



NSW Centre for Overweight and Obesity



**NSW
Schools Physical
Activity and
Nutrition Survey (SPANS)
2004
SHORT REPORT**



NSW Schools Physical Activity and Nutrition Survey (SPANS) 2004: Short Report

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This report is one of a series of three reports. The other two are:

Booth M, Okely AD, Denney-Wilson E, Hardy L, Yang B, Dobbins T (2006).

NSW School Physical Activity and Nutrition Survey (SPANS) 2004:

Full Report. Sydney: NSW Department of Health.

Booth M, Okely T, Denney-Wilson E, Hardy L, Yang B, and Dobbins T (2006).

NSW School Physical Activity and Nutrition Survey (SPANS) 2004:

Summary Report. Sydney: NSW Department of Health.

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Introduction

Several years ago, it became clear that the proportion of Australian children and young people who were overweight or obese was rising rapidly. In response, the NSW Government held the NSW Child Obesity Summit in 2002. One of the important commitments from that summit was to establish the NSW Centre for Overweight and Obesity, and for the Centre's researchers to conduct a survey of children and young people across NSW.

In 2004, the Centre conducted a study of NSW school students known as SPANS – the *NSW Schools Physical Activity and Nutrition Survey*. This work, funded by NSW Health, was one of the most comprehensive surveys of overweight and obesity among children and adolescents in Australia.

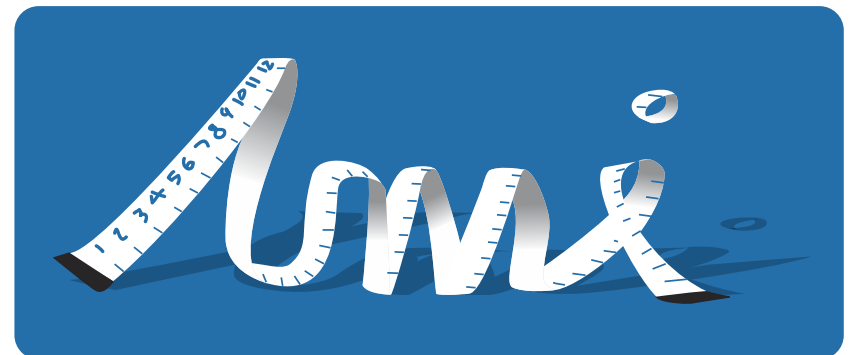
The NSW Government, researchers and community members wanted to know whether or not the rise in obesity and overweight was continuing and, if it was, why that should be so. It also wanted to understand how common were some of the risk factors for being overweight, such as eating too much of the wrong sort of food and not doing enough physical activity, among the children and young people.

Why? Well, being overweight is not just an issue of appearance. Being overweight poses serious risks to a child's health – it is associated with asthma, diabetes, high blood pressure, raised cholesterol levels, problems with bone development, and more. Even if overweight children and adolescents become thinner as adults, some of these problems persist

for the rest of their life. Overweight children and young people can also be negatively stereotyped. It is a serious problem on many counts.

The SPANS survey looked, where possible, at important factors associated with weight – physical activity, methods of travel, fitness and eating habits. In older students it also looked for the consequences of being overweight – such as high cholesterol levels, risk factors for diabetes and liver disease.

This information is important for everybody to know so they can contribute to solving the problem. Children and young people need help from many groups of people – governments, schools, parents, health agencies, planners, the non-government sector and others – to avoid excessive weight gain and becoming overweight.



Methods of study

About 5400 students from Kindergarten and Years 2, 4, 6, 8 and 10 were studied in early 2004. They were drawn from all types of schools in NSW, from both city and country, and were representative of the NSW population. Researchers gathered basic demographic data and measured the height, weight and waists of all students.

Weight alone does not tell us whether someone is a healthy or unhealthy size. So we use weight and height to calculate body mass index, or BMI.

The body mass index is calculated using the following formula:

$$\text{Body mass index} = \frac{\text{weight in kg}}{(\text{height in m})^2}$$

Students were then categorised as being healthy weight, overweight or obese. The SPANS research team used the categories recommended by the International Obesity TaskForce in 2000. These are similar to the categories used for adults, except they take the child's age into account. So the categories used are the equivalent, in children and young people, of saying that an adult with a body mass index between 25 - 30 is overweight, and an adult with a body mass index over 30 is obese.

Older students were also asked questions about their physical activity, sedentary activities and eating behaviours. (see Figure 1)

Some of the results of this 2004 survey have been compared with the results of previous surveys of school students in NSW in 1997¹ and 1985², allowing us to see the trends.

Figure 1: Measures for each Year group

Measure	Year K	Year 2	Year 4	Year 6	Year 8	Year 10
Demographics	√	√	√	√	√	√
Height and weight	√	√	√	√	√	√
Fundamental movement skills		√	√	√	√	√
Self-reported information on physical activity, sedentary behavior, travel, eating behaviours				√	√	√
Markers of chronic disease						√

The results of this survey

The weight of students

The survey found that:

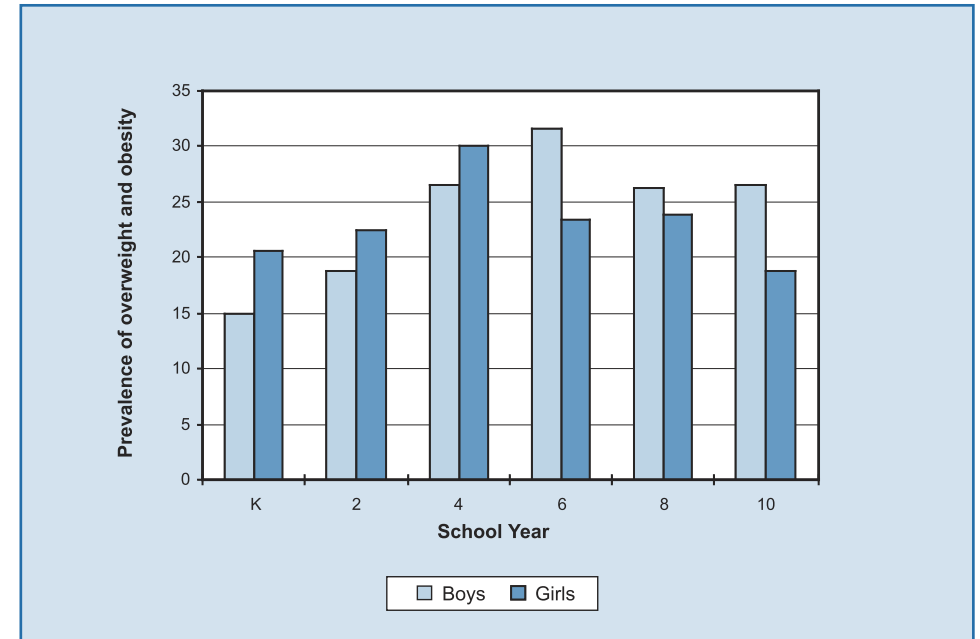
- about 8 per cent of boys are obese – this fluctuates a little across the age groups, and peaks in Year 6
- another 17 per cent of boys are overweight, but not obese – and this is highest in Year 6
- overall, a quarter of all boys (and almost a third of all Year 6 boys) are overweight or obese.

