

**A LITERATURE REVIEW OF THE EVIDENCE  
FOR INTERVENTIONS  
TO ADDRESS OVERWEIGHT AND OBESITY IN  
ADULTS AND OLDER AUSTRALIANS**

(WITH SPECIAL REFERENCE TO PEOPLE LIVING IN  
RURAL AND REMOTE AUSTRALIA  
AND ABORIGINAL AND TORRES STRAIT ISLANDERS)

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## **FINDINGS FROM LITERATURE REVIEW**

The literature review involved collating information about the prevalence and patterns of overweight and obesity in Australian adults, identifying key policy documents related to overweight and obesity and the priority population groups, and an overview of evidence on the effectiveness of interventions. The purpose of the literature review was policy-oriented, to guide the development of a framework of actions for addressing overweight and obesity; it was not intended as a comprehensive systematic review.

In this section, the findings from the literature review are reported separately for each of the priority population groups, in section 3.4 to 3.8 below.

The overview of evidence on effective interventions specifically involved literature searching, critical appraisal and assessment.

### **3.1 Search strategy**

A literature search was conducted to identify recent reviews of evidence on the effectiveness of interventions (excluding drug therapy and surgical interventions) to prevent or manage overweight and obesity in adults.

Initial searches were limited to: systematic review; review; meta-analyses. This is a highly economical and appropriate approach, as it not only makes use of the work of major international research collaborations and manages the volume of published literature, but also ensures that the review considers and reflects international perspectives.

Reviews were chosen primarily where effectiveness was measured by some weight-related outcome measure: prevention of weight gain, weight loss and/or weight maintenance.

Intermediate outcomes measures were: changes in diet (towards 'healthier' options) and/or physical activity (increase in levels).

A particular focus was placed on studies or reviews conducted in or aimed at adults in rural or remote communities and Aboriginal and Torres Strait Islanders (rural and urban).

The search was also extended to recent (2003-current) primary articles (not included in the reviews) to try and uncover more wide-ranging interventions, and indicate the broader scope of the literature, as well as increase the capacity to comment on interventions with specific priority target groups not covered in systematic reviews.

The search included the following:

- Literature search of electronic databases – all at OVID: including CINAHL, EMBASE, PUBMED, and MEDLINE. Terms used were:
  - overweight OR obesity
  - (overweight OR obesity) AND prevention
  - (overweight OR obesity) AND intervention
  - weight AND (gain OR maintenance OR prevention OR intervention)
  - (rural OR remote) AND (overweight OR obesity) AND intervention
  - (rural OR remote) AND weight AND (prevention OR management)
  - nutrition AND intervention
  - physical activity AND intervention

- weight AND (nutrition OR physical activity) AND (intervention OR prevention).
- Search of EBM reviews databases (Cochrane, Trials Register, DARE, ACP). Terms used: obesity, exercise, weight, overweight, physical activity.
- Expert guided search of international websites, including:
  - CDC physical activity website
  - Victorian Public Health Research
  - Centre for Nutrition Policy Promotion.
- Google search using the terms: obesity evidence interventions adults.
- Online 'hand search' of the last 5 years of volumes of the journal 'Obesity Reviews'.

Limits were generally: Adults (aged 19+ years), English Language, 2000 – May 2005. Particular care was taken when searching through the abstracts to identify those reviews and papers focused on different life-stages, e.g. postmenopausal women, postpartum, elderly; as well as rural or remote.

Additional searches for evidence of effective interventions in Aboriginal and Torres Strait Islanders and rural/remote populations were conducted using specific sources, including:

- Search of relevant University of Sydney electronic databases on INFORMIT<sup>1</sup>, including ATSI Health, CINCH, Health and Society, RURAL; using the keywords: weight OR obesity OR nutrition OR physical activity. All years that the databases covered were included in these searches. Limits: adults, English language.
- Online 'hand search' of ALL volumes of Aboriginal and Islander Health Workers Journal.
- Google scholar search using 'obesity, aboriginal, community'<sup>2</sup>.
- Search of the '*Australian Indigenous Health Infonet*' using keywords: obesity, nutrition, physical activity, weight.
- Search of following websites:
  - National Rural Health Alliance – particularly conference proceedings.
  - Menzies School of Health Research, including 'The Chronicle', Bulletin of the Chronic Diseases Network of the Northern Territory.

### 3.2 Critical appraisal methods

The criteria for the critical appraisal of both reviews and individual studies was developed from the National Public Health Partnership's *A Schema for Evaluating Evidence on Public Health Interventions* (Rychetnik 2002) and the Health Development Agency Evidence Base *Critical*

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<sup>1</sup> See details of databases below

<sup>2</sup> Provided by Ian Raymond and co-workers, Collaborative Centre for Aboriginal Health Promotion

*Appraisal Tool* (NHS). The criteria for critical appraisal were developed to provide a framework for the qualitative assessment of reviews and individual studies included in this review. The critical appraisal criteria aim to assess the relevance and methodological rigour of the reviews and individual studies, as well as elements of external validity, such as acceptability and transferability.

### **3. 3. Identifying effective approaches**

Most of the reviews and individual studies examine treatment or management interventions for those who are already obese. There is less evidence for interventions that aim to prevent weight gain at the population level. The multi-factorial nature of obesity, and the intensity and duration of interventions required for effectiveness, means that it is unlikely that any single program will have a significant impact on community weight status. Thus, without large, longer-term studies of multi-component prevention and maintenance interventions, we are unlikely to find effective population level interventions.

Many experts have commented on the significant gaps in knowledge regarding obesity prevention, and proposed alternative approaches for systematically and rigorously designing a comprehensive framework for action. Firstly, a problem solving approach or health promotion planning framework can be used to identify a range of potential intervention points, based on an understanding about factors contributing to the problem. This type of process ensures that solutions are designed to fit the problem (Green 2001). Secondly, a more inclusive approach to evidence, that recognises that different types of evidence are needed in different stages of the decision-making process can be used (Swinburn, Gill & Kumanyiki 2005).

These authors recommend that the range of opportunities for action be identified through a variety of forms of evidence, beyond specific intervention studies, and include:

- Parallel evidence from other public health initiatives.
- Existing frameworks for action.
- Current policies and systems.
- Informed opinion.
- Program logic and theory.

Thus, the literature search and appraisal process sought to identify best available evidence, and to then use this to identify valuable interventions.

### 3.4 Interventions at the whole of population level

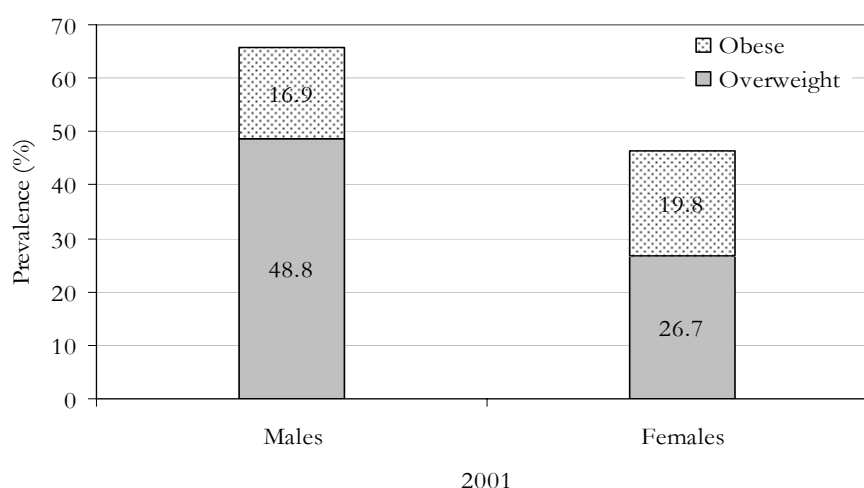
#### Epidemiology of overweight and obesity in adults

##### *Prevalence*

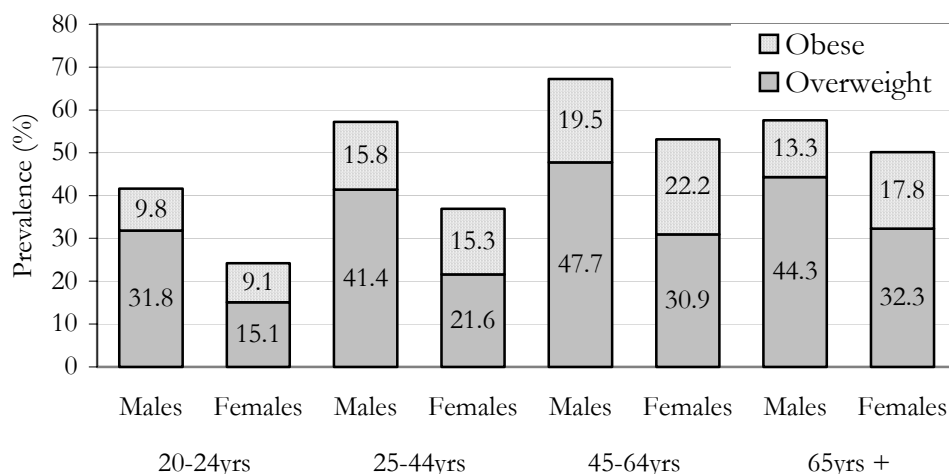
Overweight and obesity is a widespread and serious problem for around half of adult Australians, with 66% of men aged 20 and over and, 47% of women in the same age group either overweight or obese (Figure 3.4.1). Men are more likely to be overweight but less likely to be obese (Figure 1). (AIHW, 2003)

##### *Distribution*

Both overweight and obesity increase with age in men and women until age 65 years when the prevalence of both overweight and obesity decrease in men and the prevalence of obesity decreases in women (Figure 3.4.2) (AIHW, 2003)



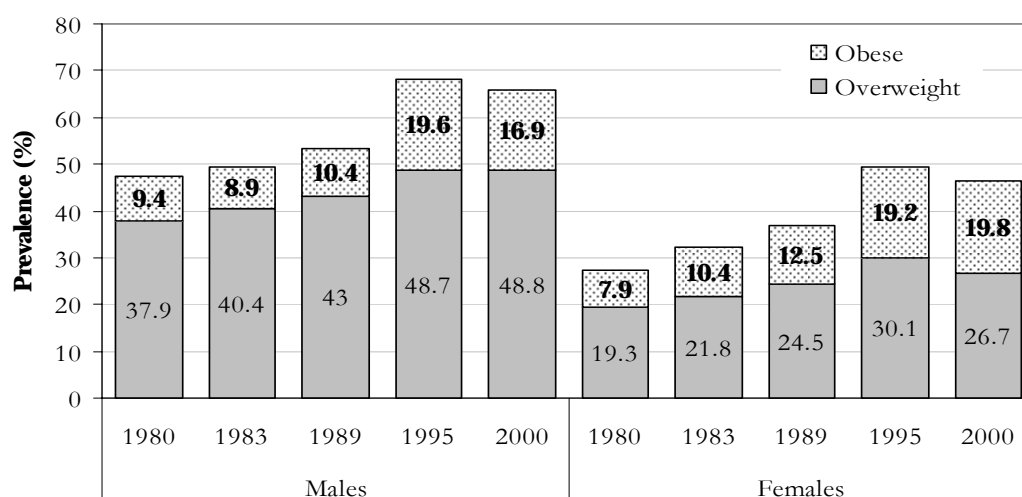
**Figure 3.4.1** Prevalence of overweight and obesity among Australian adults in 2001. (AIHW 2003)



**Figure 3.4.2** Prevalence of overweight and obesity among Australian adults by age group in 2001. (AIHW 2003)

#### *Secular trends*

The prevalence of overweight and obesity has increased across all adult age groups over the last twenty years (AIHW 2003), with increases in the range of 6 to 7 kilograms (kg) (see Figure 3.4.3). Using repeated cross-sectional samples, the AIHW has reported that the prevalence of both overweight and obesity increased from 1980 to 1995, but did not change significantly between 1995 and 2000. While there are higher rates of overweight and obesity in some age groups, the variations are small compared with the size of the overall increase in weight across age groups.

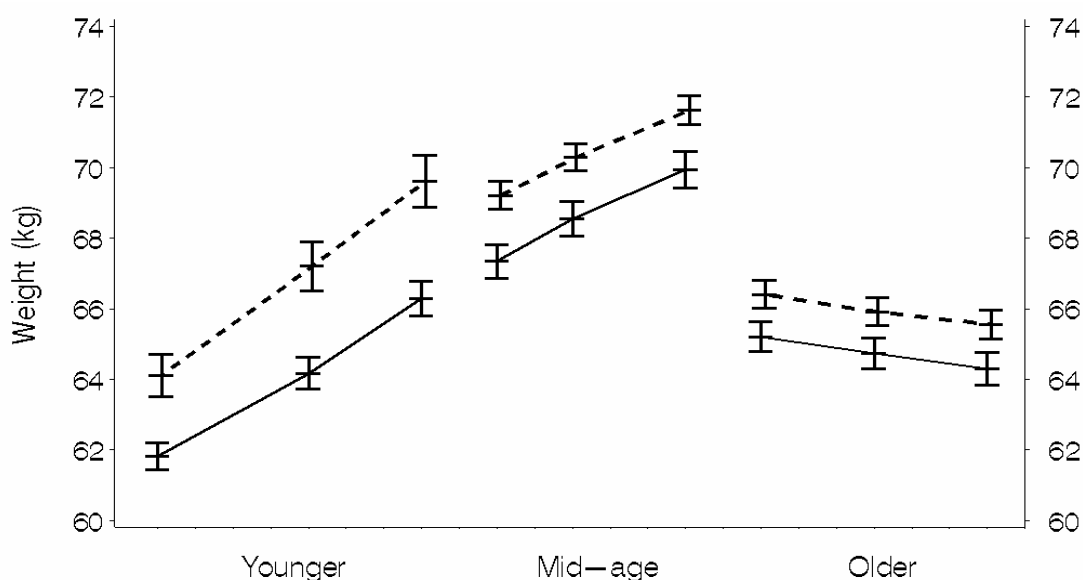


**Figure 3.4.3** Trends in prevalence of overweight and obesity in Australian adults aged 25-64 years, 1980-2000 (AIHW 2003)

The magnitude of the gradual increase in weight at the population level from 1996 to 2003 is illustrated in Figure 3.4.4 using prospective data from the Australian Longitudinal Study of

Women's Health (Brown et al., 2005). This study involves three age based cohorts (young women in their twenties, mid-age women in their fifties and older women in their seventies). In 1996 the younger women had the lowest average weight, 62.6 kg, while the mid-age women were the heaviest with an average of 68.6 kg - a difference of 6 kg. After 5-7 years, the younger women had gained more weight than the mid-aged women, reducing the average difference in weight to 3.6 kg. Average weight gain was significantly higher in younger (649 g per year) than in mid-age women (494 g per year). The pattern of weight change was different in the older cohort: their average weight decreased by nearly ½ kg during the first six years of the study (162 g per year). In all three age cohorts, the average weight of women living in rural and remote areas was higher than that of urban women. Young rural women gained weight faster than any other group (Brown et al., 2005).

There is increased risk for chronic health conditions related to obesity for all adult age groups, and these are discussed in the background paper on “Addressing overweight and obesity in people at risk of chronic health problems associated with overweight and obesity”.



**Figure 3.4.4:** Average weight of participants in the Australian Longitudinal Study of Women's Health 1996 – 2003. *Solid lines = urban women; dashed lines = rural/remote women. (Vertical bars indicate 95% confidence intervals.) (Brown et al., 2005)*

### Determinants of overweight and obesity

Weight gain and obesity develop from an accumulated period of energy imbalance, where energy intake exceeds energy expenditure.

The *Expert Report on Diet, Nutrition and the Prevention of Chronic Disease* (World Health Organization, 2003) identified a range of factors that decrease and increase risk of weight gain and obesity (see Table 3.4.1). A detailed review of the evidence of a wide range of potential aetiological factors has also been published by (Swinburn, Caterson, Seidell, & James, 2004)). Furthermore, as evidence

from Table 3.4.1 shows, the modifiable risk factors for obesity are common to those for other chronic conditions.

**Table 3.4.1.** Summary of the strengths of evidence on factors that might promote or protect against weight gain and obesity in adults.

<b>Evidence</b>	<b>Decreases risk</b>	<b>Increases risk</b>
Convincing	Regular physical activity High dietary fibre intake	High intake of energy-dense foods* Sedentary lifestyles Physical inactivity Quitting smoking
Probable	Home and school environments	Heavy marketing of energy dense foods and fast foods outlets Adverse social and economic conditions Sugar-sweetened soft drinks and juices
Possible	Low glycaemic index foods Breastfeeding	Large portion sizes High proportion of food prepared outside of homes Fad dieting
Limited	Increased eating frequency	Alcohol

\* energy dense foods are high in fat/sugar and energy dilute foods are high in fibre and water (e.g., vegetables, fruits, legumes and whole grain cereals. Source: Adapted from (World Health Organization, 2003; Gill, King, & Webb, 2004)

## The national policy context

The project team has identified a range of national health strategies and plans which are relevant to its task. Key documents include:

- *Healthy Weight 2008* – Australia's future: the national action agenda for children and young people and their families.
- *Eat Well Australia*.
- *NHMRC Clinical Practice Guidelines for overweight and obesity* (2004) – designed primarily for GPs.
- *Australian Dietary Guidelines for Adults*.
- *Physical Activity Guidelines for Adults*.
- *Be Active Australia*: a framework for health sector action for physical activity 2005-2010.
- *Preventing Chronic Disease: A strategic framework* (NPHP 2001).
- *A health promotion strategic plan for the veteran community 2001-2005*.
- *Active Australia. A national participation framework* (1997).



