

Vitamin A and iron supplementation in schools

Successes and lessons learned from Mangochi District, Malawi, September 2008

BACKGROUND

In 1980, the World Health Organization reported that Malawi's most severe incidence of vitamin A deficiency occurred in the Shire Valley of Mangochi District, where 1 percent of preschool-age children were blind, primarily as a result of vitamin A deficiency.¹ When Save the Children launched its School Health and Nutrition program in Mangochi eighteen years later, a baseline survey found that vitamin A deficiency was still a public health problem: 1 percent of school children had Bitot's spots, a sign of advanced vitamin A deficiency and a signal that the deficiency is a public health problem.² Although vitamin A deficiency is often largely invisible (clinical symptoms appear only when the deficiency is severe), it affects children's health and ability to learn even when children are symptom-free. A deficit of vitamin A impairs immune function and iron metabolism, increases risk of mortality from infectious disease, and, if left untreated, eventually causes blindness.³

Save the Children's 1998 baseline survey in Mangochi also found that 40 percent of children were anemic.⁴ Iron deficiency anemia is the most common nutritional

deficiency in the world and school-aged children are one of the groups most severely affected. Anemia causes fatigue, low productivity, and apathy. Among possible causes for iron deficiency anemia, the most common are parasitic infection (such as bilharzia, hookworm, and malaria) and a poor diet. Other nutritional deficiencies, including vitamin A deficiency, are associated with anemia. Among school-aged children, anemia inhibits physical and cognitive development, leading to poor academic performance.

School-based vitamin A and iron supplementation is increasingly seen as an effective way of preventing vitamin A deficiency and iron deficiency anemia in the school-age population. Save the Children conducted studies in Mali and the Philippines that showed weekly iron supplements, combined with teacher provision of deworming pills and vitamin A supplements, can effectively prevent and reduce the prevalence of anemia.^{5,6} Evidence also suggests that iron supplementation improves schoolchildren's cognitive function.³

APPROACH

Since 1998, Save the Children, in partnership with District Health and Education Offices, schools, and communities, has provided vitamin A capsules once a year in 101 schools in Mangochi. In 2003, Save the Children added an additional 70 schools in Balaka district. We administered weekly iron supplements in 20 schools in Mangochi as operational research. The supplementation was part of a comprehensive School Health and Nutrition program, aimed at addressing all key health and nutrition problems that prevent children from fully participating in school.

To facilitate distribution, schools treated children with capsules containing a high dose of vitamin A (200,000 IU) just once a year, a week after bilharzia treatment. Schools provided treatment only to children younger than 11 as



A Malawian school boy



teenage pregnancy is common in Mangochi and a high dose of vitamin A can be harmful to a fetus.

Once weekly for 15 weeks, 20 schools gave all children one iron tablet, containing 65 milligrams of iron and 0.25 milligrams of folic acid. Schools organized make-up days for children who were absent on distribution day. Trained teachers administered both supplements with support from parents. Schools recorded the number of children who received supplements in a school-based register and sent a summary to Save the Children.

Schools always combined distributions with nutrition education. Save the Children trained teachers to use a participatory approach to teach nutrition and promote the use of locally-available foods rich in vitamin A, iron, and other nutrients. Each school received a manual to help teachers plan these sessions.

COVERAGE

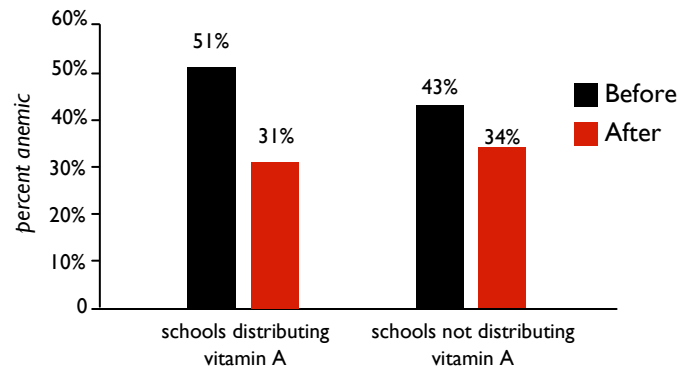
Between 2004 and 2007, approximately 27,000 children in 101 schools in Mangochi districts received vitamin A. This represents 52 percent of children enrolled in primary school, the proportion of children who were younger than 11. Though Save the Children expected students to receive 15 weekly iron supplements, our operational research in 2002, the showed that only 10 percent of children took the recommended 15 tablets. Sixty-three percent of children took at least 10 tablets.

SUCCESSSES

Baseline and post-intervention surveys conducted in 1998 and 2001 compared hemoglobin levels in six schools that provided vitamin A supplements and six similar schools that did not. The prevalence of anemia fell by 35 percent in intervention schools and only 21 percent in the others (see chart at right).⁷

A randomized controlled study of schoolchildren in Tanzania found similar results: over three months, the hemoglobin concentration, body weight, and height of children receiving vitamin A supplements improved significantly more than those of children in a control group,⁸ suggesting that **vitamin A alone can prevent anemia.**

Prevalence of anemia in intervention and control populations (n=1037)



In 2002, Save the Children also conducted a randomized controlled trial to evaluate the impact of a course of 15 weekly iron supplements. However, the sample suffered from poor compliance among many children and an attrition rate of nearly a third due to famine and a belief by some communities that the tablets were contraceptives. As a result, the study was uninterpretable. However in 2007, Save the Children conducted a survey using the same methods and schools used in the vitamin A study. The 2007 study found that the prevalence of anemia had fallen to 24 percent from 44 percent in 1998. A number of factors may have influenced this change, including bilharzia treatment and vitamin A supplementation, as well as other environmental factors unrelated to Save the Children's programs.

CHALLENGES AND LESSONS LEARNED

- Although iron supplements are easy to administer, weekly supplementation requires time and commitment from teachers and acceptance by children and parents. Communities in Mangochi often associate mass drug distribution with contraceptives, complicating the process of achieving community acceptance. Further, community members could not directly link the absence of symptoms of anemia and vitamin A deficiency with supplementation, as they might with bilharzia treatment. To ensure high compliance, it was important therefore to work closely with the community, introduce the supplements to community members prior to distribution, and involve the community in distribution. Save the Children also organized regular

meetings with area development committees and school communities to discuss issues as they arose.

- Identifying children ten years old and younger for vitamin A supplementation was also problematic because many classrooms comprised students of widely different ages. Teachers had to distribute capsules carefully to ensure that only children younger than 11 received them.

NEXT STEPS

In 2007, the Ministry of Education launched a national School Health and Nutrition program, modeled largely on Save the Children's program in Mangochi district. The program includes vitamin A and weekly iron supplementation, which are now being provided in all schools across the country. Meanwhile, Save the Children is phasing its programs out of Mangochi district. The District Health and Education Office and individual communities will take up all SHN-related activities. The Ministry of Education will continue to provide training for teachers and the vitamin A and iron tablets. Community participation should continue to be an essential element of the program to ensure high coverage and program impact.



Preparation of vitamin A capsules for distribution

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