Research Findings and Commentary

about Healthy Nutrition and Food Security













Hayden Brown

2019



CONTENTS

**THE IMBALANCED DIET** 5

**Recommended Diet** 5

Vegetable and Fruit Diet Patterns 5

Fibre and Fat Consumption 7

Sugar-sweetened Foods 8

Excess Salt and its Impact 10

Infant Nutrition 10

Impact of an Excess or Deficiency in Consumption of Various Nutrients 11

**OBESITY 13**

The Prevalence of Obesity 13

Health Risks Associated with Obesity 16

Causes of Rising Obesity Prevalence 17

**FOOD INSECURITY 22**

Definitions of Food Insecurity 22

Measurement of Food Insecurity 22

Prevalence of Food Insecurity 23

Impact on Children including Obesity 26

Impact on Adults 27

Causes of Food Insecurity 28

**RESPONDING TO FOOD INSECURITY AND INADEQUATE NUTRITION** 39

**Sources of Food** 39

Material Aid 39

Low Cost Meals at Local Cafes 40

Delivery of Food/Community Transport 41

Private and Community Gardens 42

Alternative Food Outlets 43

**Improving the Quality of Retail Supply** 45

Regulatory Measures to Encourage Healthy food outlets 45

Encouraging Supply and Promotion of Healthy Meals by Retail Providers 46

Reformulation of Food 47

**Improving Children’s Access to Food and Understanding of Nutrition** 48

Teaching Children about Food 48

Food in Canteens 48

Breakfast Programs 49

**Fostering Public Understanding of Nutrition** 51

Public Promotion of Nutrition 51

Government Supply of Healthy Food 52

Training in Nutrition 53

*Aboriginal and Torres Strait Islander Initiatives 54*

*Refugee and CALD Initiatives 57*

Training Community Workers in Nutrition 59

**The Promotion of Healthy Food** 60

Food Advertising and Children 60

Labelling of Food 61

**Economic Incentives and Ecological Considerations for Access to Food** 63

Subsidies and Taxes 63

Addressing Education, Employment, Incomes and Other Structural Issues 65

Preservation of Natural Resources 65

**Government Policy Responses** 69

**Bibliography 71**

THE IMBALANCED DIET



Surveys reveal widespread insufficiencies in fruit, vegetable and fibre intake among the general population, while many people consume excessive amounts of fat, sugars and other energy-rich foods – all of which contribute to obesity and further adverse outcomes. Dietary imbalances are prevalent among socioeconomically disadvantaged groups and Aboriginal and Torres Strait Islanders, accounting for about 7% of the impact of disease upon health in Australia and 17% of mortality.

‘\* \* \* \*

**Recommended Diet**

The Australian Dietary Guidelines describe nutrition intended to promote sound health and achieve an optimal weight. It stipulates that such a diet should include:

“…a wide variety of nutritious foods from these five groups every day”; among them:

* “Plenty of vegetables, including different types and colours, and legumes/beans
* Fruit
* Grain (cereal) foods, mostly wholegrain and/or high cereal fibre varieties, such as breads, cereals, rice, pasta, noodles, polenta, couscous, oats, quinoa and barley
* Lean meats and poultry, fish, eggs, tofu, nuts and seeds, and legumes/beans, and
* Milk, yoghurt, cheese or their alternatives, mostly reduced fat.”

The guidelines also advise people to “Drink plenty of water” and to “Limit intake of foods containing saturated fat, added salt, added sugars and alcohol.” (National Health and Medical Research Council - hereafter, NHMRC (2013a).

Similar diets are endorsed in the literature, with such nutrition incorporating vitamins; minerals, such as calcium, iron or zinc; and fibre; as well as sufficient protein, drawn from meat, dairy and vegetable sources.

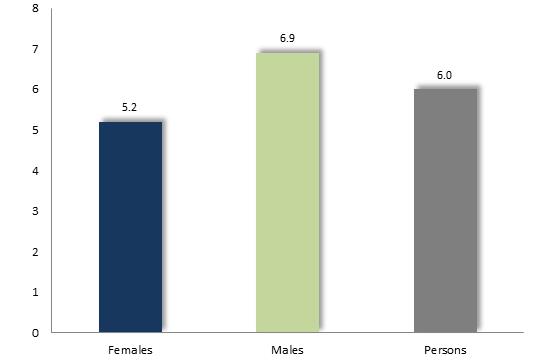
A balanced diet contributes to sound health and is credited with moderating the prevalence of hypertension (due to its low salt content), type-two diabetes (through avoidance of obesity) and its cardiovascular complications, osteoporosis (weakening of bones, linked with in adequate calcium intake), impairments of thinking ability, poor dental health, and cancers of the mouth, pharynx, oesophagus and lungs (VicHealth, undated E; Morgan, 2008; Lawlis et al, 2018A).

**Vegetable and Fruit Diet Patterns**

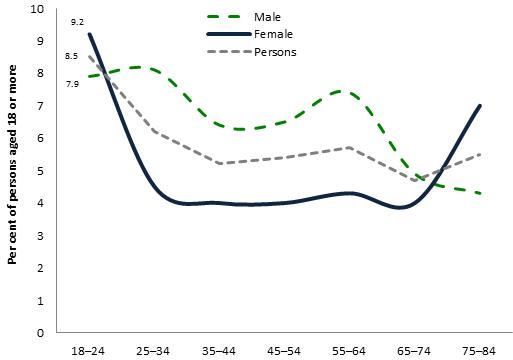
Population studies confirm that many Austrians consume an insufficient quantity of many beneficial foods, such as vegetables, fruit, fibre, legumes and dairy foods (AIHW, 2018A, 2018B; Sadegholvad et al, 2017).