Many of these documents have involved extensive consultation processes, as part of their development. This project does not aim to duplicate this work, but to draw from it, and incorporate key aspects of these documents and issues arising in consultations into the current work.

## **Addressing overweight and obesity – enabling actions**

Over the last ten years, public health policies and plans have increasingly recognised the importance of more macro-level enabling actions as an essential adjunct to programs and settings-based initiatives in addressing public health problems. There is a consistent set of enabling actions identified in current frameworks promoting physical activity, nutrition and healthy weight. In *Healthy Weight 2008* these factors are described as national actions, and include: community-wide education, whole of community demonstration areas, evidence and performance monitoring and coordination and capacity building. Similarly, in *Be Active Australia*, the overarching strategies comprise: communication and community education, increasing workforce capacity, evidence, research, monitoring and evaluation; and strategic management and coordination.

These enabling or overarching strategies are designed to provide essential resources and tools to underpin and support the implementation of specific interventions. In general, such strategies are not sufficiently discrete or identifiable to be evaluated. Thus, they typically fall outside the scope of evidence reviews. Nevertheless, they are important components of a comprehensive approach.

The specific overarching strategies required to address overweight and obesity in adults need to be distilled, on the basis of existing policies and initiatives, as well as expert opinion. It is important to recognise that there may be differing requirements for overarching strategies in relation to specific priority target groups.

## What works?

### Findings on the effectiveness of interventions to prevent weight gain in the whole population

The *WHO Global Strategy on Diet, Physical Activity and Health* (2004) report provides an important basis for action. It synthesises available evidence for action and aims to facilitate the development and implementation of national action plans to improve diets and increase physical activity, with specific reference to healthy weight. It is directed to whole population approaches. The *Strategy* emphasises the infrastructure support required at national levels to promote the widespread adoption of healthy diets and physical activity and achieve population level impact. The *Strategy* proposes a range of actions, covering interventions related to consumer information, including food labelling and marketing; policies, including agricultural, fiscal and food policies; the role of health services in prevention; and investment in research and evaluation.

Interventions to prevent weight gain in the whole population seek to produce changes that can benefit everyone, whether they are healthy, or have health problems. They apply the population health approach described by (Rose, 2001), where the aim is to make small changes across large numbers of environments or people over time, and that this will have the biggest impact on overall population health. One way interventions can achieve this is through having a direct effect on individuals, so that they make individual changes, as long as the intervention reaches a significant proportion of the target population, and not just a tiny part of it. A small change across the target population can have a powerful and significant impact overall at population level.

Another approach is to implement population-wide interventions through environmental or policy changes that lead to increased activity or reduced energy intake, but in ways where individuals themselves are not *actively* involved. For example, reduced fat in the meat supply is a population wide strategy that can reduce fat consumption. It is generally more sustainable, effective and efficient to make small environmental and policy changes, rather than ongoing efforts to encourage large numbers of individuals to make and sustain individual level changes. While there are few studies of such approaches to preventing weight gain, there is an accumulating body of literature on such approaches to promoting nutrition. Approaches to promote physical activity through environmental changes have not, however, had the same success.

Not all changes in people's levels of physical activity and /or food consumption lead to changes in population weight status. For example, if more people met the guideline of being active for 30 minutes on most days, this by itself might not be sufficient to prevent weight gain, because energy intake is also important. Conversely, reducing energy intake may not prevent weight gain, especially in those who are already overweight or obese, unless there are simultaneous increases in physical activity (Brown et al., 2005). However, at the population level any increases in physical activity or reductions in energy intake are likely to contribute to preventing weight gain.

The evidence on population interventions to address weight gain and overweight and obesity in adults has been the subject of a number of recent reviews. The report published by the Heart Foundation of Australia (2004) draws from community cardiovascular prevention studies, and reviews of nutrition interventions to note:

- Results of large scale community CVD prevention trials (Farquhar et al., 1990; Puska, 1995; Jeffery, 1995) have reinforced the difficulty of preventing weight gain in the

community, but also demonstrate the time lag that can be expected between the implementation of a truly community-wide program and the extent of behaviour change likely to be required to impact upon the weight status of the community.

- Interventions focusing on increasing fruit and vegetable intake (Ciliska et al., 1999; AHRQ, 2000) and decreasing total dietary fat (AHRQ, 2000) have been particularly successful at achieving change, and potentially influencing energy balance sufficiently to prevent weight gain or assist weight loss.

The recent reports *Getting Australia Active (GAA) I and II* collate and review a wealth of research on the evidence base for promoting physical activity, and provide an important foundation for further findings. The reports build on the major reviews published in the American Journal of Preventive Medicine in 1998. Key findings related to settings comprise:

- *Primary health care setting* – brief interventions involving verbal advice and written materials can produce short-term changes in physical activity (Smith, 2004). Studies which involved partnerships between GPs and other health professionals and in which patients received counselling outside the routine contact time with the GP, appeared to show more consistent improvements in PA (Smith, 2004). GAAII found substantial new evidence on the effectiveness of individually adapted health behaviour change programs, especially for older people.
- *Workplaces*. GAA II found that the evidence remains inconclusive - most programs have a combination of health checks, education programs, motivational prompts, exercise programs or incentive based programs (Marshall, 2004). The more successful interventions adopted a more comprehensive approach, including changes in the organizational structure and culture of the workplace, as well as individual programs. A recent study in WA which promoted active commuting reported success in changing levels of walking but not cycling among the volunteers who agreed to participate (Pikora, 2004). Workplace has considerable potential, but requires better designed studies with appropriate attention to recruitment, retention, compliance and analyses.
- *Media approaches*. A recent review found that mass media can be effective in raising awareness but it did not translate into behaviour change (Marshall & Owen, 2004). The conclusion was that better results might be obtained when more than one ‘mediated’ approach is used (i.e. print, electronic media, telephone, internet), or when media are used as part of a coordinated ‘whole community’ intervention.
- *Environmental and policy approaches*. Overall, the body of research is limited and of poorer quality. However, a number of interventions have evidence of effectiveness: Point of decision prompt to promote stair use are recommended for working adults who have access to stairs, although it must be noted that a large proportion of the Australian population do not have access to stairs, so that the impact of widespread dissemination of this strategy would have limited reach. In addition, initiatives to create or enhance access to places for activity, combined with information outreach activities, are strongly recommended.
- Community-wide approaches using multiple strategies, including mass media, education, environmental changes and social support show promise, but at the time of writing GAAII there was little evidence to support the effectiveness of these interventions.

Building on these foundations, our literature search identified some additional, recent reviews.

The evidence collated by Hillsdon and colleagues (Hillsdon, Foster, & Thorogood, 2005) supports the effectiveness of professional counselling and advice in promoting levels of physical activity in the short to mid-term (6 to 12 months). There are many variations of this type of intervention, with few clear-cut differences in effect. For example, home and facility-based exercise sessions, and ongoing professional support and self-directed efforts following professional guidance did not differ. However, greater intervention intensity, with more sessions, tended to be more effective. As discussed below, in relation to interventions with people who are overweight or obese, these types of interventions, directed to individuals, are limited in their potential for prevention at a population level. This is consistent with conclusions reached by Swinburn & Egger (2002) based on a theoretical analysis, by Saris et al (2003) in their review of the level of physical activity required for weight management, and by Schulze et al (2005) in translating knowledge about prevention of diabetes into population level changes.

One review does focus on policy and environmental interventions to promote physical activity and nutrition (Matson-Koffman, Brownstein, Neiner, & Greaney, 2005). This review reinforces the findings on effective approaches to promoting physical activity, and also includes preliminary evidence on workplace interventions and environmental changes to promote nutrition. Drawing on 5 studies, they note that there is preliminary evidence on the effectiveness of comprehensive interventions, combining education, peer support, incentives and access to facilities such as showers, change rooms and gyms. They conclude that there is strong evidence for point-of-purchase strategies (such as menu changes, price reduction and labelling) and for improved access to healthier foods in vending machines and food services, in increasing purchase and consumption of healthier foods.

Ogilvie (Ogilvie, Egan, Hamilton, & Petticrew, 2004) addresses approaches with the potential to prevent weight gain at a population level, and has studied whether changes in walking and cycling infrastructure results in reduced car use and change towards active transport. While there are mixed results, it is clear that infrastructure interventions can have an impact, although the impact will be mediated by other psychological and social factors, which suggest infrastructure and psychological and social factors need to change simultaneously.

The review by Swinburn and his colleagues (Swinburn et al., 2004), prepared for WHO, analyses the key intervention points and identifies nutrition strategies with potential to prevent excess weight gain and obesity. The review considers a range of intervention strategies of specific relevance to adults and identifies strategies that effectively change people's food purchasing, including nutrition signposting, pricing policies and nutrition information panels.

The findings from a recent analysis of evidence on the links between physical environments and physical activity, nutrition and obesity are consistent with reports from earlier published reviews. While there is an accumulating body of evidence on how physical environments affect physical activity, there is very little published or available research on influences of the environment on nutrition and obesity. However, there are several urban form characteristics (natural and built environment) that tend to be associated with physical activity, and possibly nutrition-related obesity behaviours. These include:

- Mixed land use and density.
- Footpaths and cycle ways and facilities for physical activity.
- Street connectivity and design.
- Transport infrastructure and systems, linking residential, commercial and business areas.

**Some approaches that aim to prevent weight gain at a whole population level are considered as enabling actions (as discussed above).**

*So what is effective in preventing weight gain across a whole population?*

Overall, the studies and reviews on population level interventions are few and quite disparate. The most valuable population-wide approaches would appear to involve building new combinations of strategies that promote physical activity and improve nutrition. This is consistent with the approach adopted in the report *Best options for promoting healthy weight and preventing weight gain in NSW* prepared by the NSW Centre for Public Health Nutrition (Gill et al., 2004). This report synthesises information from a wide range of sources and study types, as well as parallel evidence from public health actions in other areas, to propose valuable interventions to prevent weight gain in adults through a mix of behaviour change and environmental action in key settings, particularly in local communities and workplaces. The report also recommends a set of enabling actions designed to build the capacity of systems to reinforce, strengthen and potentially multiply the effects of local programs.

It will be important to build more evidence on population approaches, by ensuring sound evaluation of future community interventions.

Care must be taken when applying the results from studies addressing weight control or loss within small groups or individuals to the formulation of population-wide strategies to prevent weight gain. In addition, the goals of population strategies to prevent weight gain are not always translatable to strategies which focus on individuals. For example, there is a growing body of evidence that indicates that increasing the protein content of the diet of individuals improves satiety and aids weight loss. However, the protein intake of populations appears particularly stable and difficult to change to a degree that would have benefits on energy balance at an individual level.

There have been attempts to estimate the extent of the population energy surplus which has led to the recent increases in mean population weight. However, attempts to translate these estimates of population energy surplus to individual energy intake and expenditure recommendations are challenging because there appear to be variations in the genetic and physiological processes which control energy balance and, these may differ in individuals. The evidence from longitudinal studies of the Australian population suggest that modest changes in energy intake and energy expenditure are likely to account for the mean population weight gain of around 0.5kg per year (Brown et al 2005, in press).

## **Potential settings for intervention programs**

### *Community and workplace settings*

- Physical activity facilities – access to places for physical activity, with informational outreach.
- Cues for stair use in buildings – signs near elevators and stairwells.
- Infrastructure and promotion of active transport options, such as walking paths and cycleways.
- Social support for physical activity - such as buddy systems, workplace groups.
- Pricing, point-of-sale labelling and promotion of healthier food choices in food services, food retail and vending machines.
- Urban planning initiatives to provide mixed land use.

### *Media and marketing*

- Media campaigns to promote awareness of healthier lifestyle options (precursor to behavioural change).
- Specific campaigns addressing particular behaviours e.g. 1% or less to promote consumption of reduced fat milk.

### *Primary and allied health professionals*

- GP and health professional advice on dietary and physical activity behaviours.
- Weight management programs that cover diet, physical activity and psychological interventions (see below)

## **Case studies**

- *Smoking, nutrition, alcohol and physical activity (SNAP) 2001.* The SNAP Framework has been developed by Joint Advisory Group on General Practice and Population in conjunction with Chairs of National Population Health Strategies, to guide the implementation of integrated approaches to behavioural risk factor modification in general practice focusing on smoking, nutrition, alcohol and physical activity (SNAP). A wide range of patients in any practice may present with one or more of these risk factors. The SNAP Framework develops a system-wide approach to supporting general practice in the management of these behavioural risk factors with patients.
- *10,000 steps Rockhampton – a whole community multi-strategy approach that increased PA levels in women by 5% above baseline levels (Brown et al, in press).* This project was guided by the social ecological framework which emphasises intervention at multiple levels (social marketing, advice from healthcare providers and environmental strategies) to address physical inactivity in this regional Queensland city.
- *Travelsmart.* A joint initiative of Australian, State and Territory Governments. Program is about reducing reliance on cars and making smart choices about other forms of transport. Resource kits are available to assist schools, universities and special events managers to plan better travel access.
- *Heart Health Awards for Local Government (National Heart Foundation of Australia):* The Heart Foundation Kellogg Local Government Awards give recognition to local governments working with their communities to impact health and encourage healthier lifestyles. Since 1992, these Awards have celebrated the important role that local governments have in fostering the health of individuals and members of their community. They have been presented to local governments and collaborative projects that support and improve heart health, which involve initiatives that typically encourage health eating, physical activity and recreation. The Awards aim to encourage local governments to continue to work towards improving the heart health of their communities.
- *“Concord: A great place to be active” (Central Sydney AHS):* This was a community-based multi-strategic health promotion intervention promoting physical activity in women aged 20 –50 years conducted by Central Sydney health promotion unit in partnership with Concord local government. The intervention involved local social marketing campaign. Community walking events and council environmental projects that made changes in

parks, walking paths and maps of walking routes. Conducted over a 2 year period, the intervention was effective in producing statistically significant reductions (6.4%) in the proportion of sedentary women. These findings demonstrate that a community-based intervention targeting a specific population can achieve positive changes in physical activity and that a local government has the capacity to be involved in and sustain physical activity interventions (Wen et al., 2002).

- *1% or Less* Campaign: (Centre for Science in the Public Interest, [www.cspinet.org/kids](http://www.cspinet.org/kids).) Multiple messages and activities are used to influence communities to increase consumption of low-fat milk. A feature of the campaign is the 1% or Less School Kit, which contains materials for primary and secondary school students: idea sheets, fact sheets, marketing strategies, model press releases, handouts, posters, and instructions for conducting taste tests.

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### **3. 5 Interventions addressing people with established risk of weight-related chronic health problems**

The high-risk adult population includes all those at increased risk of developing weight-related chronic disease, including type 2 diabetes and cardiovascular disease. This population includes both overweight and obese adults, and those with other risk factors for chronic disease, such as hypertension or high cholesterol.

Obesity is considered both a risk factor for a range of chronic diseases, as well as a disease in its own right. Obesity is associated with the cluster of preventable chronic diseases that are responsible for the major portion of morbidity and mortality.

Cardiovascular diseases (CVD) and type 2 diabetes are significant health issues for Australians and overweight and obese people are at greater risk of developing these conditions. Despite major improvements in the cardiovascular health of Australians and falling death rates over the past 30 years, coronary heart disease and stroke remain the leading causes of death in Australia (AIHW 2004). Overweight and obesity are also associated with increased risk for other conditions including certain cancers, osteoarthritis, incontinence, gall bladder disease and depression (Dobson et al: in press).

Cardiovascular diseases (CVD) are the most expensive group of diseases in Australia in terms of direct health care expenditure. CVD were responsible for 11% of total allocated health system expenditure - \$5.48 billion in 2000-01. In 2000, the cost of cardiovascular drugs was \$1,546 million (34% of all prescription PBS drugs dispensed through pharmacies). Health system expenditure on diabetes in 2000-01 was estimated at \$784 million (1.7% of allocated recurrent health expenditure).

There is also growing evidence that weight gain is associated with risk of disease, including coronary heart disease, stroke and post-menopausal breast cancer, independent of initial body mass. Weight gain has also been independently associated with decreased physical functioning and vitality among women, and with all-cause mortality in middle-age among women (Dobson et al: in press).

Estimates of the proportion of cancers attributed to obesity range from 3% to 20% of all cancer deaths. Taken together, excess body weight and physical inactivity account for approximately one quarter to one third of cancers of the colon, breast (in postmenopausal women), endometrium, kidney and oesophagus/gastric cardia, and as such, adiposity and physical activity are the most important avoidable causes of these cancers (IARC 2002). However research shows excess body weight is a risk factor for the development of some cancers independent of other factors such as physical activity levels (IARC 2002).

