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SUBMISSION TO THE HOUSE OF REPRESENTATIVES' STANDING COMMITTEE ON HEALTH AND AGEING:

INQUIRY INTO OBESITY

Submission from:

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SUBMISSION TO THE HOUSE OF REPRESENTATIVES' STANDING COMMITTEE ON HEALTH AND AGEING - INQUIRY INTO OBESITY

In order to assist the Committee's deliberations, the Public Health Information Development Unit (PHIDU) at The University of Adelaide offers the following submission concerning the evidence on which estimated prevalences of obesity and overweight are based in Australia.

[Information about PHIDU and its work is contained in Appendix 1. A full list of PHIDU publications is available online at http://www.publichealth.gov.au].

SUMMARY OF SUBMISSION

1. Unlike the USA, UK, NZ and many other comparable nations, Australia lacks a funded program of regular national population health surveys that include objective data - such as measured height and weight, waist circumference, and a range of biomedical tests such as blood glucose, cholesterol, blood lipids, markers of renal function and so forth.
2. As a result, Australia has no current, nationally representative, objective data on the prevalence of overweight and obesity across the population. This hampers the development of health policy and of interventions to prevent and manage obesity at a population level.
3. Population estimates of obesity based on self-reported height and weight are likely to be far less accurate than those derived from measured (objective) data.
4. Surveys that collect self-reported information on obesity are less reliable than those that collect measured data, as they also contain biases due to poor population and geographic coverage, inadequate response rates, and limited survey methodologies. However, they can be used to assess patterns and trends over time using repeat surveys with standardised methodologies. They can also be adjusted if there are available estimates of the extent to which they underestimate the actual prevalence of overweight and obesity. However, where these adjustments have been available, they have never been applied when reporting survey-derived estimates of obesity and overweight prevalence.
5. An example of trends in overweight and obesity measured in South Australian four-year-old children is highlighted, showing an increase in the proportion who are obese, with small falls among those from high socioeconomic status areas, and larger increases among those from low socioeconomic areas. However, there is evidence of a halt, from the late 1990s, to the growth in the proportion that are overweight, and a decline in recent years, without the application of any system-wide policy- or health-based intervention. This illustrates the need for appropriate analysis and use of reliable data if we are to address these complex issues.
6. Obesity, with its many adverse consequences for individuals, population groups and societies, is a complex issue, which cannot be appropriately tackled without access to accurate, up-to-date and reliable data. The presence

of a socioeconomic gradient across the population also reveals that there is much in the social and physical environment which needs attention. A sole focus on the obese individual does not help to address the broader social and economic issues that influence people's lives.

1.0 Determining the prevalence of obesity in Australia – issues of measurement and reliability of data

Body Mass Index (BMI) is an internationally recognised measure of the amount of fat and muscle in the human body and is used as an index of obesity. BMI is calculated as a person's weight (kg) divided by their height, squared (m^2). A classification defined by the World Health Organization is generally used to group people into categories based on their BMI. A BMI of 18.5 to less than 25 is defined as a normal (that is, healthy) weight; obesity is defined as a BMI of 30 or more (WHO 2000).

Although BMI provides a useful indicator of the prevalence of obese people, it does not distinguish between weight associated with muscle and weight associated with fat. A complementary measure is waist circumference: it can indicate excess fat in the abdominal region, which is associated with an increased risk of ill health. The standard indicator of abdominal obesity is a waist circumference greater than or equal to 102 cm in men and 88 cm in women (WHO 2000). Some studies suggest that abdominal obesity is a more important indicator of health risk among older people than BMI (Rossner 2001).

Therefore, the BMI as a measure of obesity may be misleading in some circumstances:

- athletes who have a low body fat percentage but a significant increase in muscle mass can deliver an excessive BMI. As the index is a calculation of weight and height alone, it assumes that the increase is due entirely to body fat;
- in certain ethnic groups, BMI values need to be modified. For Chinese, Indian and Malaysian people, a BMI greater than 23 is regarded as overweight and a BMI greater than 27.5 is regarded as obese;
- in children, BMI can be misleading, as body fatness changes as they grow, and girls and boys also differ in their body fatness as they mature. In children, it is better to express weight as a percentile value, in which it is compared to others of the same age and sex (CORE 2008).

Furthermore, robust research undertaken by Professor Stephen Blair and colleagues has shown that a person's individual BMI score is not a strong indicator of cardio-respiratory fitness or of poor health. In fact, low cardio-respiratory fitness is a far more important predictor of mortality and morbidity from chronic disease than BMI, fat distribution, or overall percent body fat (Jurca et al. 2005).

