ETHIOPIAN NATIONAL VITAMIN A DEFICIENCY SURVEY REPORT

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EXECUTIVE SUMMARY

Background
Vitamin A is a fat-soluble vitamin, needed in small quantities for several metabolic activities in the body. When vitamin A intake is below the requirement, a number of manifestations collectively known as Vitamin A deficiency disorders occur. These include physical and mental growth retardation, impairment of the visual system and increased susceptibility to infection. Studies have shown that by improving Vitamin A status, mortality of children can be reduced by 23% and maternal mortality by as much as 40%. Several studies in the past and present have established that vitamin A deficiency is a major public health problem contributing to much of the child morbidity, mortality and blindness in Ethiopia. In order to effectively address the problem, up-to-date information on the magnitude and determinants is imperative.

Objective
The national survey on VAD, therefore, was aimed at assessing the magnitude and determinants of vitamin A deficiency and availing the information for appropriate actions.

Methods
The national survey employed multi-stage, cluster-sampling approach and a cross-sectional study design. A total of 23,148 children were included in the clinical examination (86% response rate), blood was collected from about 996 children (85% response rate) for serum retinol analysis and a questionnaire consisting of all potential determinants was administered to 2565 households (95% response rate).

Results
The survey revealed national bitot’s spot prevalence rate of 1.7% (95% CI; 1.6% - 1.9%) with the highest rate in Amhara region (3.2%), followed in Afar (2.1%), Oromia (1.5%), Addis Ababa (1.4%), Harari (1.2%) and Dire Dawa (1.1%) regions. It was found that male children and older children are affected more than female children and young children.

The results also showed national maternal night blindness prevalence rate of 1.8% (95% CI; 1.7% - 2.0%) with the highest prevalence rate in Tigray (14.1%) followed in Beneshengul (5.7%), Afar (1.2%) and Amhara (1.0%).

The findings indicate that the national weighted prevalence rate of subclinical vitamin A deficiency is (<0.7 μmole/l) is 37.7% (95% CI; 35.6%-39.9%), with the highest prevalence rate in Afar (57.3%) and Oromiya regions (56.0%).

Findings related to the consumption of dark green leafy vegetables by the index children indicate that nationally only 31% of the children have consumed three or more times in the week preceding the survey. The proportion is highest in Dire Dawa (59.6%), followed in SNNPR (51.8%), Harari (41.8%), Oromia (33.9%), Amhara (22.1%) and Addis Ababa (20.6%). The least consumption rate is recorded in Beneshengul (8.3%), Tigray (12.2%) and Afar (13.4%).
Similar pattern was observed regarding the consumption of yellow/orange vegetables. The proportion of index children consuming red/yellow vegetables three times or above in a week nationally is 24%, with the highest proportion in Harari (38.3%) followed in Addis Ababa (36.4%), Dire Dawa (34.2%), Oromia (32.2%), Beneshengul (26.0%), Amhara (19.1%) and in SNNPR (18.3%). The least again is found in Tigray (10.5%) and Afar (14.6%).

The proportion of index children, reported to have consumed fruits three or more times in a week that preceded the survey nationally is about 17%. The proportion of index children consuming fruits three times or above in a week is highest in Dire Dawa (43.6%), followed in Harari (40.1%), SNNPR (29.9%), Addis Ababa (25.1%). Amhara (15.4%) Oromia (15.3%), Beneshengul (14.0%). The least again is found in Tigray (2.7%) and Afar (2.8%).

With regards to VAS coverage, the survey indicated that significantly, more children have received VAS in Tigray region (77.0%) followed in SNNPR (33.9%) and Afar (21.0).

Pertaining to morbidity, the survey results show that nationally, 49.1% of the children included in the clinical study were sick two weeks prior to the survey. More than 60% of the children were sick in Afar, Amhara, and SNNPR. A little over half of the children were sick in Tigray, Beneshengul and Harari regions.

Results pertaining to the knowledge regarding functions of vitamin A indicate that 87.7% of the mothers do not know any function of vitamin A. Slightly over 86% do not know the consequences and 87.8% do not know foods rich in vitamin A. In general the knowledge of mothers is poor in Afar, Amhara, Addis Ababa, Oromiya, Beneshengul and Tigray regions. It is slightly better in SNNPR and Harari regions.

The proportion of women who initiated breastfeeding immediately (within one hour) after delivery nationally is slightly over 30% with the lowest prevalence in Afar (21.6%), Tigray (21.8%), Dire Dawa (29.9%), Harari (21.7%), and Amhara (28.9%) regions. Nearly half of the mothers have reported to have discarded colostrums nationally.

