

03/2008

The effect of rainfall during gestation and early childhood on adult height



This work collects the results of a study in a foraging-horticultural society of native Amazonians in Bolivia, the Tsimane'. The objective was to determine if the rainfall during gestation and early childhood could affect adult height, a step to understanding the influence of the environment on human development.

Recent research documents the effects of adverse conditions during gestation and early childhood on growth responses and health throughout life. For example, and specially in subsistence societies, the amount and variability of rains might affect the production of food, generate changes in levels of physical activity, and increase pathogens exposure, all factors that affect growth and thereby height on adulthood.

Using 2005 data from 211 women and 215 men (people over 20 years of age) from a foraging-horticultural society of native Amazonians in Bolivia (Tsimane'), we estimate the association between (a) adult height and (b) rainfall amount and variability during three stages in the life cycle: gestation, birth year, and infancy (years 2–5).

Rainfall amount and variability during gestation and birth year bore weak associations with adult height. However, rainfall variability during years 2–5 of life bore a negative association with adult female height. Among women, a 10% increase in the coefficient of variation of

rainfall during years 2–5 was associated with 1 to 2 cms lower adult height. We did not find an association between rainfall at infancy and adult height.

Our data suggest that the protective role of placental physiology and breastfeeding during the first year of live offer an effective protection against climate perturbations. Our data also suggests that environmental perturbations that take place after the cessation of weaning seem to leave the strongest effect on adult height, and specially among women. The difference might have to do with intra-household allocation of resources in favor of boys during and after mishaps, or with differences in physiology between men and women that make girls more vulnerable to environmental perturbations.

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References

“The effect of rainfall during gestation and early childhood on adult height in a foraging and horticultural society of the Bolivian Amazon” Godoy, R; Tanner, S; Reyes-Garcia, V; Leonard, WR; Mcdaie, TW; Vento, M; Broesch, J; Fitzpatrick, IC; Giovannini, P; Huanca, T; Jha, N. AMERICAN JOURNAL OF HUMAN BIOLOGY, 20 (1): 23-34 JAN-FEB 2008

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