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Title: Secular trend in body weight of Rhesus macaques (*Macaca mulatta*) at Cayo Santiago

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Abstract: Secular trend in body weight is an indicator of environmental adaptation and changes in nutrition and health over time. In this study, we examined body weight of *Macaca mulatta* from Cayo Santiago to investigate how body weight changed in past 80 years. Rhesus macaques were introduced from India to the Caribbean island in 1938, and the colony history was characterized by fluctuations in resource provisioning, population dynamics, and medical care, in addition to acclimation. We collated body weight data of 921 females and 1202 males born between 1938 and 2009, collected by researchers between 1956 and 2014. All subjects were categorised by sex, partitioned into five period cohorts based on colony conditions at the time of their birth (1938-55, 1956-68, 1969-74, 1975-83, 1984-2009), and body weights for each cohort were calculated at different age-intervals (yearly from 0-1 to 5-6, then 6-10 and 11-15). Results revealed that overall, males and females alike, in early age-intervals (0-4 years), the 1938-55 cohort had the lightest body weight, while in the young adulthood age-intervals (6-10 years) the 1969-74 cohort had the heaviest body weight. This latter cohort experienced low population densities, unlike subsequent generations (1975-83), and a protein increase in provisioning relative to previous generations (1956-68). However, the most recent cohort (1984-2009) displayed the lowest mean body weights across almost all age-intervals, despite them receiving a tetanus vaccine (hence longer expectancy), annual population culling and regular provisioning. Further investigation is warranted to differentiate the effects of different environmental factors on the Cayo Santiago colony.

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