

**Impact of the Mexican Program for Education, Health and Nutrition (Progresa)
on Rates of Growth and Anemia in Infants and Young Children:
A Randomized Effectiveness Study**

Rivera JA, Sotres-Alvarez D, Habicht JP, Shamah T, Villalpando S, "Impact of the Mexican Program for Education, Health and Nutrition (Progresa) on Rates of Growth and Anemia in Infants and Young Children : A Randomized Effectiveness Study." *JAMA*. 2004; 291:2563-2570.

Abstract:

Context: Malnutrition causes death and impaired health in millions of children. Existing interventions are effective under controlled conditions; however, little information is available on their effectiveness in large-scale programs.

Objective: To document the short-term nutritional impact of a large-scale, incentive-based development program in Mexico (Progresa), which included a nutritional component.

Design, Setting, and Participants: A randomized effectiveness study of 347 communities randomly assigned to immediate incorporation to the program in 1998 (intervention group; n = 205) or to incorporation in 1999 (crossover intervention group; n = 142). A random sample of children in those communities was surveyed at baseline and at 1 and 2 years afterward. Participants were from low-income households in poor rural communities in 6 central Mexican states. Children (N = 650) 12 months of age or younger (n = 373 intervention group; n = 277 crossover intervention group) were included in the analyses.

Intervention: Children and pregnant and lactating women in participating households received fortified nutrition supplements, and the families received nutrition education, health care, and cash transfers.

Main Outcome Measures: Two-year height increments and anemia rates as measured by blood hemoglobin levels in participating children.

Results: Progresa was associated with better growth in height among the poorest and younger infants. Age- and length-adjusted height was greater by 1.1 cm (26.4 cm in the intervention group vs 25.3 cm in the crossover intervention group) among infants younger than 6 months at baseline and who lived in the poorest households. After 1 year, mean hemoglobin values were higher in the intervention group (11.12 g/dL; 95% confidence interval [CI], 10.9-11.3 g/dL) than in the crossover intervention group (10.75 g/dL; 95% CI, 10.5-11.0 g/dL) who had not yet received the benefits of the intervention ($P = .01$). There were no differences in hemoglobin levels between the 2 groups at year 2 after both groups were receiving the intervention. The age-adjusted rate of anemia (hemoglobin level <11 g/dL) in 1999 was higher in the crossover intervention group than in the

intervention group (54.9% vs 44.3%; $P = .03$), whereas in 2000 the difference was not significant (23.0% vs 25.8%, respectively; $P = .40$).

Conclusion: Progesa, a large-scale, incentive-based development program with a nutritional intervention, is associated with better growth and lower rates of anemia in low-income, rural infants and children in Mexico.

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