



SCALING UP VITAMIN A SUPPLEMENTATION IN INDIA

Evidence and Lessons Learned from
15 Major States in India

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SUMMARY

BACKGROUND AND OBJECTIVE

Preventive vitamin A supplementation (VAS) is an essential, evidence-based child survival intervention. Since 2006, the national and state governments of India supported by their development partners have made combined efforts to strengthen the implementation of biannual rounds.

This paper reviews the VAS programme in India with the aim to respond to three key questions that are of particular relevance to inform the future implementation of programmes for the delivery of VAS to children in India:

1. Where do we stand with the VAS programme coverage in India at both national and state levels?
2. What are the critical success factors and bottlenecks that need to be taken into account to ensure high, equitable and sustained coverage of the state VAS programme in India?
3. Is India ready to scale back the VAS programme and shift from universal high-dose supplementation to targeted delivery?

Methods: we carried out a thorough analysis of the VAS programme coverage data, a review of relevant literature, field observations and interviews with key stakeholders.

FINDINGS

QUESTION I

Where do we stand with the VAS programme coverage in India at both national and state levels?

The national full VAS coverage increased from 33% in 2006 to 63% in 2012, with a record 61 million children protected in 2012. In 2012, full VAS coverage above 80% was achieved in Bihar, Gujarat, Madhya Pradesh, Odisha, Rajasthan and Tamil Nadu. In contrast, a few states such as Andhra Pradesh, Kerala and West Bengal had extremely low coverage of VAS, with less than

20% of pre-school children having received two doses of vitamin A. Importantly, Jharkhand and Karnataka had zero full coverage, as there was only one round of VAS in 2012.

Since 2006, the coverage has remained high ($\geq 80\%$) in Bihar and Odisha, while it underwent significant fluctuations in Karnataka and Tamil Nadu. A few states have had persistently low coverage ($< 50\%$). Notably, programme coverage has significantly increased in the districts with the highest concentration of poor households, and scheduled caste and scheduled tribe populations.

QUESTION II

What are the critical factors that are required to ensure high, equitable and sustained coverage of the state VAS programme in India?

The states of Bihar and Odisha have been implementing successful VAS programmes, as indicated by their high VAS coverage over the past five years. Therefore, it is important to learn from these top performing states, analyse and document the reasons for their success, and apply these lessons in states with low performing VAS programmes. The critical success factors for the VAS programme include high political commitment and coordination across departments, good district-level micro-planning, timely, adequate and sustainable supply of VAS, flexible delivery mechanism covering hard-to-reach areas, effective social mobilization and communication, and constant supervision and monitoring.

QUESTION III

Is India ready to scale back the VAS programme and shift from universal high-dose supplementation to targeted delivery?

Recently, however, concerns have been raised regarding the universal supplementation of high-dose vitamin A based on the notion that vitamin A deficiency (VAD) prevalence has declined substantially in India and the deficiency is now lim-

ited to isolated geographical pockets within the country. Some evidence exists that clinical signs of VAD, such as keratomalacia and Bitot's spots, have indeed decreased in India. However, the decline in the clinical signs of VAD has not been uniform throughout the country.

In addition, it should be noted that the recommendation for a targeted approach was drawn primarily based on clinical indicators of VAD, which reflect severe forms of deficiency. It is well documented that even a mild, subclinical deficiency of vitamin A increases the risk of infectious morbidity and mortality in young children. Available evidence on population vitamin A intake and status consistently indicates that mild to moderate VAD remains highly pervasive in India.

Currently, periodic high-dose VAS is considered as the only public health intervention to control VAD that is implemented at scale in India. No other intervention such as food fortification or other food-based approaches are being implemented at scale. Taken together, mild to moderate VAD remains highly prevalent among pre-school children in India and the evidence in hand does not support the decision to shift from universal supplementation to targeted delivery of VAS.

CONCLUSION

The programme experience in Bihar and Odisha demonstrates that it is feasible to implement a successful and inclusive VAS programme in India that reaches all children if efforts are made to understand who the most vulnerable children are and where they live, and if political decisions are made to assign the human and programme resources needed to reach all children in a sustained way.

The challenge now for India is to reach out to the remaining 30%-40% of children who are not yet benefiting from the national VAS programme and are potentially among those in highest need. Special plans are warranted to reach children who live in remote rural areas or urban slums and who belong to tribal communities or socially excluded groups. Business as usual will not do for these children; these children deserve a different deal.

Specific recommendations are made for special urgent consideration including streamlining the VAS procurement mechanism, carrying out regional workshops on the VAS programme, expanding biannual rounds to all states, improving the VAS coverage reporting, and assessing the prevalence of clinical and subclinical VAD in pre-school age children and evaluating the impact of the national VAS programme.





REPORT

INTRODUCTION

Vitamin A deficiency (VAD) is a leading cause of preventable blindness, morbidity and mortality in pre-school age children in developing countries¹. A meta-analysis of 17 trials comprising 194,795 children indicates that in regions where VAD is prevalent, vitamin A supplementation (VAS) can reduce child mortality by an average 24%². Thus, the World Health Organization (WHO) recommends that children aged 6-59 months in vitamin A deficient areas receive a preventive dose of VAS every 4-6 months³.

