



overweight and obesity

This chapter reports the prevalence of overweight, obesity and overweight and obesity combined among boys and girls in each school Year and the prevalence of overweight and obesity combined across the socio-demographic measures. Secular trends in the prevalence of overweight and obesity among boys and girls in each Year, for the period 1985-1997-2004, are also reported.

PREVALENCE OF OVERWEIGHT AND OBESITY BY SEX AND YEAR GROUP

Figure 4.1 and Table 4.1 show the prevalence of overweight, obesity and overweight/obesity combined among students in each school Year, for boys and girls separately. The mean, standard deviation, number of valid measures and 5,10,15, 20, 30, 40, 50, 60, 70, 80, 85, 90 and 95 percentiles for height, weight, waist girth and BMI for boys and girls in Years K, 2, 4, 6, 8 and 10 are provided in Appendix L.

Among boys, there was a clear association between Year group and the prevalence of overweight and overweight/obesity combined. The prevalence of overweight/obesity combined rose from 15% among Year K boys to a maximum of 32% among Year 6 boys, then declined to 27% among secondary school boys. The prevalence of overweight followed a very similar pattern. The prevalence of obesity exhibited a similar, although much less marked pattern; rising from 6.6% among Year K boys, peaking at 9.4%

among Year 6 boys then declining to 7.0% among Year 10 boys. Overall, the prevalences of healthy weight, overweight, obesity, and overweight/obesity combined were 75%, 17.3%, 7.7% and 25%, respectively.

Among girls, the association between Year group and the prevalence of overweight and obesity combined was less clear than for boys. The prevalence rose from 21% among Year K girls to 30% among Year 4 girls then fell to 19% among Year 10 girls. The prevalence of overweight was approximately 15% among girls in Years K, 2, 6 and 10, but increased to 22% and 19% among Year 4 and Year 8 girls, respectively. The prevalence of obesity rose from 4.6% among Year K girls to a peak of 7.7% among Year 4 and 6 girls, then declined to 4.2% among Year 10 girls. Overall, the prevalences of healthy weight, overweight, obesity, and overweight/obesity combined were 76.7%, 17.2%, 6.1% and 23.3%, respectively.

The prevalence of overweight and obesity combined was greater among girls than boys in Years K, 2 and 4, but this relationship was reversed for Years 6, 8 and 10. The differences between boys and girls were statistically significant for Years K, 6 and 10. However, the overall differences between boys and girls, combined across age groups, were small.

Figure 4.1. Prevalence of overweight, obesity and overweight/obesity combined among boys and girls in Years K, 2, 4, 6, 8 and 10 (%)

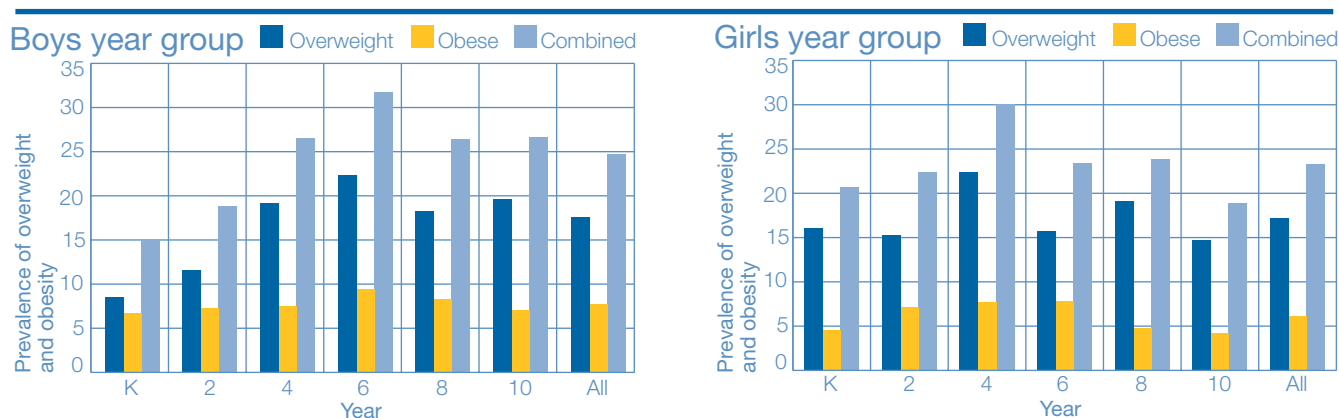


Table 4.1. Prevalence of overweight, obesity and overweight/obesity combined among boys and girls in Years K, 2, 4, 6, 8 and 10 (%)