### **Epidemiology of risk factors associated with overweight and obesity**

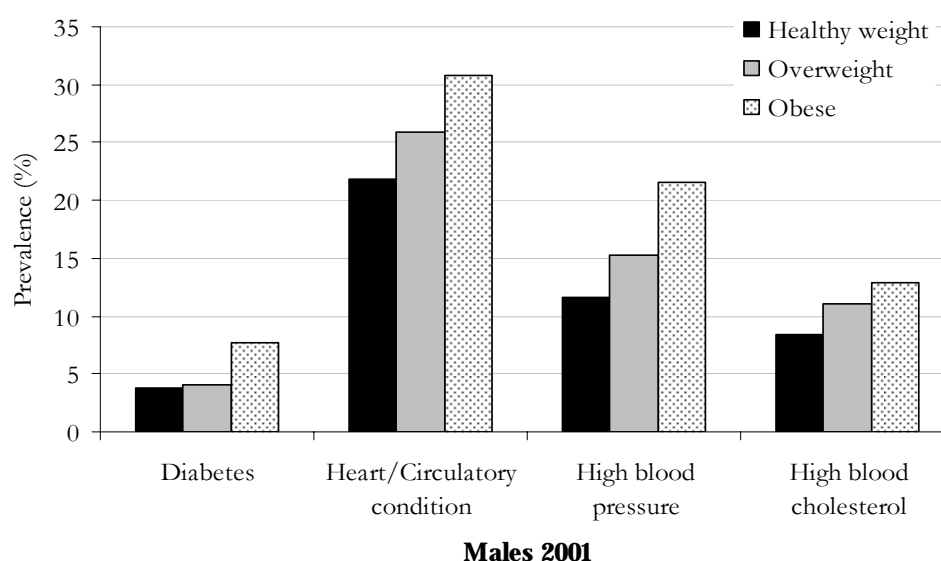
The estimated prevalence of risk factors among Australians presented in this paper come from data collected by the National Health Survey, 2001 (Australian Bureau of Statistics) and reported on by the Australian Institute of Health and Welfare (AIHW: 2003). It is important to note that the data are self-reported, and rely on the respondents' knowledge of their health status, and therefore may under-estimate the true prevalence rates.

## Prevalence

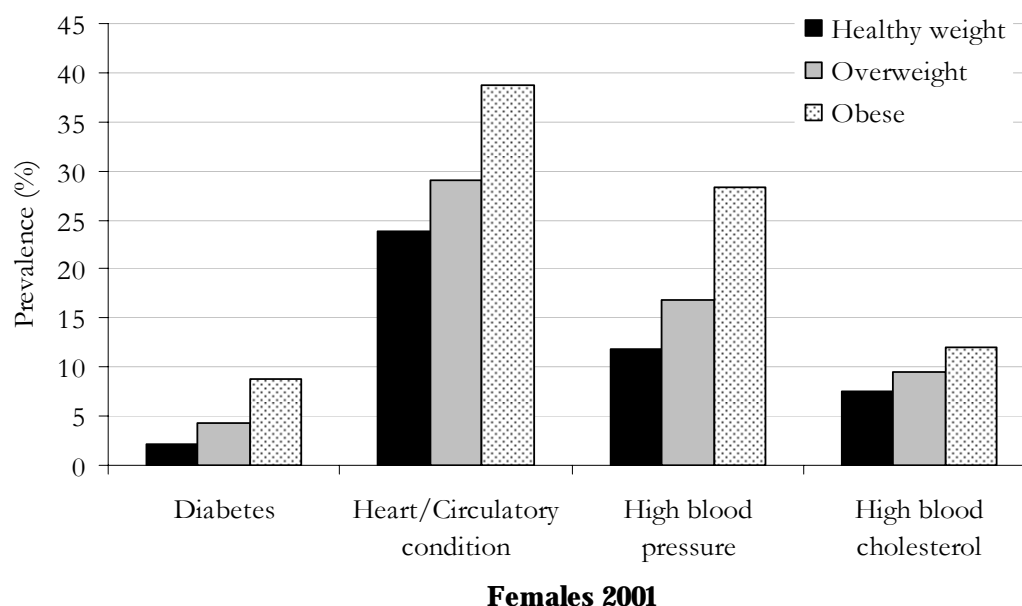
- **Type 2 Diabetes:** Self-reported diabetes was four times more prevalent among obese women than healthy weight women (8.7% and 2.2% respectively). Obese men were twice as likely to report diabetes, than healthy weight men (7.7% compared with 3.8%).
- **Heart or circulatory condition:** Proportionally more obese than healthy weight men reported having a heart or circulatory condition (30.8% compared with 21.9%). Similarly, a greater proportion of obese women reported having a heart or circulatory condition than women of healthy weight (38.8% compared with 23.8%).
- **Blood pressure:** Obese women were nearly three times as likely to report having high blood pressure than women of healthy weight (28.3% and 11.8% respectively). Correspondingly, a much higher proportion of obese men reported having high blood pressure than healthy weight men (21.6% compared with 11.6%).
- **High blood cholesterol:** Proportionally more obese men reported having high blood cholesterol than healthy weight men (12.9% and 8.4% respectively). Similarly, a greater proportion of obese women reported high cholesterol levels than women of healthy weight (12.1% compared with 7.6%).
- **Cancer** Three percent of cancer deaths in Australia are attributable to BMI>25 (Mathers et al, 1999). More recent figures in Europe attribute 5% of cancers to being overweight (Bergstrom et al, 2005). A large cohort study in the USA estimated that 14% of all deaths from cancer in men and 20% of those in women could be attributed to overweight and obesity (Calle et al, 2003).

## Distribution

The prevalence of diabetes and CVD among adult men and women are shown in Figures 3.5.1 and 3.5.2, respectively for each weight category. There is a clear positive association between the prevalence of overweight and obesity and the prevalence of diabetes and cardiovascular diseases in both men and women.



**Figure 3.5.1** Prevalence of major chronic health diseases among healthy weight, overweight and obese men.



**Figure 3.5.2** Prevalence of major chronic health diseases among healthy weight, overweight and obese women.

#### *Secular trends*

There are no available trend data on populations at risk of weight-related chronic health diseases. It is, however, reasonable to assume that the risk of weight-related chronic health problems has increased as the prevalence of overweight and obesity has increased.

### **Policy context**

The following section lists recent, major Australian policies, projects and initiatives that have been developed to address populations who are overweight and obese and people at risk of weight-related chronic health problems. The review includes existing initiatives undertaken by the Commonwealth and States and Territories, sometimes in collaboration with health and community organisations that aim to improve services for overweight and obese people and those weight-related chronic health problems. This section is representative of the scope of activity in this area and is not meant as a comprehensive list of all programs in this country.

### **Commonwealth Policies, Programs and Initiatives**

- *NHMRC Clinical Practice Guidelines for the Management of Overweight and Obesity in Adults (NHMRC 2003).* The National Health and Medical Research Council (NHMRC) in conjunction with Population Health Division of the Australian Government Department of Health and Ageing has developed clinical practice guidelines for doctors on the management of overweight and obesity in children, adolescents and adults. The Guidelines provide comprehensive advice that will help doctors identify the best and safest way for their patients to maintain a healthier body weight and ensure that consistent and evidence-based information is given. The Guidelines will also be useful to other health professionals.

- *National Cardiovascular Disease and Diabetes Database.* The purpose of this database is to provide easy access to the data currently held by the Cardiovascular Disease, Diabetes and Risk Factor Monitoring Unit at the Australian Institute of Health and Welfare. The database contains the latest available data and will be updated as new data become available. The database currently contains information on deaths from cardiovascular diseases and diabetes, prevalence of the traditional cardiovascular disease risk factors and cardiovascular procedures and operations conducted in Australia.
- *The National Centre for Monitoring Cardiovascular Disease.* The Centre is active in data collection, analysis, development and dissemination, and all its projects have the approval of the AIHW Health Ethics Committee. The Centre works closely with the National Centre for Aboriginal and Torres Strait Islander Statistics on matters of mutual interest, and other government and non-government organisations.
- The *National Heart Foundation* provides guidelines and policy advice as well as Australia-wide support and resources for the planning, implementation and evaluation of cardiac rehabilitation programs.
- *Diabetes Prevention Program (DPP).* The Diabetes Prevention Program is an initiative of the Australian Government Department of Health and Ageing. The program provides funding to develop and conduct innovative projects that test methods of implementing the NHMRC National Evidence Based Guidelines for the Management of Type 2 Diabetes Mellitus: Primary Prevention.
- *Make the Connection - Be Well Know Your BGL.* An initiative of Diabetes Australia aimed at increasing awareness of the link between diabetes, cardiovascular disease and stroke. The campaign encourages people to discuss with their doctor and the diabetes care team ways to reduce the risk of cardiovascular complications.
- *Don't Ignore Diabetes.* The first campaign to be implemented under the National Diabetes Action Program. The program also aims to make people aware of their personal risk and improve community access to appropriate information, services and support.
- *Lifestyle Prescriptions.* A lifestyle prescription is written advice that is given to the patient recommending healthy behaviour change. The Lifestyle Prescriptions initiative aims to make it easier for GPs to encourage their patients to adopt healthier lifestyles.

## **Queensland Policies, Programs and Initiatives**

- *Queensland Standard Care Pathway* Project developed for the management of diabetes mellitus in adults and is “an integrated diabetes management guideline which identifies screening, diagnosis and stabilisation standards, criteria for the quarterly, six monthly and annual review, referral criteria and guidelines for acute management” (GPAC 2000).
- *West Moreton Cardiovascular Outcomes Project.* A collaboration between public and private hospitals, community health, public health and the Division of General Practice, aims to improve cardiovascular outcomes for its population. The project also aims to analyse the acute management of acute coronary heart disease and secondary prevention measures.

## **South Australia Policies, Programs and Initiatives**

- *Diabetes services in metropolitan South Australia.* The project was undertaken by the Department of Human Services in South Australia to develop a minimum level of service model for diabetes nurse educator, dietician and podiatry services for people with diabetes.

## **Victoria Policies, Programs and Initiatives**

- *Loddon Mallee Regional Strategic Support Branch 2002.* The Victorian Department of Human Services conducted a review of the allied health services in the Loddon Mallee region. The purpose was to map the allied health system, identify gaps and other issues in service delivery, and collate data on how services operate. Although the project was not specific to diabetes, the allied health services included those involved in diabetes management, such as dietitians and podiatrists.
- *Diabetes Prevention: Go for your Life Program.* Targets individuals at high risk and provides an evidence-based lifestyle intervention course for people with identified pre-diabetes.

## **New South Wales Policies, Programs and Initiatives**

- *NSW Chronic Care Program: Improving health for people with chronic illness: A blueprint for change 2001-2003.* The group included representation from a range of health disciplines, general practitioners, consumers, managers and external agencies. These groups provided advice on key directions and issues relevant to the respective disease areas.
- *Hunter on the Move* A demonstration project jointly coordinated by Cardiovascular Medicine, John Hunter Hospital and the Hunter Division of the NHF (with funding from NSW Health). The project aims to improve the availability of appropriate community-based physical activity programs for people with known heart disease and those at high risk of heart disease.
- *Heartmoves* The aim of the Heartmoves project was to develop and implement a sustainable exercise program, which was open to everyone, but which met the specific needs of clients with CVD or with risk factors for CVD.

## **Western Australia Policies, Programs and Initiatives**

- *WA Diabetes Program.* Focuses on integrating primary, secondary and tertiary care, via a coordinator for each region/area, with direction from a local diabetes committee.
- *Healthy Lifestyles 2002-2007: A Strategic Framework for Primary Prevention of Diabetes and Cardiovascular Disease* aims to facilitate a more coordinated and strategic approach to the development and implementation of strategies and interventions to prevent type 2 diabetes and cardiovascular disease in WA
- *Family Affair Program 1999-2001.* Developed to increase diagnosis of diabetes and impaired glucose tolerance, and decrease the incidence of diabetes, in relatives of people with Type 2 diabetes mellitus in the inner city area. The strategies were developed through consultation with people attending community education and with other key stakeholders.

## **Northern Territory Policies, Programs and Initiatives**

- *Community Health Centre Organisation and Quality of Care for the Prevention and Management of Chronic Disease.* Focus is on improving care for Indigenous Australians in rural and remote areas. A number of health centre organisational changes, such as best practice guidelines and information systems for reminders and recall, have been introduced in implementing the Preventable Chronic Disease Strategy in the NT

## **What works?**

### **Findings from the literature of interventions for people at high risk of weight-related chronic health problems**

#### **Interventions targeted at those people at risk of diabetes**

Systematic review of interventions among adults who are pre-diabetic indicate that intensive interventions which target life-style changes, i.e., incorporating dietary, physical activity and behavioural interventions, are effective among pre-diabetics (Norris et al, 2005; Curtis et al, 2005). In overweight adults with the metabolic syndrome, interventions that induce weight loss and increase physical activity assist in delaying progression to type 2-diabetes (Rosenson et al, 2004).

A recent review of evidence for lifestyle interventions to prevent type 2 diabetes in adults by the Centers for Disease Control demonstrated that maintenance of modest weight loss through diet and physical activity reduces the incidence of type 2 diabetes in those at high-risk by as much as 60% over 3-4 years (CDC, 2004). The reviewers recommend that overweight adults aged 45 years and older and should be opportunistically screened for type 2 diabetes, as should younger overweight patients with additional risk factors.

A review of individual randomized control studies among pre-diabetic adults reaffirms the strengths of developing intensive, individually tailored lifestyle programs to improve metabolic biomarkers of diabetes (Kosaka et al, 2005; Brekke et al, 2005; Tate et al 2003). Individualised programs which incorporate goal-setting and motivational programs (e.g., walking groups, competitions) have reported successful, long-term lifestyle changes (Lindstrom et al, 2003).

The Finnish Diabetes Prevention Study (DPS) was one of the first controlled, randomized studies to show that type 2 diabetes is preventable with lifestyle intervention (Lindstrom et al, 2003). The program was designed to be used in primary health care systems and reported that the risk of diabetes was reduced by 58% in the intensive lifestyle intervention group compared with the control group. The authors conclude that, in order to be effective, intervention needs to be individualized and continuing and performed by skilled professionals.

Overall, the findings indicate that intensive multi-component weight loss interventions provide some benefit to adults at risk of diabetes and with type 2 diabetes. The addition of exercise to dietary advice is effective in improving metabolic control in adults with type 2 diabetes.

Greater lifestyle intervention intensity may improve effectiveness. Spouse involvement in weight loss may improve effectiveness in obese diabetic women and telephone-based peer support may also be useful for increasing physical activity. Further work may be required to translate evidence from these interventions to community settings.

## **Interventions targeted at those people at risk of cardiovascular diseases**

A review of clinical trials among hypertensive adults indicate that programs that focus only on dietary change produce modest, non-significant decreases in blood pressure and weight loss (Mulrow et al, 1998). Similarly, other reviews indicate that individual dietary interventions in primary prevention can achieve modest improvements in dietary intake and cardiovascular disease risk status that are maintained for 9 to 18 months (Brunner et al, 1997; Ketola et al, 2000; Brekke et al, 2005).

Aggressive treatment of multiple cardiovascular risk factors (e.g., hyperglycaemia, hypertension, dyslipidemia), through lifestyle modifications that improve diet and physical activity, with, or without, pharmacotherapy, delays the onset of type 2 diabetes and cardiovascular events in individuals with metabolic syndrome (Rosenson et al, 2004).

The evidence demonstrates that improved health outcomes are associated with multi-factorial interventions that target overweight and obese people at high risk of chronic diseases. When delivered as an intensive program, the combination of diet and physical activity has the potential to improve hypertension control, lipid profile and prevent type 2-diabetes. Higher intensity behavioural interventions appear to improve effectiveness.

## **Interventions targeted at those people who are overweight or obese.**

Effective weight management interventions with adults who are overweight or obese involve psychological interventions in combination with diet and physical activity change. Generally, these interventions have been conducted in outpatient community settings, with a duration of several months. Greater intensity of intervention increases effectiveness. These interventions produce changes at an individual level, and have limited population impact. It is uncertain whether these approaches can be extrapolated and applied to population health interventions, such as brief advice by health professionals.

A significant proportion of the literature concerns interventions specifically targeted at people who are overweight or obese. This work is essentially concerned with effective approaches to achieving weight loss in individuals.

The *NHMRC Clinical Practice Guidelines for the Management of Overweight and Obesity in Adults* (NHMRC 2003) are a key synthesis of evidence for addressing this target group. This document provides a valuable synthesis of evidence in relation to strategies used in clinical settings to achieve sustained weight loss. The *Guidelines* clearly state that their work is for clinical practice, and does not represent a comprehensive population-based approach.

The *Guidelines* consider the evidence and recommend clinicians provide guidance in lifestyle change, using reduced energy, low fat diets in combination with regular, weight-bearing exercise (for example, walking) as the basis for successful management overall. In addition, they report that behavioural treatments can augment the effectiveness of treatment, as can medications, surgery and very low energy diets in more serious cases.

A recent Cochrane Review (Shaw et al, 2005) provides an update on the effectiveness of psychological interventions in the management of individuals who are overweight or obese. This review concludes that psychological interventions in combination with diet and physical activity changes, is optimal in producing weight loss. This review is based on studies conducted in outpatient community settings, including hospital clinics, medical centres and primary care settings. The effective psychological treatments included stimulus control, reinforcement, self



monitoring and goal setting. The studies varied in intensity, with a median period of 12 weeks. Increased intensity, through longer duration, more frequent contact, or more behavioural strategies was associated with increased effectiveness.

The evidence from more recent reviews on diet types (low fat versus low energy etc) continues to appear contradictory, due to differing endpoints and target groups (e.g. Pirozzo et al 2005; Avenell et al 2004). Overall, the approach recommended by the *NHMRC Guidelines*, for a reduced energy diet based on low fat intake, continues to offer robust, evidence-based recommendations.

