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Children of the outer Cook Islands have lower BMI compared to their urban peers

Childhood obesity rates have risen globally and especially among Pacific Island children.[1]

In the recent *NZMJ* publication[2] regarding obesity management, Carroll et al point to the need for changes in lifestyle at a personal level and note that adherences to the intervention and hence behavioural change is a predominant factor in success. However, Pacific Island children are also thought to be genetically large and this genetic predisposition may well weaken resolve to address lifestyle issues through effective intervention[3] if obesity is seen as part of the Pacific Island phenotype and thus out of personal control.

This contribution of the Pacific Island phenotype could be put in perspective by comparing Pacific Island children who are not subject to urban lifestyle influences to genetically similar populations who are.

One of us (DS) in 2012 had the opportunity to observe children in the remote Northern Group of the Cook Islands. The islands are between 270 and 737 nautical miles from the most populated island of Rarotonga in the South. Some of these remote islands have no airstrip and are supplied by occasional freighters.

There are no shops and the diet is essentially taro, coconut and seafood. The main imported items are rice and sugar. There is no distraction from regular exercise and no screen time. Most children were seen as part of a general physical check up and height and weight were measured. The impression was that these children were not obese.

Cook Island Māori are the predominant ethnicity in the Northern Islands (97%),[4] making this group ethnically comparable to children in Rarotonga, and children identified as Cook Island Māori living in Auckland, New Zealand. We thus took the opportunity to compare the body mass index (BMI) of the Northern Island children with BMI of children in Rarotonga and Cook Islanders in Auckland.

The Northern Island data excluded children with medical conditions that may affect growth and those older than primary school age. Based on the 2011 census count, our sample of children represents around 40% of the population under 15 years. The Rarotonga data was collected by us from randomly selected primary school children. The Auckland Cook Island children data were from the Pacific Islands Family Study (PIF), a longitudinal study of Pacific Island children living in Auckland.[5]

For our comparison a single time point BMI from each Cook Island primary school aged child in the PIF was randomly selected. BMI were converted to age and sex corrected standard deviation scores (SDS) based on the World Health Organization (WHO) standards.[6]

On average the BMI SDS of the children living in the Northern Cook Islands was almost one SDS lower than that of Cook Island children living in Auckland, with children in Rarotonga in-between (Table 1). That children of the Northern Islands

have a higher average BMI than the WHO standard (zero) supports the notion that even with non-obeseogenic lifestyles, Pacific children have greater BMI than European, and other ethnicities.

Table 1. Mean body mass index standard deviation score (BMI-SDS) of Cook Islands children from the Northern Cook Islands, Rarotonga and Auckland

Location	N	Female %	Age mean (y)	Age range	Mean BMI-SDS	95% confidence interval
Northern Cook Islands	172	49	7.3	(1.5–11.9)	0.72	(0.57–0.87)
Rarotonga	95	49	8.9	(3.2–14.3)	1.29	(1.08–1.50)
Auckland	213	61	7.3	(2.1–11.9)	1.62	(1.46–1.77)

Assuming these Cook Island groups are genetically similar, then the difference in BMI may be understood in terms of different environmental influences over and above genetic susceptibility.

These results are observational and we provide no direct evidence of lifestyle differences between the groups, but we think the data indicates that the further Cook Island children are away from the Northern Islands lifestyle the heavier they become, suggesting that lifestyle change in urban communities is worthwhile and could meet with success in managing Pacific Island childhood obesity.

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