The survey found a similar result in girls, although the rates were slightly lower. It found that:

- about 6 per cent of girls are obese – more in Years 2 to 6 than among older or younger girls
- another 17 per cent are overweight but not obese, and this is highest in Years 4 to 8
- overall, almost a quarter of all girls are overweight or obese.



Figure 2: Percentage of students who are overweight or obese, by school year



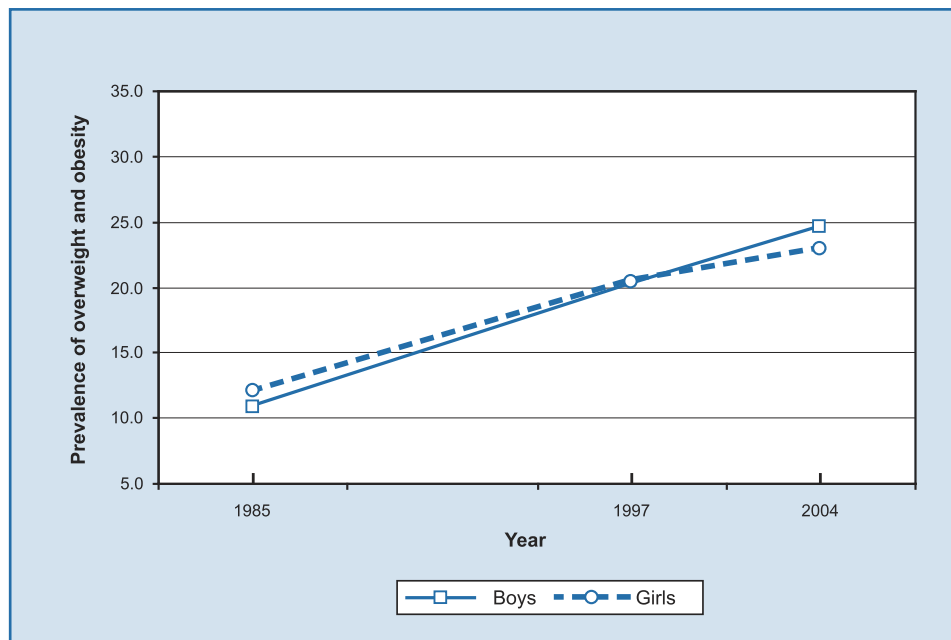
The survey also found that:

- girls from low income areas are more likely to be overweight than girls from high income areas
- boys from Middle Eastern backgrounds are more likely to be overweight than other boys
- girls from Middle Eastern backgrounds are more likely than other girls to become overweight as they get older.

Trends in students' weight

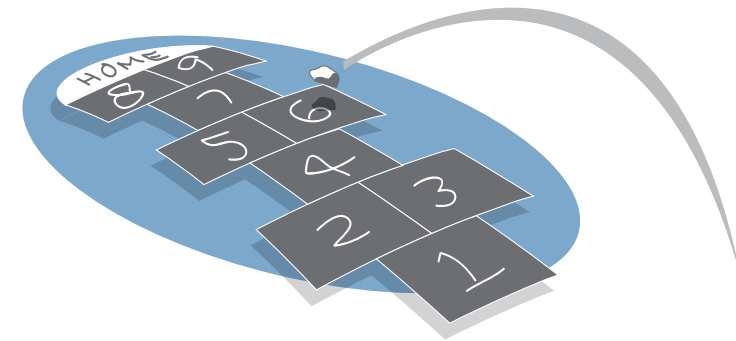
Many school students in NSW are becoming overweight, and this is occurring at an increasing rate. In 1985, 11 per cent of boys and 12 per cent of girls were above a healthy weight. In 2004, 26% of boys and 24% of girls across years 2 to 10 were above a healthy weight. For boys, not only is the prevalence of overweight and obesity increasing, but the rate of change is accelerating. The increases were largest for boys in Years 6, 8 and 10. The trend is different for girls, where the rate of increase is slowing, except for Year 4 girls.

Figure 3: Trends in the percentage of students who are overweight or obese



Physical activity

Physical activity brings its own rewards. Physical activity plays an important role in achieving a healthy weight and preventing unhealthy weight gain. Physical activity also builds stronger bones, which should reduce the chances of osteoporosis (weak bones) later in life. Active children and young people are less prone to anxiety or depression than less active ones. Physical activity helps children and young people develop important social skills. Vigorous physical activity is linked to lower blood pressure, low cholesterol and low insulin levels, which can help prevent heart disease and diabetes among adults.



The Australian *Physical Activity Recommendations for Children and Young People* recommend that students spend at least 60 minutes a day in moderate-to-vigorous physical activity. This recommendation is used as a benchmark for the results from this study.

Researchers also surveyed a number of schools about the time they allocated to sport, their physical education lessons and their facilities.

The survey found that:

- boys are more active than girls
- younger students are more active than older students
- rural students are more active than urban students
- students are more active in summer than winter
- three quarters of boys and girls met the recommendation for at least 1 hour of moderate-to-vigorous physical activity each day.