	Year K	Year 2	Year 4	Year 6	Year 8	Year 10	Overall
Boys							
Healthy weight	85.0	81.2	73.5	68.4	73.7	73.5	75.0
Overweight	8.4	11.6	19.1	22.2	18.2	19.6	17.3
Obese	6.6	7.2	7.4	9.4	8.2	7.0	7.7
Overweight + obese	15.0	18.8	26.5	31.6	26.4	26.6	25.0
Girls							
Healthy weight	79.4	77.6	70.0	76.6	76.2	81.2	76.7
Overweight	16.1	15.3	22.4	15.7	19.1	14.7	17.2
Obese	4.6	7.1	7.7	7.7	4.7	4.2	6.1
Overweight + obese	20.7*	22.4	30.1	23.4*	23.8	18.9*	23.3

* Indicates that the difference in the prevalence of overweight/obesity combined between boys and girls within a school Year is statistically significant at P<.05.

Note: The values shown have been adjusted based on the findings of the response bias study (see Appendix K).

PREVALENCE OF OVERWEIGHT AND OBESITY BY RURALITY, SOCIOECONOMIC STATUS AND CULTURAL BACKGROUND

Figure 4.2 and Table 4.2 show the distribution of overweight and obesity combined for rurality, socioeconomic status and cultural background for boys and for girls in Years K, 2, 4, 6, 8 and 10.

RURALITY

The prevalence of overweight and obesity was higher for urban boys in Years K, 2, 4 and 10, but was lower for urban boys in Years 6 and 8. The difference between urban and rural boys was statistically significant for Kindergarten, but not for any other Year. The differences between urban and rural girls were generally small and none were statistically significant.

Socioeconomic status

Among boys, there appeared to be an inverse association between socioeconomic status and the prevalence of overweight and obesity, although the distribution of overweight by socioeconomic status varied a little by school Year (most notably Year 4). The results for girls also suggested an inverse association between overweight and socioeconomic status. The prevalence of overweight and obesity was lower in the high socioeconomic status tertile than in the low socioeconomic status tertile for every Year group for both sexes, except for Year 4 boys. The difference between the low and high tertiles was statistically significant for Kindergarten boys and Year 10 girls, but no other comparisons were statistically significant.

Cultural background

With regard to the association between cultural background and the prevalence of overweight, boys from a Middle-Eastern cultural background had the highest prevalence of overweight in every school Year. The differences between English-speaking and Middle-Eastern boys approached statistical significance for Years K, 4 and 6. There did not appear to be any other consistent associations among boys.

Among girls, the associations between the prevalence of overweight and cultural background varied substantially across school Years, although the prevalence of overweight/obesity among girls from a Middle-Eastern cultural background was statistically significantly higher for Years 6 and 10. There are two notable features of Figure 4.2. First, the prevalence of overweight increased markedly across school Years among Middle-Eastern girls and, second, the differences between girls from English-speaking, European and Asian cultural backgrounds were very small by Year 10. There were no overweight or obese Year 8 girls from European or Middle-Eastern cultural backgrounds, although it should be noted that few Year 8 girls from these cultural backgrounds participated in SPANS.

Figure 4.2. Prevalence of overweight and obesity combined among boys and girls in Years K, 2, 4, 6, 8 and 10 by rurality, socioeconomic status (SES) and cultural background (%)