1.1 A lack of accurate national data for the Australian population

At the present time, Australia has no current, nationally representative, measured (objective) data on the prevalence of overweight and obesity across the population. This is in stark contrast to most comparable developed countries (New Zealand, USA, UK, and numerous countries in Europe and Asia), and to many less developed nations, including Iraq.

Unlike the USA, many countries of the European Union, New Zealand and the UK, Australia lacks a funded program of regular national population health surveys that include objective measures. As a result, Australia has no up-to-date biomedical data for its population. For example, there are no nationally representative, measured data for population prevalence of disordered blood lipids (including elevated cholesterol), impaired glucose tolerance (predicting development of type 2 diabetes), iodine and iron levels, or markers of poor kidney function (e.g., urinary protein). Numerous attempts to highlight the need for such data have been made over the last decade, but, to date, have been unsuccessful in attracting recurrent funding (Hetzel et al. 2003; AIHW 1999).

Up-to-date information about the population's health is critical for decision-making. A lack of reliable information hampers health policy, funding provision and service planning. Research on the efficacy of health promotion and disease prevention also suffers from the absence of timely data and information on the population's health, health risks and their determinants. Therefore, without current data on obesity and overweight, it is difficult to determine accurately the true extent of the obesity problem across Australia, or how best to address it at a population level. Similarly, this also applies to assessing the prevalence of those chronic diseases for which obesity is a risk factor.

The most reliable national data we have on measured overweight and obesity in the Australian population were collected as part of the ABS National Nutrition Survey in 1995, and are now well over a decade old. In that survey, participants were interviewed, physically measured (height, weight and waist circumference) and underwent a number of biochemical tests. Importantly, the data on obesity and overweight were measured according to a standard protocol. Previous surveys that also collected measured data included the series of Risk Factor Prevalence Surveys conducted during the 1980s by the National Heart Foundation. Unfortunately, these surveys, which measured weight, did not include people aged 65 years or older (AIHW 2004).

It is preferable to use measured data for determining the extent of obesity in the population. Surveys that include measured data provide more accurate estimates that are not subject to the biases of self-reporting, where weight tends to be under-reported and height over-reported. However, most of the former surveys did not use common survey methods, they covered different age ranges, and they generally achieved lower participation rates than surveys that collect self-reported data (AIHW 2004).

The 1999-2000 Australian Diabetes, Obesity and Lifestyle Study (AusDiab) collected data on measured height and weight from participants aged 25 years and above. Around 55% of people who completed the survey questionnaire (who represented about 50% of eligible households) also provided physical measurements, but this figure did not include people who refused to participate in the study, suggesting that the true response rate was much lower (ABS 2008). Adjustments to the sample were made in the weighting process to account for the fact that young males were under-represented in the physical examination (IDI 2001). The results are unlikely to be robust enough to be applied nationally to the population, given the unnecessarily clustered nature of its population sample and the low participation rate (only 29% of those estimated to be eligible, and only 52% of those invited, actually completed the study) (Coyne et al. 2004). Furthermore, the AusDiab study comprised an older, more highly educated population group than the Australian average (obtained from the Census). For these reasons, PHIDU believes that caution should be used when considering any national estimates derived from the AusDiab study.

The ABS National Health Survey 2007-08 is being conducted from August 2007 to June 2008. For the first time in over a decade, the survey will collect physical measurements from persons aged 5 years and above, including height, weight, waist and hip circumference, as well as self-reported estimates of height and weight from those aged 15 years and above. However, the results from this survey will not be available until April-May 2009.

We understand that a National Nutrition Survey is being planned by the Australian Government Department of Health and Ageing, with the possibility of including physical and biomedical measurement. However, to date, there has been little work done to build on the lessons from similar surveys in Australia and overseas; and it is likely that response rates will be poorer (and therefore, unreliable), if such a survey is not undertaken in association with the ABS National Health Survey program, which represents current 'best practice' in Australia. If a National Nutrition Survey were run in association with a National Health Survey, its participation rate would be likely to be higher, and the attributes of non-participants in the Nutrition Survey could be determined.

