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Vitamin A at Birth: A New Way to Save Infant Lives in Southern Asia

Vitamin A given at birth improves infant survival in South Asia.

Early infancy is a period of high risk for both vitamin A deficiency and mortality. Infants are born with small liver reserves of vitamin A (VA)¹. Infants in most poor societies require adequate breastfeeding and good health, relatively free from infection, to build body stores of vitamin A². However, low breast milk vitamin A concentration, inadequate breast milk intake³ poor complementary food quality⁴ or frequent infection⁵, including enteropathies, can all be expected to reduce an infant's ability to achieve normal vitamin A status. Depressed vitamin A status can also expect to increase an infant's chances of severe, potentially fatal infection⁶, representing a classic "vicious cycle".

Newborn vitamin A dosing trials

Vitamin A can be safely given to infants shortly after birth⁷ as a single oral dose (50,000 IU), contained in several oily drops (*Figure 1*).

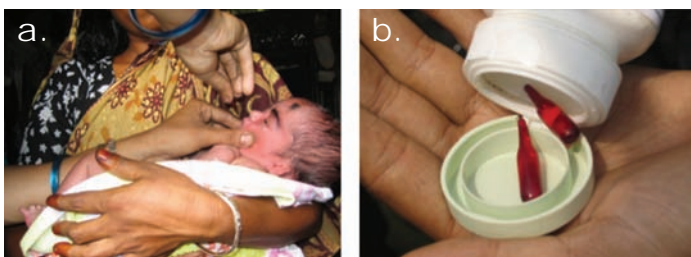


Figure 1. a) Newborn receiving vitamin A, b) 50,000 IU vitamin A capsules.

The intervention has been tested in three field trials in Southern Asia (*Figure 2*), each of which has reported significant reductions of $\geq 15\%$ in infant mortality in the 1st six months of life⁸⁻¹⁰. When combined, the results suggest that infant mortal-

ity can be reduced by $\sim 20\%$ in Southern Asia by giving newborns a single, approximately 2 US cents, oral dose of vitamin A¹¹, with reduced case fatality from febrile and diarrheal illnesses being particularly evident⁶.

Given previous evidence of safety with respect to short- or long-term side effects^{7,12,13}, newborn vitamin A supplementation appears to be a low cost-approach to reduce infant mortality in the South and Southeast Asian region.

In Africa, however, newborn vitamin A receipt has shown no beneficial effect on infant survival, to date in an urban, HIV-endemic setting in Zimbabwe¹⁴ and in a peri-urban setting in Guinea Bissau^{15,17}. Both African studies were done in populations with little, if any, maternal vitamin A deficiency. Further, infant mortality in non-HIV infected infants in the Zimbabwean study was low¹⁴; and in Guinea-Bissau, exclusion of highest risk infants (those with low birth weight) and providing free medical care may have minimized potential effects of an early neonatal nutrient supplement¹⁶.

WHO has commissioned three randomized, double-blind, placebo-controlled trials that are currently underway in India, Ghana and Tanzania to add to the evidence base on the efficacy of neonatal vitamin A supplementation in improving infant survival. Results of the three trials are anticipated in 2013. WHO currently does not recommend this intervention globally but recognizes it may reduce mortality in some settings¹⁷.

Evaluating delivery mechanisms

Following publication of its findings that newborn vitamin A could reduce infant mortality, Johns Hopkins University, in collaboration with the A2Z Micronutrient Project and its in-country partner, the Micronutrient Initiative, conducted meetings in Nepal and Bangladesh with scientists, government policy-makers, NGOs, and professional societies to disseminate the regional findings on newborn vitamin A, and to stimulate operations research on ways to reach and administer vitamin A to newborns within the first two days of life. In both countries, >85% of rural infants are born at home and suffer from low coverage of post-natal care services, presenting challenges to implementing newborn vitamin A supplementation.

In Bangladesh, the Ministry of Health and Family Welfare has undertaken research to test two vitamin A delivery models in six sub-districts: the first is a “Mother/Family Member Dosing” (MF) approach which integrates vitamin A provision to mothers during routine antenatal care visits where health workers instruct mothers about why, when, and how to administer the dose to their newborns, and how to manage any potential side effects. The second is a “Health Worker Dosing” (HW) model in which health workers directly dose the newborn during a postnatal care visit.

Key findings were:

- The MF model, whereby family members provided the vitamin A to the baby at birth, performed significantly better than the HW model with respect to coverage of infants within the first 30 days after birth (54.7% vs. 36.3% of all reached), and within the first 48 hours (41.8% vs. 26.6%) (Figure 3)¹⁸.
- Health workers administered ~62% of the vitamin A doses to infants irrespective of delivery model, suggesting that mothers and family members in the MF group lacked the confidence to administer the dose even when given the supplement with instructions during an antenatal care visit¹⁸.
- Relative to baseline levels, after six months there had been a significant increase in the proportion of infants who had a post-natal care visit in both the MF (38.4% vs. 65.9%) and HW (26.4% vs. 60.5%) delivery groups, suggesting that integrating vitamin A delivery at birth into health services can lead to increased postnatal care coverage in rural areas (Figure 4)¹⁸.

At an overall ability to reduce infant mortality by 20%, newborn vitamin A supplementation offers the potential to avert an estimated 200,000 infant deaths each year across Southern Asia. Further, doing so may be expected to lead to increased postnatal health care check ups.

