

Tracking the Obesity Epidemic: New Zealand 1977–2003

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Foreword

Obesity has long been recognised by the Ministry of Health as a major public health issue. ‘Improving nutrition’ and ‘reducing obesity’ are priority objectives in the New Zealand Health Strategy, launched by the Minister of Health in December 2000. In a study carried out jointly by the Ministry and the University of Auckland, higher than optimal body mass index (BMI, weight adjusted for height) was estimated to contribute to approximately 3200 deaths per year in New Zealand, mostly through type 2 diabetes, ischaemic heart disease and stroke.

This burden is growing, as mean BMI and the prevalence of obesity continue to increase in New Zealand, the latter doubling over the past quarter century in both males and females. Until now we have lacked a description of the shifts over time in the full BMI distribution. Such a description is the purpose of the present study. Using data from four national health and nutrition surveys, we have applied graphical techniques to visualise trends in the BMI distribution among adults, for the total New Zealand population from 1977 to 2003, and for Māori from 1989 to 2003. The results not only provide a richer and more comprehensive picture of the ‘obesity epidemic’ than previously available, but also give some cause for cautious optimism that the epidemic can be contained and even reversed. This report provides the first indication that the rate of growth of the epidemic – while still positive – may be slowing among some population groups. However, there is no reason for complacency and the possibility that the apparent slowing may be at least partly artefactual cannot be excluded. The BMI data from the next round of health and nutrition surveys (scheduled for 2005–07) are therefore awaited with keen interest.

In the interim, this report on *Tracking the Obesity Epidemic: New Zealand 1977–2003* provides detailed information that will be useful in further developing and evaluating the Ministry’s Healthy Eating – Healthy Action strategy, launched by the Minister of Health in March 2003, and the strategy’s Implementation Plan, launched by the Minister in June 2004. In fact, this report may well represent the most thorough and comprehensive description of a national ‘obesity epidemic’ yet produced for any country. In particular, its focus on the full BMI distribution and its use of innovative graphical techniques to visualise and quantify shifts in this distribution provide a solid evidence base for policy and planning. While the report is national in scope, District Health Boards and primary health organisations (PHOs) may find this information of value in framing their own response to the epidemic. Indeed, as the setting in which population health meets personal health care, PHOs in particular have a critical role to play in bringing the epidemic under control and minimising its harm.

We invite readers to comment on the content, relevance and direction of this report. Please direct any comments to Public Health Intelligence, Ministry of Health, PO Box 5013, Wellington.



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Executive Summary

Graphical methods have been applied to visualise trends in the body mass index (BMI) distribution of the New Zealand adult population from 1977 to 2003 by age, gender, ethnicity and socioeconomic position.

The BMI data are derived from measured weight and height from nationally representative samples of New Zealanders examined in four serial cross-sectional prevalence surveys: the 1977 National Diet Survey ($n = 1761$), the 1989 Life in New Zealand Survey ($n = 2924$), the 1997 National Nutrition Survey ($n = 4100$) and the 2003 New Zealand Health Survey ($n = 10,813$). For Māori, there were insufficient respondents in the earliest (1977) survey, so analysis is restricted to the 1989 to 2003 period.

BMI distributions are described using frequency histograms after kernel smoothing (kernel density plots), cumulative distribution functions, and Tukey mean-difference plots. Trends in the prevalence of ‘overweight’ (BMI 25.0–29.9 for European/Other and 26.0–31.9 for Māori and Pacific ethnic groups), ‘obesity’ (BMI ≥ 30.0 and 32.0, respectively) and ‘extreme obesity’ (BMI ≥ 40.0 for all ethnic groups) are also described.

Three patterns of BMI distributional shift are theoretically possible: uniform right shift of the whole distribution (universal pattern), increased skewness (high-risk subgroup pattern), or both combined (mixed pattern).

Pooling all adult ages and time periods, the overall visualisation of the ‘obesity epidemic’ from 1977 to 2003 (total population) and from 1989 to 2003 (Māori population) is shown below (Figures 1–4). There were too few Pacific or Asian respondents in any but the most recent survey (ie, 2003) to allow separate analysis of BMI distributional shifts for these ethnic groups.