Findings related to own production/cultivation of common vegetables (kale, spinach, cabbage, carrots, tomatoes and pumpkin) by households over the year preceding the survey indicate that about 58% have cultivated kale, while other vegetables were reported to have been cultivated by less than 30% of the households. Nearly all households reported that they did not produce any of the common vegetables in Addis Ababa (main city), followed by in Afar region (pastoralist region), Harar and Dire Dawa regions (mostly urban). The proportion of households reporting the production of the common vegetables in other regions that are predominantly rural and agricultural varies from 13.6% in Tigray to 50% in SNNPR and 56.5% in Oromiya region.

The results pertaining to own production of fruits indicate that over 90% of the households did not have avocado in their gardens; over 80% did not have oranges, and close to 80% did
not have mango, papaya and banana in their gardens. The proportion of households reporting the production of a minimum of one of these fruits at least once over the year is below 10% in six regions and below 15.9% in all regions. The highest proportion of households who have reported own production of fruits is in SNNPR (15.9%), followed in Oromia (15.2%) and in Beneshengul (14.3%).

Findings regarding availability of common vegetables in nearby markets over the year preceding the survey (kale, tomato, carrots, spinach, cabbage) indicated that over 60% of households did not see cabbage in the nearby markets, over 40% did not see pumpkin and spinach and over 20% did not see tomatoes and carrots. Kale was reported to have been present in the near by markets by over 90% households. Results also show that over 40% of households did not see banana, about 50% did not see mango, papaya and oranges and close to 80% did not see avocado in the nearby markets over the year.

The proportion of index children consuming meat three times or above in a week is least in SNNPR (0%), Beneshengul 0%, Tigray (2.0%), and Oromia (3.0%). The proportion of index children consuming egg three times or above in a week is least in Tigray (2.0%), Afar (2.0%), SNNPR (3.0%) and Beneshengul (3.0%).

Conclusions and recommendations
The national prevalence rate of bitot’s spot 1.7% is more than three times higher compared to the WHO cut-off points indicating public health significance\(^1\). Similarly, the prevalence of subclinical vitamin A deficiency (37.7%) is close to two times the WHO cut-off points indicating a serious level\(^2\). Although there has been a number of interventions, VAD is still prevailing unabated, urging for more strengthened efforts. Particularly, the prevalence is markedly high in Amhara and Afar regions and must constitute priority. The results obtained in Addis Ababa, Harari and Dire Dawa has shown that VAD can be a serious problem in bigger towns as well. It highlights the need to also focus on bigger towns.

The weighted national prevalence of maternal night blindness is nearly two times higher than the WHO cut-off points. This calls for interventions aimed at improving maternal vitamin A nutrition. Particularly, maternal VAD in Tigray must receive prompt attention. Postpartum supplementation can improve vitamin A status of women and should be pursued.

High coverage of VAS in Tigray and relatively good coverage in SNNPR was observed. The coverage in other regions is considerably low. In light of the impact of VAS (low levels of VAD in Tigray and sharp decline from the previous levels, is presumed as the impact of it) intensification in other regions is recommended\(^3\).

The national morbidity rate is high in any standard. The morbidity rate is markedly high in

\(^1\) WHO considers prevalence rate of bitot’s spot greater than 0.5% as a public health problem

\(^2\) WHO considers prevalence rate of subclinical VAD (Serum retinol <0.7μmole/l) greater than 20% as indicative of serious public health problem

\(^3\) Strengthened VAS was implemented after the survey and it is believed that the coverage could be higher in all regions currently
some regions, particularly in Amhara, Afar and SNNPR. This might have aggravated VAD in Amhara and Afar. Attempts to improve the health status of the children must be strengthened. The opportunities created as the result of the health extension package must be tapped towards this end.

Maternal knowledge regarding the vitamin A is unsatisfactory across the nation. Efforts to improve women’s education and awareness creation activities regarding vitamin A must be strengthened. Child feeding practice related to initiation of breastfeeding immediately after delivery (within one hour) and feeding whole colostrums are all unsatisfactory, calling for serious and intensive awareness creation activity. This again calls for strengthening the health extension program so that appropriate, adequate and consistent behavior change messages are delivered.

Own production/cultivation of common dark green leafy vegetables (kale, pepper, spinach, cabbage and haleko), red/yellow vegetables (carrot, tomato, pumpkin, yellow sweet potato) and fruits (mango, papaya, oranges, avocado and banana), the main sources of vitamin A in developing countries, is negligible in many regions. Attention must be given to enable households to produce/cultivate their own vegetables and fruits. This calls for strengthening/reinforcing the agricultural extension program, so that strong awareness creation and sufficient technical support are provided by agriculture extension workers.

Majority of children do not consume vegetables and fruits adequately. The consumption of meat and eggs in almost all regions is close to nil. Attempts aimed at enhancing the consumption of vegetables, fruits livestock products must be intensified along with the attempts to ensure availability. Both agriculture extension workers and health education workers must create a strong linkage to empower the community in terms of enhancing production/cultivation and promoting the consumption of these food sources.