

Four decades of socioeconomic inequalities and secular changes in the physical growth of Guatemalans

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Guatemalans remain some of the shortest people in the world with high rates of growth faltering. It is unknown if previously reported moderate secular increases in Guatemalan heights have benefitted individuals of all socioeconomic status (SES), and whether secular changes have taken place in weight, body mass index and grip strength. Longitudinal data of 40,484 Guatemalans in height, weight, body mass index and grip strength were modelled using Super Imposition by Translation and Rotation. Resulting Z-scores, summarising growth in size, timing and intensity were compared between five SES groups for males (N=21,788) and females (N=16,844) born between 1955 and 1993 in and around Guatemala City. The difference between the lowest and highest SES in height reduced from -2.0 (95% CI -2.2 to -1.9) to -1.4 (95% CI -1.5 to -1.3)SD in males, and from -2.0 (95% CI -2.1 to -1.9) to -1.2 (95% CI -1.3 to -1.2) in females between 1960-1990. Inequalities between the groups were also reduced for weight, BMI and grip strength over the four decades studied, largely due to increased size of the lowest two SES groups (state-schooled Ladinos and the ethnic Maya). The higher SES showed rapid weight increases compared to height, combined with a pattern of plateauing grip strength. In the presence of such opposing patterns of secular trends within a population, national averages of anthropometric outcomes are not informative of whole population health. The observed inequalities and secular changes likely reflect early life environmental exposures.

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