Recently, a vitamin A mortality study of 1 million children aged 1-6 years in Uttar Pradesh, India, found no survival impact of high-dose VAS⁴. However, serious concerns have been raised on the scientific rigour of the trial and validity of the reported coverage⁵. Also, as reported by its principal investigators, single trial results should not be considered on their own, but together with all other randomized evidence⁴. When the results from this and eight other randomized trials were combined, the weighted average indicated that high-dose VAS can reduce all-cause child mortality by 11%, making preventive VAS an effective child survival intervention⁴.

In India, VAD has long been recognized as a major public health problem⁶. An estimated 62% of Indian pre-school age children have low serum retinol concentration (<0.7 µmol/l), making VAD a severe public health problem in India¹. Currently, India's national VAS programme is in line with global recommendation that all infants aged 6-11 months and all children aged 1-5 years should receive one dose of vitamin A – 100,000 IU and 200,000 IU, respectively – every six months⁷.

However, in 2006, the National Family Health Survey (NFHS-3) indicated that only 25% of underfives were benefiting from this child survival intervention⁸. Furthermore, additional analyses of the NFHS-3 data set showed that children who were being missed by the VAS programme would benefit greatly as they

were more likely to be undernourished and belong to vulnerable families⁹.

Recognizing the need to address this situation, the Government of India adopted a biannual approach in 2006 to reach out to children aged under five years with VAS⁷. The approach recommends that children below one year of age receive the first VAS dose with their routine measles immunization at nine months, while the subsequent nine VAS doses for children aged 1-5 years are to be administered twice a year, six months apart, through a biannual large scale outreach strategy⁷.

Currently, 15 major states in India – Andhra Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Jharkhand, Karnataka, Kerala, Maharashtra, Madhya Pradesh, Odisha, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal – are implementing this biannual outreach strategy with technical support by UNICEF and other partners. As a result, the full VAS coverage (i.e. two VAS doses per child per year) – the indicator of choice to measure the performance of national VAS programmes – increased from 33% in 2006 to 63% in 2012, with a record 61 million children protected in 2012. Notably, 6 of the 15 states reported full coverage figures above 80%. However, the programme is implemented in various ways in different states, with variable degrees of success. The coverage varied widely by state in 2012, ranging from ~5% in West Bengal to ~100% in Bihar. Only one round of VAS was undertaken in Jharkhand and Karnataka in 2012.

This paper seeks to respond to three key questions that are of particular relevance to inform the future implementation of programmes for the delivery of VAS to children in India:

- 1. Where do we stand with VAS programme coverage in India at both national and state levels?** How has the national and state specific VAS coverage changed since 2006? Has the VAS programme in India been reaching a sufficient and equitable number of children?

Table 1 National and state specific full vitamin A supplementation (VAS) programme coverage between 2006 and 2012 (%)

	Full VAS Coverage (%)						
	2006	2007	2008	2009	2010	2011	2012
Andhra Pradesh	30	29	20	11	21	20	12
Assam	5	0	12	15	24	0	27
Bihar	0	0	91	91	0	100	96
Chhattisgarh	46	35	69	82	77	0	74
Gujarat	57	37	76	70	63	74	82
Jharkhand	108	25	85	85	0	0	0
Karnataka	17	37	83	86	76	42	0
Kerala	4	-	-	11	8	16	20
Madhya Pradesh	22	62	0	54	83	96	92
Maharashtra	39	53	63	70	75	78	75
Odisha	61	95	83	85	83	97	92
Rajasthan	74	69	76	73	68	90	84
Tamil Nadu	100	57	11	0	76	96	111
Uttar Pradesh	10	14	16	52	0	49	38
West Bengal	41	64	64	67	22	0	5
National	33	33	57	66	34	67	63

- 2. What are the critical success factors and bottlenecks that need to be taken into account to ensure high, equitable and sustained coverage of the state VAS programme in India?** What are the lessons to be learned from top performing states where the VAS programme has had consistently high coverage?
- 3. Is India ready to scale back the VAS programme and shift from universal high-dose supplementation to targeted delivery?** Does India have sufficient evidence to justify the need to switch from a universal to a targeted delivery of VAS to pre-school children?

RESULTS

QUESTION I

Where do we stand with the VAS programme coverage in India at both national and state levels?

The national full VASⁱ coverage increased from 33% in 2006 to 63% in 2012, with significant inter-state differences (see Table 1). In 2012, full VAS coverage above 80% was achieved in Bihar, Gujarat, Madhya Pradesh, Odisha, Rajasthan and Tamil Nadu. In contrast, a few states such as Andhra Pradesh, Kerala and West Bengal had extremely low coverage of VAS, with less than 20% of pre-school children having received two

ⁱ Following international recommendations, 'VAS coverage' was defined as the proportion of eligible children who received at least one VAS dose in a given year while 'full VAS coverage' was defined as the proportion of eligible children who received two VAS doses per year. As recommended globally, the VAS coverage in a given district and year was computed as that of the semester with the highest VAS coverage whereas full VAS coverage was computed as that of the semester with the lowest VAS coverage, thus assuming that all children who benefited from the VAS programme in the semester with the lowest VAS coverage also did in the semester with the highest VAS coverage.

doses of vitamin A. Importantly, Jharkhand and Karnataka had zero full coverage, as there was only one round of VAS in 2012.