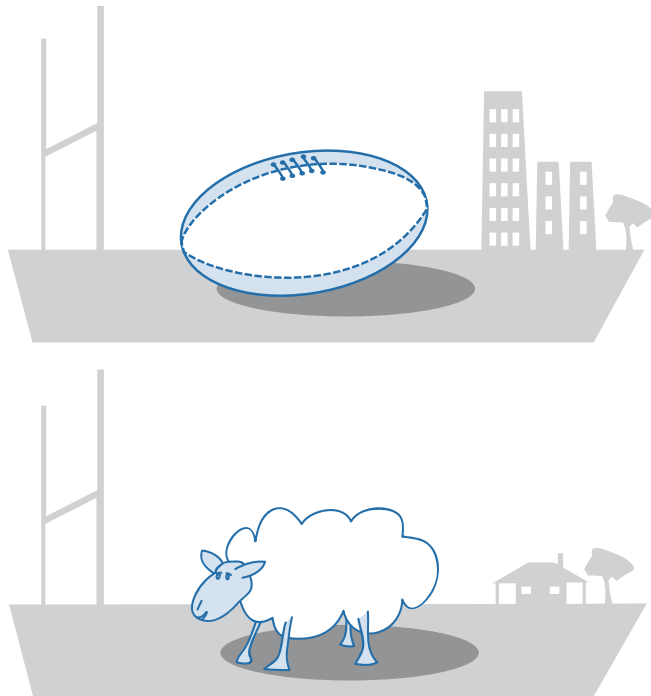
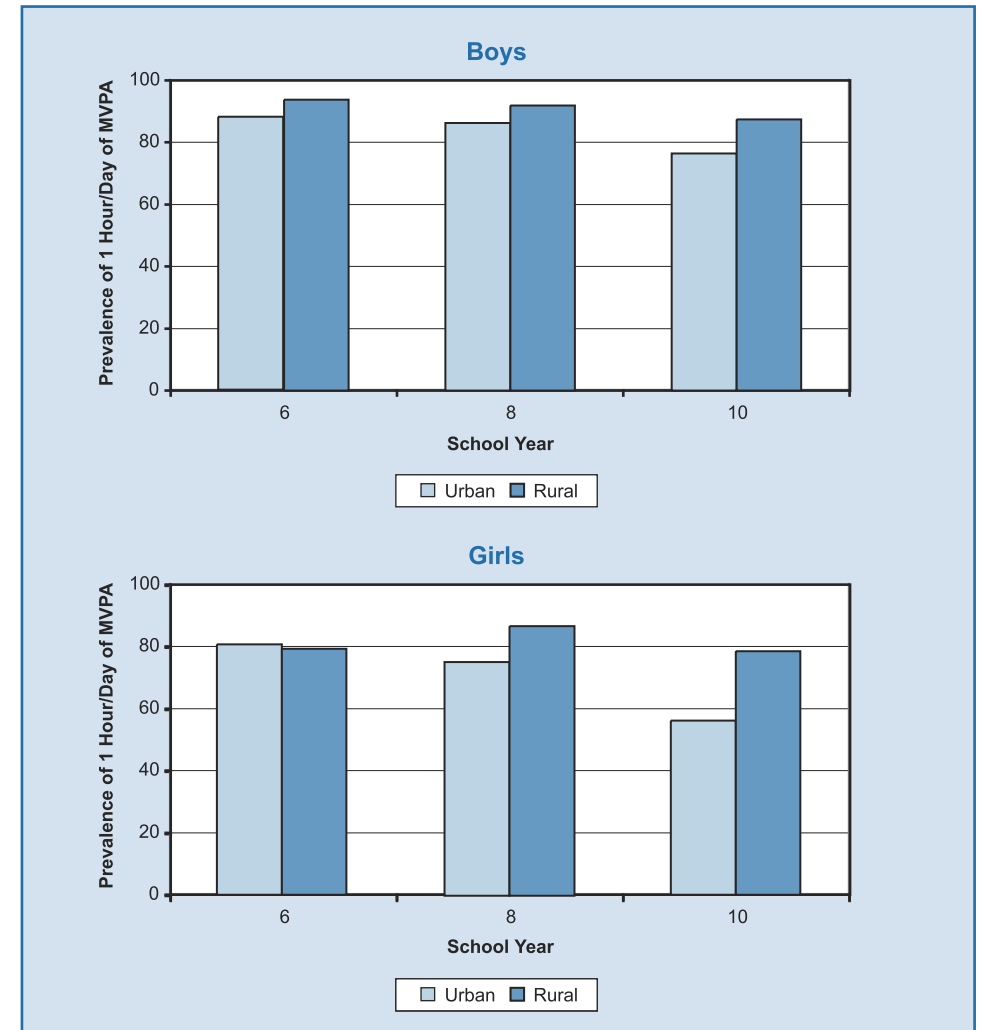


Figure 4: Proportion of urban and rural students spending at least an hour a day on moderate-to-vigorous physical activity, by school year and place of residence (summer*)



* the results are similar for winter, but the figures are slightly lower.

Although the results were not as clear-cut, the survey also revealed trends that:

- boys of Asian background and girls of Middle Eastern background are less active than other students
- girls from high income areas are more active than girls from low income areas.

Perhaps surprisingly, the survey did not show any clear correlation between BMI and the amount of physical activity.

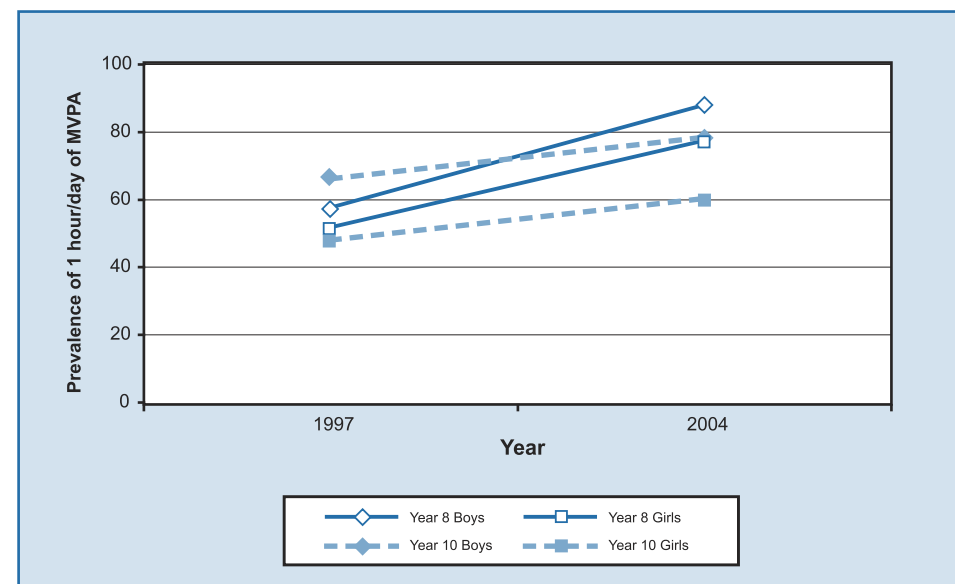
The school survey showed that the amount of time available to students for sport and physical education each week increased as students became older. The proportion of schools offering more than 2 hours per week grew from 3 per cent in Year 2, to 23 per cent in Year 6, to 72 per cent in year 10.

It also showed that most schools encourage students to be active at lunchtime by making facilities available, and a substantial number allow their facilities to be used before and after school. It is clear that the more schools make their facilities available, the more often children used them.

Trends in students' physical activity

School students in NSW in 2004 were a lot more active than students of the same age in 1997. This is true for both boys and girls, and for students in both Years 8 and 10.