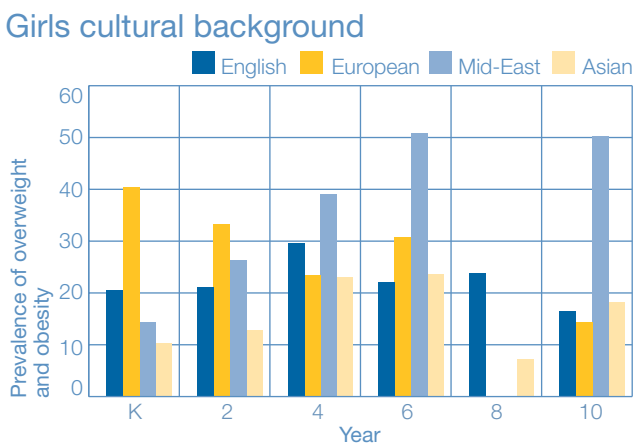
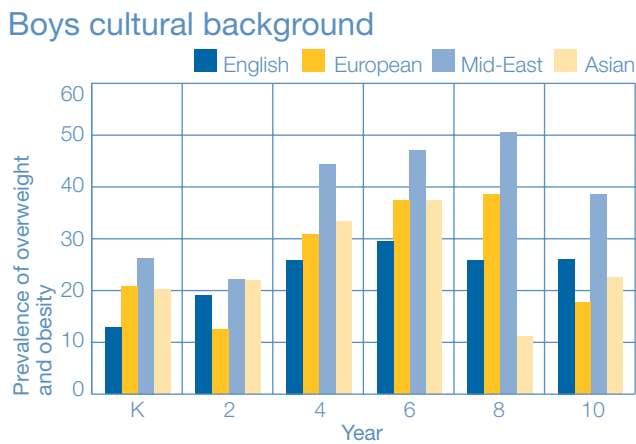
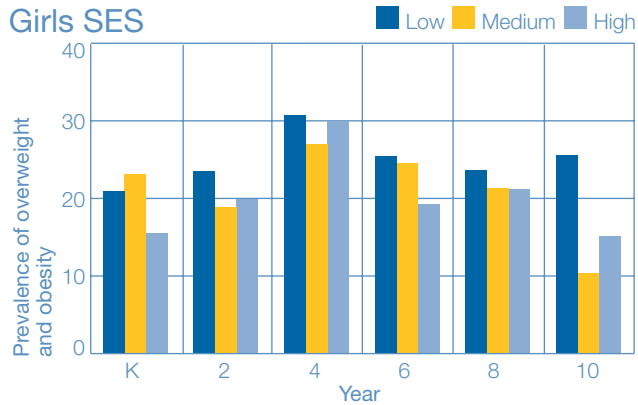
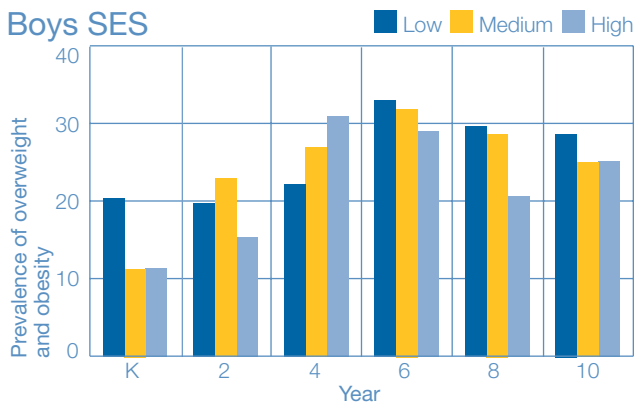
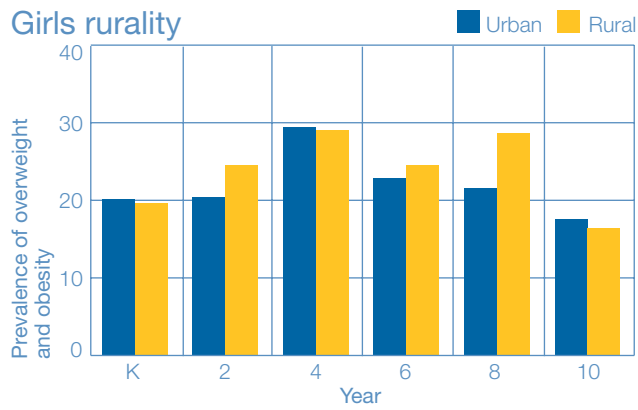
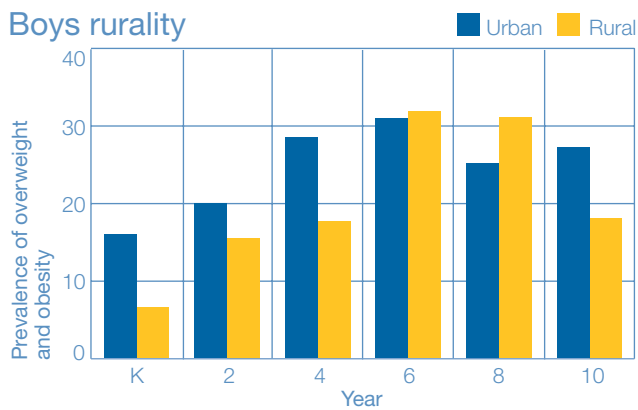