A few states have shown steady improvement in VAS coverage since 2006. Notably, the coverage has remained high above 80% in both Bihar and Odisha since 2008 (see Figure 1). Bihar has maintained exceptionally high coverage in the past five years, reaching nearly 100% since 2011, except for the second round in 2010 when there was no round of VAS due to a supply disruption. Between 2008 and 2012, the Government of Bihar was able to implement 9 of the 10 biannual, state-wide VAS rounds and reach an average 13.4 million children annually. In Odisha, the state was able to implement the 10 biannual rounds, and the coverage was maintained above 80% until 2010, and has further increased to above 90% in 2011 and 2012 (see Figure 1).

On the other hand, Karnataka and Tamil Nadu experienced significant fluctuations in VAS coverage, while Andhra Pradesh, Assam, Kerala and Uttar Pradesh had a consistently low VAS coverage of below 50% since 2006 (see Table 1). Notably, there has been only one round of VAS in Jharkhand since 2010 and no biannual rounds of VAS in West Bengal since 2011, significantly pulling down the national VAS coverage estimates. Although the number of uncovered children has substantially declined in the past few years, an estimated 36 million preschool children still remained either uncovered or non-fully covered in India in 2012.

India currently has the lowest full VAS coverage in South Asia. In 2011, the full VAS coverage in India was 66%, while other South Asian countries including Bangladesh, Nepal and Pakistan all had full VAS coverage above 90% in the same year.

In order to document the extent to which the VAS programme is reaching children who are potentially the most vulnerable, disaggregated analyses of VAS coverage were conducted in the seven states with the highest burden of child mortality in 2006. These include Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Odisha, Rajasthan and Uttar Pradesh, home to 52% of India's underfive population and

where 74% of underfive deaths in the country occurred. Districts were divided into quintiles, the lowest quintile comprising districts with the lowest concentration of poor households at one end and the highest quintile comprising districts with the highest concentration of poor households at the other end. Similar analysis was conducted by dividing the districts into quintiles according to proportion of scheduled caste/scheduled tribe (SC/ST) households.

While in 2006 the full VAS coverage was highest in the districts with the lowest proportion of poor households, in 2011, the highest full VAS coverage figures were recorded in the three district quintiles with a higher proportion of poor households (see Table 2). This indicates that the equity lens applied to the design and implementation of the biannual strategy is paying the expected dividends.

QUESTION II

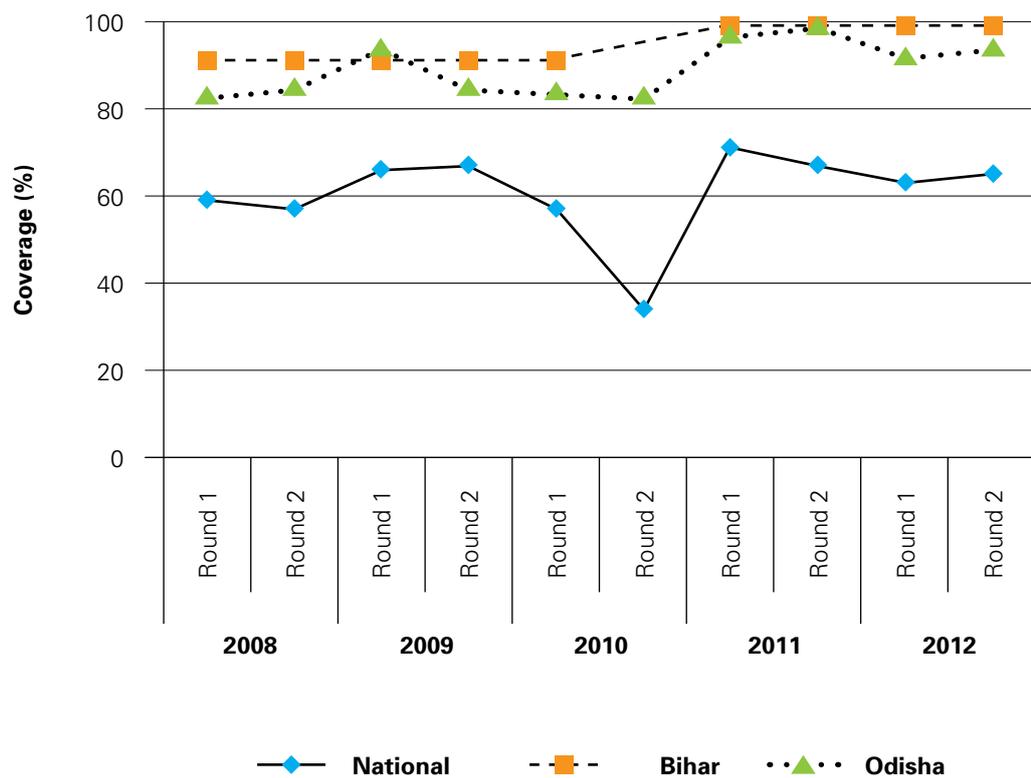
What are the critical factors that are required to ensure high, equitable and sustained coverage of the state VAS programme in India?

The states of Bihar and Odisha have been implementing successful VAS programmes, as indicated by their high VAS coverage over the past five years. Therefore, it is important to learn from these top performing states, analyse and document the reasons for their success, and apply these lessons in states with low performing VAS programmes. With this in mind, in early 2013, UNICEF carried out an in-depth documentation of the VAS programme in Bihar and Odisha to document good practices and identify critical success factors. The study comprised thorough review of relevant literature, field visits and interviews with selected partners and stakeholders. An overview of critical factors for success is described in this section.