1.2 Use of self-reported height and weight data to determine the extent of obesity in Australia

1.2.1 <u>Data from the ABS National Health Surveys and the National Aboriginal and Torres Strait Islander Health Survey</u>

Population health surveys, which are most commonly cited in relation to estimating the extent of obesity in the Australian population using self-reported estimates, include the series of National Health Surveys (NHS) conducted by the Australian Bureau of Statistics in 1989–90, 1995, 2001 and 2004-05. These surveys provide estimates of the prevalence of obesity based on self-reported height and weight and derived BMI. As height and weight measures are 'as reported' by respondents, they can differ substantially from those which might be obtained for the same person by actual physical measurement. Overall, people tend to overstate their height and understate their weight, resulting in an inaccurate BMI score (ABS 1998; Gorber et al. 2007). [1]

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[1] With the construct of the BMI as weight (in kilograms) divided by the square of height (in metres^2), the biases in weight (over-estimated) and height (under-estimated) result in a larger bias in the BMI score (under-estimation). For example, for a 100 kg/180 cm person who reports that s/he is 98 kg/182 cm, the actual BMI score of 30.8 (obese) is reported as 29.6 (overweight). These differences are the median biases

A comparison of self-reported data from the 1995 NHS and measured data from the 1995 National Nutrition Survey (NNS) (a sub-sample of the 1995 NHS) showed that self-reported data underestimated the true prevalence rates of obesity and overweight by an average of around 6 percentage points and 5 percentage points respectively (ABS 1998). The reason for this is that people tend to overestimate their height and underestimate their weight. Further, shorter people tend to overestimate their height to a greater extent than taller people, and lighter people tend to report their weight more accurately than heavier people (AIHW 2003). However, despite having determined the weighting that could adjust estimates based on self-report, these are never applied when reporting survey-derived estimates of prevalence of obesity and overweight.

While prevalence estimates from the NHS are based on a high response rate, and cover a wide age range, they do not cover some rural areas or the remote areas of Australia, nor do they survey people residing in non-private dwellings (such as hospitals, nursing homes, hostels, hotels, and prisons) or those who are homeless or transient.

An Indigenous health survey, the National Aboriginal and Torres Strait Islander Health Survey (NATSIHS), was conducted in 2004-05. This survey included people living in Indigenous communities in some remote areas of Australia; and was the most extensive survey to date of the health of Indigenous Australians conducted by the ABS. Previous Aboriginal and Torres Strait Islander health surveys were conducted as components of the NHS rather than as separate surveys. In the 2004-05 NATSIHS, information on self-reported height and weight of respondents as reported during interview, and derived body mass was collected for all Indigenous respondents aged 15 years and over (ABS 2006a). No measurements of height and weight were taken in non-remote areas. However, in remote areas, interviewers offered to measure the respondents' height and weight where they did not know this information.

Although prevalence estimates of obesity based on self-reported data are known to underestimate the true prevalence, they can be used to assess patterns and trends over time using repeat surveys with standard methodologies; and can be adjusted if there are available estimates of the extent to which they underestimate the prevalence of overweight and obesity (ABS 1998).

1.2.2 Data from State- and Territory-funded population health surveys

Most surveys undertaken by these jurisdictions collect self-reported height and weight from participants interviewed via a landline telephone (Table 1). There is limited population coverage with these surveys due to the nature of the sampling strategy and the survey methodology employed.

Generally, they do not include:

- people who do not have a telephone;
- people who only use a mobile phone and do not use a landline telephone;

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identified by Gorber and colleagues (2007). When there is a 5% under-reporting of weight and a 2% over-reporting of height, the BMI is under-estimated by 8.7%.

- people who cannot communicate either as a result of a disability, age or illness, or because their spoken language is not covered by the survey interviewers;
- people who are in nursing homes, hostels, hospitals, prisons etc. or are homeless; and
- people living in remote Indigenous communities, where there is likely to be limited access to a telephone (e.g., only one telephone per community).

These exclusions are likely to result in considerable biases regarding age, non-English-speaking background, socioeconomic status, and Indigenous status.

A reliance on telephone-based interview surveys, which have proved useful to date, is being undermined by the increasing prevalence of mobile telephone-only households and individuals. Data were purchased from Roy Morgan household surveys, conducted over two periods August 2001 to July 2003 and January 2006 to December 2007 by the Australian Institute of Health and Welfare. The purpose of obtaining the data was to understand:

- the extent to which Australian households and individuals have access to fixed-line phones;
- how this has changed over time; and
- the variations in the characteristics of the individuals who have and do not have such access.

The Roy Morgan household survey found that, overall, 7.9% of responding households had no fixed-line phone (excludes 'not stated whether have fixed-line phone or mobile phone') over the period January 2006 to December 2007. Compared with the level of 4.0% over the period August 2001 to July 2003, this represents almost a doubling of the proportion with no fixed-line phone (a rate ratio of 1.98) in the later period. Certain population groups have even higher percentages in this category - for example, males age 18-24 years had over twice the proportion (2.4 times, 18.9%) without a fixed-line phone when compared with the total population 18 years and over, and for females, the differential was 2.2 times (17.6% without a fixed-line phone).