Table 4.2. Prevalence of overweight and obesity combined among boys and girls in Years K, 2, 4, 6, 8 and 10 by rurality, socioeconomic status (SES) and cultural background (%)

	Year K	Year 2	Year 4	Year 6	Year 8	Year 10
Boys						
Rurality						
Urban	16.0	20.0	28.5	30.9	25.2	27.2
Rural	6.5*	15.5	17.7*	31.8	31.1	18.1
SES						
Low	20.3	19.7	22.1	32.9	29.6	28.0
Medium	11.3	22.9	26.9	31.8	28.0	24.9
High	11.4	15.3	30.8	28.9	20.6	25.1
Cultural background						
English-speaking	21.9	19.1	25.0	29.4	25.9	36.1
European	20.0	12.5	30.8	37.5	38.5	17.7
Middle-Eastern	26.3	22.2	44.4	47.1	50.0	38.5
Asian	20.0	21.9	33.3	37.5	11.1	22.0
Girls						
Rurality						
Urban	20.2	20.5	29.6	22.9	21.0	17.6
Rural	19.7	24.7	29.2	24.6	28.8	16.4
SES						
Low	21.2	23.8	31.0	25.8	23.9	25.9*
Medium	23.4	19.1	27.3	24.0	21.6	10.4
High	15.7	20.1	30.0	19.5	21.4	15.3
Cultural background						
English-speaking	20.5	21.2	29.6	22.0	23.9	16.5
European	40.0	33.3	23.5	30.8	0	14.3
Middle-Eastern	14.3	26.3	39.1	50.0*	0	50.0*
Asian	10.0	12.9	23.1	23.7	7.1	18.0

* Indicates a statistically significant difference at $P < .05$. Comparisons are: between urban and rural; low and medium socioeconomic status compared with high socioeconomic status; European, Middle-Eastern and Asian cultural backgrounds compared with English-speaking cultural background. Comparisons are within each sex/Year group category.

TRENDS IN OVERWEIGHT 1985-1997-2004

Table 4.3 shows secular trends in the prevalence of healthy weight, overweight, obesity/overweight and obesity combined between the years 1985, 1997 and 2004 for boys and girls in Years 2, 4, 6, 8 and 10. Figure 4.3 shows the prevalence of overweight and obesity combined between the years 1985, 1997 and 2004 among boys and girls in Years 2, 4, 6, 8 and 10.

Among boys, the increases in the prevalence of overweight and obesity combined between 1985 and 1997 were fairly uniform at 9-10% for each Year group. This was not the case for the period 1997-2004. The change in prevalence was negligible among Year 2 boys, prevalence increased by 4% among Year 4 boys and by 10% among Year 6 boys. Among Year 8 and Year 10 boys, the increases were approximately 6% and 8%, respectively. Because the health consequences associated with obesity are much more serious than the problems associated with overweight, it is concerning to note that the prevalence of obesity increased by at least the same amount as did the prevalence of overweight among Year 6, 8 and 10 boys. It is also informative to examine the average annual rates of change in the prevalence of overweight and obesity. The rate of change either fell or remained stable among Year 2 and Year 4 boys, but increased among Year 6, 8 and 10 boys. That is, among older

boys, the prevalence of overweight and obesity is not only continuing to increase, but the rate of increase is accelerating.

Like boys, a fairly uniform increase of 7-10% in the prevalence of overweight and obesity between 1985 and 1997 occurred among girls. For the period 1997-2004, although there was no increase in the prevalence of overweight and obesity among girls in Years 2, 6 and 10, the prevalence increased by 9% and 5.6% among girls in Years 4 and 8, respectively. In almost all Years, the increases in the prevalence of overweight and of obesity were markedly smaller among girls than among boys. In contrast to the findings for boys, the rates of increase in the prevalence of overweight and obesity between 1997 and 2004 were either lower than or roughly equal to the rates of increase between 1985 and 1997 in all Years except Year 4. That is, the rate of increase appears to be slowing among girls. The average annual rates of increase in the prevalence of overweight and obesity for the period 1997-2004 were lower among girls than boys in every school Year except Year 4.

Regardless of the differences between boys and girls over time, the data lead to a clear conclusion. Overall, the prevalence of overweight and obesity combined among young people in NSW has risen from 20% in 1997 to 25% in 2004.