- **Leadership and ownership by the state Department of Health and Family Welfare**

Political commitment and ownership by the state government is needed to generate strong motivation and action at the district level. There has been strong political commitment and

Figure 1 Vitamin A supplementation coverage nationally and for the states of Bihar and Odisha between 2008 and 2012



leadership for the VAS programme at the state and district levels in both Bihar and Odisha. This commitment stemmed from the recognition of VAS as a life-saving intervention, given that both states have had a relatively high under-five mortality rate. In Odisha, an impact evaluation study of VAS conducted in 2000 also helped to reduce concerns about safety, while strengthening the state-specific evidence on the effectiveness of VAS in reducing VAD. The commitment and leadership has further increased with the success of the programme in achieving high coverage, and its positive influence on other preventive services such as immunization.

In Bihar, strong leadership and ownership by the Department of Health and Family Welfare (DHFV) are reflected by the fact that each round of VAS is launched by the health minister. The launches receive extensive media coverage calling for the full and active participation of the entire state. Both in Bihar and Odisha, a joint coordination committee meeting attended by high-level authorities from DHFV and the Department of

Women and Child Development (DWCD) is held at the state level before each supplementation round, to review previous VAS rounds and provide overall programme oversight and planning.

A guideline describing the standard operating procedure is issued by the Directorate of Family Welfare to each district one month before each supplementation round. All districts follow the recommendations of the state, and there is no apparent difference in commitment to the programme among districts. Importantly, both state governments make adequate budget allocations for the VAS programme.

- **Coordination between the DHFV and DWCD**

Effective implementation of the VAS programme requires strong coordination between the DHFV and DWCD, as any discord between the two departments may affect the ability of frontline health workers – anganwadi workers (AWWs), auxiliary nurse midwives (ANMs) and

accredited social health activists (ASHAs) – to coordinate their efforts. The coordination between the ANMs, AWWs and ASHAs appears to be critical for achieving high coverage. The DHFW is the nodal department responsible for implementation, coordination and technical guidance pertaining to the VAS programme at the state level. Additionally, the DWCD mobilizes its extensive network of village-level anganwadi centres (women and child health care centres) and workers for community mobilization, preparation of the due list of eligible children and supplement administration.

In Bihar and Odisha there is strong coordination between departments at the state and district levels. In Bihar, there was a common director for both departments in 2007 that led to an effective interdepartmental collaboration for the VAS programme. Although the situation has changed, the two departments still work closely together under the chief secretary, with joint planning at all levels.

In both states, the joint coordination committee meeting takes place before and after each biannual round at the state, district and block levels for collaborative review and planning. The coordination is further enhanced by issuance of joint guidelines and training of frontline workers. This coordination has resulted in strong team building at the community level and effective collaboration among ANMs, AWWs and ASHAs.

- **District-level micro-planning**

Effective micro-planning prior to each biannual round, ideally involving senior management at the district level, is critical to the success of the VAS programme. The needs of each district in terms of VAS, communication materials, and monitoring and reporting formats must be quantified prior to each biannual round to ensure the timely distribution and availability of supplies to the distribution sites. Both Bihar and Odisha benefit from a strong micro-planning process which is enhanced compared to routine immunization micro-plans, in that it goes down to the AWW level.

Micro-planning is done using a bottom-up approach. The first step in developing a micro-plan

is to create lists of eligible children in the village. Prior to each biannual round, the AWWs are responsible for conducting door-to-door household surveys, with the help of ASHAs, to prepare a due list of children eligible for VAS. For urban and hard-to-reach areas, all the underserved communities are mapped out and an intensive tactical approach is used to enlist all eligible children through door-to-door enumeration.

This list is key to ensure proper coverage and reporting, as the required quantity of vitamin A bottles and other supplies are projected based on this list. The lists prepared by the AWWs and ASHAs are submitted to the ANMs, who prepare the micro-plans for each health sub-centre. Once the micro-plan is ready at the health sub-centre, a copy is sent to the primary health centre (PHC) and feeds into the micro-planning at the block and district levels.

The micro-plans define logistical needs, clear roles and responsibilities of the frontline workers, and a supervision plan for the upcoming round. The number of additional sites required to cover unreached areas and staff allocation for dosing is also worked out in the micro-planning process at the PHC and block levels. The micro-plans are discussed in detail during the block level coordination committee meeting chaired by the block development officer and attended by the field workers, medical officer-in-charge (the head of PHC), and child development programme officer and others.

- **Procurement, supply and distribution of vitamin A supplements**

A stable procurement and distribution mechanism to ensure an adequate, timely and sustainable supply of VAS is a critical determinant of programme success. Currently, procurement is done by the states themselves and most states have sufficient funds to obtain adequate supplies. However, in many states poor procurement performance has been the cause of significant reductions in VAS coverage due to the low relevant capacity of state governments. Thus, UNICEF has been supporting state governments in streamlining the mechanism to procure VAS, while building the ca-

Table 2 Full vitamin A supplementation coverage by poverty concentration quintile in the seven states with the highest burden of underfive mortality, 2006-2011 (%)

	Year	District poverty concentration quintile				
		Lowest	Lower	Middle	Higher	Highest
Full VAS Coverage (%)	2006	50.0	41.3	47.2	47.5	37.7
	2007	43.5	34.6	42.9	46.0	41.2
	2008	72.1	59.9	62.8	64.4	47.3
	2009	68.8	74.8	81.2	80.4	76.2
	2010	52.2	26.5	39.4	52.1	52.1
	2011	57.7	59.9	71.2	73.4	72.4
	2006-2011	57.3	49.4	57.4	60.6	54.4

capacity of the state government system to distribute the supplements to districts and blocks in a timely and quality manner. Notably, however, UNICEF has phased out completely from direct supply procurement and distribution since 2011.