## **Summary of the effectiveness of interventions**

The literature on interventions for people at high risk of weight-related chronic health problems provides limited information on the effectiveness of population-level interventions. Most interventions focus on improving lifestyle and behavioural factors and there is insufficient evidence of sustained effect. No interventions examined the efficacy of changing ‘obesogenic’ factors within community settings, such as modifications to food supplies and town planning policies.

The literature indicates that interventions span a range of innovative systems for the delivery and indicate the feasibility and acceptability of strategies in specific settings. It appears that Australian adults need greater support to make changes to improve their health through modifying risk factors, such as overweight, physical inactivity and poor nutrition, by exploring investments in behavioural support systems to ensure lifestyle changes are enduring.

Similarly, the studies and reviews on interventions addressing people who are overweight or obese all seek to produce changes at an individual level. While beneficial for the individuals involved, such interventions have limited population impact. A substantial population impact would require the individuals involved to sustain the weight losses and changed lifestyles, and for a substantial proportion of the overweight population to participate in such interventions. This is an unlikely, and expensive, scenario.

Many experts seek to extrapolate approaches that are effective in clinical settings, and apply these in population health interventions. Community-based group weight management programs are an example of adapting and incorporating evidence from clinical studies to population-level strategies.

## **Case studies**

The evidence suggests that intensive, individually tailored interventions for overweight and obese people and people at high risk of weight-related chronic disease provide some success. However, further evaluation is required to ascertain the long term benefits of these interventions. Implementing intensive programs for large numbers of individuals at high risk is likely to be expensive, although the long-term benefits may be substantial.

The following case studies were selected to provide an example of population-wide approaches that include strategies such as increasing community awareness of the seriousness of weight-related chronic health problems.

## **Increasing Community Awareness**

### *National Diabetes Action Program:*

Australians are less concerned about diabetes than conditions such as cancer and heart disease, believe they know more about diabetes than they actually do and consider it to be 'manageable'. They also perceive their risk of developing diabetes as being low. Diabetes Australia's National Diabetes Action Program aims to increase community awareness of the seriousness of diabetes. The program also aims to make people aware of their personal risk and improve community access to appropriate information, services and support. *Don't Ignore Diabetes* is the first campaign to be implemented under the National Diabetes Action Program.

Unless current misconceptions are addressed, Australians are unlikely to be motivated to take action to reduce their risk of developing diabetes or to seek medical advice. The *Don't Ignore Diabetes* Campaign aims to position diabetes as a serious health issue by providing information about the potential consequences of diabetes such as limb amputation and blindness, as well as raising awareness about risk factors. The target audience is Australians over the age of 30 years. Although Type 2 diabetes is more likely in people over 45 years of age, risk factors such as being overweight or obese and inadequate levels of physical activity are becoming more common in younger adults.

The campaign suggests a number of community-based strategies to engage the public, particularly those at risk, including;

- Linking with other local groups and agencies to advocate for improved services and facilities around physical activity or better access to healthy foods in local settings such as schools, workplaces, takeaway outlets
- Working with local sporting and recreation organisations to conduct a '*Come and Try*' day to increase awareness of opportunities and enhance participation in activities
- Collaboration with a local gym to offer reduced rates for off-peak users and programs suited to people who have or are at risk of developing Type 2 diabetes.

## **Interventions targeting overweight and obese people**

### *Lighten Up: group weight management program (Queensland Health 1996)*

*Lighten Up* is a well-developed program of Queensland Health. It is a weight management program incorporating educational, skill development, self-help and environmental strategies, designed to provide participants with support in weight loss and subsequent weight maintenance, and to enable professionals to coordinate a scientific based educational program.

The program places equal emphasis on healthy eating, increasing physical activity, and dealing with habits. The program aims to establish sustainable social support networks with links to the health service, to establish a mechanism for program implementation and evaluation state wide, and to provide community health workers with sufficient knowledge. The program is being offered by a range of Health Service Districts including Townsville, Mackay, Fraser Coast, Redcliffe-Caboolture, Southern Downs and Logan-Baundesert.

Evaluation shows that this program is effective in achieving short-term weight management and behaviour change. Long-term evaluation of weight management is difficult to obtain. However, Queensland Health actively supports continued implementation of the program. Reference: Harvey, et al , 1996a Harvey et al, 1996b.

## **Integrated community-based exercise program**

*Heartmoves (National Heart Foundation)*

The *Heartmoves* program is a community-based exercise program, specifically designed to be safe and accessible for those with risk factors or chronic disease. The program can be accessed through industry promotions targeting older adults, from word of mouth and from local GP and Allied Health professional referral.

The program promotes low to moderate intensity exercise, delivered by trained and accredited fitness leaders, using commercial gyms and facilities already existing in the community. The fitness leaders are able to develop their own program within the safety guidelines, so that the program can take various forms, from personal programs to group aerobics, aqua classes, weights, stretching and balance. The program is available in a variety of fitness centres and community venues in the ACT, NSW, SA and Tasmania, or via a home-based video/DVD.

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### **3.6 Addressing Overweight and Obesity in Aboriginal and Torres Strait Islander Peoples**

As at 30 June 2001, the Aboriginal and Torres Strait Islander population of Australia was estimated to be 458,520, or 2.4% of the total population. Persons identifying as 'Aboriginal origin' comprised about 90% of this estimated resident Indigenous population; persons of 'Torres Strait Islander origin' comprised 6%, and those with both Aboriginal and Torres Strait Islander origin comprised 4% (AIHW 2004). Much greater proportions of the Indigenous Australian population are found in age groups less than 20 years, compared with corresponding proportions in the non-Indigenous population, and lower proportions are found in age groups 40 years and over. In 2001 the median age of Indigenous Australians was 20.5 years, compared with 36 years for other Australians. More than half of all Indigenous Australians lived (in 2001) in New South Wales and Queensland, with the majority residing in urban areas. New South Wales had the greatest number of Indigenous Australians (135,000) and the Northern Territory had the highest proportion, with around 29% of its population reporting being Indigenous. Around 25% of the Indigenous Australian population lived in areas classified as 'remote' or 'very remote', compared with only 2% of the non-Indigenous population.

Aboriginal and Torres Strait Islander people are disadvantaged across a range of socio-economic factors reported upon in the 2001 Census. They experienced lower incomes than the non-Indigenous population, higher rates of unemployment, poorer educational outcomes and lower rates of home ownership – all of which can impact upon a person's health and wellbeing (AIHW 2004).

#### **Epidemiology of overweight and obesity in Aboriginal and Torres Strait Islander adults**

##### *Central Obesity*

Adiposity in Aboriginal and Torres Strait Islander people has a characteristically central or 'android' pattern of distribution. In non-Indigenous Australians central obesity (as determined by waist:hip ratio) is seen much more frequently in men than women. The prevalence of central obesity is the same in non-Indigenous and Indigenous men, however the rate of central obesity is much higher in Indigenous women than non-Indigenous women. One survey has found central obesity to be most prevalent among Aboriginal women (Guest et al 1993). Central distribution of obesity is associated with a higher risk of development of chronic diseases such as diabetes and cardiovascular disease than overall obesity.

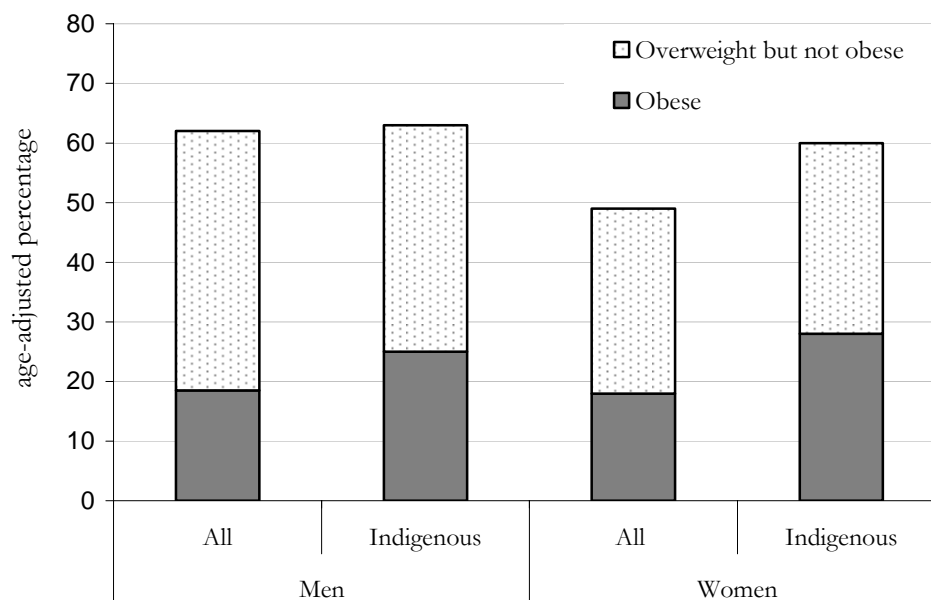
##### *Body Mass Index (BMI)*

##### *Gender*

Comparing the findings on the weight status of indigenous Australians in the National Aboriginal and Torres Strait Islander Survey (NATSIS) conducted in 1994, and the information on all Australians in the 1995 National Nutrition Survey (NNS) (Gill et al 2003):

- There was little difference between age-adjusted proportion of overweight or obese Indigenous Australian men (62%) and all Australian men (63%).
- Almost 25% of Indigenous Australian men were obese, compared to 18.5% for all Australian men.
- Almost 60% of Indigenous Australian women were overweight or obese, a rate much higher than that seen among all Australian women (49%).

- Rates of obesity were much higher among Indigenous Australian women compared with all Australian women (29% compared with 18%).



**Figure 3.6.1:** Prevalence of overweight and obesity in adult Indigenous Australians (18+ years) in 1994 (National Aboriginal and Torres Strait Islander Survey, NATSIS), and all adult Australians (19+ years) in 1995 (National Nutrition Survey) (*Data Source: NSW Health/CPHN Report on the Weight Status in NSW, Gill et al 2003*)

More recent data reported on by the AIHW also indicate that the prevalence of obesity is dramatically higher among Aboriginal and Torres Strait Islanders than for the rest of the population (31% compared with 16%, in 2001; AIHW 2003), although the prevalence of overweight is similar to non-indigenous Australians.

#### *Place of residence*

Indigenous Australians living in non-remote areas had double the rate of obesity of other Australians in these locations (AIHW 2003). This difference was observed in the 1994 NATSIS also – rates of overweight and obesity were higher in the capital cities and other urban locations than in rural locations (Mackerras & Cunningham 1996, NHMRC 2000).

#### *Age*

Differences in the level of overweight and obesity between Indigenous and non-Indigenous men and women are more pronounced in the younger age groups. High levels of obesity are found even amongst the youngest adult age groups (19-24 years) and they continue to increase throughout life, up to the sixth decade (Gill et al 2003).



## ***Torres Strait Islander versus Aboriginal***

Data from the NATSIS 1994 (Mackerras & Cunningham 1996, NHMRC 2000) show that rates of obesity are particularly high among people of Torres Strait Islander descent compared to those of Aboriginal descent.

### **The Context of Food & Nutrition in Aboriginal and Torres Strait Islander Peoples Change from traditional to contemporary diet**

The diet of Aboriginals and Torres Strait Islanders has undergone large and rapid changes since European colonisation.

Aboriginals were traditionally hunter-gatherers, deriving their diet from a wide range of uncultivated plant foods and wild animals (NHMRC 2000). The most highly prized components of the Aboriginal hunter-gatherer diet were the relatively few energy-dense foods – depot fat, organ meats, fatty insects and honey. Other favoured foods such as witchetty grubs and marine mammals also have a high fat content. The traditional diet was generally low in energy density but high in nutrient density – high in protein, low in sugars, high in complex carbohydrates of low glycaemic index and high in micronutrients. Although the traditional diet contained a high proportion of animal foods, it would have been low in total fat and low in saturated fat (most native animals are very lean).

Torres Strait Islanders were traditionally a marine-hunting, horticultural and trading society. They were more reliant on subsistence agriculture than Aboriginals, and supplemented this with fishing, hunting and foraging. Garden foods were stored, preserved and traded. In Torres Strait Islanders now, the diet consists primarily of white flour, white rice, corned beef, syrup and oils. The demand for fruit and vegetables exceeds supply. Traditional staple crops are produced by some for household consumption and ceremonial purposes but no trading or movement of foods occurs due to quarantine restrictions. Marine foods make a substantial contribution to the diet – including turtle and dugong.

In summary, with the transition from a traditional hunter-gatherer lifestyle to a settled westernised existence, Aboriginal and Torres Strait Islander diet has changed from a varied, nutrient-dense diet to an energy-dense diet, high in fat and refined sugars. Preferred foods such as meat, fat and sweet foods were not readily available traditionally and were shared among a large number of people. Foods now eaten to substitute traditional foods include fresh, frozen and tinned meat, fatty cuts of beef and lamb, honey, treacle, golden syrup, jam, confectionary, and refined sugar. These are now readily available in comparatively large quantities. Contemporary dietary practice reflects the continuing influence of the high value associated with fat – and hence frying of meats and other foods. There are variations in diet between rural, remote and urban regions. Flour, sugar, sweets and fats provide much of the energy from store-purchased foods [NHMRC 2000].

### **Barriers to a healthy diet**

Aboriginal and Torres Strait Islanders' access to a healthy diet can be limited, on the basis of food supply, income, storage and cooking facilities and cultural barriers (AIHW 2003).

- Socio-economic – low income and difficulty in procuring healthy food (food access).

- Geographical factors – cost of food in rural and remote higher (transport, storage, wastage) – as noted in the market basket surveys. Remote community foodstores generally stock a limited range of foods, often of high energy-density, low nutrient content. Affected by: carrying capacity for chiller/freezer lines, frequency and method of deliveries, consumer demand, stock management.
- Environmental factors – inadequate cooking facilities and lack of cool storage for perishables. Difficulty in paying power bills is an ongoing problem in low-income families of which Aboriginals and Torres Strait Islanders are disproportionately represented. Refrigerators and stoves are then unavailable which may mean purchasing foods prepared away from home. These frequently comprise high-fat, low nutrient-density take-away foods. Also, community food services often operate from very inadequate premises with limited equipment which means that foods offered are often less nutritious.
- Agriculture/horticulture – lack of local supply.
- Social factors, such as consumption of alcohol, tobacco, and other drugs, play an important role in the nutritional status of populations. In addition to the direct effect of these drugs on nutrient intake, the use and abuse of substances can direct substantial amounts of money away from the purchase of food and other necessities.
- Social and environmental factors interact and can result in the paradoxical situation in which food insecurity is associated with higher levels of obesity (e.g. Burns 2004).

It has been noted that the nutritional status of many Aboriginal and Torres Strait Islander communities is so poor, especially in relation to low fresh fruit and vegetable intake, that relatively modest improvements in dietary quality can be expected to be associated with substantial health benefits (O'Dea et al 2001).

## **Social and cultural aspects of food**

In Indigenous people, foods were prepared, proportioned and distributed according to traditional law, with strict cultural practices being determined by kin obligations. Sharing of food has a social, as well as physiological function, enabling the affirmation of relationships and confirming the significance of ceremonies and rights of passage (NHMRC 2000).

The social and cultural context of food has also been highlighted by Thompson et al (2000) in 'the social and cultural context of risk and prevention: Food and physical activity in an urban Aboriginal community'. These authors indicated that Aboriginal people generally have a good knowledge of what food is good for the health of their physical body. However, more important than the physical health of their bodies, is the "social" health or health of their relationships to family, their role in the family and community, and their connectedness to extended family, to land and to the past. Foods that are seen as core to linking generations include sugar, salt, meat and fat. Fast foods can become a type of family food when used as a source of social exchange or purchased to be shared around the family. They can become an important resource in fulfilling social obligations.

Men's connections are more tenuous thus making the link through eating the family meal one of the only sure ways of retaining the connections they need for maintaining their identity and well-being.

## **Spirituality**

Aboriginal and Torres Strait Islander peoples have long maintained that continued association with and caring for ancestral country (land and sea) is an important pre-requisite for human health. McLennan and Khavarpour (2004) indicate that the encouragement of spiritual connections with ancestors and the land could be an important instrument in preventive programs and health program promotion initiatives. They identified: identity, family and community kinship, culture and spirituality, and land, as related to the meaning of 'well-being'. They recommend that the promotion of positive self and community identity through increased opportunities for spiritual expression, including ceremonial performances, rituals, painting, story-telling, community/family gatherings, and dance, should be integrated wherever possible in health promotion initiatives. The specific activities indicated in the published literature (Table 1) and in 'The Chronicle' (Table 2) indicate that this is already happening to some considerable extent.

## **Physical Activity in Aboriginal and Torres Strait Islander Peoples**

The change from a predominantly nomadic and dispersed people to a more centralised and sedentary way of life has had a major impact on the activity levels of Indigenous people in Australia today. There has been an erosion of more traditional activities (collecting and preparing traditional foods, for example, was very labour intensive) and sport as Aboriginal and Torres Strait Islander communities have adopted a more 'Western' lifestyle.

As is noted in the relationship with food, physical activity if done solely for the benefit of the individual, is often seen as shameful or as disconnecting individuals from ties to their social world (Thompson et al 2000). Exercise for individual health and fitness can upset the balance, whereas sport and everyday activities that are socially oriented can help maintain it – this idea is supported by Guest & O'Dea (1992) and O'Dea (1992).

