A strategy for scaling up vitamin A supplementation for young children in a remote rural setting in Zimbabwe

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Background. Vitamin A deficiency is a public health problem in Zimbabwe. Addressing vitamin A deficiency has the potential to enhance resistance to disease and reduce mortality, especially in children aged <5 years.
Objective. To describe a vitamin A supplementation outreach strategy implemented in one of the remote rural districts in Zimbabwe, which increased coverage after being implemented in difficult circumstances in a remote rural region.
Methods. We implemented and adapted a vitamin A supplementation outreach strategy within the national immunisation days (NIDs) and extended programme of immunisation in a remote rural district in Zimbabwe. The strategy involved supplementating children at prescheduled outreach points once per month for the whole year. Despite usual operational challenges faced at implementation, this approach enabled the district to increase delivery of vitamin A supplements to young children in the district.
Results. The strategy covered 63 outreach sites, with two sites being covered per day and visited once per month for the whole year. Coverage reached 71% in an area in which previous coverage rates were around <50%.
Conclusion. Implementing a vitamin A supplementation outreach strategy increased vitamin A supplementation coverage among children living in a remote rural region. This strategy can potentially be used by Scaling Up Nutrition (SUN) member states. However, we recommend further exploration of this strategy by others working in similar circumstances.

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In developing countries it is estimated that deficiencies in iron, zinc and vitamin A each rank among the top ten leading causes of death.[1] In Africa about 350 million children and women suffer from deficiencies in vitamin A and iron,[2] and Zimbabwe is no exception to the effects of micronutrient deficiencies and 'hidden hunger'.[3] Results of a micronutrient survey in 1999 showed a 35.8% prevalence of vitamin A deficiency among young children (aged 12 - 71 months) and 18% among schoolgoing children.[4]

Zimbabwe was categorised by the World Health Organization (WHO) as being at high risk of vitamin A deficiency in 1997.[5] The results of the 1999 micronutrient survey, which showed high levels of vitamin A deficiency in Zimbabwe,[4] led to the country adopting WHO recommendations for vitamin A supplementation in children and women. Several initiatives have been and/or are being implemented to address vitamin A deficiency, including food fortification, education to increase the consumption of foods rich in vitamin A, and high-dose oral supplements.[6]

The National Vitamin A Supplementation Programme was thus initiated in 2001.[7] In 2002, with funding from the United Nations Children's Fund (UNICEF), vitamin A supplementation was integrated into the national immunisation days (NIDs) and the expanded programme on immunisation (EPI).[5,8] The 2003 national nutrition and EPI survey found that the vitamin A capsules distributed through the NIDs and EPI had reached only 46% of the targeted population.[5] Worse still, the food and nutrition survey in 2004 observed that only 23% of assessed children had received vitamin A supplementation in the past 6 months.[9]

It was found that up to 90% of children in remote rural areas did not receive vitamin A supplementation.[10] Support from Helen Keller International (HKI) then increased coverage in 2006 to 65% at the second dose[8] through child health days and by taking advantage of integrated measles campaigns. HKI leadership and funding of the programme made it possible to have an extensive collaborative structure comprising the Ministry of Health, Community Welfare Department, the Nutrition Department (Ministry of Health), UNICEF, Rotary International, Plan International and other non-governmental organisations as partners in the programme. With HKI pulling out in 2010, the vitamin A national supplementation coverage was again low, at 49%.[11] This was attributed to several factors including economic changes in the country, challenges in government financial support and other inputs. The situation was made worse by an economic environment of hyperinflation and subsequent challenges that followed a change in currency to the US dollar. This left UNICEF as the main support partner together with the Ministry of Health sectors and required the formulation of additional strategies to bring about more sustainable vitamin A supplementation, and equip national staff to implement these strategies.[5]

Objective

Here we describe a successful vitamin A supplementation outreach strategy implemented in one of the remote rural districts in Zimbabwe, which increased coverage under the hard-to-reach circumstances of this remote rural region.

Methods

The Gokwe-North District initiated and adapted a vitamin A supplementation outreach strategy within the national NIDs and EPI programme in 2011. This programme involved collaboration

of departmental heads from different key government departments (Nursing, Nutrition, Health Education and Promotion, Administration and Accounting); their different responsibilities are listed in Table 1. These did not require specialised personnel in regions where staffing was a challenge; lower-level staff could be trained to carry out the different responsibilities. A nursing officer was responsible for the overall co-ordination of the programme. The key implementers in the programme were a team of EPI nurses, being a mix of registered general nurses and primary care nurses.

The team, led by the nursing officer, designed a year-long EPI outreach schedule for routine vaccination and vitamin A supplementation (Tables 2 and 3). Outreach sites were determined in consultation with village health workers (VHWs) to ensure that even the furthest areas from the rural health centres (RHCs) were adequately covered. Part of the logistical planning of the outreach programme involved ordering vitamin A supplements from the provincial EPI department to the district, from where the teams distributed to their respective outreach sites. Each outreach site was visited once per month in the year. When funding was available for fuel and special district inventory, the district administrator would support the running of the programme.

