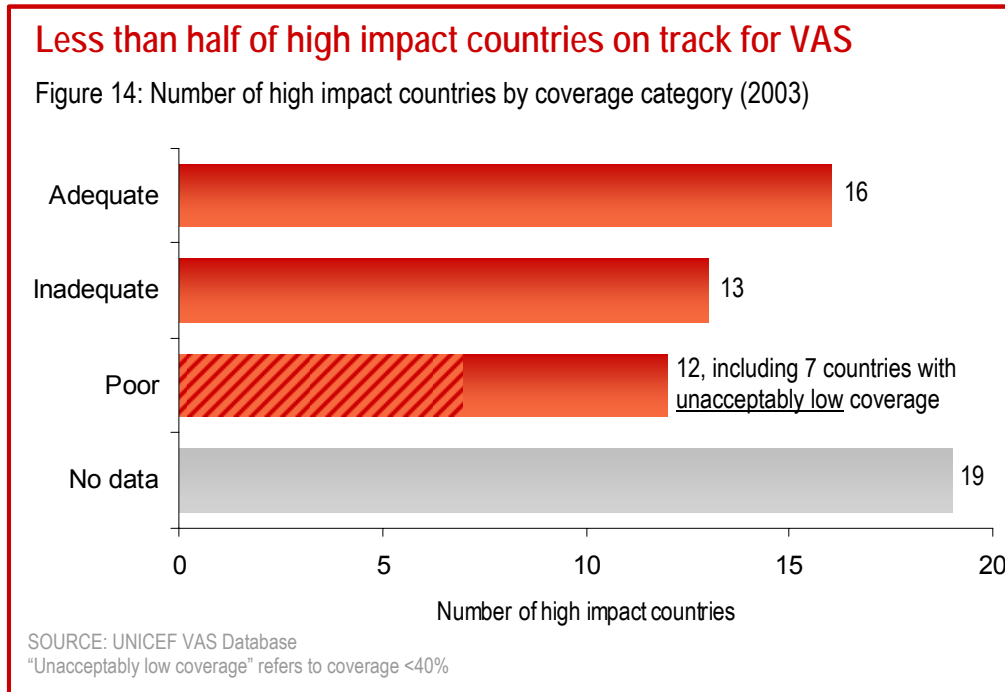


Table 6: VAS Programming in 60 high impact countries

Country	# Child deaths annually	Under-five supplementation	Post partum supplementation	Vitamin A-fortified foods available
India	2,210,000	targeted		X
Nigeria	1,049,000	X	X	X (large-scale)
Democratic Republic of the Congo	572,000	X	X	
CHINA	539,000	Not VAS target; sub-national programme for children 6-36 months in 42 counties		
Ethiopia	509,000	X	X	
Pakistan	478,000	X	X	X
Afghanistan	359,000	X	X	
Bangladesh	288,000	X	X	
Uganda	195,000	X	X	X
Angola	195,000	X	X	X
Niger	190,000	X	X	
Tanzania	177,000	X	X	X
Indonesia	171,000	X	X	X
Kenya	159,000	X	X	X
Mali	142,000	X	X	
Cote d'Ivoire	128,000	X	X	X
BRAZIL	127,000	Not VAS target; sub-national programme in northeastern regions		
Iraq	122,000	targeted	X	X
Mozambique	117,000	X	X	
Burkina Faso	115,000	X	X	
Sudan	106,000	X	X	
Myanmar	105,000	X	X	
Malawi	96,000	X	X	X (large-scale)
Yemen	92,000	targeted		X
Chad	91,000	X	X	
Madagascar	87,000	X	X	
Zambia	85,000	X	X	X (large-scale)
Cameroon	84,000	X	X	X
Somalia	81,000	X	X	
Ghana	76,000	X	X	X
Rwanda	74,000	X	X	
South Africa	73,000	X	X	X
Sierra Leone	69,000	X	X	
Philippines	69,000	X	X	X (large-scale)
Egypt	68,000	targeted	X	
Burundi	63,000	X	X	
Mexico	62,000			X
Nepal	60,000	X	X	X
Cambodia	60,000	X	X	
Guinea	59,000	X	X	
Senegal	57,000	X	X	
Benin	52,000	X	X	

Table 6: VAS Programming in 60 high impact countries (continued)

Country	# Child deaths annually	Under-five supplementation	Post partum supplementation	Vitamin A-fortified foods available
Zimbabwe	50,000	X	X	X
Liberia	39,000	X	X	
Togo	33,000	X	X	
Haiti	30,000	X	X	
Central African Republic	29,000	X	X	
Tajikistan	22,000	X	X	
Congo	19,000	X	X	
Guinea-Bissau	16,000	X		
Papua New Guinea	16,000	X		
Mauritania	15,000	X		
Azerbaijan	12,000	X		
Turkmenistan	11,000			
Gambia	6,000	X	X	
Botswana	5,000	targeted	X	X
Swaziland	5,000	X	X	X
Equatorial Guinea	4,000	X	X	
Gabon	4,000	X		
Djibouti	3,000	X	X	

SOURCE: SOWC 2006; UNICEF VAS Database

Key Messages

Significant progress has been made

- ✓ Global coverage with at least one dose has climbed from 50% in 1999 to 61% in 2003.
- ✓ The proportion of children fully protected by two doses has increased three-fold over the same period, as countries have found opportunities to ensure two rounds of supplementation.
- ✓ More than 2 million lives have been saved by supplementation programmes since the late 1990s.
- ✓ VAS has sparked the innovative delivery of multiple interventions through child health packages.