Vegetables were the subject of inquiries in the 2016 Victorian Population Health Survey, which found that 8.4% of females and 2.2% of males meet vegetable consumption guidelines.

The more recent 2017/18 National Health Survey found that 92% of Australians consumed an insufficient quantity of vegetables, with six per cent of adults eating less than one serve per day (5-6 serves per day are recommended), including 5.2% of females and 6.9% of males (ABS, 2019H).

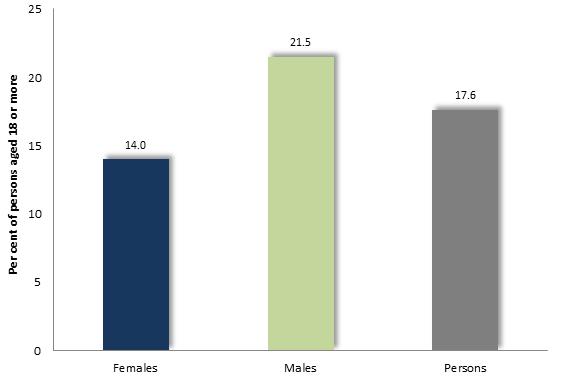


Per cent of adults who consume less than one serve of vegetables each day, by gender: Australia, 2017/18 (National Health Survey, 2018)



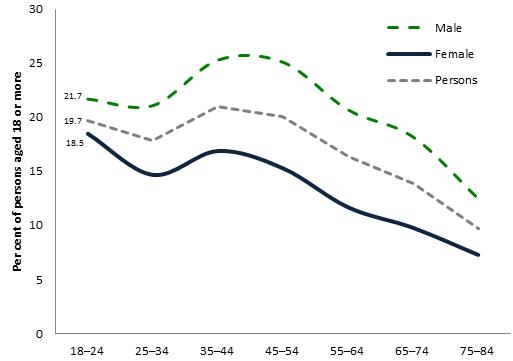
The proportion of adults who eat less than one serve of vegetables each day dwindles in the first decades of adulthood, then remains relatively stable until older age, while remaining higher among males than females throughout the lifespan.

Per cent of adults who consume less than one serve of vegetables each day, by age and gender: Australia, 2017/18 (National Health Survey, 2018)



The 2017/18 National Health Survey also determined that about 18% of adults eat less than one serve of fruit per day, including 14% of women and 22% of men.

Per cent of adults who consume less than one serve of fruit each day, by gender: Australia, 2017/18 (National Health Survey, 2018)

The percentage of people who consume less than one serve of fruit each day declines from middle-age and is higher among males than females for most of the lifespan.

Per cent of adults who consume less than one serve of fruit each day, by age and gender: Australia, 2017/18 (National Health Survey, 2018)

In relation to children, surveys commissioned by the Victorian Government revealed that in 2017, 77% of children met guidelines for fruit intake and 3.8% for vegetable consumption (Department of Education and Training, 2019A).

Population surveys also show that levels of fruit and vegetable consumption are lower among socioeconomically disadvantaged groups than others. The 2016 Victorian Population Health Survey which found that 43% of Victorians met fruit consumption guidelines, including 38% of residents in the *most* disadvantaged municipalities and 46% of those in the *least* disadvantaged municipalities (Victorian Government, 2019). Vegetable consumption guidelines were met by 3.6% of residents in the *most* disadvantaged municipalities and 7.1% of those in the *least* disadvantaged.

Australian and US investigations report a similar association between inadequate fruit and vegetable intake and limited formal educational attainments (Burns, 2004).

**Fibre and Fat Consumption**

In addition to fruit and vegetables, many Australians consume a diet with a fibre and fat content which does not match guidelines.

Fibre consists of long molecules, largely originating in plant cell walls and formed from strings of simple sugars which cannot be absorbed by the human gastrointestinal system. Instead, fibre remains in the intestine, assisting in in its mechanical function; improving its balance of bacteria and other organisms; and displacing some high-energy food from the diet (NHMRC, undated). Benefits of fibre include a reduced prospect of obesity and its complications such as diabetes and cardiovascular disease; lowering of cholesterol and blood pressure; and fewer gastrointestinal disorders such as diverticulitis, colo-rectal cancer, polyps, gallstones, diarrhea and others (Mayo Clinic, 2019; CSIRO, 2019A).

Consumption of high-fibre food – including fruit, vegetables, peas, beans nuts and seeds – coupled with an avoidance of foods that are highly-processed (which removes the fibrous outer layer from grains), contributes to a healthy, balanced diet. The CSIRO (2019A) recommends a daily intake of 38 grams of fibre for men and 28 grams for women.

By contrast, dietary guidelines propose limiting consumption of saturated fat – found in dairy products, animal and processed meat, and snacks such as crackers, cookies and chips – to 5 or 10% of energy intake, to suppress levels of harmful cholesterol. The balance of expert opinion instead favours unsaturated fats, found in nuts, vegetable oils, olives and avocados, as well as salmon and tuna.