There are very limited data on physical activity participation amongst Aboriginal and Torres Strait Islander populations (Bauman et al 2002). For example, from the 1995 National Health Survey (ABS 1999), it was clear that Indigenous populations were less likely to do any physical activity in the two weeks prior to interview than non-Indigenous populations. Indigenous females were particularly likely to be inactive. However, in the only National Aboriginal and Torres Strait Islander Health survey, carried out by Australian Bureau of Statistics in 1994, information was sought about tobacco use, alcohol use, nutrition and obesity, but not physical activity. Similarly the 1999 Active Australia report indicated that Aboriginal Australians are less likely to be adequately physically active than non-Aboriginal Australians (36.9% compared with 50.1%).

## **Commonwealth Policies, Programs and Initiatives**

- *National Framework for Aboriginal and Torres Strait Islander Health (2002)* The Aboriginal and Torres Strait Islander Health Workforce National Strategic Framework (Workforce Strategic Framework) was developed by a drafting committee of the Commonwealth, State and Territory government Standing Committee on Aboriginal and Torres Strait Islander Health. The document was endorsed on 30 May 2002. The Workforce Strategic Framework presents a 5-10 year reform agenda to build a competent health workforce to address the health needs of Aboriginal and Torres Strait Islander peoples.
- The Aboriginal and Torres Strait Islander Health Workforce Working Group oversees the national level implementation of the Aboriginal and Torres Strait Islander Health

Workforce National Strategic Framework and ensures effective national level coordination of workforce policies and activities. A report (February 2004) provides information on the implementation (2002-2003) of the Workforce Strategic Framework. Includes 'National Strategic Framework for Aboriginal and Torres Strait Islander Health July 2003 Framework for action by governments' and 'National Strategic Framework for Aboriginal and Torres Strait Islander Health Context July 2003'

- *The National Aboriginal and Torres Strait Islander Health Council (1996- )* Established in 1996, under the auspices of the Aboriginal and Torres Strait Islander Health Framework Agreements, to advise the then Commonwealth Minister for Health and Ageing on Aboriginal and Torres Strait Islander health policy and planning, and to monitor the national implementation of the agreements.
- *National Aboriginal and Torres Strait Islander Nutrition Strategy and Action Plan, NATSINSAP (2000-2010)* The Strategic Inter-Governmental Nutrition Alliance seeks to provide strategic direction and coordinate action on public health nutrition issues. It was developed and is guided by the National Public Health Partnership's Nutrition Strategy and Action Plan.
- *The Aboriginal and Torres Strait Islander Co-ordinated Care Trials, National Evaluation Summary (2001)* Outlines the background, description, experiences and outcomes of the four Coordinated Care Trials conducted in Aboriginal communities between 1997 and 1999. The trials were located in Katherine (Northern Territory), the Tiwi Islands (Northern Territory), Wilcannia (New South Wales) and Perth/Bunbury (Western Australia).
- *Achievements in Aboriginal and Torres Strait Islander Health Summary Report (2001)* In 2001, the Achievements in Aboriginal and Torres Strait Islander health project was commissioned by the Office for Aboriginal and Torres Strait Islander Health (OATSIH) and reported to the Standing Committee on Aboriginal and Torres Strait Islander Health (SCATSIH). A summary report was prepared to inform health policy and planning decision-makers about the critical factors that contribute to successful health initiatives. The full two volume scientific report, including a comprehensive literature review, is available online at [www.crcah.org.au](http://www.crcah.org.au).
- *Better Health Care: Studies in the successful delivery of primary health care services for Aboriginal and Torres Strait Islander Australians (October 2001)* Examines the concept of comprehensive primary health care, provides national and international evidence of the effectiveness of this approach in improving health outcomes of Indigenous people, and illustrates the success of this approach through a series of case studies on successful health service interventions.
- *Nutrition in Aboriginal and Torres Strait Islander Peoples: An Information Paper (NHMRC, 2000)* This report presents background information about nutrition and nutrition-related diseases in Aboriginal and Torres Strait Islander peoples including the nutritional needs of people at risk of lifestyle-related ill-health. It includes a thorough description of the change from traditional to more westernised diet and specific food patterns. It also discusses some of the underlying factors affecting food choice.

## Summary of the evidence of effectiveness of interventions

The searches identified 23 papers as being of particular relevance to the issue. Early on in the search it was clear that there are a paucity of studies (4 were found) that specifically measured weight or waist circumference as outcome variables. Thus, the search was extended to broader interventions with intermediate outcome variables relating to aspects of diet and physical activity. Many of the studies actually reported outcomes in terms of the extent of program implementation, uptake and participants' reported satisfaction.

Ten papers (including the 4 that measured weight) were identified that described studies involving a broad range of activities covering both diet and physical activity.

One study focussed on and measured availability of nutritious food in community stores (Lee et al 1996). Other studies (e.g. Field et al 2001) used the store turn-over method to indicate changed nutrition patterns.

A number (5) of particularly relevant papers that inform the descriptive evidence base and provide background information were also identified (Williams & Kakakios 2001; Newman et al 1999; Smith & King 1998; Parker & O'Connor 1997; Angus & Wise 1997).

A large number of local, community-based physical activity and diet interventions are described in *The Chronicle*, the Bulletin of the Chronic Diseases Network in the NT. A sample of these programs is described in Table 3.

## Programs

Three programs, each with a 'Healthy Lifestyle' approach, were identified that specifically measured weight or waist circumference as outcome variables:

- 'GutBuster' program for abdominal obesity reduction in Torres Strait Islander men (Egger et al 1999).
- 'Healthy Weight Program' in Queensland (Dunn & Dewis 2001).
- 'Looma Healthy Lifestyle' program in Western Australia (Rowley et al 2000).

Seven other studies were identified that were also aimed at a 'Healthy Lifestyle' but where a reduction in weight was either not the primary outcome variable, or was not specifically measured. These were:

- 'The Better Living Diabetes Project' (Pearce et al 2005).
- 'Birth to Elders: Nutrition for Life' (Pika Wiya Health Service) (Edwards 2004).
- 'Wadja Warriors Football Team's Healthy Weight Program (Smith 2002).
- 'Laramba Family Wellness Model' (Field et al 2001).
- 'Fun, Food and Fitness for Noongars' (Lorraine et al 2001).
- "'Urimbirra Geen" – To take care of your heart' (Green & Dangerfield 2000).
- 'Health and nutrition program in a remote aboriginal community' (Lee et al 1995<sup>3</sup>).
- "Survival Tucker/Minjilang' (Lee et al 1994).

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<sup>3</sup> The two papers by Lee et al describe different aspects of the same program at Minjilang

Programs varied according to whether they were gender-specific (*Gutbusters* directed at men, Egger et al 1999), community groups ('*Wadja Warriors*' football team in Smith 2002), whole community programs (*NT Health and Nutrition Program (undefined)*, Lee et al 1995), or focussed on people with a chronic condition such as diabetes (Pearce et al 2005, Rowley 2000) and/or cardiovascular disease (Edwards 2004, Green & Dangerfield 2000). The '*Looma Healthy Lifestyle Program*' was initially called the '*Looma Diabetes Program*', aimed at weight loss in diabetics. In those programs aimed at the wider community and not gender-specific, male participation tended to be low (e.g. Dunn & Dewis 2001).

Nearly all of the programs are based on a healthy lifestyle approach (the exception being Lee et al 1995 where few details are given), most involved nutrition (diet) and physical activity interventions or messages. All programs were conducted in rural or remote Aboriginal communities.

#### *Nutrition education:*

- Messages primarily included: cutting the fat off meat before cooking, reducing the intake of sugar, increasing the consumption of fruit and vegetables, and/or were aimed at cooking methods (grilling, boiling rather than frying).
- Healthy food cooking demonstrations were popular (amongst men too) as were store tours and education relating to food labels.
- 'Fat in food' photos were consistently identified as being favoured and useful.
- Culturally specific resources were developed in most instances.
- Videos with healthy messages were used in a number of interventions.

#### *Particular physical activity interventions included:*

- Sport; Hunting (men and women, separately); Walking groups (many groups were created as a spin off from other activities and interventions). A sport has been devised particularly for the older or less mobile: shot ball training (based on netball and basketball but played at a walking pace with modified lower goal posts) in the '*Urimbirra Geen*' program (Green & Dangerfield 2000).

Innovative ways of combining approaches to promoting physical activity led to improvements in cultural pride, cultural identity and self-esteem.

All reported interventions were conducted in community settings, usually in full partnership with community members. A number of programs used sport and recreation settings and approaches to promoting both physical activity and nutrition. The findings from the studies with men in particular showed the value of centring a program around sport, for example particularly football in the NT (Smith & King 1998). Self-esteem of young men is increased by seeing themselves playing football and seeing themselves as similar to positive role models and peers that are providing the health messages. In some communities, such as *Minjilang* (A Lee, *pers. comm.*), walking (or any other exercise for personal benefit) was not considered appropriate.

Community/cultural events are frequently used as a focus for delivering culturally-appropriate health messages and skills. This is seen in the programs identified in 'The Chronicle' too.

## Physical Activity Only

Shilton & Brown (2004) reviewed the literature on physical activity interventions in Indigenous people and communities. The review conclusion was that there are few formally evaluated and reported interventions aimed to promote physical activity among Indigenous Australians. They cite only one study in the peer reviewed literature from 1999-2004 (Rowley et al 2000, *Looma Lifestyle Program*), although physical activity (hunting trips, sport – basketball/football, regular walking trips) was only one component of this program (as it was for most of the other lifestyle programs). Our search identified three other studies aimed primarily at promoting physical activity (Cawood 1999; Thompson et al 2001; Elliot 2002).

Two of the physical activity programs were aimed at women only. *The Waves Program* (Cawood 1999) was aimed at inner city women (Eastern suburbs, Sydney) and involved exercise in a private hydrotherapy pool. This was the only one of the projects identified that was set in the urban environment. In the other program identified aimed specifically at women, circuit classes were identified by the women in Cherbourg, Qld (*The Cherbourg Healthy Lifestyles Program*, Thompson et al 2001) as the means for increasing physical activity. Although identified as a healthy lifestyles program, it appears to be involve physical activity components only. Regular fitness assessments assisted continued interest. Men in the community started showing an interest and young men started to participate in the classes. The other physical activity intervention identified (Elliot 2002) was aimed at *falls prevention* not increased physical activity *per se*. This intervention was water-based and aimed at older Aboriginals (Elders).

## Mass Media

The only program to use mass media (3 TV commercials promoting healthy foods – not evaluated) was the 'Fun, Food and Fitness for Noongars' (Lorraine et al 2001).

## Environmental Interventions – The Community Store

Environmental intervention has been focused on the availability of healthy foods in community stores. The local store plays a central role in the nutritional status of an Aboriginal community – people buy most of their food from the store. Stores are also a place for social interaction. Lee et al (1996) showed that individual store owners can directly influence dietary intake of Aboriginal communities in remote areas by the foods that they choose to stock – and that foods stocked were not always in response to community preferences. A need for a store food and nutrition policy was identified to avoid arbitrary variation in ordering patterns and to ensure the food reflects community preference and nutritional needs. As indicated by Lee et al (1996), store managers can be important allies in efforts to improve Aboriginal dietary and nutritional status. Community stores have the capacity to change food availability and make dietary improvements and can operate profitably whilst providing healthier food choices (Lee et al 1996, 1995, 1994). Ways to increase the sales of nutritious foods include in-store promotions, such as shelf 'talkers', posters and prominent displays, and cross-subsidising the price of fresh fruit and vegetables and cigarettes.

Other environmental intervention has involved the growing of traditional foods in community gardens (e.g. *The Garden Kai Kai Project*, NHMRC 1997 rescinded). The NHMRC (2000, 1997) highlights the particular worth of programs aimed at community/market gardens in Aboriginal communities. The benefits extend beyond improving nutritional intake. Growing some food locally reduces dependence on outsiders, helps keep money within the community, and also fits within relationship and obligation systems. The programs also address issues of self worth and

pride, which are pivotal to improvements in the health of Aboriginal and Torres Strait Islander peoples.

## **Evaluation – degree of effectiveness**

There is a lack of well-evaluated nutrition/physical activity/health programs for Aboriginal and Torres Strait Islander peoples.

Most programs identified were broad, lifestyle programs with little formal evaluation. Weight loss was achieved in the *Healthy Weight Program* in Queensland, but this was only measured at completion of the 8 week program. Longer term evaluation is necessary. Significant reductions in anthropometric measures (weight, waist, body fat, fat mass, waist-to-hip ratio) were identified from baseline to 12 months in the *Gutbuster* program aimed at men. The *Looma Healthy Lifestyle Program* achieved initial weight loss but this was not sustained. The program at *Minjilang* achieved weight loss over a 12 month period in some groups, particularly older women and those more overweight.

Most programs (Smith 2002, Dunn & Dewis 2001, Field et al 2001, Lorraine et al 2001, Rowley et al 2000, Egger et al 1999, Lee et al 1995,1994) achieved changes in eating habits towards healthier choices (wholemeal or wholegrain bread, more fruit and vegetables, less soft drink consumption, less sugar, not frying foods, less take-away) mostly measured by store-turnover method, or self-report.

Most of the programs successfully raised community awareness of health issues. Focusing physical activity interventions on or around sport seems to be particular useful for men.

Screening and feedback of the results can act as a stimulus to the community for action. Also, there was generally a good response to being asked questions/interviewed about needs – people like to know someone else is interested in them.

## **Principles of good practice**

A number of papers are included which shed light on aspects relating to the barriers to successful programs addressing overweight and a healthy lifestyle (Parker & O'Connor 1997). Similarly Angus & Wise (1997 rescinded) summarised some principles of good practice in relation to promoting the health of ATSI people. Most of these principles were demonstrated as being crucial to the success of the various programs reviewed here – and are the same as those highlighted as being of importance in all health programs relating to Aboriginal and Torres Strait Islander peoples. Some essential components of any program:

- Successful interventions occur when they are a response to the expressed needs of the community rather than a response to the health agency's agenda.
- Community involvement from the beginning leads to empowerment.
- A flexible and relaxed approach is necessary.
- Community relevance, acceptance and accessibility are paramount.
- Community ownership and management of the programs are generally seen as particularly important.



In most programs, local Aboriginal ‘trained’ facilitators are viewed as preferable to non-Indigenous outside health workers. However, in one program in particular, *GutBusters* (Egger et al 1999), although it was intended that the program be handed over to the community to run, it was found that a respected outside source of information was more acceptable in these communities than a local, ‘trained’ ‘expert’. Ownership in these programs can proceed too quickly for sustainability. This is a problem also because it is often the job of the local Aboriginal Health Worker to run the program – as just one of their many tasks. Health workers employed solely to work on the ‘Healthy Lifestyle’ programs are necessary.

## Final Comments

Virtually all programs were conducted in rural or remote Aboriginal communities yet the majority of Aboriginal and Torres Strait Islanders live in urban regions and this is where the prevalence of obesity is highest. However, as Aboriginal and Torres Strait Islander peoples live in urban, rural and remote locations, programs need to be developed that are accessible, culturally appropriate and relevant to people in each of these areas.

Communities need to be involved in all aspects of development, implementation and evaluation of programs. In developing appropriate and sustainable health and food-related, and physical activity-related, policy and interventions, it is imperative that Aboriginal people’s ideas about food, diet and physical activity are taken into account. ‘Diet’ and ‘exercise’ are seen as western health messages (London & Guthridge 1998).

It is noted that a program similar to that successfully implemented in *Looma* and *Minjilang* did not achieve weight loss in Hermannsburg, Central Australia (McDermott et al 2000). This has been attributed to the overriding problems associated with excess alcohol consumption in the Hermannsburg community, compared to the other two ‘dry’ communities (A Lee, *pers. comm.*).

Egger et al (1999) used ‘ANGELO’ (Analysis Grid for Environments Linked to Obesity) to conduct an audit of the ‘obesogenic’ environment in the Torres Strait. Their conclusion was that, over the long term, environmental changes must be seen as the primary goal for obesity management.

In contrast to the numerous resources for promoting healthy eating in Aboriginal and Torres Strait Islander communities (see below), there are very limited resources for promoting physical activity.

## Resources for Promoting Healthy Eating/Improving Food Supply

- The *Aboriginal and Islander Health Worker Journal: Indigenous Health Promotion Resources Guide (4th edition)* provides information about individual health promotion resources developed specifically for Aboriginal and Torres Strait Islander people. The resources cover over 80 health topics and relate to specific conditions, population groups, and environmental and social issues. The guide also includes details of how to obtain the resources and, where relevant, price and online access information.
- *The Bush Book (Department of Health & Community Services, Northern Territory, 2<sup>nd</sup> Edition 2002)* has chapters on: Sharing Health Information; Strategies for Health Promotion; Planning and evaluating a health promotion project. Chapter (1 of 3) in Volume 2 on ‘Food and Nutrition’: ‘Actions and strategies to address food and nutrition issues’ including:

- ‘Strategies to improve food supply’ – the community store; using local foods (with a case study)
- Strategies to encourage better food choices’ – store tours, shelf talkers, cooking contemporary foods, doing brief interventions
- *FoodNorth: Food for Health in North Australia July 2003, Department of Health, Government of WA.* Summary of the key issues involved in food supply to remote communities and includes examples of interventions and strategies used in different locations. These were provided with the aim of identifying models for future work to achieve sustained improvements in food supply in this region.