Greatest gains in the least developed countries of the world

- ✓ The least developed countries have maintained an average coverage of greater than 70% over the period of 1999-2003 with at least one dose, often reaching greater than 90% of under-fives.
- ✓ Some of the most successful and model programmes have emerged in these countries
- ✓ Opportunities exist for supplementation to be sustained through poverty reduction strategies, but advocacy is necessary to ensure continued support for VAS

Acceleration needs to happen – soon!

- ✓ Over 200 million children under-five remain unprotected each year in the 103 target countries, as they are not yet reached by two rounds of supplementation.
- ✓ Supplementation of women in the post partum period has not achieved significant gains and opportunities are being missed to pair this intervention with the BCG immunization contact.
- ✓ All targeted children have the right to vitamin A supplements once every four to six months, in addition to any doses necessary for the treatment of severe malnutrition or measles.
- ✓ The full potential of vitamin A as a child survival intervention is still to be realized

Monitoring Supplementation Coverage

UNICEF relies on information from a variety of sources to monitor VAS coverage:

- **Campaign tally sheets:** For campaign activities, distributors record each child receiving vitamin A on a tally sheet. Tallies are compiled at the local, district and national levels and divided by the estimated population of children 6-59 months to determine coverage. Problems may occur with both numerators (ineligible children receive capsules) and denominators (due to inaccurate census data or migration). However, when tally sheet data is reported from the each level and eventually to the global level, both the numerator and denominator are reported.
- **Routine health data:** Coverage of VAS delivered on a routine basis is based on the administrative records of health centers and the national reports compiled from these records. Quality of data on routine reporting depends largely on the country's Health Information System and the extent to which vitamin A has been integrated into that system.
- **Population-based surveys:** Coverage estimates may be drawn from nationally-representative surveys such as MICS and DHS, where mothers or caretakers are asked if their child has received vitamin A within the last six months. Due to problems of maternal recall and the timing of surveys, these data by and large underestimate coverage and are used only when other information is unavailable, however are valuable to validate or confirm reported coverage.
- **Rapid coverage assessments:** A limited number of countries carry out coverage surveys immediately following distributions using methods similar to those developed to track immunization coverage. Although they require additional funding, such efforts provide the most accurate coverage estimates.

Information from these various sources is sent by UNICEF country offices to headquarters. An intensive dialogue ensues to determine the most complete numerator and denominator for each country. Reports are received for approximately 80 countries each year, from which SOWC estimates are derived. Coverage

estimates accepted for inclusion in SOWC must: a) be nationally representative; b) cover the full age range of children 6-59 months, unless a country can provide justification for targeting a reduced age range (e.g., deficiency prevalence patterns); and c) represent the most recent distribution.

Summary coverage figures

SOWC relies on a common methodology across all child health and nutrition indicators: regional or global coverage estimates are based on the mean coverage of all reporting countries, weighted according to the under-five population. To maintain consistency with previous reports, all summary coverage figures have been taken directly from SOWC estimates. Therefore all tables/figures in the present report referencing SOWC as their source will include information on all countries reporting in that particular year, regardless of their status as a VAS target country. The indicator for VAS reported in the SOWC publication has not changed; however the criteria used to select the data point to publish changed in the SOWC 2004 when reporting 2002 VAS data. In previous years, if two doses were reported for a given country, the higher of the two numbers was reported in SOWC as coverage “of at least one dose”. To err on the side of more conservative estimates, the decision was made to select the more recent of the two data points reported per country. Tables and figures with UNICEF’s VAS Database as the source include information on all 103 countries identified as targets for VAS.

Children fully protected

A shortcoming of current programme monitoring is the inability to assess how many children have been fully protected by two annual doses of vitamin A. While the assumptions used in this report are currently under review and subject to change, current information suggests that children reached by a first round distribution are highly likely to be the same children covered by a second round, in particular if the coverage is over 70%. Based on this assumption, the proportion of children fully protected with two doses would be equivalent to coverage for whichever round reached fewer children. In Ghana, for example, 95% coverage was reported for the 2003 first round and 78% for the second round. Assuming that all of the same children reached in the second round had already been covered by the first, 78% of Ghanaian children 6-59 months were fully protected by two doses in 2003. If a country only implemented one round of VAS in a given year, no children were fully protected by two doses.

Lives saved by VAS

Large-scale supplementation trials prove that adequate coverage with vitamin A can lead to reductions in child mortality of up to 34 percent. This impact is estimated to vary by region (on average 30% in ROSA, 20% in SSA, and 10% all other regions), the dose provided and the targeted age group. Given these pieces of information, we can calculate an approximate number of lives saved by VAS each year. To illustrate: an estimated 210,000 children between the ages of 6 and 59 months were expected to die in Pakistan in 2003. However, the country was able to reach far greater than 70% of children with two doses of vitamin A in 2003 and realize an approximate 30% reduction in mortality. Thus supplementation saved the lives of 63,000 Pakistani children.