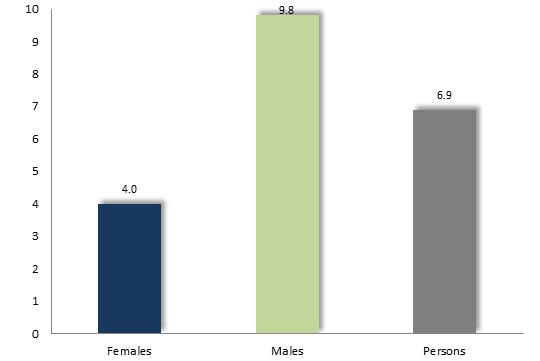
In addition, trans-fats, largely originating in the manufacturing process, may have detrimental impacts upon cholesterol levels and raise the probability of cardiovascular disease. Trans-fats are added to many discretionary foods (food whose consumption is unnecessary for human health), including fast food and snacks such as French fries, chops, crackers, cookies, fried chicken, pies, pastries, donuts, margarine and peanut butter (Dieticians Association of Australia, 2019). As a consequence, much of the discretionary food consumed by Australians, including many fast and snack foods, may be harmful to health, owing to their often high content of trans-fats, as well as salt and added sugar.

For many people, diets are compromised by such an excess of fats and by insufficient fibre. The 2009/10 Victorian Health Monitor found that 57% of Victorian adults did not meet fibre intake guidelines, while 73% exceeded recommended levels of fat consumption. These figures were relatively uniform across categories of age, gender and income, and between metropolitan and rural localities (cited in Department of Health and Human Services, 2016).



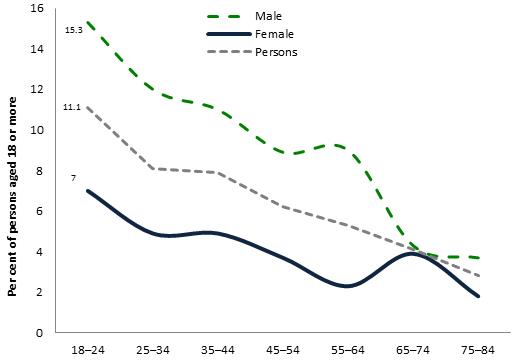
**Sugar-sweetened Foods**

Excessive consumption of food high in sugars and other carbohydrates – to a level exceeding the body’s energy requirements – has contributed to rising levels of obesity in Australian society, the subject of a later section.

An example of such sugary foods, and one which has attracted considerable attention, is sugar-sweetened drinks, which represent a significant source of sugar and energy in the Australian diet (ABS, 2017B), particularly among young adults (University of Sydney, 2019; Bawadi et al, 2019).

Per cent of Australian adults who consume two or more cups of sugar-sweetened drinks per day, by gender: 2016/17 (National Health Survey, 2018)

The 2018 National Health Survey found that approximately one in ten males (9.8%) consume and average of two or more metric cups of selected sugar-sweetened drinks each day, more than twice the corresponding proportion of 4% among women (ABS, 2019H).



The average volume of such drinks consumed by Australians declines throughout the lifespan.

Per cent of Australian adults who consume two or more cups of sugar-sweetened drinks per day, by age and gender: 2016/17 (National Health Survey, 2018)

Similarly, the Victorian Population Health Survey found that 10% of Victorians consumed sugar-sweetened soft drinks daily (Victorian Government, 2019). Consistent findings emerged from an analysis of the 2011/12 National Nutrition and Physical Activity Survey by the CSIRO, which determined that sugary beverages and fruit juices accounted for 4% of discretionary food energy intake in children and 8% in adults (Hendrie et al, 2016).

Consumption of such sugary drinks is most prevalent among males, younger adults, people in poor or fair health, those with little interest in their health, and people who purchase meals away from home (Pollard et al, 2016; Richardson et al, 2019; Bawadi et al, 2019; Rangan et al, 2009).

Consumption levels are also relatively high among socio-economically disadvantaged groups. The 2017 Victorian Population Health Survey determined that residents of the five *most* disadvantaged Victorian municipalities were almost three times as likely to consume sugar-sweetened drinks daily, at 14%, as those in the *least* disadvantaged communities, at 5.6% (Victorian Government, 2019). Conversely, the 2015 VicHealth Indicators Survey found that 5.3% of respondents from the five *most* disadvantaged municipalities had consumed no water on the day of the survey, compared with 2.1% of those in the *least* disadvantaged municipalities (VicHealth, 2015).

The sugar content of sugary drinks is substantial: regular 600 ml soft drinks contain an average of 16 teaspoons of sugar; sports drinks, nine teaspoons; and 250 ml fruit drinks, 6.5 teaspoons (Uncited, 2019A). Notably, a 330ml bottle of coke-a-cola contains nine teaspoons of sugar, while the World Health Organisation (hereafter ‘WHO’) recommends a daily adult consumption of fewer than six per day (Davey, 2018). The impact of such drinks is accentuated by the fact that consumers of such beverages only slightly lower their energy intake from other sources to compensate for such sugar intake, resulting in elevated energy consumption (Rangan et al, 2009), thereby contributing to weight gain and predisposing to diabetes mellitus. Consumption of sugar-sweetened drinks are therefore implicated in obesity[[1]](#footnote-1), as well as tooth decay, diabetes mellitus and other unfavourable health outcomes (Richardson et al, 2019; ABS, 2017B; Uncited, 2019A).