These trends reflect the increasing difficulties that will be faced by government and community agencies in obtaining reliable estimates of health issues if collecting self-reported data from surveys using fixed-line telephones. This situation is not unique to Australia. The latest figures from the USA's *National Center for Health Statistics* indicate similar trends, and the Center has observed that 'the potential for bias due to undercoverage remains a real and growing threat to surveys conducted only on landline telephones' (Blumberg & Luke 2008).

Table 1: Comparison of surveys for collection of height and weight in the population

Survey	Type of survey	How height and weight data were collected	Scope	Sample	Response	Other
National Health Surveys (ABS)	Face to face interview	Self-reported	All States/ Territories; Urban & rural areas, not remote areas	Nationally representative; age 15 yrs & over	1995 = 97% 2001 = 92% 2004-05 = 90%	Excludes those in non-private dwellings
AusDiab (IDI)	Face to face interview & biomedical examination	Measured using standard protocol	Not in ACT	Highly clustered; age 25 years & over	2001 = 29%	
National Nutrition Survey (ABS)	Face to face interview & physical measurements	Measured using standard protocol	All States & Territories; Urban and rural areas, but not in remote areas	Nationally representative	1995 = 61% (selected for the survey from the NHS sample)	Excludes those in non-private dwellings
Risk Factor Prevalence Surveys (NHF)	Self-completion questionnaire & biomedical examination	Measured in 1980,1983 & 1989 Self-reported in 1989	Capital cities only	Nationally representative of urban respondents	1989 = 74.7%	
National Aboriginal & Torres Strait Islander Health Survey ABS)	Face to face interview	Self-reported; measured in remote areas if respondent did not know their height and weight	All States & Territories; Urban & rural areas, & remote communities; TSI pop'n over-sampled some areas	Nationally representative	2004-05 = approx 85%	Excludes those in non-private dwellings
State/territory computer assisted telephone surveys	Telephone interview			Sample (a)	Response	
NSW	List assisted random digit dialling	Self-reported	1 200+ in each AHS collected throughout the year	2006: 10 345 total (includes 7062 aged 16 years and over)	2006 = 33%	
Victoria	List assisted random digit dialling	Self-reported	Regions over-sampled and collected August - November	2006: 7 500 aged 18 years & over	2006: participation rate = 62%	
SA	EWP as at July 2004	Self-reported	Collected throughout the year	2004: 6 738	2004 = 68.4%	
WA	EWP as at July 2004	Self-reported	Collected throughout the year; rural & remote areas over-sampled	2006/07: 7 127 (18 years and over)	2006/07 = 73.6%	
Qld	EWP	Self-reported	Collected throughout the year	1 210	2004 = 63%	

(a) Survey sample generated by Random Digit Dialling and/or the Electronic White Pages (EWP). The use of the EWP limits the sample to those in private dwellings where a landline is connected, available and listed in the telephone directory.

Note: EWP – Electronic White pages

2.0 Trends in the prevalence of overweight and obesity in South Australian four-year-old children – an example of measured data

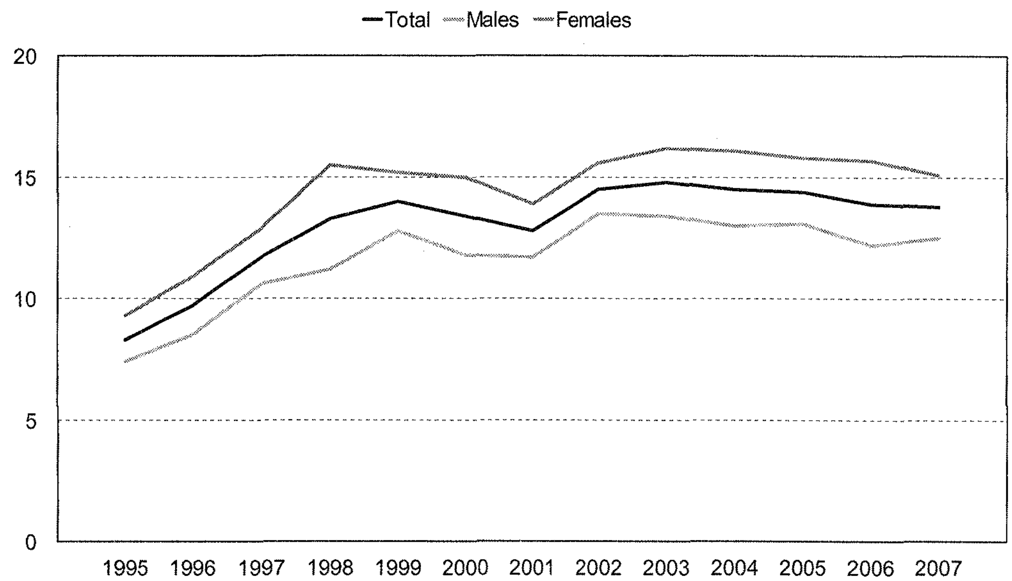
In South Australia, young children are measured as part of the Children, Youth and Women's Health Service's preschool health assessments of four-year-old children throughout the State. BMI scores are calculated from their height and weight data, and prevalence of overweight and obesity for males and females determined using the standard world-wide International Obesity Task Force (IOTF) definition (Cole et al. 2000).