In Odisha, the procurement of VAS has been managed by the state government since 2006. At present, the state government has an efficient and stable procurement mechanism that is able to receive vitamin A supplies within 60 days of initiating the tendering process. The supplies are distributed to the districts, which in turn distribute them onward to the blocks. At the block level, supplements are distributed to the ANMs during routine meetings prior to the round.

The entire supply chain of VAS, from requisitions made by the districts to the final distribution of vitamin A bottles at the community level, takes ~230 days. To provide an uninterrupted supply of vitamin A for both rounds, the state has now institutionalized positioning of vitamin A supplies in the system, which means positioning the vitamin A stock for the first biannual round in the previous financial year, so that the supply order is placed for two rounds at once.

On the other hand, Bihar has a decentralized procurement scheme. Each district places the order and makes its own payment, while the state is responsible for the tendering process. However,

procurement has not been a problem in Bihar because each district appears to have adequate capacity for procurement. Districts distribute the supplements to blocks, which in turn distribute the supplements onward to the ANMs and AWWs during their training programme or routine meetings.

Importantly, VAS has been de-linked from Kit A, the essential drug kit distributed twice yearly in fixed numbers to ANM sub-centres, which is currently procured separately. The states estimate the amount of VAS required on a round by round basis, taking into account the micro-planning for the upcoming round, previous coverage figures and residual supplies. Previously, VAS was included in Kit A. This resulted in shortages of vitamin A stock during the early phases of the programme, as the implementation of a biannual approach resulted in massive demand for VAS for two months each year, which requires a procurement process different than that of Kit A.

- **Flexible dosing mechanisms that enhance coverage in hard-to-reach areas**

Most dosing is performed during the biannual rounds in May and November in Bihar and in June/July and November/December in Odisha. Each biannual round continues for four days, with the first two days dedicated to mapping the geographic areas that need to be covered and mobilizing communities, while the

last two days are devoted to delivering VAS to the children. Doses are primarily provided by ANMs in fixed immunization posts including the anganwadi centres, schools and health sub-centres. About 15% of children are then reached by AWWs through a 'mop-up' house-to-house dosing process.

Notably, Bihar and Odisha have made special efforts to reach out to all children, including children of socially disadvantaged communities – scheduled castes, scheduled tribes and minority groups – as undernutrition and mortality rates are significantly higher among these children. In Bihar, more than 80,000 anganwadi centres and 11,000 primary health centres have been mapped out to become the core distribution sites of the biannual VAS rounds. Additionally, underserved and hard-to-reach communities were clustered and 3,500 temporary sites were created to deliver VAS with the help of trained volunteers from the community.

In each temporary site, one community volunteer is identified to manage the four-day supplementation round. Volunteers are given a small financial incentive for their services on all four days. Frontline workers at the fixed sites and volunteers at the temporary sites are in charge of preparing the lists of eligible children, motivating and mobilizing parents and communities, and administering the vitamin A supplements. Moreover, hard-to-reach and left-behind communities are mapped annually and reached out to through additional sites. So far, nearly 10,000 additional sites have been created for the hard-to-reach areas and vulnerable population groups.

In Odisha, partnerships with local non-governmental organizations (NGOs) have helped to strengthen the delivery of VAS to remote rural areas and to children who belong to tribal (indigenous) communities or socio-economically excluded groups through enhanced communication and social mobilization activities. In addition, volunteers are trained to help the frontline workers in organizing the biannual round. For children who are missed, door-to-door visits are conducted by the NGO workers with support from designated AWWs.

For urban areas, an intensive strategy to enlist all children by door-to-door enumeration is carried out before the biannual rounds, and due lists are prepared for each dosing site. Anganwadi centres in the city are divided into zones attached to nearby hospitals for better planning and coordination. In addition to the provision of supplements at the fixed posts, distribution booths are organized in bus and railway stations to cover populations in transit.

- **Social mobilization and communication**

Social mobilization is key to the success of any public health programme. In Bihar and Odisha, before each biannual round, intensive communication and mobilization drives are undertaken at the state, district, block and distribution site levels in order to raise community awareness about the benefits of VAS and to mobilize mothers, families and communities to bring their children to the nearest supplementation sites. The AWWs and ASHAs are usually involved in community mobilization, as these workers know their communities intimately.

Importantly, intensive efforts are made particularly in poor performing blocks to inform and educate both communities and frontline workers serving them about the importance of VAS. Local NGOs are engaged for the special social mobilization campaigns to increase demand for vitamin A and ensure greater participation of vulnerable children in hard-to-reach areas. A range of media such as drum beating, mobile public address systems, local community meetings, village rallies and home visits are used to build awareness and mobilize the community. In urban areas, cable television and radio are used as the main media channels as well as public announcements through cycle rickshaws.

- **Training, supervision and monitoring**

Currently, most posts for ANMs and AWWs are filled and functional in Bihar and Odisha. The states have expanded the number of ANMs and AWWs, and increased their focus on the ASHAs and their role. This change has helped to reduce the workload for any given worker.