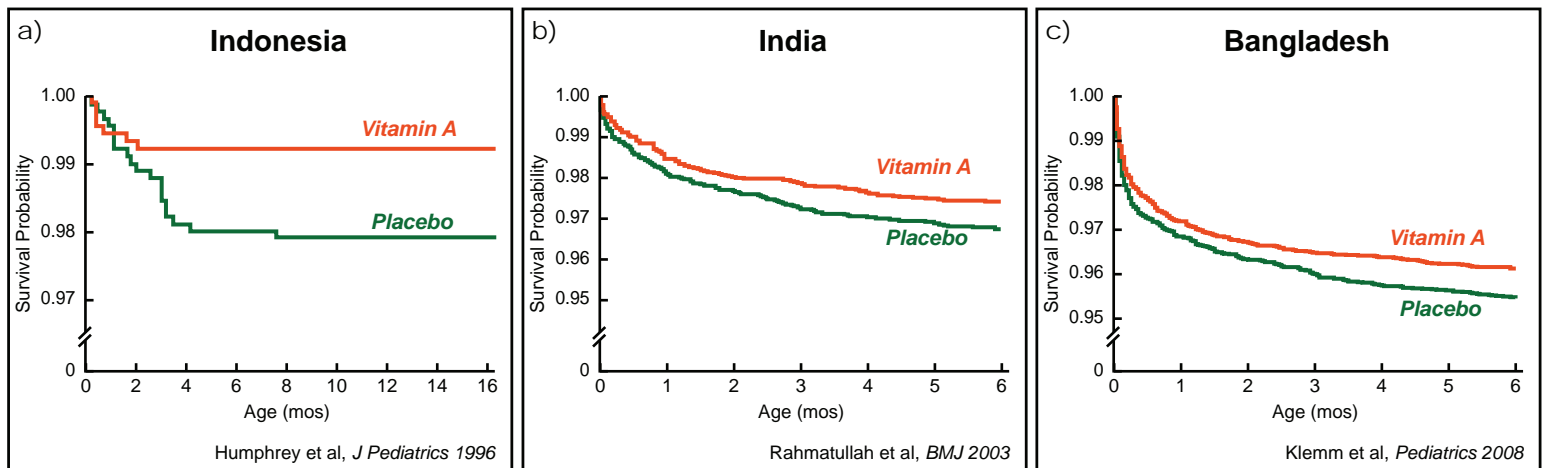
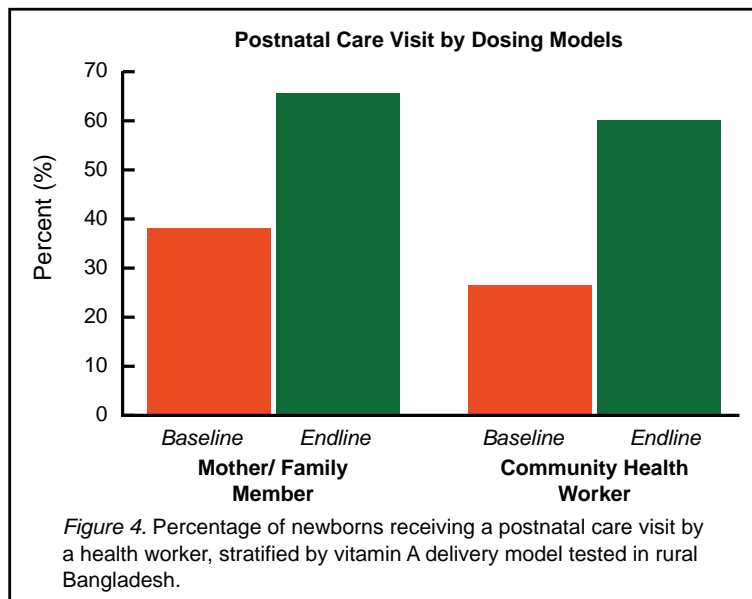
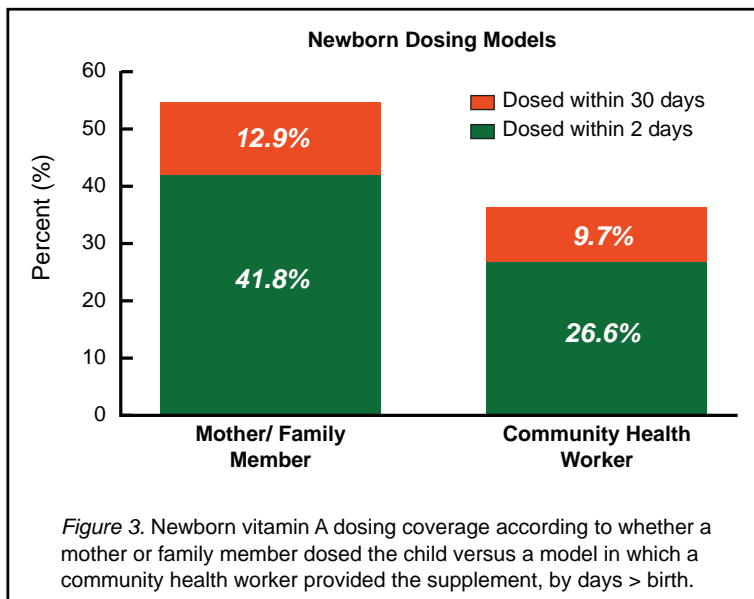


Figure 2. Vitamin A reduced infant mortality in the first 6mos of life in field trials conducted in **a)** Indonesia, **b)** India, and **c)** Bangladesh¹¹⁻¹³. Curves show cumulative survival of infants receiving vitamin A (upper lines), or placebo (lower lines) shortly after birth.

JiVitA is a project of the Center for Human Nutrition of Johns Hopkins University, spanning 19 unions of Gaibandha and Rangpur Districts in rural Northwestern Bangladesh. JiVitA has been conducting community trials, supported by epidemiologic, ethnographic, and laboratory research since 2000, to reveal the impact of public health interventions in order to guide nutrition and health programs and policies in Bangladesh and elsewhere in South Asia.



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