Figure 5: Proportion of students spending at least an hour a day on moderate-to-vigorous physical activity, by gender and school Year (summer)* for 1997 and 2004

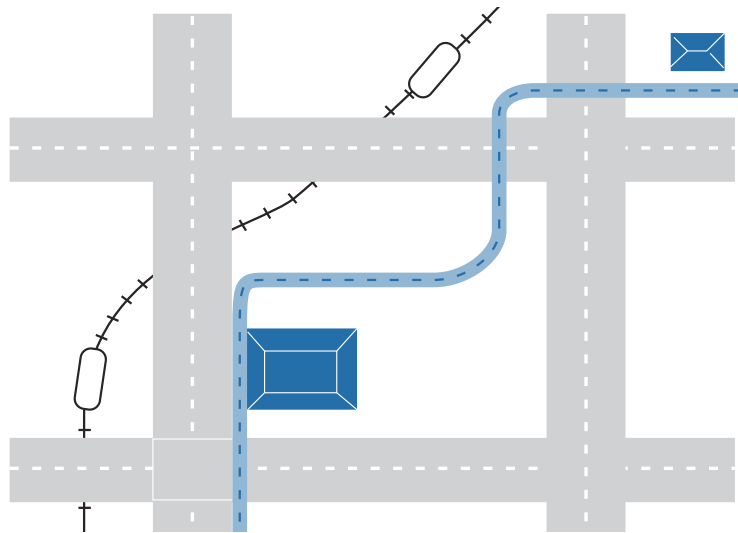


* Note that 1997 data are not available for Year 6 students.

By also comparing the results to a 1985 survey, we know that this trend has been occurring since 1985, and that there have been large increases in physical activity by boys and girls between 1985 and 2004. The proportion engaged in at least an hour of moderate-to-vigorous activity increased by 15% in Year 8 boys and 20% in Year 10 boys.

Travel to and from school

Active travel to and from school is frequently cited as an important opportunity to increase energy expenditure among young people. Australia's *Physical Activity Recommendations for Children and Young People* identify transportation, as well as play, games, sports, recreation, physical education and planned exercise as important contributors to an active lifestyle.



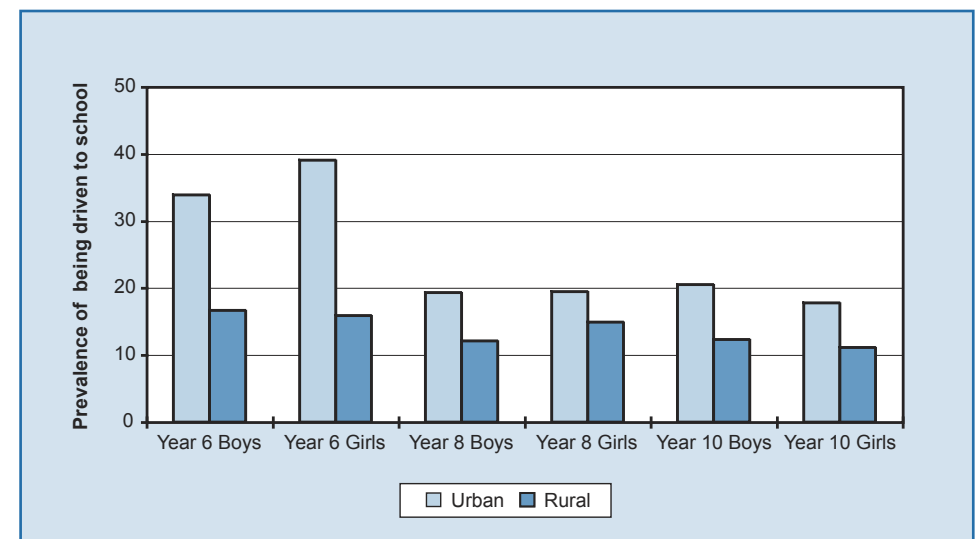
The SPANS survey found that:

- one third of Year 6 students travel to school by car each day, as do about 20 per cent of Year 8 and 10 students
- urban Year 6 students are twice as likely to be driven to school as rural Year 6 students

- about 30 per cent of Year 6 students walk to school, as do about 20 per cent of Year 8 and 10 students
- fewer than 20 per cent of urban Year 6 students catch public transport to school, while more than 50 per cent of Year 8 and 10 students do so
- in the afternoon, some of the students who were driven to school either walked home or caught public transport.

The survey also found that those who walk to school spend an average of 10-15 minutes doing so. Those who catch public transport to school spend about five minutes walking.

Figure 6: Proportion of students who are driven to school, by school year, gender and rurality



The survey found no clear links between how students got to and from school and their weight, cultural background or the income level of the area they lived in.

Trends in travel to and from school

School students in Years 8 and 10 are walking and cycling to school much less than they were in 1997. Walking to school has decreased by 10-15% in boys, and about 20% in girls.

Cycling also has decreased, with virtually no high school students cycling to school regularly (see Figure 7).