[](https://www.google.com/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&ved=2ahUKEwjJgZ2TwqTlAhVTmuYKHT4yBfUQjRx6BAgBEAQ&url=https%3A%2F%2Fwww.msn.com%2Fen-za%2Ffoodanddrink%2Ffoodnews%2Fis-salt-really-as-damaging-as-doctors-claim-scientific-sceptics-claim-there-is-no-real-evidence-it-causes-health-problems%2Far-AAEZpxL&psig=AOvVaw3bybbFC7aoiaOGgEx3vCwO&ust=1571443702868911)**Excess Salt and its Impact**

The average daily salt consumption of Australian adults exceeds national guidelines (AIHW, 2018A) averaging 8-9 g. per day – nearly twice the endorsed daily intake of 5 g (Heart Foundation, undated; Malakellis et al, 2017). Approximately three-quarters of such salt originates from processed foods and meat, takeaway food and convenience snacks (VicHealth, undatedF), though the 2011/12 Australian Health Survey found that 60% of adults also add salt while preparing food, and 49% to food at the table (ABS, 2012).

The resulting excessive intake of sodium is a primary cause of hypertension (Webster and Bolham, 2016) – a condition accountable for an estimated 48% of chronic kidney disease, 60% of strokes and 50% of heart disease in Australia, according to the Global Burden of Disease study (VicHealth, undated F). As a consequence, excessive salt intake was a contributing cause of an estimated 5% of mortality in Australia in 2010 (VicHealth, undatedF) – equivalent to over 8,000 deaths in Australia by 2019.

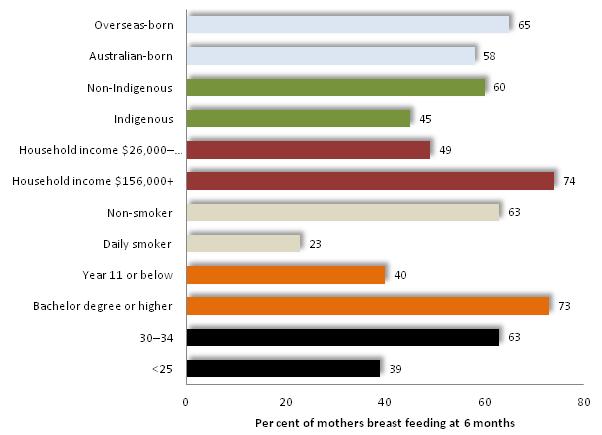
**Infant Nutrition**

“The first food a human being consumes—breast milk—is one of the safest for newborn babies, providing all essential nutrients, offering immunological protection, and creating an emotional bond between mother and child”, writes Prof. Margaret Chan (2014) of the World Health Organisation (hereafter, ‘WHO’). Breast-feeding reduces the probability of asthma, infection, diabetes, high blood pressure and obesity in children, and of maternal ovarian and breast cancer, and diabetes mellitus (Strategic Inter-governmental Nutrition Alliance, 2001; NHMRC, 2013b). Moreover, among low-income families, for whom infant formula may not be readily affordable, breast-feeding may prevent nutritional deficiency in their infants (Rosier et al, 2011B). The Australian Infant Feeding Guidelines and WHO, therefore recommend exclusive breast-feeding for the first six months of life (AIHW, 2018B; WHO, 2018).

However, in 2015/16, rates of full breast-feeding in Victoria at three months stood at 52%, including 73% among the least disadvantaged five municipalities and 45% among the most disadvantaged municipalities. By six months, full breast-feeding rates had declined to 32% overall, including 44% among the *least* disadvantaged five Victorian municipalities and just 10% among the *most* disadvantaged (Victorian Department of Education and Training, 2018B).

The earlier 2010 National Australian Infant Feeding Survey determined that breast feeding rates at six months (full or partial) were relatively low among socioeconomically disadvantaged women, those without tertiary education and people in lower-income households (NHMRC, 2011). The survey also recorded low breast feeding rates among Aboriginal and Torres Strait Islander mothers, of 45% at six months, compared with 60% among others. (Accompanying diagram)

Rates of breastfeeding at six months, by selected maternal characteristics, 2010, Australia



The Strategic Inter-Governmental Nutrition Alliance (2001) reports that inadequate infant and maternal nutrition is also widespread among teenage mothers and members of some cultural communities.

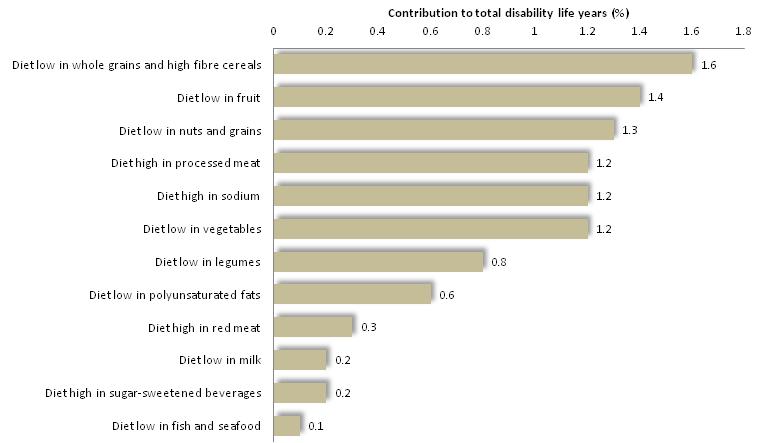
****

**Impact of an Excess or Deficiency in Consumption of Various Nutrients**

Diets insufficient in fruit, vegetables and grain, or with excessive amounts of sugar and other energy-rich food, salt or saturated fats, detract from health and the prosperity of the community (State Government of Victoria, 2011B; Public Health Association, 2018) making a leading contribution to disease and mortality (VicHealth, undated E, undated U; AIHW, 2015).