Figure 1: Changes in the BMI distribution, total population, ages pooled, 1977–2003

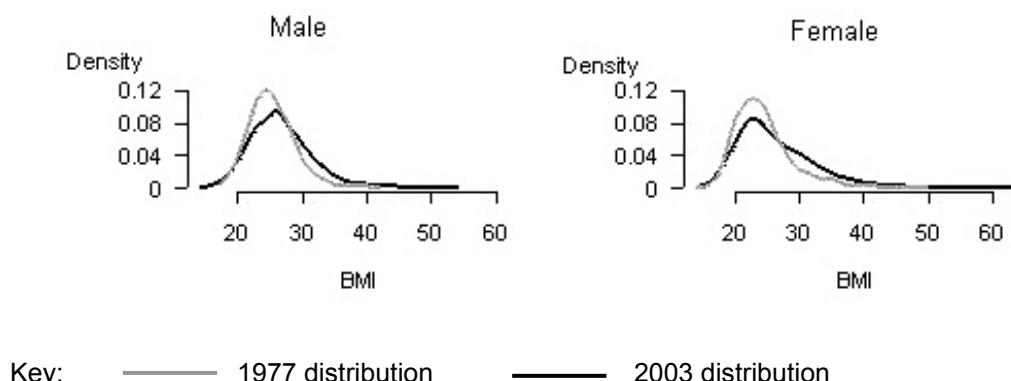


Figure 2: Prevalence of overweight and obesity, total population, ages pooled, 1977–2003

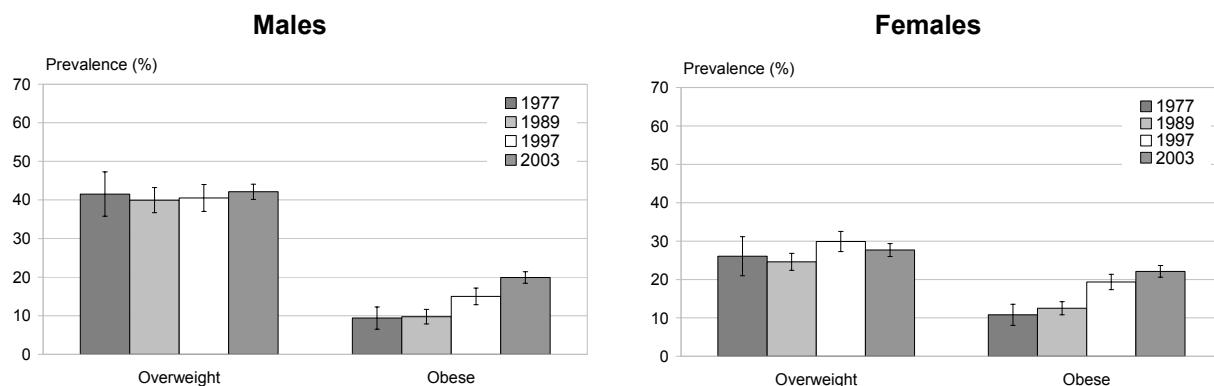
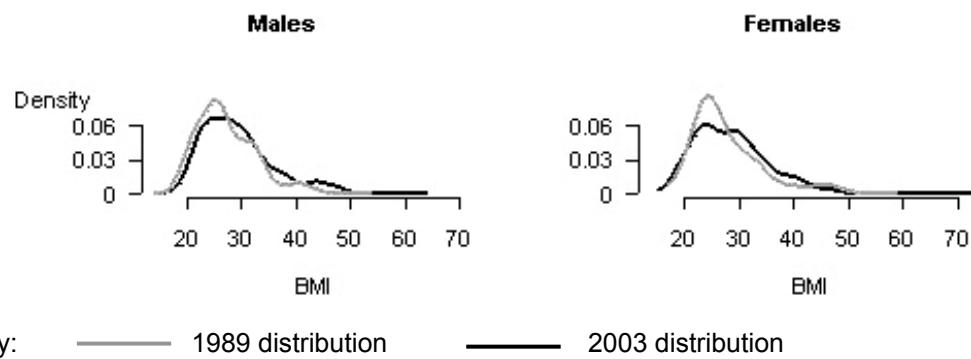
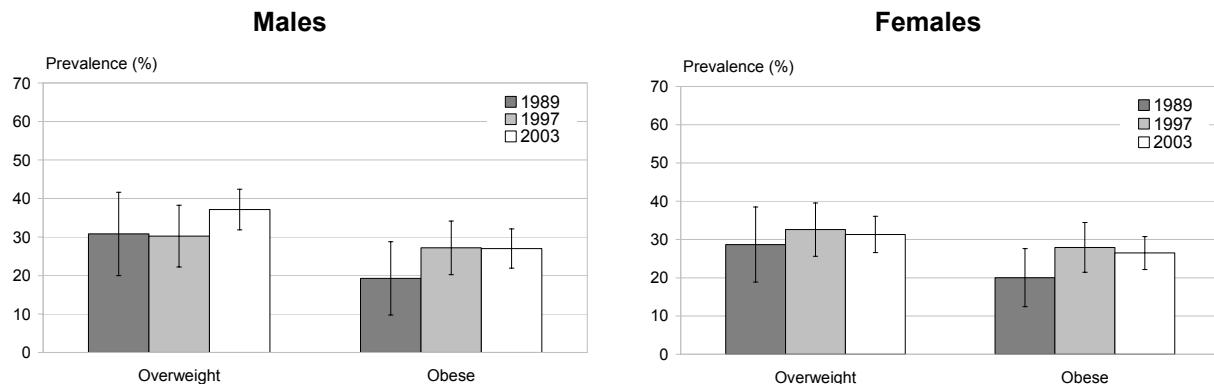