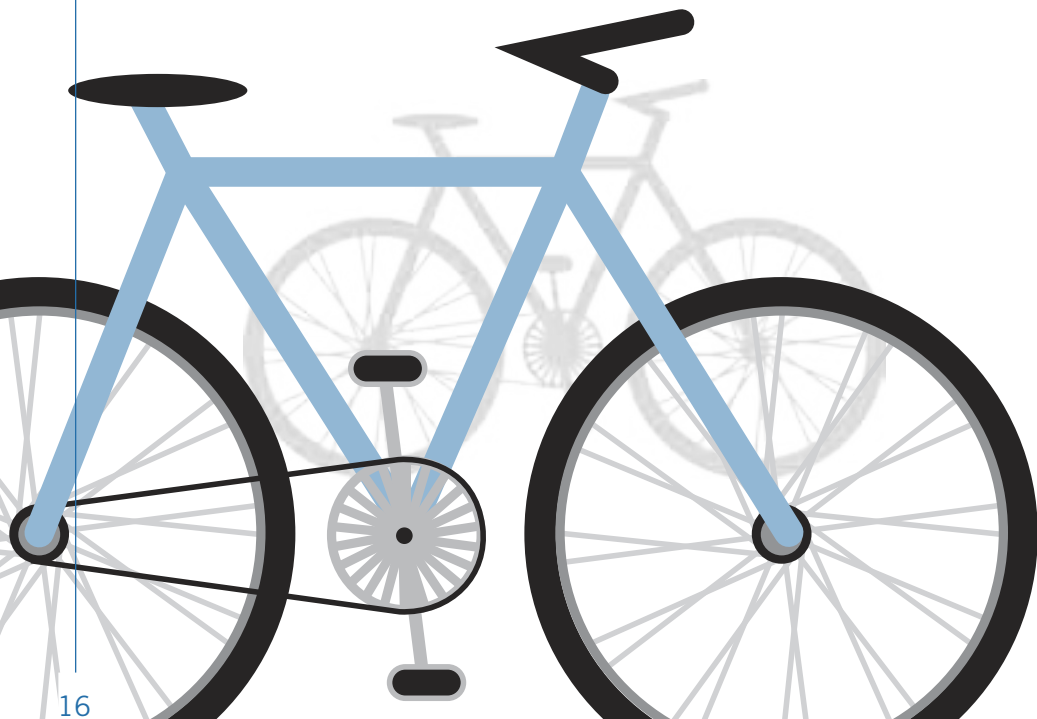
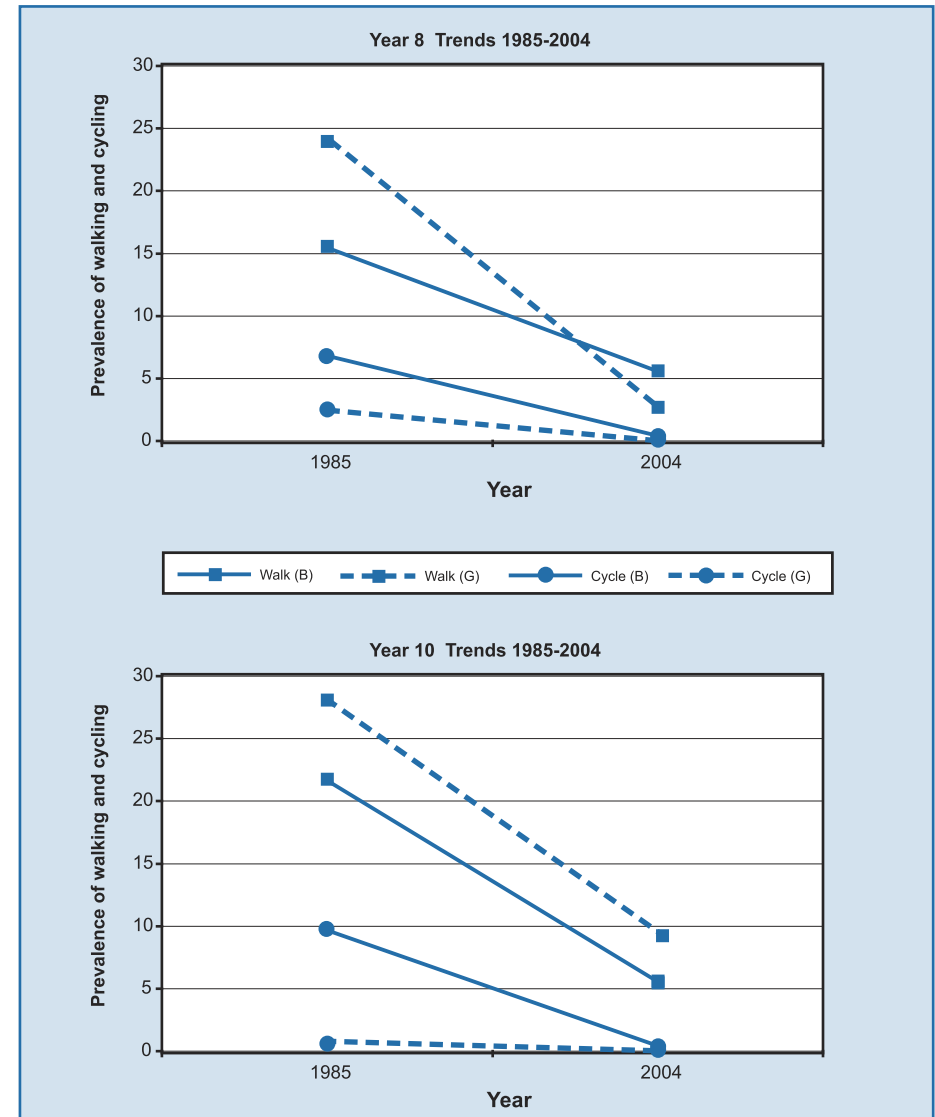
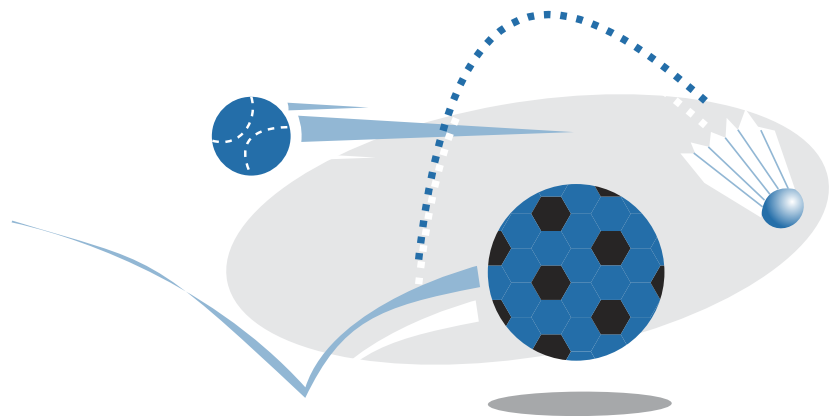


Figure 7: Prevalence of regularly walking and cycling to school (at least 4 days/week) among boys (B) and girls (G) in Years 8 and 10 in 1985 and 2004



Fundamental movement skills

Fundamental movement skills are taught as part of the NSW primary school Personal Development, Health and Physical Education (PDHPE) curriculum. Fundamental movement skills focus on developing children's co-ordination and skills so they know how to run, jump and catch properly. Previous research has shown that students with better skills are more active, fitter, leaner and have better self esteem than students with poorer skills.



This survey found that:

- girls are more skilled than boys at three of the four locomotor skills
 - vertical jump, side gallop and leap
- boys are more skilled than girls at the three object control skills
 - catch, kick and throw
- girls and boys perform much the same at the sprint run.

These differences may reflect the amount of time and energy boys and girls have to develop these skills in their sport and play, with boys playing more ball games and girls doing more dancing, gymnastics and skipping. The survey also found that:

- students from high income areas, especially girls, performed better in physical skills tests than students from low income areas, which may reflect parental support and better access to organised sports
- students with a healthy weight consistently outperformed students who were overweight.

The survey also examined what proportion of students at each age mastered, or nearly mastered, the skill. In every case, the proportion of students achieving mastery or near-mastery increased as the students got older, with about 50% of Year 10 students achieving this level in most skills.

Trends in fundamental movement skills

Students' performance in these assessments improved markedly between 1997 and 2004.