WHO (2017) contends that an inadequate consumption of fruit and vegetables is responsible for 30% of coronary heart disease, 14% of strokes and 20% of gastrointestinal cancer, worldwide. Of their impact in Australia, the AIHW (2015) estimates that dietary factors overall contribute to 7.3% of the impact of disease upon mortality, disability and quality of life in Australia – termed the ‘burden of disease’.

The AIHW also estimated the contribution of dietary deficiency in a variety of nutritious foods, to the overall ill-health of the Australian population – calculated as ‘Disability Adjusted Life Years’ or ‘DALY’. Diets low in whole grain and high fibre cereals exert the highest impact among all dietary deficiencies, accounting for 1.6% of DALYs while diets low in fruit contribute 1.4%, according to these figures. The estimated percentage of total DALYs, or overall ill-health and mortality in Australia in 2015, arising from a selection of dietary imbalances, is illustrated below. (AIHW, 2015).



Disability Life Years due to impact of selected dietary imbalances: 2015, Australia

Conversely, Prof. Collins of Newcastle University maintains that adherence to dietary guidelines by Australians would reduce the burden of disease due to type two diabetes by 41%, stroke by 34% and bowel cancer by 22% (cited in Barry, 2019).

In a review of 16 investigations into the impact of inadequate diet in Australia, Crosland (2019) concluded that unhealthy diets – including an insufficient intake of fruit and vegetables – are accountable for 17% of mortality in Australia. Crowley et al (1992) on the other hand, adds that poor nutrition plays a *contributory role* in approximately 56% of deaths across Australia.

Accordingly, commentators draw attention to the cost of sustaining a diet high in meats, fats and sugar, with the observation that a shift to a diet low in energy-producing sugars and other carbohydrates, with sufficient fruit and vegetables, and largely reliant upon marine foods and plants such as legumes, nuts and seeds, for protein, would improve health (Heart Foundation, 2019A), as well as easing the burden of agriculture upon the environment and lowering the price of food for consumers (Larsen, 2008; McCrindle Consulting, 2018A) – matters which are addressed in further detail further on.

OBESITY

The prevalence of obesity among Australians has escalated from 19% to 31% in the past two decades, with a quarter of children and three-quarters of adults now either overweight or obese. Causes include increasing consumption of high-energy foods, accompanied by the relentless marketing of unhealthy food, its appealing taste and time-saving convenience, and limited government regulation. Rising obesity levels have also been spurred by a decline in physical exertion at work, in recreation and at home, with one in ten teenagers and half of middle-aged Australians taking no exercise in a typical week.

Obesity is most widespread among people in middle to older age, Aboriginal and Torres Strait Islanders, residents of rural and remote areas, and socioeconomically disadvantaged groups. Obesity impairs mobility and self-sufficiency, shortens the average lifespan by up to a decade, and accentuates the risk of diabetes, cardiovascular conditions and cancer, making it the second largest contributor to disease in Australia.

‘\* \* \* \*

**The Prevalence of Obesity**

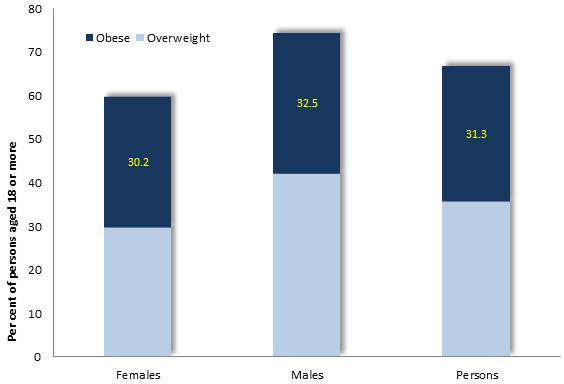
Obesity is defined by the World Health Organisation as “A disease in which excess body fat has accumulated to an extent that health may be adversely affected” (Burns, 2004: 8).

Obesity is sometimes gauged by waste circumference, with risk identified by a measurement exceeding 80 cm. among women and 94 cm. among men – though such criteria are not considered valid for some ethnic groups (AIHW, 2018B). A more popular method employs the body mass index, or BMI, calculated as a ratio of mass to height: kilograms/m2. A BMI greater than 25 is held to represent overweight, over 30 as obesity, and over 40 as class-three obesity (AIHW, 2018B, 2017B).

Regardless of the technique applied, caution is advised in its interpretation. First, the two methods – waste circumference and BMI – do not generate the same results. DeVille-Almond et al (2011) recount the findings of research which documented the prevalence of obesity among study participants of 46% using the BMI, but 73% based upon measures of waste circumference. Second, direct measurement generates higher measures of the prevalence of obesity than self-reporting. In one example, the prevalence of obesity among Victorians was recorded at 25%, based on the BMI (from the VicHealth Monitor 2012), substantially higher than the self-reported prevalence of 17% (VicHealth, 2012B).

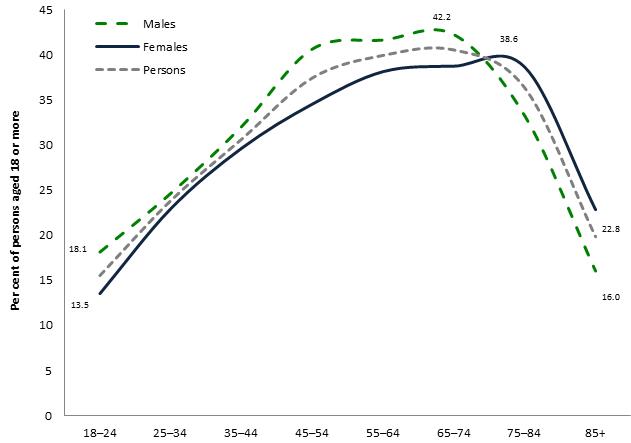
Notwithstanding such considerations, a succession of surveys conducted in Australia and Victoria in recent years has documented a surge in the prevalence of obesity, from 18.7% in 1995, to 31% in the 2017/18 National Health Survey (ABS, 2019H).

