

BMI transitions in Australian women: amount and causes of weight change associated with progression from healthy to unhealthy BMI over 16 years.

Wendy J. Brown¹ Enamul Kabir²; Sjaan Gomersall^{1,3}; Bronwyn Clark^{1,4}

¹School of Human Movement and Nutrition Sciences, ³School of Health & Rehabilitation Sciences, ⁴School of Public Health, The University of Queensland, Australia, and ²University of Southern Queensland

Introduction and Aims

Progression from healthy weight to overweight or obesity is associated with numerous health problems in young adult women. The aims were to track BMI over 16 years in women who had a healthy BMI in 1996 (when they were 18-23), to calculate rates of weight change associated with maintenance and/or change in BMI, and to examine the determinants of these changes.

Methods

4881 women with healthy BMI at baseline, and either healthy, overweight or obese BMI at 16-year follow-up, reported demographic characteristics, weight, height, health and health behaviours in six surveys of the Australian Longitudinal Study on Women's Health between 1996 and 2012. Associations between sociodemographic and behavioural determinants of BMI maintenance and change were estimated using bivariate logistic regression and generalised estimating equations (GEE).

Results

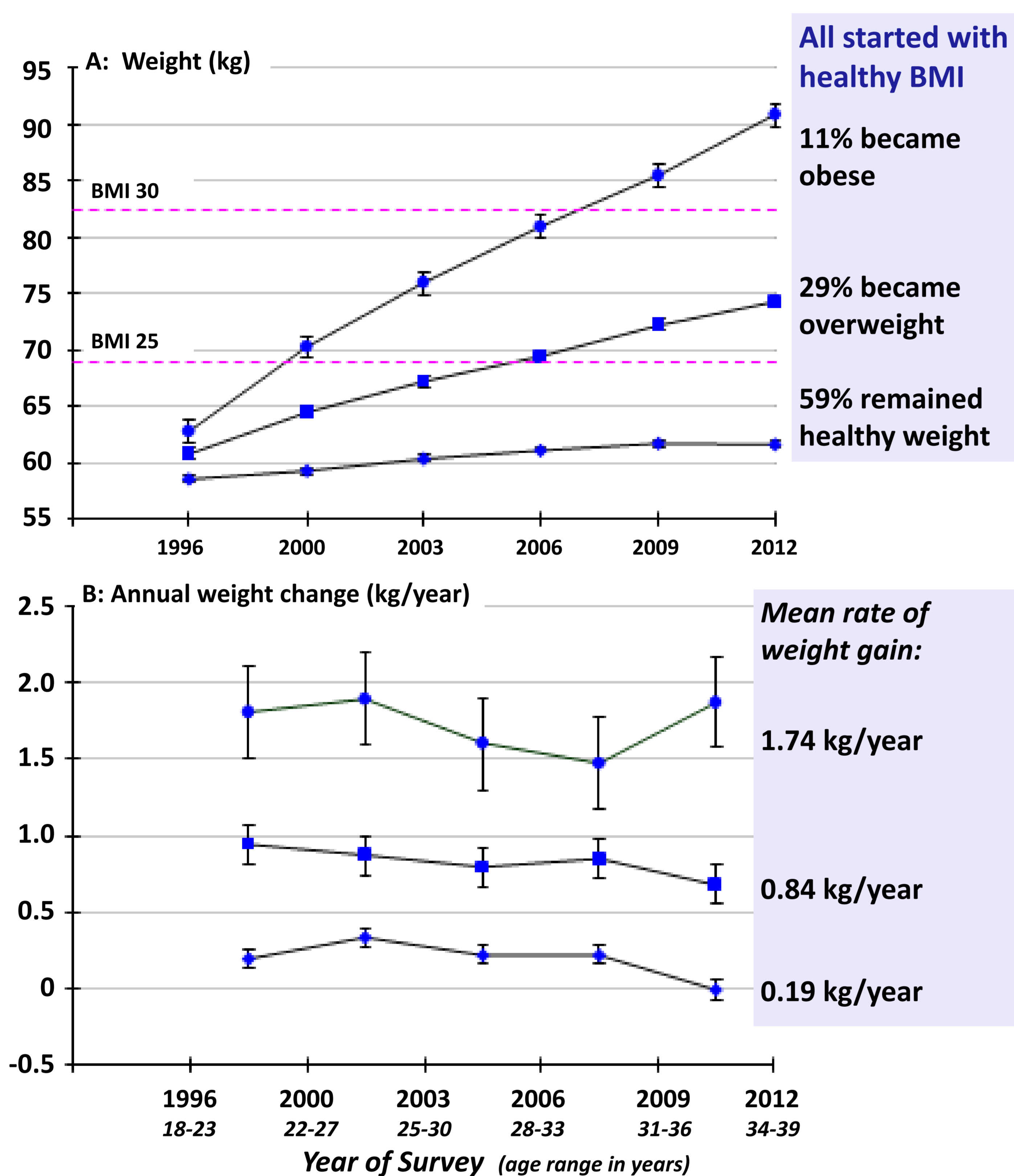


Figure 1: 16 year change in weight and rates of weight change in young adult women

A: Average weight (kg) of women in each BMI transition group, at each survey, from 1996 to 2012. Dashed horizontal lines show BMI of 25 and 30 kg/m², calculated for a woman of average height (1.66 m).

B: Average annual rate of weight change (kg/year) in each survey interval. NB Data points are between the year/age markers, signifying the rate of weight gain between consecutive surveys.

Key: ◆ women with healthy BMI in both 1996 (age 18-23) and 2012 (age 34-39) (N=2903);
 ■ women with healthy BMI in 1996 and overweight BMI in 2012 (N=1414);
 ● women with healthy BMI in 1996 and obese BMI in 2012 (N=564).
 (Bars indicate 95% confidence intervals).