All staff engaged in programme implementation and monitoring should receive appropriate training and supervision. There is a normal training process for all ANMs and AWWs. Due to minimal turnover of field functionaries, training has focused mostly on new workers. Each district provides on-going refresher trainings to ANMs, AWWs and various district and block staff. The training sessions focus on improving the knowledge and skills of all community frontline workers and volunteers on how to prepare the list of eligible children, counsel mothers on the benefits of VAS, administer vitamin A syrup to children and tally the results of the VAS round in their site.

Supervision is performed by officials at state, district and block level. There are supervisory teams that visit approximately 10% of the sites during the biannual rounds. In Odisha, the state provides 15 officers to assist with VAS programme monitoring, while districts develop their own supervisory systems, and appoint a full time field monitor. Supervisors help with emergency back-stopping, observe activities at the sites visited and provide feedback during the regularly scheduled block meetings. Monitoring has helped to improve the performance of field functionaries.

To further strengthen programme monitoring, districts receive additional support from local medical societies. In Odisha, a partnership with local medical colleges to provide support and supervision on the rounds, guide programme managers, facilitate planning sessions and review meetings in the districts has added to the effectiveness of the biannual approach. This support is important because medical colleges have the capacity required for timely, quality-driven monitoring and are well respected by the frontline workers and monitors at block, district and state level.

QUESTION III

Is India ready to scale back the VAS programme and shift from universal high-dose supplementation to targeted delivery?

The Government of India recommends that every child 6 months to 5 years of age be

administered vitamin A every six months because VAD is still recognized as a major controllable public health and nutrition problem in India. Recently, however, concerns have been raised regarding the universal supplementation of high-dose vitamin A based on the notion that VAD prevalence has declined substantially in India and the deficiency is now limited to isolated geographical pockets within the country¹⁰.

Some evidence exists that clinical signs of VAD, such as keratomalacia and Bitot's spots, have indeed decreased in India. The 2011-2012 survey of the National Nutrition Monitoring Bureau (NNMB) of the Indian Council of Medical Research indicated that Bitot's spots and conjunctival xerosis were virtually eliminated in Kerala and Tamil Nadu and their prevalence was below 0.5% (indicating public health significance) in children 1-5 years of age in 7 of the 10 states where the NNMB survey was carried out¹¹.

Recent surveys also found that the prevalence of Bitot's spots exceeded 0.5% only in population groups which are socio-economically disadvantaged and have poor health infrastructure¹⁰. This has led eminent scientists to believe that there is an urgent need for adopting a targeted rather than universal approach towards VAS for pre-school children in India¹⁰.

However, the decline in the clinical signs of VAD has not been uniform throughout the country. The 2011-2012 NNMB survey indicated that the prevalence of conjunctival xerosis remained high at 2.5% in West Bengal and VAD was still recognized as a significant public health problem in Karnataka, Uttar Pradesh and West Bengal¹¹. Importantly, it should be noted that the recommendation for a targeted approach was drawn primarily based on clinical indicators of VAD, which reflect severe forms of deficiency. It is well documented, however, that even a mild, subclinical deficiency of vitamin A increases the risk of infectious morbidity and mortality in young children.

In the past 15 years, approximately 80 countries have successfully scaled up VAS pro-

grammes, with coverage rates regularly exceeding 80%-90%¹². In light of this success, global stakeholders have begun to question the need for continued universal supplementation, in response to which the Global Alliance for Vitamin A recently issued a consensus document that outlines a framework for scaling back from universal high-dose VAS¹².

The document recommends that the shift from universal supplementation should be guided by a population's vitamin A status, as indicated by its serum retinol distribution. The collective decision on scaling back VAS should be taken based on two essential steps: i) a thorough situational analysis aiming to compile, analyse and interpret available information on vitamin A intakes and status at the country level; and ii) taking stock of all interventions that may have an influence on population vitamin A status (see Figure 2)¹².

Available evidence on population vitamin A intake and status consistently indicate that mild to moderate VAD remains highly pervasive in India. The 2011-2012 NNMB survey found that approximately 82% of Indian children 1-3 years of age were consuming less than 50% of the recommended vitamin A requirements (see Table 3)¹¹. Approximately 89% and 81% of children 1-3 years of age were consuming less than 50% of the recommended daily intake for green leafy vegetables and milk and milk products, respectively, which are rich dietary sources of vitamin A¹¹.

Importantly, studies have found that Indian children who are not fed foods rich in vitamin A tend to be younger and are less likely to have received VAS in the previous six months, underlining the need to universalize the coverage of the VAS programme to enhance children's vitamin A intake. In addition, the prevalence of low serum retinol concentration (<0.7 µmol/l) was high, ranging from 55% in Maharashtra to 88% in Madhya Pradesh (see Table 3)¹³.

Currently, periodic high-dose VAS is considered as the only public health intervention to control VAD that is implemented at scale in India. No other intervention such as food

fortification or other food-based approaches are being implemented at scale. Taken together, mild to moderate VAD remains highly prevalent among pre-school children in India and the evidence in hand does not support the decision to shift from universal supplementation to targeted delivery of VAS. Further, high quality studies and surveys are warranted to ensure a representative and precise prevalence estimate of clinical and subclinical VAD and to better understand vitamin A intake and status of the population.