The proportion of the State's four-year-old children measured has varied between 70% and 80% since the commencement of the study, with the exception of a lower proportion (66.6%) in 2002 (Vaska & Volkmer 2004). The overall participation rate in 2007 was 79.8%, with efforts to achieve adequate representation of children from the most disadvantaged areas ensuring their participation remained close to the average.[2] Similar data were collected for children in kindergartens in the ACT some years ago but have not, as yet, been analysed.

Yearly prevalence rates are compared over time, with separate graphs for trends in overweight and obese for four-year-old children (Figures 1 and 2).

Figure 1

Percentage of Overweight Four Year Old Pre-School Children By Sex in SA 1995-2007



Source: CYWHS, May 2008

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[2] In order to examine variations in overweight and obesity by socioeconomic status, areas (Statistical Local Areas) across the State were allocated to one of five groups, based on their socioeconomic status as measured by the Index of Relative Socio-economic Disadvantage (ABS 2006b), with each group comprising approximately 20% of the population.

After a steep increase from 1995 (when data was first collected) to 1998, the proportion of four-year-old girls who were assessed as being overweight generally levelled off, to a proportion around 15%; the increase for boys continued until 1999, before establishing a similar trend to that for girls. Over this period, rates for girls were consistently 2 percentage points or more above those for boys - the exception was in 1995, where the difference was 1.9 percentage points (Table 2).

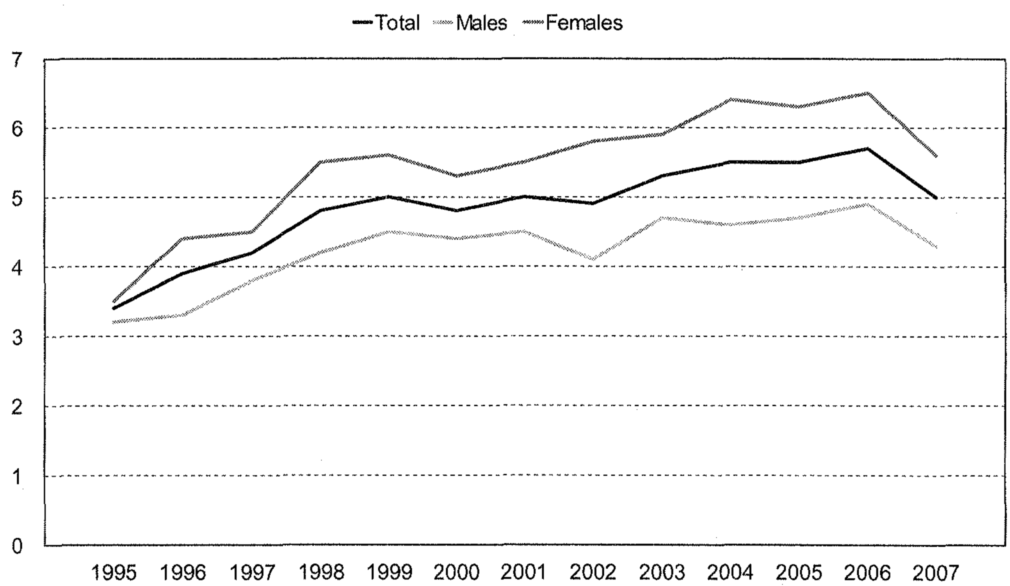
Table 2: Percentage of Overweight Four Year Old Preschool Children by sex, SA, 1995-2007