Figure 4.3. Prevalence of overweight and obesity combined among boys and girls in Years 2, 4, 6, 8 and 10, for the 1985, 1997 and 2004 NSW data sets (%)

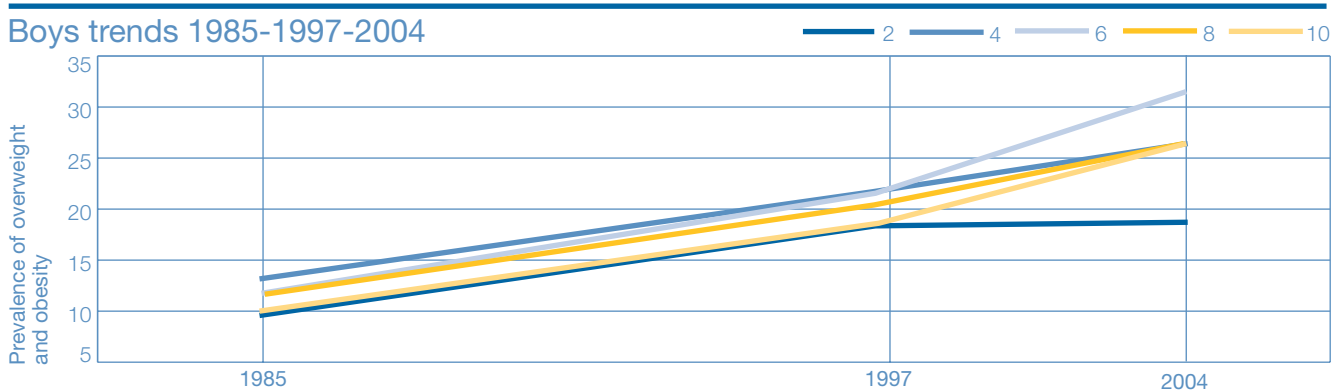


Figure 4.3. Prevalence of overweight and obesity combined among boys and girls in Years 2, 4, 6, 8 and 10, for the 1985, 1997 and 2004 NSW data sets (%) (continued)

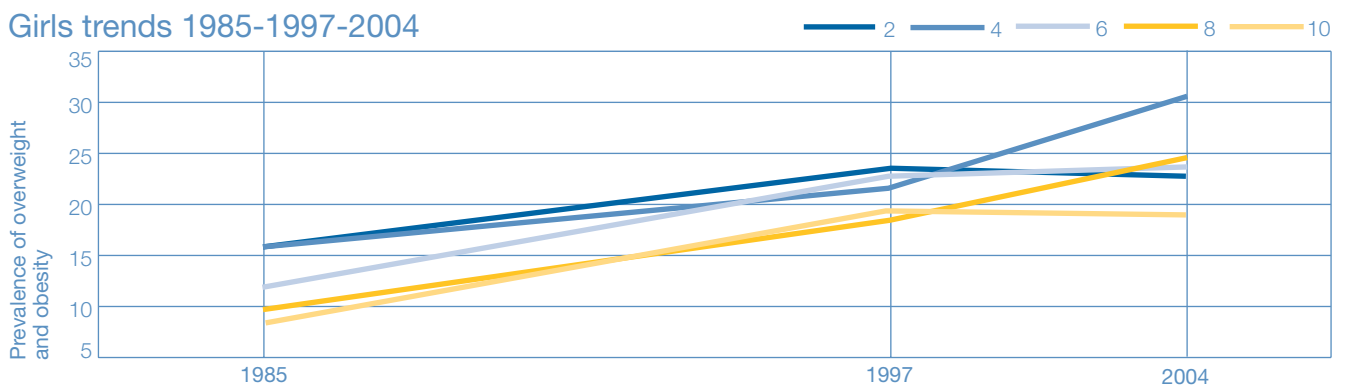


Table 4.3. Prevalence of healthy weight, overweight, obesity and overweight/obesity combined (O+O) in the 1985, 1997 and 2004 NSW data sets and the average annual change in the prevalence of overweight/obesity between subsequent surveys