Two outreach teams were used for the whole district of population size 234 673 as per 2011. The two teams were strategically allocated to cover the eastern (E) and western (W) blocks of the district. Travelling distances to the supplementation sites totalled ~1 000 km of mostly rough gravel roads. Each team consisted of three EPI nurses responsible for supplementation, and a driver. These nurses were originally stationed in the largest EPI department of the district. The nurses were responsible for ensuring reach to those failing to obtain supplementation at their nearest RHC. A team would camp in the field for 5 days, and were supported with general supplies (food and general needs) from the district health services fund. In addition, in the year of the programme, UNICEF twice offered a small amount of funding to cover fuel and allowances. The allowances were calculated using prevailing government rates and were used to fund about 4 months' expenses. Accommodation for the team members was provided by the RHCs located close to the sites where outreach would be implemented. This was to ensure that no costs were incurred by the nurses and was a

Table 1. Different departmental personnel and their responsibilities to the outreach programme

Departmental personnel	Key responsibilities and contributions
District nursing officer	EPI manager and co-ordination (vitamin A orders and assigning staff to outreach)
District nutritionist	Vitamin A supplementation manager and specialised co-ordination of vitamin A supplementation; monitoring and coverage
District pharmacist	General drug, vaccines and vitamin A management for the programme and whole district
District health education and promotion officer	Co-ordination of information education; communication materials (vitamin A flyers)
District health services administrator	Programme logistics co-ordinator (transport and general supplies)
Accountant	Field allowances (subsistence) calculation and general programme financing
VHWs	Mobilisation of communities and overall facilitators at implementation level

EPI = expanded programme on immunisation; VHWs = village health workers.

Table 2. 2011 district EPI and vitamin A supplementation schedule: E block, adjusted to present active supplementation dates*

Outreach point code	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
E1 and E2	10	7	7	4	9	6	4	8	12	10	7	5
E3 and E4	11	8	8	5	10	7	5	9	13	11	8	6
E5 and E6	12	9	9	6	11	8	6	10	14	12	9	7
E7 and E8	13	10	10	7	12	9	7	11	15	13	10	8
E9 and E10	14	11	11	†	13	10	8	12	16	14	11	9
E11 and E12	17	14	14	†	16	13	11	15	19	17	14	12
E13 and E14	18	15	15	12	17	14	12	16	20	18	15	13
E15 and E16	19	16	16	13	18	15	13	17	21	19	16	14
E17 and E18	20	17	17	14	19	16	14	18	22	20	17	15
E19 and E20	21	18	18	15	20	17	15	19	23	21	18	16
E21 and E22	24	21	21	18	23	20	18	22	26	24	21	19
E23, E24 and E25	25	22	22	19	24	21	19	23	27	25	22	20
E26 and E27	26	23	23	20	25	22	20	24	28	26	23	21
E28 and E29	27	24	24	21	26	23	21	25	29	27	24	†
E30 and E31	28	25	25	28	27	24	22	26	30	28	25	†

E = eastern; EPI = expanded programme on immunisation.

* Actual site names replaced with codes for readability and reproducibility.

† Supplementation not done on these dates.

Table 3. 2011 district EPI and vitamin A supplementation schedule: W block, adjusted to present active supplementation dates*

Outreach point code	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
W1 and W2	6	10	14	11	9	13	10	8	7	3
W3 and W4	7	11	15	12	10	14	11	9	8	4
W5 and W6	8	12	16	13	11	15	12	10	9	5
W7 and W8	9	13	17	14	12	16	13	11	10	6
W9 and W10	10	14	18	15	13	17	14	12	11	7
W11 and W12	13	†	21	18	16	20	17	15	14	10
W13 and W14	14	18	22	19	17	21	18	16	15	11
W15 and W16	15	19	†	20	18	22	19	17	16	12
W17 and W18	16	20	24	21	19	23	20	18	17	13
W19, W20 and W21	17	†	25	22	20	24	21	19	18	14
W22, W23 and W24	20	†	28	25	23	27	24	22	21	17
W25 and W26	21	25	29	26	24	28	25	23	22	18
W27 and W28	22	26	30	27	25	29	26	24	23	19
W29 and W30	23	27	31	28	26	30	27	25	24	†
W31 and W32	24	28	1 June	29	27	31	28	26	25	†

W = western; EPI = expanded programme on immunisation.
* Actual site names replaced with codes for readability and reproducibility.
† Supplementation not done on these dates.

gesture of appreciation from the RHC for the commitment of the team in covering their catchment area.