Year	Total % overweight	Male % overweight	Female % overweight	Difference between sexes (%)
1995	8.3	7.4	9.3	1.9
1996	9.7	8.5	10.9	2.4
1997	11.7	10.6	12.9	2.3
1998	13.3	11.2	15.5	4.3
1999	14.0	12.8	15.2	2.4
2000	13.4	11.8	15.0	3.2
2001	12.8	11.7	13.9	2.2
2002	14.5	13.5	15.6	2.1
2003	14.8	13.4	16.2	2.8
2004	14.5	13.0	16.1	3.1
2005	14.4	13.1	15.8	2.7
2006	13.9	12.2	15.7	3.5
2007	13.8	12.5	15.1	2.6

Rates of obesity are around 40% of those for overweight. The trend has been of increasing proportions for both girls (with the higher rates) and boys, with the gap between their rates increasing from around one third of a percentage point in 1995, to around one and a half percentage points in the later years (Table 3). There was a sharp decline in rates between 2006 and 2007.

Figure 2

Percentage of Obese Four Year Old Pre-School Children By Sex in SA 1995-2007



Source: CYWHS, May 2008

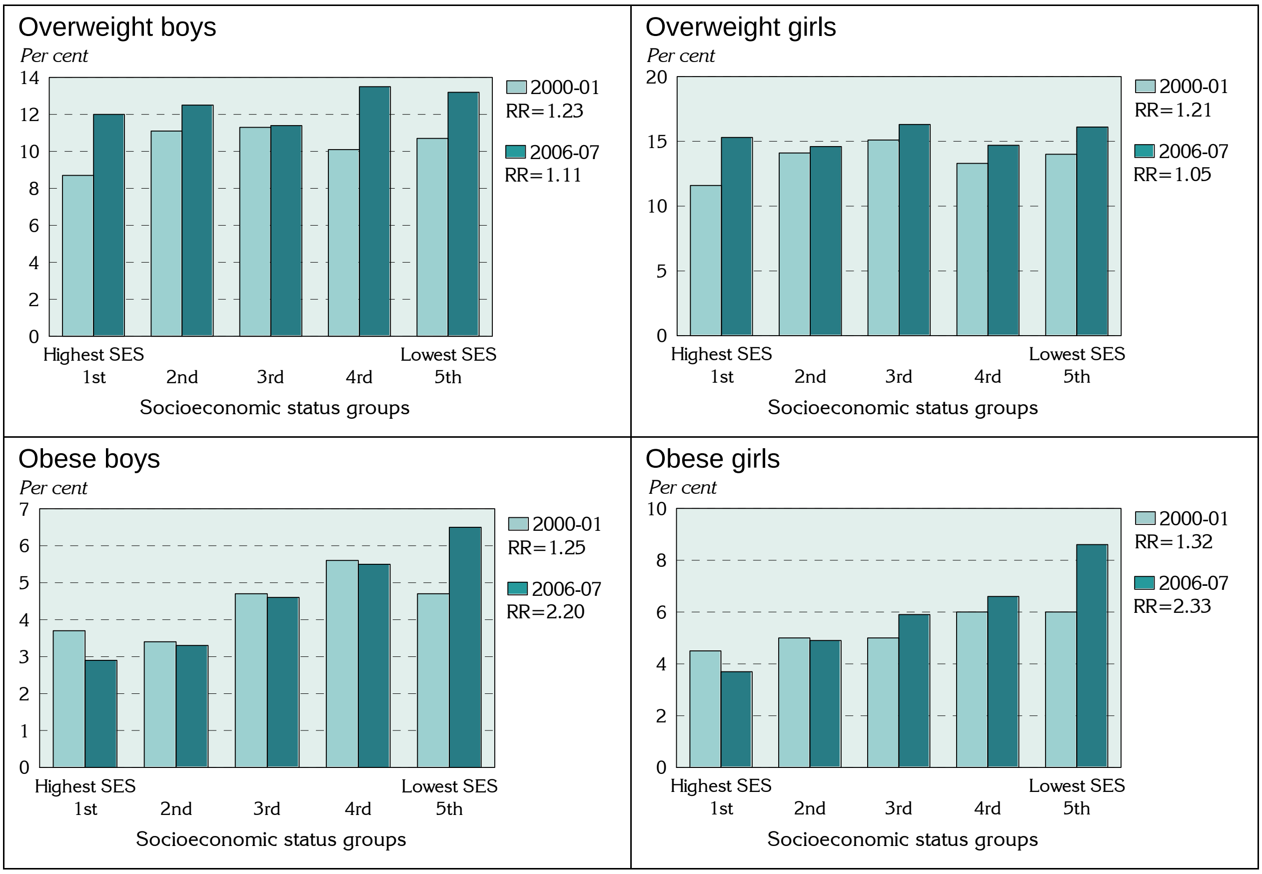
Table 3: Percentage of Obese Four Year Old Preschool Children by Sex, SA, 1995-2007