**Table 3.6.1: Summary table of published interventions relating to prevention of overweight and obesity in Aboriginal and Torres Strait Islander Peoples**

Program/Title of publication	Descriptor	Publication	Authors / Year
Healthy Weight Program Evaluation, Queensland 1996-1999	Weight outcomes / healthy lifestyles	<i>Aboriginal and Islander Health Worker Journal</i>	Dunn & Dewis (2001)
Effectiveness of a community-directed 'healthy lifestyle' program in a remote Australian Aboriginal Community (Looma)	Weight outcomes / healthy lifestyles	<i>Australian and New Zealand Journal of Public Health</i>	Rowley et al (2000)
Abdominal obesity reduction in Indigenous men	Weight outcomes / healthy lifestyles	<i>International Journal of Obesity</i>	Egger et al (1999)
The Better Living Diabetes Project	Healthy lifestyle (PA and diet)	<i>Aboriginal and Islander Health Worker Journal</i>	Pearce et al (2005)
Birth to Elders: Nutrition for life – Pika Wiya Health Service	Healthy lifestyle (PA and diet)	<i>Aboriginal and Islander Health Worker Journal</i>	Edwards (2004)
Wadja Warriors Football Team's Healthy Weight Program	Healthy lifestyle (PA and diet)	<i>Aboriginal and Islander Health Worker Journal</i>	Smith (2002)
Laramba Family Wellness Model: Integration, sustainability and transferability	Healthy lifestyle (PA and diet)	<i>6<sup>th</sup> National Rural Health Conference</i>	Field et al (2001)
Fun, Food and Fitness for Noongars.	Healthy lifestyle (PA and diet)	<i>6<sup>th</sup> National Rural Health Conference</i>	Lorraine et al (2001)
"Urimbirra Geen" – To Take Care Of Your Heart	Healthy lifestyle (PA and diet)	<i>Aboriginal and Islander Health Worker Journal</i>	Green & Dangerfield (2000)
Sustainability of a successful health and nutrition program in a remote aboriginal community.	Healthy lifestyle (PA and diet)	<i>Medical Journal of Australia</i>	Lee et al (1995)
Survival tucker: improved diet and health indicators in an Aboriginal Community	Healthy lifestyle (PA and diet) wt measured	<i>Australian Journal of Public Health</i>	Lee t al (1994)
Physical activity among Aboriginal and Torres Strait Islander people and communities	PA review	<i>Journal of Science and Medicine in Sport</i>	Shilton & Brown (2004)
Falls Prevention – The Aboriginal Elders Water-based Exercise group	PA (Falls prevention)	<i>Aboriginal and Islander Health Worker Journal</i>	Elliot T (2002)
Getting Fit for Family, Health and Fun: A Diary of the Cherbourg Healthy Lifestyles Program	PA / healthy lifestyle	<i>Aboriginal and Islander Health Worker Journal</i>	Thompson S et al (2000)
Aboriginal WAVES Project	PA – urban, women	<i>Aboriginal and Islander Health Worker Journal</i>	Cawood C (1999)
The Garden Kai Kai Project	Community gardens	<i>Promoting the Health of Aboriginal and Torres Strait Islander communities</i>	NHMRC (1997 rescinded)
The effect of retail store managers on Aboriginal diet in remote communities	Community stores	<i>Australian and New Zealand Journal of Public Health</i>	Lee et al (1996)
Review of the nutrition policy of the Arnhem Land Progress Association	Community stores	<i>Australian and New Zealand Journal of Public Health</i>	Lee et al (1996)
The Aboriginal Men's Health Implementation Plan	Commentary	<i>NSW Public Health Bulletin</i>	Williams & Kakakios (2001)
Community-based interventions to reduce the risk of diabetes and cardiovascular disease in indigenous Australians	Commentary	<i>The Chronicle</i>	O'Dea et al (2001)
Story-telling: Australian Indigenous Women's means of health promotion	Video/ cultural development	<i>Aboriginal and Islander Health Worker Journal</i>	(Koori Elders) Newman J et al (1999)
Well men's checkups – A program of the East Arnhem Health Promotion Unit	Screening & education/ targeted messages	<i>Health Promotion Journal of Australia</i>	Smith & King (1998)
Improving Indigenous health in rural Queensland.	Barriers	<i>National Rural Health Alliance</i>	Parker & O'Connor (1997)
What has been learned? Some principles of good practice	Descriptive / principles	<i>Promoting the Health of Aboriginal and Torres Strait Islander communities</i>	Angus & Wise NHMRC (1997 rescinded)

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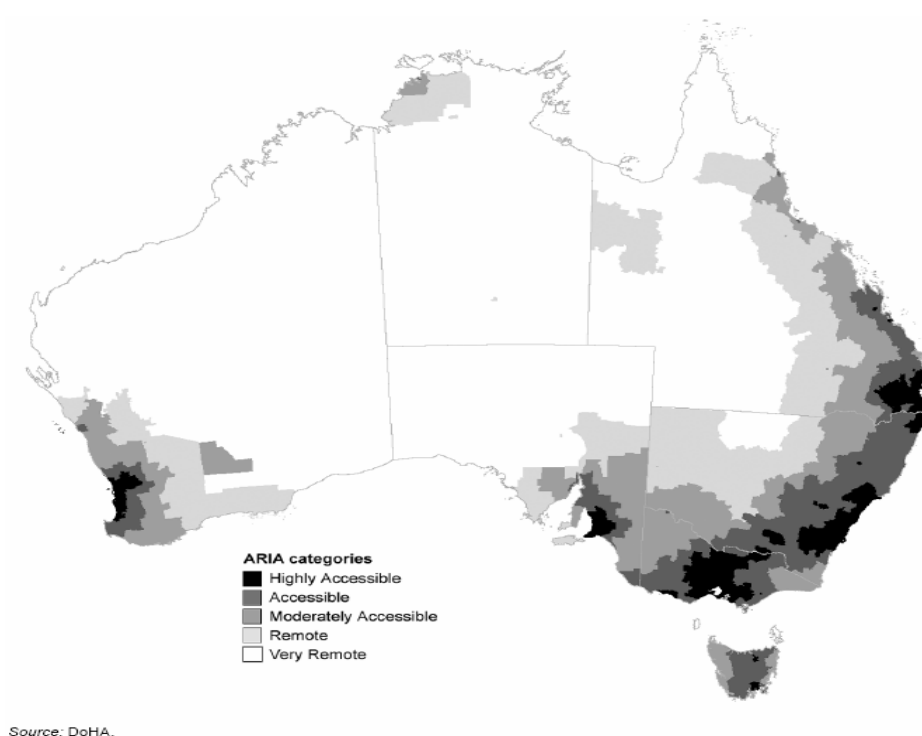
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### 3.7 Addressing Overweight and Obesity Among Rural And Remote Populations

The recent report on *'Rural, regional and remote health'* (AIHW, 2005) notes the importance of differentiating between the effects of living in a remote area and the effects of being Indigenous, and that many issues previously identified as rural health issues may have more to do with Indigenous status than with rurality or remoteness, while for others remoteness makes an independent contribution.

Remoteness can be interpreted as 'access to a range of services, some of which are available in smaller and others in larger centres: the remoteness of a location can thus be measured in terms of how far one has to travel to centres of various sizes' (AIHW, 2005). Figure 3.7.1 shows the proportion of Australia that is classified regional and remote by the Accessibility /Remoteness Index of Australia (ARIA). In 2001 the proportion of Australians living in Inner Regional, Outer Regional, Remote and Very Remote areas were 21%, 10%, 2% and 1% respectively. The proportion of these populations that were Indigenous were 2%, 5%, 13% and 44%, respectively

There are 1,139 discrete Indigenous communities in remote areas of Australia. Health indicators for remote Australia show a high prevalence of chronic disease reflecting the high proportion of Indigenous people who suffer an excessive disease burden. Poor nutrition is a major underlying factor for the high prevalence of chronic disease among Indigenous and also non-Indigenous populations. Better access to good quality, affordable, healthy foods (particularly fruit and vegetables) in remote communities and increased consumption of these foods will contribute to improving health outcomes, and the prevention of chronic diseases among all people living in rural and remote communities.



**Figure 3.7.1:** ARIA areas of remoteness in Australia

## **Epidemiology**

There are limited data on the prevalence of overweight and obesity among rural and remote populations in Australia. Sparsely populated areas of Australia are not included in the Australian Bureau of Statistics (ABS) sampling frame. Most estimates for non-urban populations are extrapolated from national surveys and because there is a diverse mix of people living in rural and remote areas, it is likely that crude population statistics mask the considerable variation between population groups in these areas. Additionally, the data are based on self-report data, which is known to under-estimate the prevalence of overweight and obesity (Flood, Webb, Lazarus, & Pang, 2000a)

### *Prevalence*

Australian adults living outside major cities have higher rates of overweight than other urban populations. National estimates indicate the prevalence of overweight and obesity among adults in inner regional areas<sup>4</sup> is 54% and other rural/remote<sup>5</sup> areas at 55.2% (AIHW, 2005) compared with 50% in major cities.

### *Distribution*

Figure 3.7.2 shows the prevalence of overweight and obesity for men and women by geographical area and shows was lower in major cities compared with rural and regional populations. Forty-two percent of males and 24.6% of women living in major cities were overweight and 15.2% and 16.9%, respectively, are obese. In inner regional areas the prevalence of overweight and obesity among men was 43.1% and 18.1%. Among women in inner regional areas, 29.4% were overweight and 17.8%. The prevalence of overweight and obesity among men living in other rural/remote areas were 45.2% and 16.9%, respectively and 27% of women were overweight and 20.4% obese.

### *Secular trends*

National estimates indicate that overweight and obesity has increase between 1995 and 2001. (1995: males 52%, females 37%; 2001 males 58%, females 42%). There are no prevalence rates for rural and regional populations. Rather, the data indicate only the likelihood of change in prevalence among non-urban populations compared with major city populations.

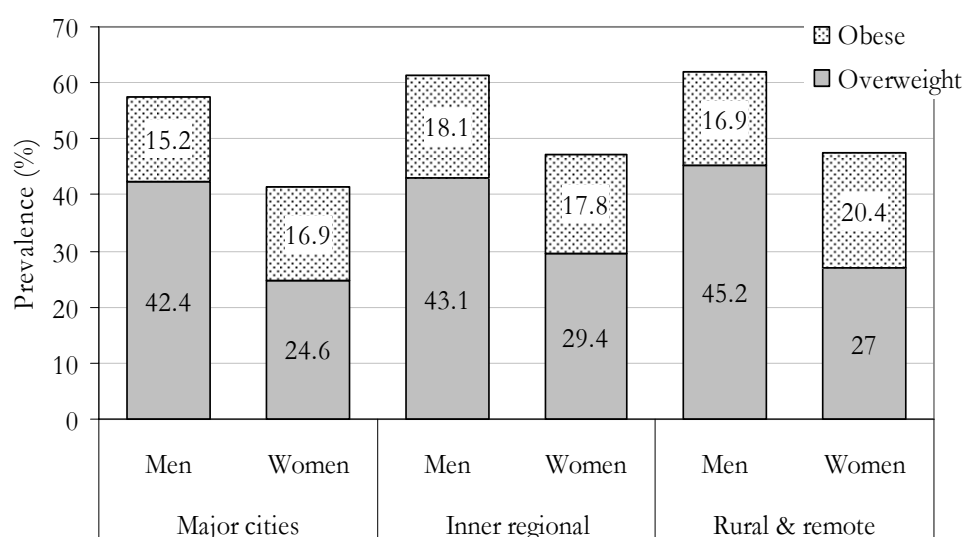
In regional areas in 1995, the prevalence of overweight and obesity among males (aged 15 years and over) was about the same as males living in major cities. Females (aged 15 years and over) living in regional areas were 1.12 times, and 25-44 year olds 1.19 times more likely to be overweight/obese compared with women in major cities. Between 1995 and 2001, the estimated likelihood of the prevalence of overweight and obesity among non-urban males and females compared with major cities populations was 1.14 and 1.16, respectively (ABS, 1997; ABS, 2002; AIHW, O'Brien, & Webbie, 2003).

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<sup>44</sup> Inner regional Australia: ARIA index values greater than 0.2 to less than and equal to 2.4.

<sup>5</sup> Outer regional and remote Australia: ARIA index values greater than 2.4





**Figure 3.7.2.** Prevalence of overweight and obesity among men and women living in major cities, inner regional and rural and remote Australia.

## Policy context

The following section lists the major policies, projects and initiatives that have been developed to address health issues, including overweight and obesity, among rural and remote populations in Australia. The review includes existing initiatives undertaken by the Commonwealth and State governments and other health professional groups and only includes those that mention strategies for rural and remote populations. While the review is not exhaustive, it does demonstrate that there has been significant investment in a broad range of strategies to try and address key functional health problems. Specifically, some of the key features affecting health care in rural Australia include reduced access to health services, including lower numbers per capita of General Practitioners, specialists, pharmacists, nurses and allied health professionals; reduced choice of provider; increased cost of services, with reduced rates of bulk billing; increased travel distances to access services, with associated increases in costs to the consumer, and subsequently reduced frequency of doctors' visits (Wilkinson et al 2004). Other frameworks have focused on health problems including those that are associated with overweight and obesity (e.g., cardiovascular disease, diabetes) in rural communities.

## Commonwealth Policies, Programs and Initiatives

- *Healthy Horizons. Outlook 1999-2003 and 2003-2007.* A framework for improving the health of rural, regional and remote Australian.
- *Building Healthy Communities - A Guide for Community Projects* is a guide for people in small rural communities who want to try new ways to make a difference to chronic disease at a local level.
- *National Chronic Disease Initiative –Draft (2005).* Aims to provide an overarching framework of national direction for improving chronic disease prevention, including obesity, across Australia, including rural and remote communities.

- *Eat Well Australia: A strategic Framework for Public Health Nutrition 2000-2010.* Aims to improve the health of all Australians through better food and nutrition. One of the first priorities is to map food supply system, particularly in rural/remote areas to identify which factors influence supply for vulnerable groups and develop strategies to address these.
- *Rural Chronic Disease Initiative 2000-2004.* Funding for primary health projects to prevent and better manage chronic disease and injury among rural Australians.
- *Training for Rural and Remote Procedural General Practitioners Program 2004.* The objective of the Program is to support Procedural General Practitioners (RRMA 3-7), through the provision of a grant to cover up to two weeks of training, up-skilling or skills maintenance activities per annum.
- *Workforce Support for Rural General Practitioners (WSRGP) Program (2000-2004).* Program is used to support the newly arrived and existing general practice workforce in rural areas. This includes support for training, professional development and locum coverage.
- *Rural Women's GP Service (2003-2007).* The Service aims to improve access to primary and secondary health care services for women in rural and remote Australia who currently have little or no access to a female GP.
- *Rural and Remote General Practice Program.* Funding for Rural Workforce Agencies in each State and the Northern Territory to provide a range of activities and support to improve the attraction, recruitment and retention of GPs to rural and remote areas.

### **New South Wales Policies, Programs and Initiatives**

- *Health Services in Smaller Towns - A Framework for Change (1999).* Developed to examine current issues and opportunities facing small rural communities in providing health and aged care services.
- *The Rural Health Implementation Coordination Group (RHICG)* was established in 2000 to advise on how to progress the commitments in the Government Action Plan relating to rural health and advice on additional strategies to improve health care.
- *One-stop-shop projects.* Joint pilot between NSW Health and the Department of Community Services (DoCs) to improve the health and wellbeing of adolescents in rural towns.
- *Wellington Challenge 2004* Funded under the Government's Rural Chronic Disease Initiative, the Wellington community came up with a creative way of tackling the problem of obesity, diabetes and heart disease on a mass scale.
- *Health Support Functions in Broken Hill - NSW Government Response to Report of Review Group 2005.* This is the NSW Government's response to the review group's report on health support functions in Broken Hill. The recommendations in this response provide a blueprint for ensuring a continued strong local health presence at Broken Hill that supports local communities and business, and that paves the way for Broken Hill to become a leader in remote, primary and Aboriginal healthcare.
- *Far West Area Health Service (FWAHS) Market Basket Survey 2002* The FWAHS conducted a market basket survey in 2002 that looked at food costs, availability, variety and quality in

stores. The survey was carried out in 22 stores across the area. Important findings include, significant differences in the average price of food baskets according to the local government area (LGA). The difference in the costs of purchasing food was much greater between large and small stores than it was between LGA. The survey identified key factors related to cost and variety and store size. Discussions with store owners/store managers indicated that a major impact on the cost of food, particularly products that require refrigerated transport, was the cost of freight. Store owners reported that only items that the community will purchase are made available and it would not be economically viable to offer other items.

### **South Australia Policies, Programs and Initiatives**

- *First Steps Forward.* Health reform strategy focusing on three main themes – building better governance, building better services and building better system support, including rural and remote areas.
- *Eat Well SA 1999.* One of the key activities of this program was to examine access to a healthy diet in rural and remote South Australia.
- *The Eat Well Outback SA.* A curriculum resource on food in the local community for South Australian rural schools. Developed so that all rural schools can participate in the Eat Well Outback SA project. It encourages upper primary children to learn more about the food supply to their school and town. The broader project aim is to increase consumption of healthy food, particularly fruit and vegetables, by people in the far north and west and upper Eyre Peninsula region. The project is based at Whyalla Hospital and Health Service.

