

**Researchers**

Gustavo Bobonis  
University of Toronto

Edward Miguel  
University of California, Berkeley  
Center for Effective Global Action (CEGA)

Charu Puri Sharma  
Pratham

**Timeline**

2001-2003

**Sample Size**

2,392 children in 200 preschools aged 2-6 years old

**Research Implemented by IPA**

No

# Balwadi deworming in India

## Policy Issue

Nearly 40% of children in Africa and Asia suffer from iron deficiency anemia (IDA), which can result in weakness, stunted physical growth, and a compromised immune system. Intestinal helminths (worms) cause chronic intestinal blood loss which contributes to iron deficiency anemia. Worms are prevalent among children in developing countries and are believed to have a negative impact on education, impacting child cognitive and physical development as well as school attendance. Estimates suggest that the impact of iron deficiency anemia—through both physical and cognitive channels—could be as large as 4% of GDP on average in less developed countries, yet there is little rigorous work by economists on the effects of anemia on economic development.

## Context of the Evaluation

Like other developing nations in the region, iron deficiency anemia and Vitamin A deficiency affect many of India's children. Over 69% of preschool aged children in urban Delhi are anemic and 30% suffer from intestinal worms, contributing to the high prevalence of malnutrition. In 2005, 46% of children were found to be underweight, and 38% were found to have stunted growth. Children in this study typically came from families of poor migrant laborers, and have a particularly high risk of anemia and other nutritional deficiencies.

## Details of the Intervention

This study evaluated the impact of NGO Pratham's preschool nutrition and health project in the slums of Delhi, India. The program delivered a package consisting of iron and Vitamin A supplementation and deworming drugs to 2-6 year old children through an existing preschool

network.

Two hundred preschools with a total of 2,392 children were randomly divided into three treatment groups, which were gradually phased into the program over two years. The deworming drugs were taken at “health camps” held at the preschool approximately every three months. Preschool teachers in treatment schools were instructed to administer daily iron doses for thirty school days following each health camp. Children in both treatment and comparison groups were also administered Vitamin A supplements, which in addition to other health benefits, promotes the absorption of iron.

A household survey was administered to a random 30 percent of the child population from each preschool both at the baseline and then again before the final group was phased into the program. Hemoglobin (Hb) tests (to measure anemia) and parasitological tests (to measure the presence of worms) were administered in conjunction with the household survey. Child height and weight were measured during each health camp, and participation data was collected during monthly, unannounced visits to each preschool.

## Results and Policy Lessons

*Child Weight Gain:* Large gains in child weight—roughly 0.5 kg on average—were found in the treatment schools relative to comparison schools over the two-year study period. No gains in average child height were found, but this pattern makes sense from a clinical standpoint: iron supplementation is thought to reduce acute malnutrition in the short-run by improving the absorption of micronutrients and increasing appetite, but improvements in chronic malnutrition are not expected over short periods.

*Impact on School Attendance:* Average preschool participation rates increased sharply by 5.8 percentage points among treated children, reducing preschool absenteeism by roughly one fifth.

Weight gains and school-participation improvements were most pronounced for sub-groups with high baseline anemia rates, in particular, for girls and children in low socioeconomic status areas.

Given the low cost of the intervention (averaging approximately US\$1.70 per additional year of schooling induced for one child), these results suggest that the package of iron, Vitamin A and deworming drugs is a highly cost-effective means of improving child school participation and health in a poor urban setting where anemia and worm infections are widespread.

March 01, 2013