Meantime, the national prevalence of overweight/obesity has increased from 57% in 1995 (AIHW 2012a) to 75% in the 2018 National Health Survey – a figure which is forecast to reach 79% by 2025 (VicHealth, undatedT).



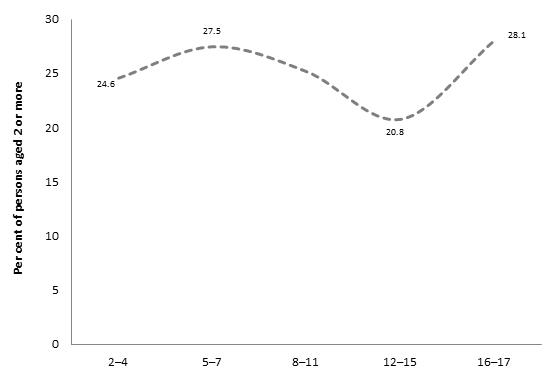
Prevalence of obesity and overweight by gender: Australia, 2017/18 (National Health Survey, 2018)

The prevalence of obesity recorded in the 2017/18 National Health Survey was slightly higher among males, at 33%, than females (30%), and rose steeply with age to its peak in early retirement age, before declining sharply among people aged 85 years or more.



Prevalence of obesity and overweight by age and gender: Australia, 2017/18 (National Health Survey, 2018)

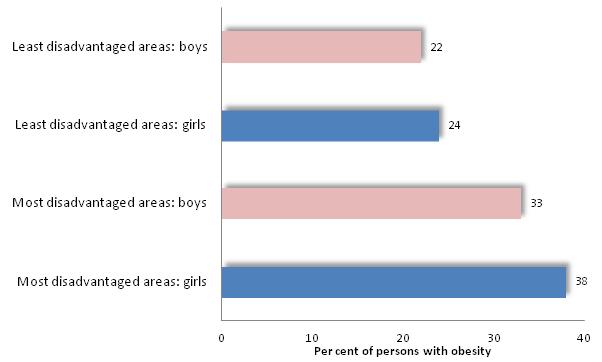
The 2017/18 National Health Survey also found that approximately one-quarter of children are overweight or obese, with a prevalence that fluctuates between 20 to 30 per cent between ages 2 and 17.



Prevalence of obesity and overweight by age: persons aged 2 to 17 years, Australia, 2017/18 (National Health Survey, 2018)

Other research reveals that obesity is relatively widespread among socioeconomically disadvantaged people (Burns, 2004; VicHealth, 2014B).

Prevalence of obesity among children, by gender: Australian National Health Survey: 2014/15

The 2014/15 Australian National Health Survey found that 34% of adults in the *most* disadvantaged fifth of communities were obese, compared with 22% of those in the *least* disadvantaged localities (AIHW, 2018A), though this difference was most pronounced among women and barely discernible among men (AIHW, 2017A). The survey also found that 33% of boys among the *most* disadvantaged fifth of the population were obese, compared with 22% in the *least* disadvantaged groups. Among girls, the corresponding figures were 38% and 24% respectively.

Similar findings emerged from the 2014 and 2017 Victorian Population Health Surveys, where the recorded prevalence of obesity in the *most* disadvantaged five municipalities was nearly twice that of the *least* disadvantaged municipalities (Victorian Government, 2019; Victorian Government, 2015).

Exploring a further dimension of socioeconomic disadvantage, the Victorian Health Monitor (2013) recorded elevated levels of obesity among people with lesser levels of formal education.

Other research confirms that the prevalence of obesity is relatively high among Aboriginal and Torres Strait Islanders (AIHW, 2018A, 2017), with a 2012/13 survey documenting a prevalence of 37% (ABS, 2013) – in excess of the corresponding level of 28% among Australians, recorded in 2014/15.

Elevated rates have also been recorded among people in rural and remote areas. The 2014/15 National Health Survey determined that 69% of adults in regional areas were overweight or obese, compared with 61% in metropolitan regions (NHMRC, 2016).

Contemplating such disparities, VicHealth remarks that obesity represents: “…a newfound threat to health equity in Australia” (undatedT: 3).

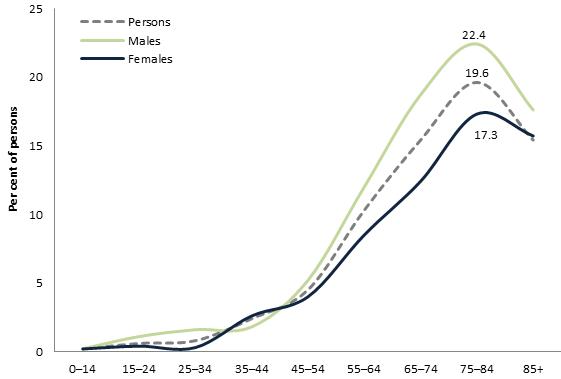
*Self-Awareness of Obesity*

Despite its rising prevalence, many people have a limited or indistinct perception of their level of obesity and of its potentially adverse consequences. DeVille-Almond et al (2011) report on a survey of 146 middle-aged males, which found that 81% of overweight respondents, and 62% of those who were obese, believed that they were not vulnerable to an increased risk of type-two diabetes.