### **Northern Territory Policies, Programs and Initiatives**

- *NT Food and Nutrition Policy 2001-2006.* Guidelines to improve the nutritional status and health of all Territorians and to reduce the burden of diet-related early death, illness and disability. Policy document considers remote communities a high-priority group for dietary intervention.
- *Educating To Improve Population Health Outcomes In Chronic Disease:2005* A curriculum package to integrate a population health approach for the prevention, early detection and management of chronic disease when educating the primary health care workforce in remote and rural northern Australia.
- *Central Stores Newsletter (CSN) 2003.* Remote nutritionists in Central Australia have developed a newsletter with the target audience of store workers and managers in remote communities. The newsletter is called the “Central Stores Newsletter” (CSN) and the first issue was distributed in May 2003. CSN is a way of keeping stores and communities up to date with what’s going on in Central Australian community stores. Food supply in remote areas is a challenging yet essential element of the Northern Territory Food and Nutrition Policy. The aim of the CSN is to share success stories with all store managers. in Central Australia so that they may consider strategies used by other stores and perhaps make contact with these other store managers for support and further ideas. Most importantly, the CSN is also sent to community councils so they too are informed about stores in their communities, and to enable them to participate in the process of ongoing process of improving food supply.

## Queensland Policies, Programs and Initiatives

- *10,000 Steps Rockhampton Project. 200?-2005.* The overarching goal of the project is to create a sustainable model of community-based PA promotion by working with the Rockhampton community to increase capacity to address the determinants of physical activity. The aim of this program is to increase participation in PA in the community, with a particular focus on sedentary people from socially and economically disadvantaged groups.
- *Bowen Healthier Shire Partnership project.* Funded by Health Promotion Queensland, the project aims to reduce the risk factors which contribute to cardiovascular disease, type II diabetes and cancer in people living in the Bowen and Collinsville communities. The project is designed to increase levels of physical activity, promote the consumption of more fruit and vegetables.
- *2000 Healthy Food Access Basket 1998-2000.* Cross-sectional survey identifying the cost of living, including the cost of basic foods, in rural and remote areas of Queensland.

## Victoria Policies, Programs and Initiatives

- *Towards a Community Health Policy Framework – Discussion Paper 2002.* Proposed framework for considering the role of Community Health and issues that need to be addressed to build capacity for Community Health to deliver a wide range of health and support services to meet local community needs, including rural and remote communities.
- *Review of Home and Community Care (HACC) Program Food Services (Draft Discussion Paper) 2002.* The main goal of the Food Services Review was to examine how food services can be better targeted to satisfy a variety of client needs, including managing people at nutritional risk and people needing social support, now and in future. Includes a review of the issues for regional and remote populations.
- *Small Rural Health Services 2003* Supports rural health services in towns with populations < 5,000 in developing stronger focus on local population health planning, including a strengthening emphasis on integrated health promotion to support sustainable health and aged care service that are responsive to local needs.
- *Leadership for Rural Population Health Projects (Baw Baw & South West).*
- *Health, Transport and Built Environment: A Promotion of Active Mobility.*

## Western Australia Policies, Programs and Initiatives

- *Eat Well WA 2010 – Health Weight and Vulnerable Groups.* State Public health Nutrition Plan for Action implementation frameworks providing strategic focus to improve nutritional status across WA.
- *Northern WA Access to Healthy Food Project.*
- *Healthy Lifestyle – A strategic Framework for Primary Prevention of Diabetes and cardiovascular Disease in WA 2002-2007.*

## What works?

### **Findings from individual studies of interventions among people living in rural and remote areas.**

The following section summarises the findings from individual studies of interventions with people living in rural and remote areas and other indigenous populations. The search strategies are documented in the main report.

Nineteen papers were selected for review. Seven were rejected because they were not intervention studies *per se* or, did not address relevant intervention strategies being sought for this review. The scope of intervention settings included innovative ways to reach rural and remote communities, including native indigenous populations such as Maori, Inuit and Native Hawaiians.

The interventions reviewed targeted people at risk of chronic disease, including overweight, diabetes and CVD, but weight was not the primary outcome in most of the studies. Instead, the main theme among the interventions was to explore different strategies of engaging at risk populations living in rural and remote areas that are considered hard to reach. The difficulties accessing health care in rural and remote areas pose different difficulties, compare with urban populations. For example, the time spent travelling to appointments is considered a significant impediment among rural populations (Aoun & Rosenberg, 2004; Johnson et al., 2001). Furthermore, access to service providers is often difficult because of the limited number of health practitioners in rural and remote areas. Some interventions, such as teleconferencing, are worth further exploration to understand the efficacy of this technology to deliver interventions in Australian rural and remote area, as this medium addresses one of the primary issue for these populations; distance.

A study undertaken in the Hunter Valley area of NSW showed that Pharmacies could successful provide screening, health promotion and referrals in small rural towns (Hourihan, Krass, & Chen, 2003). The need for interagency collaboration to successfully access people living rurally, particularly remotely was highlighted in a number of the studies (Hourihan et al., 2003; Lupton, Fonnebo, & Sogaard, 2003; Tessaro et al., 2000).

Interventions including, screening and health promotion programs run through rural worksites hold the potential to identify, reach and educate people who have poor lifestyle behaviours in rural areas where primary health care is typically under-resourced (Williams, Wold, Dunkin, Idleman, & Jackson, 2004). However, the involvement of health agencies and other organizations in the larger community is recommended to ensure workplace programs are sustainable (Tessaro et al., 2000). Workplace interventions among women highlighted the importance of strong social ties and supportive social relationships in influencing health-related behaviours. Furthermore the evidence suggests that because women diffused information about health promotion within their social networks outside the workplace, there may be additional benefits of workplace interventions in the larger community.

Intervention programs among Indigenous populations which utilise pre-existing cultural structures have the potential for improving the uptake of preventative health services among indigenous populations (Mau et al., 2001; Simmons & Voyle, 2003; Aoun et al., 2004). Given that the prevalence of overweight and obesity is high among Indigenous populations in many countries, and these groups are often hard to reach for intervention, these studies highlight the need to incorporate culturally specific programs to effectively target minority groups.

## *Summary*

The interventions reviewed provide limited information on the effectiveness of interventions and no real contribution to the overall literature on effective interventions. They do, however, span a range of innovative and potential systems for the delivery of lifestyle behavioural change programs, and to that extent indicate the feasibility and acceptability of strategies in specific locations and circumstances.

## **Case studies**

The issues associated with improving health outcomes among rural and remote populations are complex and have been outlined above. Because the necessary infra-structure required to deal with managing and monitoring rural and remote population health are limited, innovative strategies and or existing frameworks that utilise existing resources may provide an opportunity for health investments. The following case studies were selected to provide examples of engaging people in rural and remote areas using a 'whole of community' approach, developing collaboration among health professionals, and employing communication technologies to deliver interventions to people living remotely from townships.

### ***Whole of community approach***

#### *WellingtonTONNE Challenge 2004*

Health professionals at the Wellington Community Health Centre who had clients referred to them for diabetes education, cardiac rehabilitation and obesity identified that they were duplicating services and providing similar lifestyle messages to some of the same clients. In an attempt to address this issue, as well as tackle preventable diseases in their local area, a 'whole of community' program was devised.

The Federal Government's Rural Chronic Disease Initiative provided funding for the project for the Wellington community to devise a creative way of tackling the problem of obesity, diabetes and heart disease on a mass scale. Of the 9,200 residents of Wellington, around 2,400 were considered overweight. The challenge was for local residents to lose a collective tonne in body weight.

The WellingtonTONNE Challenge was originally planned to be a 12 week program, including weekly information and physical activity sessions, with supermarket tours, cooking demonstrations and regular weigh-ins. Specially designed resource kits were developed to help communities work together to promote healthier lifestyles, prevent illness and better manage chronic diseases. Due to community demand, the program was extended over a period of 15 months, including community activities, ongoing weigh-ins and physical activity sessions.

The Wellington community saw many health improvements including weight loss, an increase in physical activity levels, reduction or cessation of medications and reduction in blood glucose levels, blood pressures and pain levels.

At this stage there has been no formal evaluation of the WellinTONNE Challenge. It is, however, noted that the primary aim of the project was to change lifestyles and a greater lag time is required to ascertain whether behaviour change is enduring.

*Coalfields Healthy Heartbeat (CHHB)*  
(Higginbotham, Heading, McElduff, Dobson, & Heller, 1999)

CHHB was a coalition of community members, local government officers, health workers and University researchers involved in examining both the nature and sustainability of heart health activities undertaken in the Coalfields of Newcastle, NSW. A sociological framework was applied to tailor program activities to local interests and to try and avoid reproducing past injustices by inadvertently using a 'healthist' discourse.

The aim of the CHHB program was to stimulate development of a self-sustaining community action group responsible for heart health. It was envisaged that action by this group would lead to a reduction in the prevalence of behavioural risk factors which, in the long run, would lead to reduced mortality. The group would also promote environmental supports for healthy heart behaviour in key community settings such as schools, workplaces, social clubs and food outlets; and reduce risk imposition such as dominance of fatty foods on restaurant menus.

Intervention strategies included an initial awareness raising and public relations campaign; mobilising community resources; health heart rehabilitation; promoting healthy lifestyles; anti-smoking programs; institutional and environmental development; and mobilising institutional resources.

Process data reveal difficulties mobilising the community as a whole and activities had to be selected for interested subgroups such as families of heart disease patients, school children, retired people and women concerned with family nutrition and body maintenance.

Although the Coalfields program successfully completed a large number of activities and generated consistent media coverage, it did not produce a clear pattern of improvements in risk factor levels measured at the population level. Key findings included

- The value of clearly identifying interest groups which showed that health discourse becomes meaningful along with the regimens for health improvement when individuals are faced with mortality and a threat to one's identity.
- Community responses to the health promotion discourse showed that broadly targeted lifestyle change messages from health promoters provoke the same resistance reserved for 'outsiders' historically, and such actions were seen as 'paternalistic' and 'interfering'.

The study concluded that people's ideas about health are formed by the history of lived experiences and the cultural meanings stemming from that history. Public health interventions will fail to flourish in communities such as the Coalfields unless their strategies and messages somehow connect and resonate with cherished ideas and compelling local identities.

### **Communication-technology based approach**

*Interactive videoconferencing improves nutrition intervention in a rural population. (Johnson, A., Gorman, M., Lewis, C., Baker, F., Coulehan, N., & Rader, J. J. Am. Diet. Assoc., 101, 173-174, 2001.)*

The aim of this study was to determine whether interactive videoconferencing (IATV) improve nutrition interventions in rural populations. Although the results of the study was based on a small group of people (n = 26) and living in rural United States, the authors indicated that participants, and dieticians, found IATV an acceptable technology to receive/deliver nutritional advice. In fact,

99% indicated that the reduced travel time was a benefit, and participants were more likely to kept scheduled 'televisit' appointments. Frequent technical problems establishing the conference links and poor picture quality were the main limitations of IATV.

Provides an example of how telemedicine intervention, can improve use of nutrition, and other health services in rural areas where distance inhibits patients' motivation to seek nutritional help.

### **Health Professional Collaboration**

*Rural community pharmacy: a feasible site for a health promotion and screening service for cardiovascular risk factors. Hourihan, F., Krass, I., & Chen, T. Aust.J.Rural.Health, 11, 28-35, 2003*

The aim of this study was to describe the development of an innovative pharmacist-delivered health promotion and screening service for cardiovascular disease (CVD) risk factors in rural community pharmacies. Briefly, the program involved developing a standardised health promotion and screening protocol which also included a pharmacist-administered risk factor assessment questionnaire. The protocol was developed to enable the pharmacist to: identify appropriate participants for screening; identify risk factors for cardiovascular disease and diabetes; deliver targeted health information dependent upon risk factors identified, including exercise, dietary and smoking cessation advice; and provide appropriate referral to a GP or follow-up in the pharmacy at 6 weeks dependent upon the results of blood pressure, total cholesterol, triglycerides and presence of risk factors for diabetes. Participants with any elevated clinical parameter at their initial screening, were required to return to the pharmacy at 3months for re-assessment

The study did not report direct health outcomes, rather the authors reported the utility of the service which identified 30% of the population required referral to a GP for further assessment following their initial screening and 50% required a follow-up with the pharmacist at 6 weeks to recheck their blood levels and/or review their nicotine replacement therapy.

The study indicates it is feasible for collaboration between health service providers (GPs, pharmacists) in small rural townships in Australia, to tackle health issues. Women were over-represented in the study however, this finding is congruent with other population studies and suggests a tendency for many men to 'avoid' health screening and information.

Rural residents tend to take health for granted with their prime focus on cures for illness, rather than prevention of disease (Dixon et al, 2000). Medical services provided by both doctors and pharmacists are valued highly in rural areas so there is a need for a formalised collaborative approach to the provision of preventive health services between pharmacists and general practitioners if improved access to such services is to be realised. Community pharmacies in rural areas have the potential to increase the community's access to screening programs, and provide an opportunity to educate and refer people at risk of CVD (and other weight related morbidities) to GP services.



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### **3.8 Interventions addressing overweight and obesity in older adults**

Ageing is associated with several adverse changes in body composition, notably a loss of muscle mass (sarcopenia) and an increase in the central distribution of body fat. Middle-aged and older adults therefore, have greater total body fat, and more central adiposity, than younger adults, for any given BMI (Gill 2002). For this reason, there is some controversy in using adult BMI reference values in the older population (Inelmen 2003). Abdominal obesity has been established as a strong indicator of health risk in older people, and waist circumference is considered a better measure of this than BMI (AIHW 2004: Obesity trends in older Australians).

#### **Defining older age**

Older adults may be considered as three different subgroups; those aged 45-64 years (middle-aged), those aged 65-79 years (younger old) and those aged 80 years and over (older old) (Prime Minister's Science Engineering and Innovation Council - PMSEIC 2003).

#### **Functional capacity over the life span**

Functional capacity generally declines with age. This is usually due to a combination of genetic, individual, behavioural and environmental factors that lead to decreases in lean body mass and increases in fat mass. Physical activity and diet are strong determinants of the rate of change in body composition and therefore in functional decline (Bauman et al 2002). Preventive interventions are thought to be effective in improving health status, quality of life and functional capacity at all stages of the life span (PMSEIC 2003).

#### **Epidemiology of overweight and obesity in older populations**

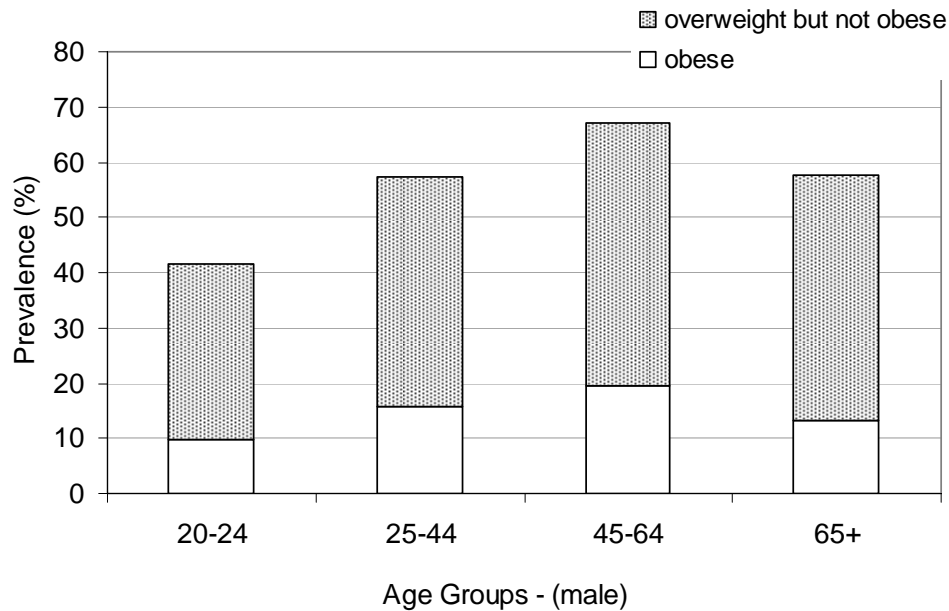
The prevalence of obesity increases in successive age groups and is greatest in the 50–59 year age group, with 24% of men and 30% of women in that age group considered obese. Figures 3.8.1 and 3.8.2 show age-specific prevalence of overweight and obesity among men and women, respectively.

Although cross-sectional data show that the average weight is highest among people of late middle age, this does not mean that all individuals lose weight as they grow older than this. Longitudinal studies indicate that there is disproportionately high mortality among obese people in middle age (Gill 2002, AIHW 2004: Obesity trends in older Australians). In addition, prospective data from the Australian Longitudinal Study on Women's Health indicates that on average, there is a decrease in weight among women in their 70s, with some women gaining and others losing weight at this life stage (Brown: in press).