Year	Total % obese	Male % obese	Female % obese	Difference between sexes (%)
1995	3.4	3.2	3.5	0.3
1996	3.9	3.3	4.4	1.1
1997	4.2	3.8	4.5	0.7
1998	4.8	4.2	5.5	1.3
1999	5.0	4.5	5.6	1.1
2000	4.8	4.4	5.3	0.9
2001	5.0	4.5	5.5	1.0
2002	4.9	4.1	5.8	1.7
2003	5.3	4.7	5.9	1.2
2004	5.5	4.6	6.4	1.8
2005	5.5	4.7	6.3	1.6
2006	5.7	4.9	6.5	1.6
2007	5.0	4.3	5.6	1.3

Source: CYWHS, May 2008

When analysed by groups of areas using the IRSD, there is a socioeconomic gradient across this population group for obese four-year-old boys and girls, which increased over time (Figure 3). For overweight children, the gradient that existed over the combined years of 2000 and 2001 (2000-01) had reduced by 2005-07, with a larger reduction evident for girls than for boys.

Figure 3: Overweight & Obese Four Year Old Children, Adelaide Statistical Division



Note: RR is the rate ratio, and shows the difference in the rate (proportion) of children assessed as overweight (or obese) in the lowest socioeconomic status (SES) areas and those in the highest SES areas. [Source: Analysis of data from CYWHS by PHIDU, 2008.]

In 2000-01, the proportion of overweight boys in the lowest socioeconomic status (SES) areas was 23% higher (a rate ratio of 1.23) than for those in the highest SES areas - by 2005-07, this had reduced to 11%. For overweight girls, the reduction was from 21% higher to 5% higher.

In contrast, the rate ratios for obese boys and girls have both increased over the time periods compared. For boys, the increase was from 25% higher in the lowest SES areas in the earlier period, to more than twice the proportion (a rate ratio of 2.2) in the later period. For girls, it was from 32% to also more than double (a rate ratio of 2.33).

These results indicate that obesity is evident as early as the preschool years, but that declines in prevalence may occur without apparent systemic interventions at a population level. Socioeconomic factors are also important across this population, and indicate the complex social and economic patterning of factors that contribute to the prevalence of obesity and overweight in childhood.

3.0 Conclusion

Obesity is a condition which has long-term consequences for an affected individual, and for society as a whole. Without data which accurately represent the size of the issue and a reliable survey vehicle to use for monitoring the health of the population, it will be difficult to determine the impact of any policy change or interventions to alleviate the situation.

The presence of a socioeconomic gradient across the population also reveals that there is much in the social and physical environment which needs attention. A sole focus on the obese individual does not help to address the broader social and economic issues that influence people's lives. We need to utilise a social ecological approach that can influence individual behaviours without isolating, discriminating, or marginalising those who are obese and overweight (Cohen et al. 2005). Such an approach will move us towards conceptualising and developing family, community, and governmental strategies that can involve those affected in inclusive and respectful actions, and result in healthier environments and populations overall (Cohen et al. 2005).

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APPENDIX 1

Background to PHIDU

The Public Health Information Development Unit (PHIDU) was established by the Australian Government Department of Health and Ageing in 1999, to assist in the development of public health data, data systems and indicators. PHIDU is located at The University of Adelaide and is a collaborating unit of the Australian Institute of Health and Welfare (AIHW) in relation to its work for the Department of Health and Ageing.

The Unit staff are committed to the development of an integrated health information system in Australia that can provide information on a broad range of health determinants across the life course. A major emphasis is on the development and publication of small area statistics for monitoring inequality in health and wellbeing.

PHIDU's work program has included:

. the publication of the *Social Health Atlas* series for Australia (second edition), three Australia-wide Indigenous Social Health Atlases, and numerous Social Health Atlases for South Australia;

. the development of the Business Case for a program of national health measurement surveys (the Australian Health Measurement Surveys) to provide objective health data to complement the self reported information collected by the ABS National Health Surveys;

. an audit of international and Australian surveillance systems for monitoring chronic diseases and their risk factors (with other partners), currently being updated;

. arranging national symposia on health data linkage and its relevance to health policy and research;

. the development of question modules for use in state and territory computer-assisted telephone interviewing (CATI) systems; and

. the publication of a number of articles, using small area data, highlighting the extent of health inequalities in Australia, and the need for better links between policy and research in this area;

. the development of an atlas of potentially avoidable hospitalisations for Australia;

. the development of an atlas of atlas of avoidable mortality for Australia and New Zealand;

. providing project officer support for the development of a discussion paper which identifies strategies to improve the identification of Aboriginal peoples and Torres Strait Islanders in communicable diseases' reporting; and

. providing project officer support for the development of a classification of public health.