[](https://www.google.com/imgres?imgurl=https%3A%2F%2Fthumbor.thedailymeal.com%2Fd1lfxq38MNEbysdHqu4lSbJ0kvc%3D%2F774x516%2Fhttps%3A%2F%2Fwww.theactivetimes.com%2Fsites%2Fdefault%2Ffiles%2Fuploads%2FF%2FFRONT%2520rsz_1shutterstock_131375909_0.jpg&imgrefurl=https%3A%2F%2Fwww.theactivetimes.com%2Ffitness%2Fyour-first-time%2F10-health-risks-obesity&docid=LLjh_rE2y-22nM&tbnid=mTQXqiFf4HdOtM%3A&vet=10ahUKEwj51Ibuw6TlAhUe7XMBHXwcBH0QMwi2AShBMEE..i&w=774&h=516&bih=962&biw=1920&q=obesity%20health%20risks&ved=0ahUKEwj51Ibuw6TlAhUe7XMBHXwcBH0QMwi2AShBMEE&iact=mrc&uact=8)A further survey, of 4,437 Australian parents, found that although 6% of their children were overweight or obese, only 1% perceived their child to be so (Merema et al, 2016). The author of the study postulated that, since perceptions of obesity are based upon comparison with others, as more children are now obese, parents have fewer healthy-weight children for comparison.

**Health Risks associated with Obesity**

Diabetes mellitus is among the more adverse consequences of obesity.



Prevalence of doctor-diagnosed diabetes mellitus among Australians, by age: 2017/18

The 2018 National Health survey found that less than 1% of children had been diagnosed with this condition, a figure which swells to 22% among people of older age, before subsiding among those aged 85 or more (ABS, 2019H). From middle-age onwards, the proportion of people with doctor-diagnosed diabetes mellitus is slightly higher among males than females.

Notably though, such measures of *doctor-diagnosed* diabetes generally underestimate its prevalence by approximately one-fifth (Department of Health and Human Services, 2016).

The Department of Health and Human Services (2016) also observed that the prevalence of diabetes mellitus in Victoria almost doubled between 2003 and 2012, a trend which may have persisted with the continued rise in the prevalence of obesity since that time.

Owing to its link to nutritional imbalance and obesity, the prevalence of diabetes is relatively high among socioeconomically disadvantaged communities. The 2014 Victorian Population Health Survey found that 8.1% of residents in the *most* disadvantaged fifth of communities had been diagnosed with this condition, compared with 2.5% in the *least* disadvantaged communities (Victorian Government, 2015).

Aside from contributing to diabetes mellitus, obesity also accentuates the risk of cardiovascular disease, chronic kidney conditions, osteoarthritis, and cancers of the colon, rectum, prostate, ovaries, cervix and breast (DeVille-Almond et al, 2011; AIHW, 2017; VicHealth, undatedT). In pregnancy, it predisposes to dangerous elevation of blood pressure, haemorrhage after birth, wound infection and of having children who develop obesity (WHO, 2018; NHMRC, 2013c). In addition, obesity in middle- or older-age may restrict mobility and the independent performance of daily self-care tasks (VicHealth, 2014B). People at a BMI over 3,5 six times as likely to experience such impairments as those in the normal weight range (VicHealth, undatedT).

Estimates rank obesity as the second highest contributor to the impact of disease in Australia (AIHW, 2017B), accounting for 7% of the national health burden in 2011 (AIHW, 2017A) and 9% of the burden of disease among Aboriginal and Torres Strait Islanders (Thorpe and Browne, 2009). Obesity also exacts a toll upon the human life-span (AIHW, 2008, 2017A), the NHMRC (2013) relating that people with class-three obesity have a life expectancy 8 to 10 years less than those with normal weight.

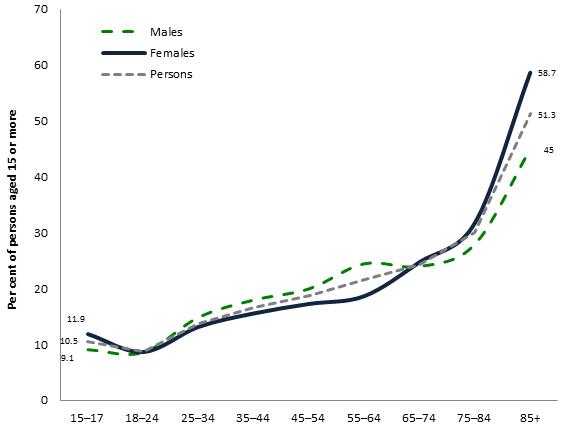
The ensuing financial expense incurred by society is substantial (AIHW, 2018A). Access Economics (2008) estimated its cost to the Australian community as $62 billion per year in 2008 (cited in VicHealth, undatedB) – equivalent to $79 billion in 2019, though the increase in prevalence of obesity since 2008 would likely have raised this cost further.