	Odds ratio	95% confidence Interval
Education		
Less than year 12	1.00	---
Year 12	0.88	0.66-1.18
Certificate/diploma	0.87	0.66-1.15
University degree	1.50	1.14-2.00
Marital Status		
Single	1.00	---
Married	1.09	0.99-1.19
Separated, divorced or widowed	0.77	0.66-0.89
Smoking Status		
Never smoked	1.00	---
Ex-smoker	1.02	0.88-1.18
Smoke <10 cigarettes/day	1.02	0.83-1.26
Smoke ≥ 10 cigarettes/day	0.64	0.50-0.81
Alcohol (standard drinks/week)		
Non-drinker/rare (≤0.75)	1.00	---
Low (>0.75 - ≤ 14)	1.25	1.10-1.41
Hazardous/harmful (>14)	0.88	0.66-1.17
Physical Activity (MET.min/week)		
None (<40)	1.00	---
Low (40-<500)	1.18	1.00-1.40
Moderate (500-<1000)	1.23	1.03-1.47
High (≥1000)	1.44	1.20-1.72
Sitting Time (h/day)		
Low (<4.5)	1.00	---
Moderate (≥4.5 - <8)	0.87	0.77-0.99
High (≥8)	0.78	0.68-0.91
Energy Intake (kJ/day)		
Very low (<4500)	1.00	---
Low (≥ 4500-<6800)	0.95	0.81-1.11
Moderate (≥ 6800-<9000)	0.84	0.71-1.00
High (≥ 9000-<11200)	0.90	0.73-1.11
Very High (≥ 11200)	0.76	0.58-0.99
Oral Contraceptive Pill		
Non-user	1.00	---
User	0.89	0.80-0.99

Table 1: GEE analyses showing odds ratios and 95% CIs for maintaining a healthy BMI from 1996 to 2012 (N=2903), compared with progressing to either overweight or obese BMI at year 16 (2012; n=1414+564). (Total N= 4881).

- Explanatory variables measured in 2003 (age 25-30) and 2009 (31-36).
- ORs adjusted for all variables in the table, plus area of residence, occupation, work hours and parity (not significant in final model).
- Boldface indicates statistical significance (p<0.05).

Conclusions

- Weight gain trajectories appear to be established early in young adulthood and are characterised by distinct and fairly constant rates of weight gain at this life stage.
- Early detection of higher than optimal rates of weight gain (around 0.2 kg/year), and associated behavioural determinants (physical activity, sitting time, energy intake, smoking) might help to avert progression to overweight and obesity in young adult women.
- Women who are separated, divorced or widowed could be a priority target group for early intervention to prevent weight gain