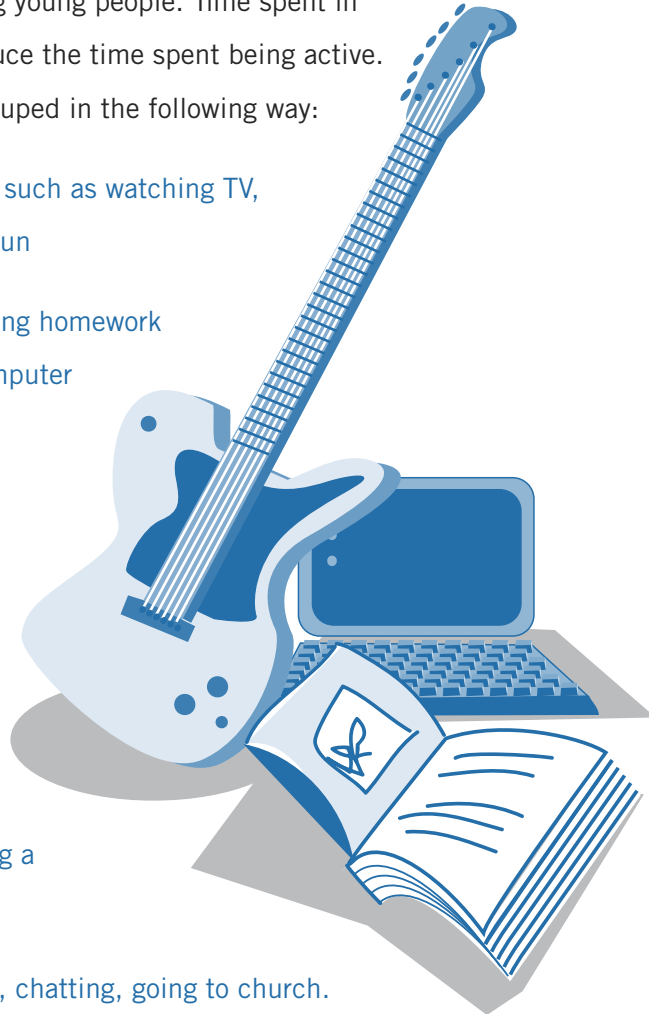
For boys of all ages, performance at every skill was improved, compared with the skills of boys in 1997. Compared with girls in 1997, girls in 2004 performed better in three-quarters of the skills tests. For girls, some of the most marked improvements between 1997 and 2004 came in areas in which girls do not traditionally perform well – catching and kicking.

Sedentary behaviours

A large amount of time spent in sedentary behaviours can increase the likelihood of overweight among young people. Time spent in sedentary behaviours may reduce the time spent being active.

Sedentary behaviours were grouped in the following way:

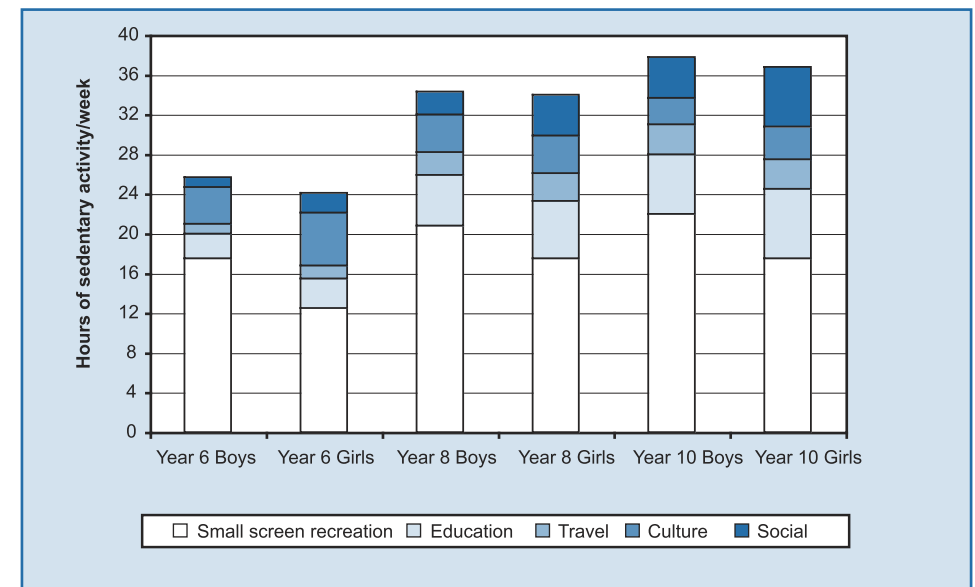
- small screen recreation, such as watching TV, using the computer for fun
- education, including doing homework (including using the computer this way), being tutored, Saturday school
- how students travel to school, whether by bus, car, train or boat
- culture, such as reading for fun, doing crafts or hobbies, playing a musical instrument
- social, such as ‘chilling’, chatting, going to church.



Sedentary behaviour is important because, in general, children and young people who spend more time sitting around may be missing opportunities to be physically active. While some sedentary behaviour is essential, and some of it is beneficial, some of it is not.

This survey found that students spend 30 to 40 hours per week on sedentary activity, in addition to time spent in the classroom. The time spent on different types of activities is shown in Figure 8.

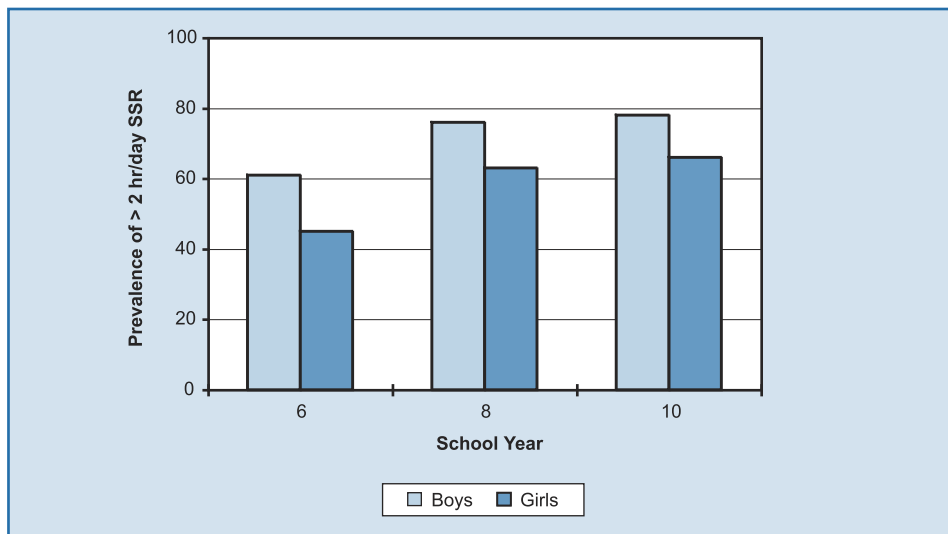
Figure 8: Sedentary activity of different types by gender and school year



It is clear that about half of this sedentary time is spent in leisure pursuits in front of the small screen – watching TV, playing on a computer, playing hand-held games and so on. Too much time spent on small screen recreation is not good for students' health. Research has shown that students who watch more TV also exercise less and eat more high-calorie foods (that is, 'junk' food).

The Australian Government, in its *Physical Activity Recommendations for Children and Young People*, recommends that students should not spend more than two hours a day using electronic entertainment. The graph below shows that 45-80% of children in Years 6, 8 and 10 spend more than two hours a day on recreation in front of a small screen.

Figure 9: Proportion of students spending more than 2 hours each day on recreation in front of a small screen, by year and gender



The survey also found that sedentary behaviour is more common:

- among older than younger students
- among urban students than rural students
- among boys of Asian background than other boys
- among students who are overweight or obese than those of a healthy weight.

Overall, three quarters of high school boys and two-thirds of high school girls spend too much time watching TV and playing computer games.