DISCUSSION

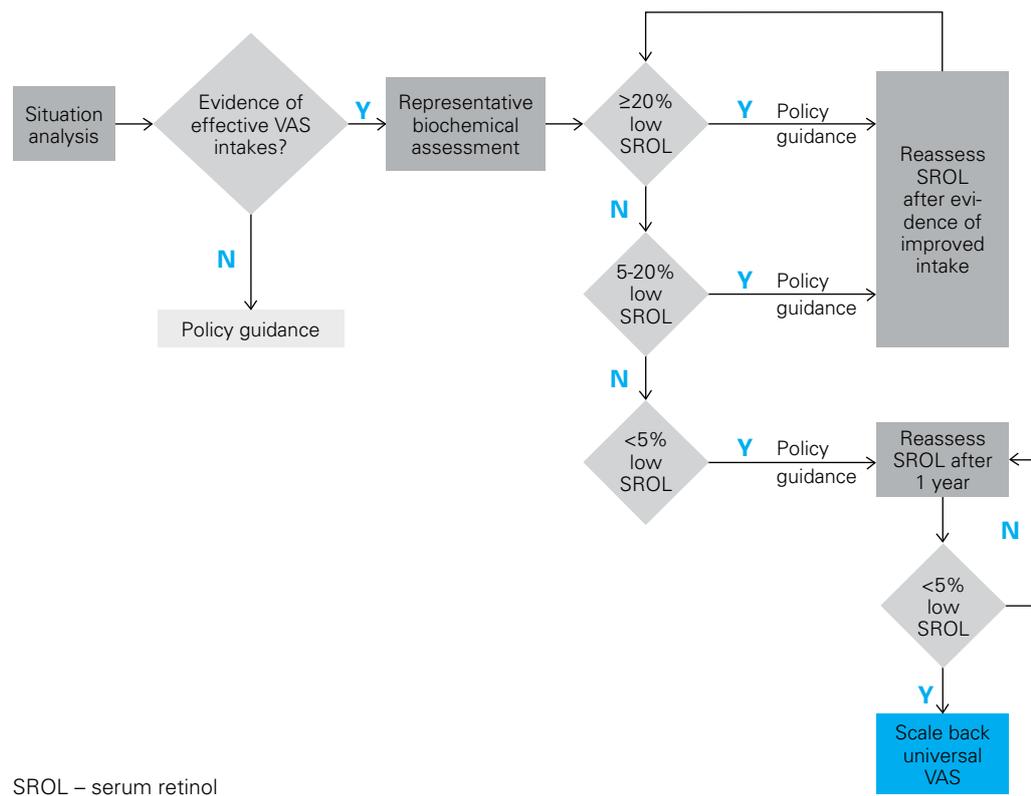
The present paper reviewed the VAS programme in India characterizing the coverage at national and state levels since 2006, and identifying better practices, success factors and bottlenecks. The important findings are summarized in this section.

1. A large number of pre-school Indian children are not yet receiving biannual doses of VAS.

The VAS programme in India has experienced remarkable expansion since 2006. The national full VAS coverage – the indicator of choice to assess the performance of national VAS programmes¹⁴ – nearly doubled, and the number of states with high (≥80%) full VAS coverage tripled between 2006 and 2012. However, despite the impressive progress made with regards to full VAS coverage, an estimated 36 million pre-school children are not yet benefiting from this life-saving intervention.

Only two states – Bihar and Odisha – managed to sustain full VAS coverage figures of ≥80% since 2008. The coverage figures underwent significant fluctuations in states such as Karnataka and Tamil Nadu, while states such as Andhra Pradesh, Assam, Kerala and Uttar Pradesh had persistently low coverage (<50%). Notably, there has been only one round of VAS in Jharkhand since 2010 and no biannual rounds of VAS in West Bengal since 2011.

Figure 2 Framework to guide decisions on the continued need for periodic, high-dose vitamin A supplementation of children aged 6-59 months¹²



Therefore, specific state-wide programme efforts are required in the states with lower and/or erratic full VAS coverage to ensure that all children aged 6-59 months benefit from two VAS doses annually.

2. The VAS programme has evolved to be a social equalizer.

The VAS programme coverage has been similar in the districts with the lowest and highest concentration of children from poor households and SC or ST households. However, a large number of pre-school children from poor households and SC/ST households are not yet covered or fully covered with VAS. Thus, in all states continuous priority needs to be given to the sub-district level units (blocks and villages) with higher concentrations of poor households and SC/ST population.

3. The critical enabling factors include high political commitment and

coordination across departments, effective district-level micro-planning, stable and efficient procurement and distribution mechanism, delivery of VAS to remote rural areas and underserved populations, intensive social mobilization and communication, and continuous supervision and monitoring of the rounds.

The Governments of Bihar and Odisha have demonstrated that it is feasible to implement a successful and inclusive VAS programme in India:

- Evidence-based, sustained advocacy efforts are needed to ensure higher political commitment to the VAS programme at the national and state levels, with emphasis on districts with a high proportion of children from socially excluded communities – the poorest and the most vulnerable.

States that consider VAS a high priority for child survival seem to generate greater political commitment at the state level, which leads to greater motivation at the district level. Therefore, advocacy at the highest level is required to position VAS as a proven (evidence-based) cost-effective child survival intervention. In addition, strong coordination between the DHFW and DWCD is important as it establishes the basis for collaboration between the ANMs and AWWs.