Figure 3: Changes in the BMI distribution, Māori population, ages pooled, 1989–2003



Key: ——— 1989 distribution ——— 2003 distribution

Figure 4: Prevalence of overweight and obesity, Māori population, ages pooled, 1989–2003



Examination of the pattern of BMI distributional shifting over time shows – despite some variation across ethnic groups, age groups and periods – a mixed pattern with little change at the lower percentiles of the BMI distribution and most of the increase in BMI being concentrated at the higher percentiles (ie, increasing skewness). This is compatible with differential susceptibility when individuals are exposed to an increasingly ‘obesogenic’ environment (Swinburn et al 1999).

This pattern of distributional shifting is reflected in increasing median (or mean) BMI, with much greater increase at higher percentiles (eg, the 90th percentile). It is also mirrored in the dramatic rise in obesity prevalence seen over the quarter century: from 9 percent (males) and 11 percent (females) in 1977 to 20 percent and 22 percent, respectively, in 2003, accompanied by near-stable overweight prevalence (42 percent for males and 28 percent for females).

Although differing in detail, the overall pattern is similar for Māori over the 1989–2003 period. Median and mean BMI increased, yet the relative increase was greater at higher percentiles of the BMI distribution. In keeping with this pattern of distributional shifting, obesity prevalence increased from approximately 20 to 27 percent (both genders), while overweight prevalence remained almost steady at approximately 30 percent for females and increased from 31 to 37 percent in males.

A socioeconomic gradient in the BMI distribution (with lower socioeconomic groups having more right-shifted distributions) was evident among females since (at least) 1989, yet was only just beginning to emerge among males in 2003.

This overall picture disguises significant differences between age groups, genders and time periods within both the total population and the Māori population. More detailed analysis shows that the ‘epidemic’ grew relatively slowly in the 1970s and early to mid-1980s (especially among non-Māori and among males), then accelerated rapidly in the late 1980s to mid-1990s, only to slow once again in the late 1990s to early 2000s among Māori, as well as among non-Māori females (but not non-Māori males). Yet the epidemic continues to grow, and the apparent slowing in the growth rate of the epidemic among some population subgroups could be due to differences in survey design. Therefore, this finding cannot be confirmed until data from the next round of health and nutrition surveys (scheduled for 2005–2007) are available.

Key policy and monitoring implications arising from this detailed analysis of shifts in the population’s BMI distribution over the past quarter century include the following.

- Mean BMI and obesity prevalence are continuing to increase, although possibly less rapidly now than in the 1990s, at least among non-Māori females and Māori of both genders. This apparent slowing could reflect technical differences between the surveys, especially for Māori (for whom sample sizes were small).
- The apparent slowing in the growth rate of the ‘epidemic’ in some population groups needs to be confirmed in future surveys, but even if true, gives no reason for complacency. Rather, this finding should invigorate intersectoral control efforts and encourage the setting of more ambitious targets.
- The pattern of shifting of the BMI distribution is compatible with a mixed rather than a universal pattern – suggesting that strategies aimed at reducing the obesogenicity of the environment could usefully be complemented with targeted strategies aimed at high-risk groups.
- BMI distributional shifting began earliest and has advanced furthest among middle-aged women, but now involves both sexes, Māori and non-Māori, and has spread to younger and older age groups.

- Increased efforts to monitor and control childhood obesity are critical for the health of future generations of adults as results of the 2002 National Children's Nutrition Survey suggest that 10 percent of school age children are now obese. Thus any slowing in the growth rate of the epidemic among adults could be temporary and may reverse as the current generation of children reach adulthood.
- Socioeconomic inequality in the distribution of BMI is marked among females and is beginning to emerge among males. Strategies tailored to the needs of lower socioeconomic groups are needed to reverse this trend.
- Monitoring of BMI distributional shifting provides a basis for the projection of future BMI-related burden. This information can also be used to assess the effectiveness of intervention strategies and to model the potential impact of different policy options.
- Such information may not only be of use at the national policy level, but may also assist District Health Boards and primary health organisations in achieving their obesity-related objectives.