PHIDU staff have expertise and skills in the following areas:

. the compilation and analyses of health and other data with a primary focus on health and social inequalities in Australia, with collaborative links to many of the key international researchers in this area;

. the theoretical frameworks and the extent of research evidence that underpins knowledge about the social determinants of health;
. policy analysis and other mechanisms to support the interface between research evidence and policy interventions;
. technical ability in the areas of health statistics, national and state health information needs, data access and coverage, survey development, and dissemination of health information to a wide range of users;
. detailed knowledge about the current range of health information and data sources in Australia;
. experience in policy and program development for disadvantaged populations, specifically Indigenous communities, children and young people, disability, and socioeconomically disadvantaged communities.

Staff at PHIDU

Director

John Glover (BEc, BA) is a demographer with an interest in the presentation of information for policy development and strategic planning, in particular, information describing health inequalities deriving from socioeconomic inequalities. The Social Health Atlases of South Australia and Australia are examples of this work, and now include online atlases delivered through interactive software. After 20 years in the SA Health Commission/ Department of Human Services, he was invited by Ms Liz Furler, then First Assistant Secretary, Public Health Division, Department of Health and Aged Care to provide specialist advice to the department. This led to the establishment of PHIDU. Prior to his time in the SAHC/DHS, he worked for the Australian Bureau of Statistics (14 years) and the SA Council for Educational Planning and Research (two years), where he was statistician to the Anderson Enquiry into Tertiary Education in SA.

Senior Research Fellows

Diana Hetzel (MBBS, Grad. Dip. Health Admin.) is a medical graduate with a clinical background in child and youth health. She has over 25 years' experience in the areas of public health research, health administration, program planning and review, research ethics, policy development, and medico-legal issues related to children and young people across the health and welfare sectors. She is a current member of the SA Council for the Care of Children, the SA Committee on Child Death and Serious Injury Review, the Human Research Ethics Committee (SA Health), the National Child and Youth Information Advisory Groups (AIHW), and a past member of the Board of the Children, Youth and Women's Health Service (Adelaide), the Council of the Child Health Research Institute, the Council of the Family Planning Association SA, and the Australian Health Information Council, a position she shared with Professor Fiona Stanley.

Fearnley Szuster (BSc (Hons), MSc (Applied Social Research)) is an accredited statistician and demographer, and has over 25 years' experience in the health sector. His work has included research and statistical analysis in labour force, social and health related areas including the development of statistical information systems and standards. He is experienced in the design, collection, management, analysis and reporting of statistics and statistical collections.

Research Fellows

Su Gruszin (BA, majoring in Mass Communication, Philosophy) has a background in research through analysis, synthesis and graphical presentations; policy development; information management; project management through product development and process change, using information technology to maximise results; planning - strategic, information, operational, productivity; and writing, including editing, summarising, indexing, abstracting.

Kristin Leahy (BHealth Sciences (Major in Public Health)) - has worked on the Divisions of General Practice Profiles and Supplementary Profiles, The Social Health Atlas of Compensable Injury, the Central Northern Adelaide Health Service Social Health Atlas and is currently working on 'Men's health and wellbeing in South Australia: an analysis of service use and outcomes by socioeconomic status'.

Anthea Page (BSocSc, majoring in geography and public health) - project work has included literature reviews, data analyses, report writing and editing. Publications have included Analysis of the contribution of Indigenous mortality to geographic variations and socioeconomic gradients in Australia, 1997-99, Inequality in South Australia: Key determinants of wellbeing, Atlases of avoidable hospitalisations and mortality, and Divisions of GP population profiles.

Sarah Tennant (BHSc (Hons), majoring in public health) has key responsibilities for data management and analyses at PHIDU. Publications have included the Social Health Atlas of Australia series; Analysis of the contribution of Indigenous mortality to geographic variations and socioeconomic gradients in Australia, 1997-99; the Atlas of Young South Australians (Second Edition), *Equity online* (SA Strategic Plan) and the Atlas of South Australia (Third Edition) and its online version.