Eating behaviours

This survey asked students about how often they ate certain ‘indicator’ foods, and about when and how they ate. Eating patterns influence what people eat. The “indicator” foods chosen were fruits, vegetables, bread, rice and pasta, meat, chicken and fish, milk, fruit juice, soft drinks and confectionery. The *Dietary Guidelines for Children and Adolescents in Australia* provide benchmarks for how much of these foods children and young people should eat.

The survey found that:

- 60 to 70 per cent of students say they eat the recommended two pieces of fruit per day
- only 15 to 25 per cent (fewer than a quarter) of children eat enough vegetables (four serves or more per day)
- 20 per cent of students drink fruit juice each day, and about 90 per cent drink some fruit juice each week
- 50 to 60 per cent of boys, but only 30 to 40 per cent of girls, drink at least 300 ml of milk per day – this is usually full cream milk
- less than one quarter of boys (10 to 16 per cent) and girls (15 to 25 per cent) usually drink reduced fat milk, (although this is recommended for children over 2 years).

- most students eat adequate amounts of bread, rice, pasta, red meat and chicken
- 20 to 25 per cent of students eat 2-3 fish meals each week
- about 20 per cent of Year 6 students and 25 to 30 per cent of older students eat confectionery more than four times a week
- about 55 per cent of boys and 40 per cent of girls drink more than one glass of soft drink (the category of ‘soft drink’ includes fruit flavoured drinks and sports drinks) each day.

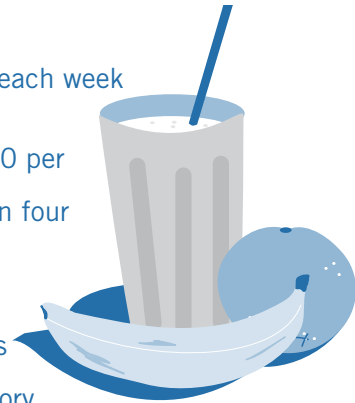
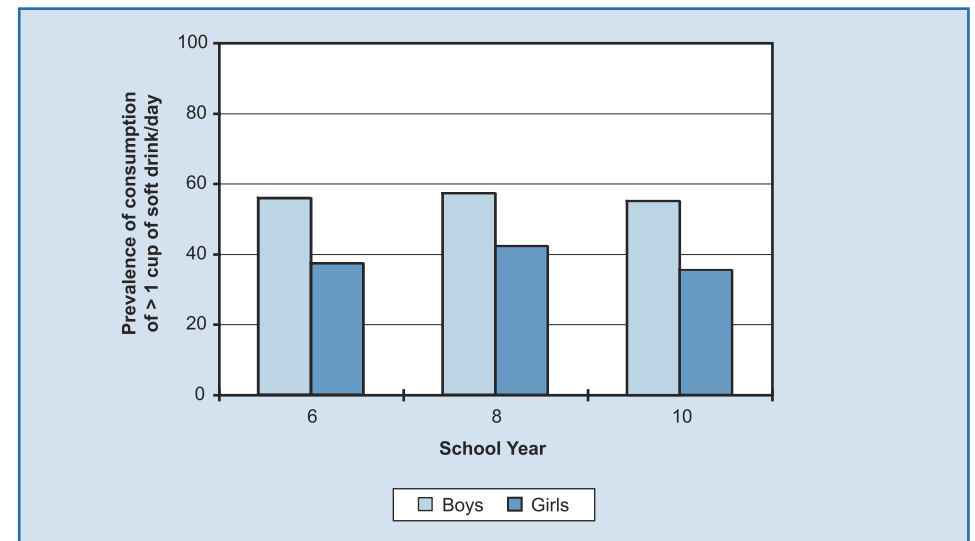


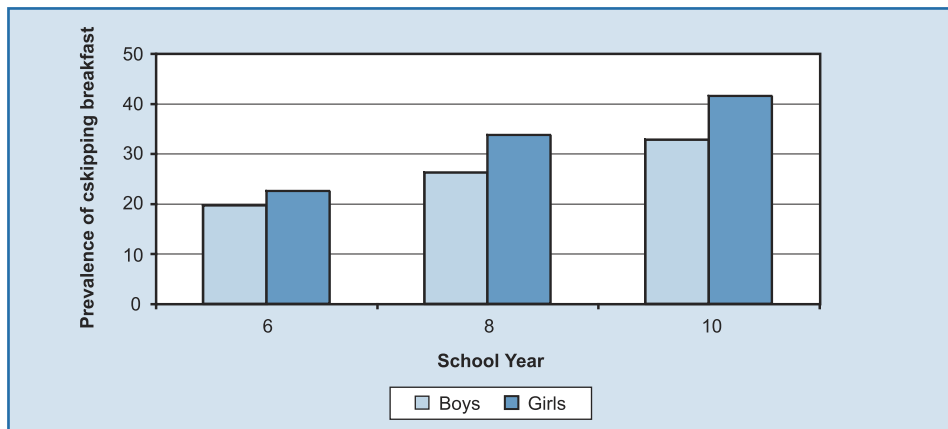
Figure 10: Percentage of children having more than one glass of soft drink per day, by school year



The survey also found that:

- the percentage of students missing breakfast every day rises from about 15 per cent in Year 6 to more than 25 per cent in Year 10. Not regularly eating breakfast was associated with overweight and obesity
- most students (over 85%) eat dinner with their families every day, and about 10 per cent of students do not eat dinner every day. This matters, as children who eat regular meals tend to have a healthier diet
- about 30 per cent of students eat most of their evening meals in front of the TV. This matters as regularly eating dinner in front of the TV can be associated with eating more energy-dense foods
- 10 to 20 per cent of students eat at fast food outlets once a week or more; that is, around 80% eat at fast food outlets less than once per week.

Figure 11: Percentage of students who do not eat breakfast every day, by school year

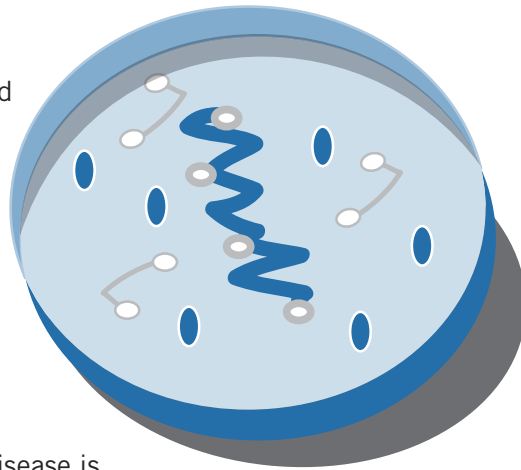


The survey also included questions on what factors influence students' food and drink choices, and their purchasing patterns. Some of the key findings are that:

- 40 to 50% of boys and a slightly lower proportion of girls reported that soft drinks were usually available at home
- about half of all boys and girls thought that soft drink was not good value for money
- 50 to 65% of students said that they went to fast food outlets because they like the taste of the food
- less than 20% said they preferred to eat at a fast food outlet compared with eating at home
- over half (50 to 65%) thought that fast food was not good value for money
- 80 to 90% of students stated that they were encouraged to eat healthy foods by parents and carers
- about 20% of high school students purchased their lunch twice per week and 15-20% did so every day
- about 20% of boys regularly purchased food on the way home from school; only half as many girls did so.