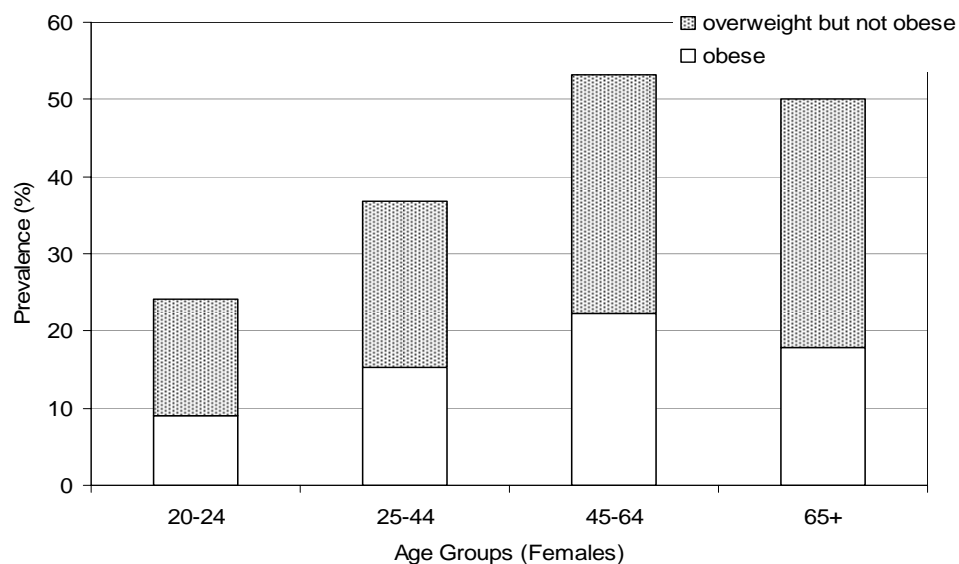
The relationship between BMI and risk of mortality changes with age, so that for adults aged over 65 years, mortality increases only in those with a BMI greater than 31kg/m<sup>2</sup> and possibly not at all for those aged over 75 years (Heiat 2001). Importantly, some evidence suggests that overweight in the oldest age groups (over 85 years) does not increase mortality risk and may actually be protective. Mechanical complications from overweight, such as osteoarthritis and respiratory complications, however, may improve with weight loss even in older age groups (Rossner 2001).

Based on waist circumference, over 30% of older men and 44% of older women are currently at substantially increased risk of disease due to abdominal obesity. The prevalence of overweight and

obesity is increasing in the older population with an average older Australian now 6–7 kg heavier than 20 years ago (AIHW 2004: Obesity trends in older Australians).



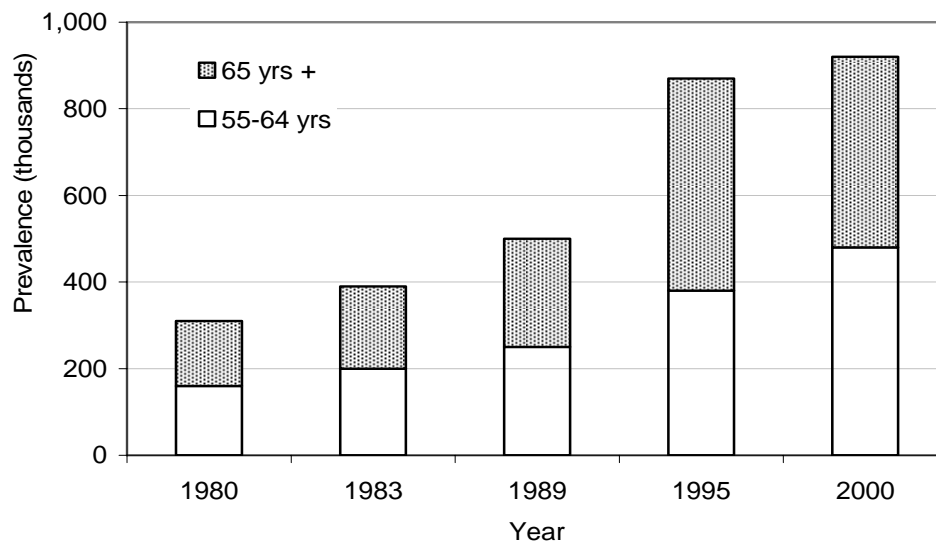
**Figure 3.8.1:** Age-specific prevalence of overweight and obesity among men, 2001. *Source: AIHW analysis of the 2001 ABS National Health Surveys.*



**Figure 3.8.2:** Age-specific prevalence of overweight and obesity among women, 2001. *Source: AIHW analysis of the 2001 ABS National Health Surveys.*

The older population is growing rapidly relative to the whole population. The largest percentage rise between 1991 and 2001 occurred in the 85 years and over age group, with an 85% increase in males

and a 67% increase in females (AIHW 2004: Australia's health 2004). The combined effect of an ageing population and the obesity epidemic has led to a trebling of the number of obese older people over the past 20 years, to nearly one million (Figure 3.8.3).



**Figure 3.8.3:** Number ('000's) of obese older Australians, 1980 to 2000. *Sources: AIHW analysis of the 1980, 1983 and 1989 Risk Factor Prevalence Surveys; 1995 National Nutrition Survey; 1999-2000 Australian Diabetes, Obesity and Lifestyle Study (AusDiab); ABS Australian Demographic Statistics 3101.0*

### The association between obesity and ill health in older adults

Debate persists about the relationship between obesity in old age and total or, disease-specific mortality, its clinical relevance, and the need for its treatment. A number of studies have examined the relationship between BMI and mortality in elderly populations and the results have varied with some studies showing an increased association between mortality and BMI with age, but most showing that the relationship weakens with age. The conflicting results have arisen due to the complex nature of the relationship between BMI and mortality, the large number of potential confounding factors and the divergent methodology employed by different researchers to assess this relationship. The recent CDC study from the USA (Flegal et al, 2005) suggested that there was virtually no excess death associated with obesity among people aged more than 70 years. A number of reasons have been proposed for this lack of association between overweight and mortality in the elderly including the protective effect of increased weight during a medical crisis, a reduced risk of osteoporosis and severe fractures, and increased lean tissue levels associated with increased weight.

However, there is relatively strong evidence that the risk of morbidity continues to increase with increasing weight in the elderly. A range of studies have shown that BMI, or fat mass, are positively related to disability, e.g., limitation in activities of daily living (Launer et al, 1994), walking upstairs, walking on flat surfaces (Visser et al, 1998); pulmonary disease; diabetes; and arthritis (Anderson et al, 1998). Visser et al. (1998) reported that in individuals over 65 years of age, body fat, measured by bioelectrical impedance, was not only related to mobility-related problems, but it also predicted the development of problems in those without the disabilities during the baseline period. It is likely that central fat and relative loss of fat-free mass may become relatively more important than BMI in determining the health risk associated with obesity in older ages.

Studies on the effect of voluntary weight loss in the elderly are scarce, but they suggest that even small amounts of weight loss (between 5 – 10% of initial body weight) may be beneficial. It has been argued that there may be little benefit in encouraging weight loss in extreme old age (because of the short life expectancy), especially when there are no obesity-related complications or biochemical risk factors and when strong resistance and distress arise from changes in lifelong habits of eating and exercise. However, weight loss in the elderly can reduce morbidity from arthritis, diabetes and other conditions, reduce cardiovascular risk factors, and improve well-being (Elia 1998). Furthermore, increased physical activity in the elderly, which is an important component of weight management, can produce beneficial effects on muscle strength, endurance, and well-being.

## **Physical activity and diet in older populations**

The prevalence of risk factors for chronic disease, such as physical inactivity, increases with age. Physical activity is associated with various health benefits including reduced risk of chronic disease, including cardiovascular disease, type 2 diabetes, some types of cancer, depression, functional, and possibly cognitive decline with age.

Physical activity levels were found to be substantially different among the subgroups of older Australians in 2001. Of those aged 65-74 years, 35% reported being sedentary in the previous two weeks, increasing to 49% in those aged 75-84 years and 63% in those aged 85 years and over. Physical activity levels for the older population did not differ substantially between the 1995 and 2001 National Health Surveys (ABS 2001: The health of older people, Australia).

People aged 65 and over have reduced participation in sport and physical activity. In 2001, only 51% of males and 41% of females aged 65 years and over, participated in organised or non-organised sport or physical activity. The most popular activity was walking for exercise, undertaken by 25% (AIHW 2004: Australia's health 2004).

Fruit and vegetable intake increases with age for those aged 25 years and over. However, of those aged 75 years and over, only 24% reported both an inadequate fruit intake (one serve or less) and an inadequate vegetable intake (three serves or less) (ABS 2001: Health risk factors).

Energy intake increases until late adolescence then gradually decreases with advancing age. Macronutrient intake (combined carbohydrate, protein, sugar, fat intake) increases with age until the second or third decade, then decreases, so that adults aged 65 years or more have similar intakes to children aged 4-11 years. The proportion of total energy provided by saturated fat and sugars decreases with age, while the proportion provided by protein increases. The proportion provided by other macronutrients does not differ significantly with age (ABS: National Nutrition Survey 1995).

In men, the median intake for most vitamins and minerals peaks at 16-24 years, although for some individual vitamins and minerals, such as vitamin C, the peak occurs in much older age groups. In women, the highest median intake for most vitamins and minerals occurs later, in the 45-64 year age group. Adults aged 45 years and over, have the highest vitamin and mineral intake relative to energy intake (ABS: NNS 1995).

## **Policy context**

*National Strategy for an Ageing Australia (AGDHA 2001)*

The National Strategy for an Ageing Australia is a framework for a national response to the challenges and opportunities arising from an ageing Australian population. The National Strategy is intended to provide a framework for coordinated action from Commonwealth, State and Territory governments, the private sector and communities.

The strategy has four principle themes, including:

- Independence and self provision.
- Attitude, lifestyle and community support.
- Healthy ageing.
- World class care.

#### *Commonwealth, State and Territory Strategy on Healthy Ageing (CDHAC 2000)*

The Commonwealth, State and Territory Strategy on Healthy Ageing is a national response to the challenges faced by the ageing of Australia's population. It was developed by the Healthy Ageing Task Force, a body established by Commonwealth, State and Territory Health and Community Services Ministers in October 1996, and was endorsed by the Commonwealth, State and Territory Ministers responsible for ageing issues.

The Commonwealth, State and Territory Strategy on Healthy Ageing is a broad framework that identifies areas and opportunities to improve healthy ageing outcomes and forms a basis for coordinated planning for the Commonwealth, State and Territory governments.

Key action areas include improving community attitudes to ageing and older people, improving the health and well being of all older Australians, improving participation of older Australians in employment and community activities, providing sustainable financial and other support for older Australians including accessible transport and housing.

#### *Dietary Guidelines for Older Australians (NHMRC 1999)*

The Dietary Guidelines for Older Australians were developed by the National Health and Medical Research Council and funded by the Commonwealth Department of Health and Aged Care. The guidelines provide an important synthesis of the available evidence that support nutritional recommendations for older Australians.

The guidelines were prepared for health care professionals who care for older people and a consumer guide is also available. The guidelines were developed to specifically address the nutritional needs of older people and apply to healthy, older Australians (greater than 65 years) living independently.

### **Summary of intervention effectiveness**

The literature reviewed in this section includes three review articles of varying methodology, five individual studies including three randomized control trials (RCTs), one cohort study and one study of quasi-experimental design. Only two of the reviews and three of the individual studies were evaluations of intervention effectiveness. The other papers looked at associations relevant to the development of interventions for this subpopulation.

#### *Summary of review evidence for intervention effectiveness:*

Six reviews attempted to assess the effectiveness of physical activity programs in various settings on the physical activity behaviour or health outcomes of older adults.

The van der Bij review found high participation rates in both home and group-based interventions in the short-term, which declined with longer intervention duration. It also found that group-based and educational physical activity interventions produced small improvements in PA in the short-term and that evidence for longer-term effectiveness is limited (Van der Bij et al, 2002).

The Ashworth review suggests that home-based exercise programs for older adults may have superior long-term adherence than centre-based programs, a result not found in the van der Bij review (Ashworth et al, 2004). This difference between the review findings may be explained by the effect of individual versus group delivery on program adherence.

The Cyarto review found that most general physical activity interventions were successful in increasing physical activity. The most successful examples include Wheeling Walks, a community-wide mass media campaign, and CHAMPS II, an individually tailored primary health care intervention. Interventions that used progressive resistance training (PRT), were successful in increasing strength, functional ability and improving several chronic disease states, including diabetes, osteoarthritis and chronic heart failure (Cyarto et al, 2004). Similarly, the Conn review found that most interventions significantly increased physical activity levels, although no association between specific intervention components and effectiveness could be found (Conn et al, 2003).

Both the Cyarto and Conn reviews emphasize the importance of defining program components in any further intervention research. The type of intervention (educational session, exercise class), the dose (intensity, frequency and duration), the delivery (instructor, self-directed, individual or group), the level and type of support (in person, written materials, telephone, internet), and the setting (primary care, community or home-based), are all important components that potentially impact on the effectiveness of an intervention.

The King review identifies several successful interventions to promote physical activity in older adults. These include physical activity promotion programs that use cognitive-behavioural strategies (such as goal setting, self-monitoring, feedback, support, stimulus control and relapse-prevention), home-based interventions with telephone support, a national mass media campaign to promote moderate-intensity physical activity, neighbourhood walking groups and the innovative use of pharmacies, clubs, shopping malls and other settings that are convenient and welcoming to older adults (King AC, 2001). The review also recognizes that further research is required among subgroups of older adults, including those aged over 85 years or who are socially isolated.

The Brawley review identified several factors associated with successful physical activity interventions in older adults, including convenience, affordability, moderate-intensity physical activity and involving a social component, especially for women. The review also suggested a number of different approaches that are potentially valuable, including home-based interventions with mediated instruction (via internet or telephone) and interventions that incorporate problem solving to help overcome barriers to participation (Brawley et al, 2003).

#### *Summary of evidence of relevant associations:*

Findings from the Brach study reinforce the importance of physical activity interventions in preventing physical function decline with age (Brach et al, 2004). Similarly, the Fiatarone Singh review suggests that both dietary and physical activity interventions have the potential to prevent age-related medical conditions and functional decline through preventing adverse body composition changes (Fiatarone Singh, 2002). In addition, the Nicklas study showed that a dietary weight loss



intervention improved biomarkers of chronic inflammation in obese, older people aged 60 years or more, independent of weight loss (Nicklas et al, 2004).

The Lim study found several factors positively associated with 30 minutes or more of physical activity in the older adult population of NSW. These factors include male sex, younger age, ability to travel independently, better physical functioning, lower psychological distress, rural residence, not having diabetes, adequate fruit and vegetable intake, and speaking a language other than English at home (Lim and Taylor, 2005).

Brown and colleagues found that the major determinants of weight gain in middle aged women, in addition to reduced physical activity and increased energy intake, are smoking cessation, menopause transition and hysterectomy. These life events may provide important opportunities for preventive action (Brown et al, in press).

Findings from the He study show that women with the greatest increase in fruit and vegetable intake were less likely to become obese in middle age, compared to those with the largest decrease in intake, after adjustment for age, physical activity, smoking, total energy intake, and other lifestyle variables. Interventions that promote fruit and vegetable intake have the potential to prevent weight gain in middle-aged women (He et al, 2004).

Two recent cross sectional studies examined associations between the built environment and physical activity in older adults. King identified several factors of the neighborhood environment associated with higher physical activity levels in older women. These include living in a more pedestrian-friendly neighborhood and within walking distance to businesses and facilities (King WC, 2005). At the neighbourhood level, Li and colleagues found that the density of workplaces and households, green and open spaces for recreation and the number of street intersections were positively associated with walking among older adults. At the individual level, perceptions of safety and number of nearby recreational facilities were positively associated with walking (Li et al, 2005).

## Case Studies

### Group exercise program

*Barnett et al. Community-based group exercise improves balance and reduces falls in at-risk older people: a randomised controlled trial. Age and Ageing 2003; 32: 407-414*

This was a randomised controlled trial to determine the effectiveness of a group exercise intervention in improving physical functioning, health status and preventing falls in older people. The target groups was community-dwelling older people aged over 65 years, assessed by their general practitioner or hospital-based physiotherapist as being at risk of falling. The intervention consisted of weekly structured exercise group classes, conducted by an accredited exercise instructor and delivered in the community. A total of 36 classes were conducted over one year. The content of the classes was developed by a physiotherapist to specifically address risk factors for falling. Exercises were designed to improve balance, coordination, aerobic capacity and muscle strength. Participants also completed a home exercise program based on class content. Both intervention and control groups were given written information on strategies to avoid falls. Participants in the intervention group attended a median of 23 group exercise classes over the year, with most undertaking home exercises at least weekly. At six months, the intervention group performed significantly better in three of the six measures of balance, than controls. At one year, the intervention group had a significantly lower rate of falling (RR=0.60, 95% CI: 0.36-0.99), compared to controls.

In conclusion, this example illustrates the effectiveness of a weekly group exercise program with ancillary home exercises in improving balance and reducing falls in older people.

### **Weight loss program for obese older women**

*Jensen et al. Weight loss intervention for obese older women: improvements in performance and function. Obesity Research 2004; 12: 1814-1820.*

A pre/post-intervention pilot study was conducted to determine the feasibility of a weight loss program for obese older women. Older obese women (60 years or greater, BMI of 30 or more) living in the community. The weight loss program included dietary, physical activity and behavioural components. The three-month program consisted of an initial assessment by a bariatric physician, followed by eight dietitian counseling session of 30 minutes duration and a physician visit on completion. The intervention was specifically tailored to the older population, through use of large-font instruction materials, calcium and vitamin D supplementation and moderate physical activity and weight loss goals. The emphasis of the program was to improve health, function and quality of life with a goal to achieve a moderate 5% reduction in body weight by the three-month follow-up visit.

The intervention group had a significant decrease in mean body weight and significant improvements in multiple risk factors (diastolic blood pressure, total cholesterol), physical activity, physical performance, physical functioning and vitality. This pilot study suggests that it may be feasible for a comprehensive, tailored weight loss program to significantly reduce weight, improve health status and functioning in self-selected obese older women.

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