- Careful district-level micro-planning is a critical component of the successful VAS programme. Frontline workers and other programme staff need to be sensitized about the importance of micro-planning and should be trained to prepare an accurate micro-plan.
- Most states continue to struggle with procurement, and even those with good mechanisms have had supply disruptions resulting in poor coverage. State governments with support by UNICEF and other development partners need to strengthen the capacity of their systems to ensure timely and quality procurement and distribution of VAS in order to stabilize their procurement process in the long term. In addition, detailed guidance on tender requirements and quality assurance issues is important.
- The Governments of Bihar and Odisha have designed and implemented special strategies to increase VAS coverage among children from socially excluded communities – scheduled castes, scheduled tribes and minority groups – by applying an equity lens to the state VAS programme. Local NGOs are engaged and volunteers are trained to effectively reach the underserved. Data are compiled and analysed to assess if children of socially excluded communities – the poorest and most vulnerable – are benefiting from the safety net of the state VAS programme. Similar efforts need to be replicated in other states to address urban and underserved areas.
- Intensive social mobilization and communication should continue to be undertaken

at the state, district, block and village levels to raise community awareness about the benefits of VAS and mobilize mothers and families to bring their children to the nearest supplementation site. A clear division of workload among the frontline workers and constant supervision and monitoring of their work is essential for programme success.

4. India is not ready to shift from universal high-dose supplementation to targeted delivery of VAS.

Mild to moderate VAD remains highly prevalent among pre-school children in India and studies have found that Indian children who are not fed foods rich in vitamin A are less likely to have received VAS in the previous six months. Thus, there is a strong need to universalize the coverage of the VAS programme to enhance children's vitamin A intake. The national VAS programme should reach at least 80% of pre-school age children twice a year to achieve the desired impact.

CONCLUSION AND RECOMMENDATIONS

The programme experience in Bihar and Odisha demonstrates that it is feasible to implement a successful and inclusive VAS programme in India that reaches all children if efforts are made to understand who the most vulnerable children are and where they live, and if political decisions are made to assign the human and programme resources needed to reach all children in a sustained way.

The challenge now for India is to reach out to the remaining 30%-40% of children who are not yet benefiting from the national VAS programme and are potentially among those in highest need. Special plans are warranted to reach children who live in remote rural areas or urban slums and who belong to tribal communities or socially excluded groups. Business as usual will not do for these children; these children deserve a different deal.

Table 3 Prevalence of clinical and subclinical VAD and low intake of vitamin A in 10 NNMB states^{11,13}

	Bitot's spot	Conjunctival xerosis	Serum retinol <0.7 µmol/l	VA intake <50% RDA
	Prevalence (%)			
Andhra Pradesh	0.2	0.2	61.5	85.7
Gujarat	0.0	0.0	-	94.6
Karnataka	0.0	0.0	52.1	86.1
Kerala	0.5	0.5	79.4	82.1
Madhya Pradesh	0.0	0.0	88.0	89.0
Maharashtra	0.0	0.0	54.7	86.4
Odisha	0.0	0.0	57.7	74.4
Tamil Nadu	0.0	0.0	48.8	63.6
Uttar Pradesh	0.5	0.5	-	80.2
West Bengal	0.3	3.1	61.2	65.0

VA – vitamin A

RDA – recommended daily allowance

The following recommendations are made for special urgent consideration:

1. Streamlining the VAS procurement mechanism

Many states continue to struggle with VAS procurement. Close monitoring and supervision by the national government is warranted and detailed guidance on tender requirements and quality assurance issues, particularly for the states with poor procurement performance, will be instrumental. Importantly, each state should be encouraged to place VAS supply orders for the next two rounds at once to avoid stock-outs.

Efforts are needed to promote and support the transfer of knowledge and skills on VAS procurement and distribution between the states through information sharing and field visits. UNICEF is willing to collaborate with the Ministry of Health to strengthen the capacity of the state government system to ensure timely and quality procurement and distribution of VAS in order to help states stabilize their procurement process in the long term.

2. State regional workshop on VAS

The Ministry of Health supported by UNICEF should carry out regional workshops to review achievements and progress in implementing the VAS programme, identify challenges in programme implementation and propose a road map towards universalizing coverage of the VAS programme. These workshops can also be taken as a training opportunity to provide detailed guidance on VAS procurement, micro-planning, enhancing coverage in hard-to-reach areas, social mobilization and communication.

3. Expansion of biannual rounds to all states

Currently, 15 major states in India are implementing a biannual outreach strategy with technical support by UNICEF and other partners. The biannual large scale outreach strategy has been extremely effective in improving the VAS programme coverage. Technical support should be provided to the remaining states to adopt a biannual approach to reach out to all children aged under five years with VAS.

4. VAS coverage reporting

Precise estimates of programme coverage at state and district levels are required to track progress made and improve public accountability. A few states have had coverage values above 100%, indicating the possibility of over-reporting and errors in denominators. The sources of information being used to estimate the denominators and numerators in each state need to be carefully reviewed and relevant training should be conducted. Efforts should be made to collect coverage estimates disaggregated by various demographic characteristics such as age, gender, social class and socioeconomic status. In addition, VAS coverage data should be compiled and reported on

a regular basis from all states in India including those where UNICEF is not present.

5. Prevalence of VAD in pre-school age children

As India approaches the 2015 deadline to achieve the Millennium Development Goal child survival targets, it will be important to assess the prevalence of clinical and subclinical VAD in pre-school age children and evaluate the impact of the national VAS programme. This will address concerns about the extent and severity of VAD in India and the relevance of the national VAS programme and build the evidence base to design the way forward post 2015.

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