Year (n)	Healthy weight (%)	Overweight (%)	Obese (%)	O+O (%)	Average increase per annum (%)
Boys					
Year 2					
1985 (149)	90.6	8.1	1.3	9.4	–
1997 (437)	81.7	13.0	5.3	18.3	0.74
2004 (545)	81.3	11.6	7.2	18.7	0.06
Year 4					
1985 (111)	87.4	9.9	2.7	12.6	–
1997 (446)	78.0	14.6	7.4	22.0	0.78
2004 (597)	73.5	19.1	7.4	26.5	0.64
Year 6					
1985 (142)	88.7	9.2	2.1	11.3	–
1997 (508)	78.5	17.1	4.3	21.5	0.85
2004 (598)	68.4	22.2	9.4	31.6	1.40
Year 8					
1985 (114)	88.6	11.4	0.0	11.4	–
1997 (413)	79.7	15.5	4.8	20.3	0.75
2004 (539)	73.7	18.2	8.2	26.4	0.87
Year 10					
1985 (112)	90.2	8.9	0.9	9.8	–
1997 (387)	81.4	15.8	2.8	18.6	0.73
2004 (849)	73.5	19.6	7.0	26.5	1.13
All ages					
1985 (628)	89.2	9.4	1.4	10.8	–
1997 (2,191)	79.8	15.2	5.0	20.2	0.78
2004 (3,128)	73.9	18.4	7.7	26.1	0.84

Table 4.3. Prevalence of healthy weight, overweight, obesity and overweight/obesity combined (O+O) in the 1985, 1997 and 2004 NSW data sets and the average annual change in the prevalence of overweight/obesity between subsequent surveys (%) (continued)

Year (n)	Healthy weight (%)	Overweight (%)	Obese (%)	O+O (%)	Average increase per annum (%)
Girls					
Year 2					
1985 (139)	84.9	11.5	3.6	15.1	–
1997 (384)	77.3	15.4	7.3	22.7	0.63
2004 (576)	77.6	15.3	7.1	22.4	-0.04
Year 4					
1985 (125)	84.8	13.6	1.6	15.2	–
1997 (377)	79.1	16.7	4.2	21.0	0.48
2004 (599)	70.0	22.4	7.7	30.1	1.30
Year 6					
1985 (130)	88.5	10.8	0.8	11.5	–
1997 (386)	77.7	17.6	4.7	22.3	0.90
2004 (610)	76.6	15.7	7.7	23.4	0.16
Year 8					
1985 (102)	91.2	8.8	0.0	8.8	–
1997 (364)	82.1	14.6	3.3	17.9	0.76
2004 (508)	76.2	19.1	4.7	23.8	0.84
Year 10					
1985 (103)	92.2	6.8	1.0	7.8	–
1997 (294)	81.9	16.1	2.1	18.2	0.87
2004 (600)	81.2	14.7	4.2	18.8	0.09
All ages					
1985 (599)	88.0	10.5	1.5	12.0	–
1997 (1,803)	79.5	16.1	4.4	20.5	0.71
2004 (2,893)	76.3	17.4	6.3	23.7	0.46

DISCUSSION

Among boys, the prevalence of both overweight and obesity rose from Year K to a peak in Year 6 before stabilising in Years 8 and 10. From Year 4 onwards, the prevalence of overweight and obesity combined was over 25%. Almost 10% of Year 6 boys were obese. A similar pattern occurred among girls, but the peak was reached in Year 4. On average, the prevalence of overweight and obesity combined was well over 20% among girls. Almost 8% of Year 4 and Year 6 girls were obese. This pattern suggests that the pubertal growth spurt may be responsible for the decline in overweight after the peak and may be a significant opportunity for primary school aged children who are overweight to achieve a healthy weight. Overweight or obese adolescents have a high likelihood of being overweight or obese as young adults and remaining so for the rest of their lives (Guo & Chumlea, 1999).

There did not appear to be an association between place of residence and overweight. In contrast, the prevalence of overweight and obesity did appear to increase with declining socioeconomic status. The strength of the association between socioeconomic status and overweight becomes steadily more marked as people age. The most striking finding with regard to associations between cultural background and overweight was that the prevalence of overweight was markedly higher among young people from a Middle-Eastern cultural background.

The prevalence of overweight and obesity has continued to increase markedly among boys over the last 20 years. Among Year 6, 8 and 10 boys, the rate of increase between 1997 and 2004 was higher than the rate of increase between 1985 and 1997. That is, the prevalence of overweight and obesity is not only increasing among boys, it appears to be accelerating. The findings are slightly more promising with regard to girls, although still of great concern. Although the prevalence of overweight and obesity continued to rise, the rate of increase appeared to be generally slowing. It is not entirely clear at this time if these are real trends or normal fluctuations that occur over decades.

REFERENCES

Guo SS, Chumlea WC 1999, Tracking of body mass index in children in relation to overweight in adulthood, *American Journal of Clinical Nutrition*, 70(suppl), 145S-148S.