Markers of chronic disease

The increasing rates of overweight and obesity have led to concerns about increased health problems in children and young people. Among Year 10 students, the SPANS survey also looked at biological markers associated with obesity, which are considered to be signs that chronic disease is already present. The survey reports on what proportion of students have these markers at a dangerous level.



The diseases and the biological markers included:

- cardiovascular disease – high density lipoprotein cholesterol (HDL), low density lipoprotein cholesterol (LDL), triglycerides, high sensitivity C-reactive protein (hsCrp) and blood pressure (BP)
- diabetes – insulin
- liver damage – the liver enzymes alanine aminotransferase (ALT) and gamma-glutamyltransferase (GGT).

The survey found that:

- almost one in five Year 10 students have high levels of insulin, putting them at risk of diabetes
- about 10 per cent of students have an elevated hsCrp, which puts them at risk of heart disease later in life
- about 10 per cent of boys have a low level of HDL, putting them at risk of heart disease later in life
- in nearly all cases, obese boys had higher levels of risk factors than overweight boys, with boys of normal weight having the fewest risk markers
- for girls, the pattern was similar, but less marked.

Figure 12: Prevalence of dangerous levels of the risk factors among Year 10 boys by BMI

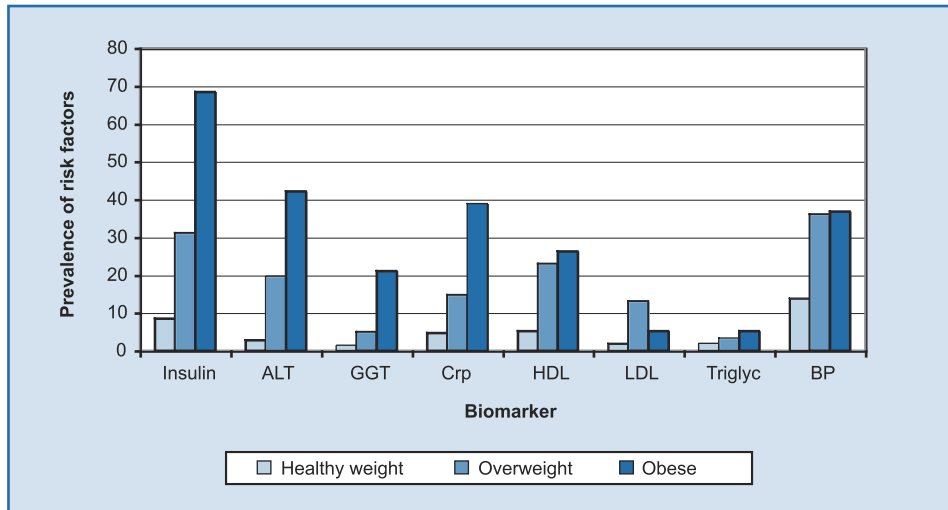
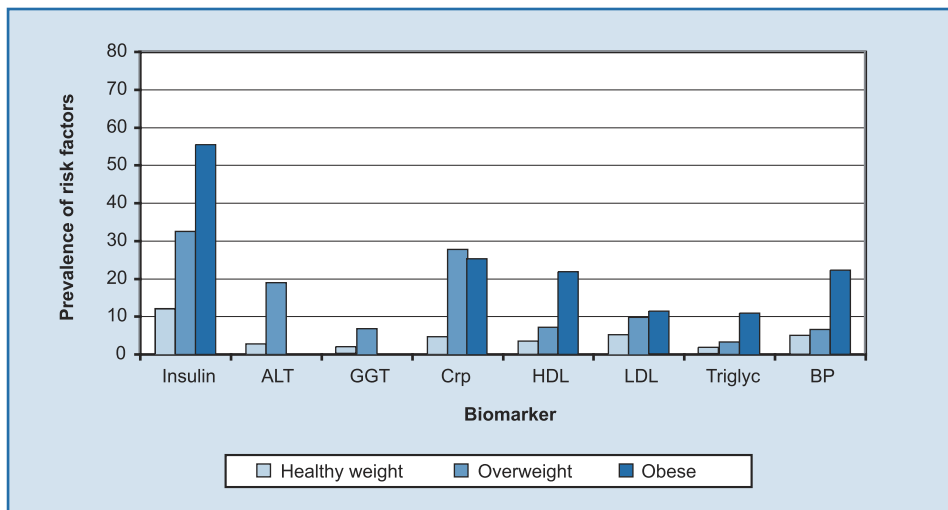


Figure 13: Prevalence of dangerous levels of the risk factors among Year 10 girls by BMI



Conclusions

Children and young people are becoming overweight and obese at an increasing rate. A student today is more than twice as likely to be overweight or obese as a student of 20 years ago. This is of serious concern.

Being overweight or obese has a significant impact on the lives of these students. They may be negatively stereotyped and teased. Already, they may suffer joint problems and asthma. In the future, they will be at risk of diabetes, high blood pressure, fatty liver disease, high cholesterol levels and a multitude of other health problems.

The results of the SPANS survey suggest that parents, teachers and community groups should support changes which promote good nutrition, encourage physical activity and reduce some sedentary behaviours. These suggestions are relevant to everyone, not just people who are already overweight or obese.

The following recommendations from the research include suggestions for schools, parents and young people:

- ensure that schools have students take part in organised physical activity for at least 2 hours per week
- provide opportunities for children and young people to be more active more often, for example schools making playgrounds available outside of school hours.

- encourage parents and teachers to practice fundamental movement skills, such as catching, throwing, kicking and running, with children
- take initiatives which increase the amount of time children and young people spend playing sport, dancing, playing, riding bikes and walking to school
- limit children and young people to less than 2 hours per day watching TV or playing on the computer
- encourage children and young people to eat breakfast every day
- encourage children and young people to eat dinner every day
- encourage families to limit how often they eat in front of the TV
- encourage families to increase their intake of fruit and vegetables
- encourage families to change to reduced fat milk, instead of full cream milk
- encourage families to keep fast foods to a minimum
- encourage children, young people and families to reduce their consumption of soft drink and other sweetened drinks, and replace with water
- encourage children and young people to limit their consumption of extra foods, such as chips, other fried potato products and confectionary, and to choose healthy snacks.

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1. Booth M, Macaskill P, McLellan L, Phongsavan P, Okely AD, Patterson J. (1997). *NSW Schools Fitness and Physical Activity Survey*. Sydney: NSW Department of School Education.
2. Pyke JE. (1987). *The Australian Health and Fitness Survey 1985: The fitness, health and physical performance of Australian school students aged 7-15 years*. Adelaide: The Australian Council for health, Physical Education and Recreation (ACHPER).

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