The teams would plan to carry out vitamin A supplementation at two different outreach sites per day as per the supplementation schedule (Tables 2 and 3); e.g. in the E block, sites E1 and E2 would be visited at different dates of the calendar month for all 12 months (Table 2). The demand for supplementation at these sites for the following months was initiated by the mobilising efforts of the VHWs. Within the communities, messages of the team's outreach efforts were spread to encourage those who had been missed to anticipate the next supplementation date. During the actual supplementation process the outreach team would make use of individual child health cards to check if the child was ready for supplementation and to avoid double/repeated doses. This process also facilitated the administration of outstanding immunisations, thereby influencing immunisation coverage positively.

After every day's supplementation, a team leader would take time to update that day's statistics. This included compilation of the numbers supplemented at a particular point, supplements provided and any wastage. The nutritionist or any district executive member would do a follow-up supervision to verify the statistics and perform any other supervisory roles to support the outreach teams. A monthly consolidation of statistics was performed to address challenges for a particular month.

VHWs were central to ensuring mobilisation at the community level for supplementation. This mobilisation was supported by an initial mobilisation before supplementation outreach under the responsibility of the health education and promotion officer (HEPO). Furthermore, the HEPO provided vitamin A supplementation brochures in vernacular and English, which the teams distributed to mothers and caregivers as take-home brochures.

Vitamin A coverage was calculated by comparing the number of children given vitamin A as a proportion of the estimated total number of children, using the WHO assumption of 90% of the total population as an estimate of the 6 - 59 months age-group population (17%).[12] Coverage was then calculated as follows:

number of children aged 6 - 59 months given vitamin A ÷ estimated total number of children aged 6 - 59 months in the target population × 100

Results

Based on the estimated district population of 234 673 for 2011, a total catchment population of 35 905 children aged 6 - 59 months was determined. Of these, 25 666 children aged 6 - 59 months (71%) were given vitamin A in the 12 months of supplementation in the district. Wastage levels were relatively low, with <10% being reported from the outreach supplementation programme.

The 1-year vitamin A schedule was implemented in both the E and W blocks of the district (Tables 2 and 3). Challenges were faced at particular times, especially due to delays or limited resources (mainly fuel and food supplies). This resulted in the teams having to leave late for their designated sites and ultimately resulted in loss of supplementation in some children who would have been mobilised for a particular day. The other uncertainty that the teams faced was where a medical emergency would occur and the outreach vehicle would be used as the ambulance. This affected the movements of the teams. Having experienced these challenges, the team could address them through the provision of a budget at local level.

Teams were affected by harsh weather conditions and this was felt most by the outreach programme that started in March for the W block (Table 3). During the summer rains, some areas became totally unreachable due to the poor state of roads.

Discussion

Despite the operational challenges faced and taking into consideration that the programme was in its initial stage, results indicate a potential strategy within the existing NIDs and EPI programme that can contribute towards ensuring the delivery of vitamin A in hard-to-reach areas such as the district in which we worked.

In 2005, with a national coverage of 22.3%, the best coverage contribution of 50% was from an urban area. For rural areas a range of between 81.9% and 96.9% of children did not receive vitamin A

in the previous 6 months.[10] To provide a preventive dose every 6 months to children aged 6 - 59 months, the country followed varied strategies at different locations (urban and rural). Coverage was higher in urban areas as supplementation was relatively easier to implement. However, supplementation in rural areas presents a different scenario of hard-to-reach areas.[13] Efforts to provide vitamin A supplements to remote rural regions are important, as children in these areas may be more vulnerable to morbidity and mortality.[12,14] Children under these types of circumstances have been reported to be born with negligible vitamin A stores while at the same time suffering frequent infections. In addition, they are also likely not to receive adequate vitamin A through breastmilk in the first 6 months of life, especially if the mother is malnourished.[15] Efficient and effective delivery of vitamin A supplements would contribute to protecting children against increased vulnerability to vitamin A deficiency and its consequences.[12]

The involvement of the different stakeholders in the entire process from planning to implementation was useful. It is important to realise the importance of collaboration and consultation of provincial and district-level nutrition programmes in all the planning activities for vitamin A supplementation from the earliest moments.[15] Furthermore, great emphasis must be placed on the need for continued support and motivation for the teams that will be physically involved in visiting the outreach teams. This can be in the form of department-to-department support structures, such as psychological rewards for the nurses and general celebrations for achieved goals/targets. Approaches such as these can support continued, sustainable motivation for the perpetual implementation of the strategy. This approach might also have had a positive effect on vaccination coverage;[16] however, this is out of the scope of the current article and remains to be verified.

Conclusion

A highly organised vitamin A supplementation outreach programme can contribute to enhanced coverage. In this instance, the adaptation of the supplementation process within existing structures resulted in a strategy with potential to improve coverage in hard-to-reach rural districts in Zimbabwe. We recommend further exploration of this strategy by others working under similar circumstances and motivate for its use in Scaling Up Member (SUN) states. We believe that if this strategy was to be well co-ordinated, it could result in full vitamin A supplementation coverage in several countries, such as seen in Guatemala (Solomon, personal communication).

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