****Causes of Rising Obesity Prevalence**

*Reduced levels of physical activity*

The Australian Dietary Guidelines state that: “...it is now internationally proposed that 45–60 minutes of moderate-intensity daily physical activity is the minimum required...to prevent overweight, while at least 60–90 minutes of moderate-activity is recommended for formerly-obese people” (NHMRC, 2013C). The benefits of exercise for health are well-established. In 2019, Victoria University researchers conducted a review of 14 studies involving 230,000 people, concluding that, compared with people who did not run regularly, those who do engage in such exercise – regardless of its level and pattern - had a 30% lower risk of death from cardiovascular disease, a 23% lower risk of death from cancer, and a 27% lower risk of mortality overall (Pedisic et al, 2019)

Many Australians do not meet such criteria owing to a decline in the physical exertion involved in employment, transport and at home during the past few decades, which may have contributed to the rise in obesity (Brownson, 2005; Borodulin, 2008; Matthews et al, 2008; Parry et al, 2013; WHO, 2003). For example, 2015 Australian Institute of Family Studies inquiry found that Australian children spend 20% of their waking time in front of screens on weekdays and 30% on weekends (Yu and Baxter, 2016), a trend which may increase the risk of obesity, in view of the link between this condition and in front of video screens reported by Banks et al (2011).



Proportion of persons who obtain no exercise in a typical week, by age: Australia, 2017/18

The 2017/18 National Health Survey found that one in ten 15 to 17 year-olds obtained no exercise in a typical week – a figure which rose gradually throughout adulthood to nearly one in five people aged 55-64, before escalating to over half of those aged 85 years or more. The proportions of women and men who engaged in no exercise each week were similar.

The 2017 Victorian Population Health Survey found that 51% of adults obtained insufficient exercise – including similar proportions of women and men – and that sedentary lifestyles were approximately three times more prevalent among residents in the five *most* socioeconomically disadvantaged Victorian communities than in the *least* disadvantaged five municipalities (Victorian Government, 2019).[[2]](#footnote-2)

*Patterns of food intake*

Specific conditions relevant to infancy and early childhood may also predispose to obesity, including use of infant formula; high birth weight; parental obesity, smoking or depression; family stresses; and socioeconomic disadvantage (NHMRC, 2013C).

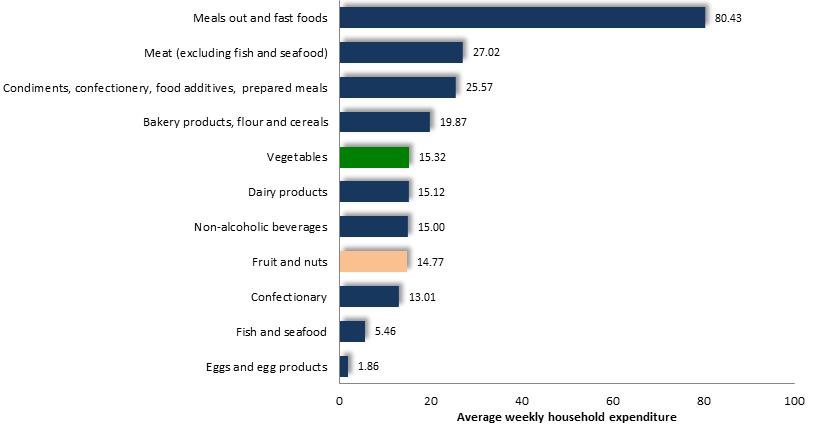
Sugary drinks, and much of the content of takeaway foods and meals eaten out, contribute to excessive caloric intake and obesity. In a review of 30 studies of the impact of sugary beverages on weight gain in children, conducted by Luger et al (2017), all but one revealed a positive association. Rangan et al (2009) contend that analyses of numerous studies establish a compelling, causal association between sugary drink consumption and weight gain, confirming that consumption of such beverages precedes weight gain; that such trends hold for differing ages, genders and other segments of the community; that weight gain is related to intake levels; and that these associations are compatible with contemporary scientific understanding of the impact of sugar upon human metabolism.

The consumption of nutrient-poor, energy-dense foods has also contributed to the rising prevalence of obesity (Public Health Association, 2018; AIHW, 2018A). It has been mentioned that such foods – which include chocolate, cakes, biscuits, pastries, potato crisps, ice cream, cream butter, other fatty and salty snack foods, as well as alcoholic, sugar-sweetened or energy drinks - are collectively termed ‘discretionary food’, as they are unnecessary for healthy nutrition – even while they may exert a deleterious influence upon health (AIHW, 2018B).

Australian surveys have determined that children aged 2-3 years consume 3.3 serves of discretionary food per day, accounting for one-third of their total energy intake (AIHW, 2018B). A similar pattern prevails among the wider population, with the 2011/12 Australian Health Survey finding that 35% of energy intake of Australians aged 2 years or more was accounted for by discretionary foods, a figure which rose to 41% among 14-18 year-olds (ABS, 2012).[[3]](#footnote-3) Overall, discretionary food accounts for 42% of dietary sugar, 35% of energy and 37% of sodium, according to Australian and Victorian surveys (Victorian Government, 2016).

Takeaway foods and snacks are a further source of unhealthy, discretionary food. A 2013 survey found that 81% of Australians aged 14 years or more, ate out or consumed takeaway food at least once per month, with higher rates recorded among people aged 14-29. Holyrod (2014) reported that on average, Australians purchased food from fast food outlets, such McDonalds or Kentucky Fried, four times a month.

The findings of the 2015 VicHealth Indicators Survey revealed that similar proportions of residents from the most and least disadvantaged five Victorian municipalities consumed takeaway meals or snacks at least three times a week – at 10.4% and 9.4%, respectively (VicHealth, 2015). The Victorian Population Health Survey also discerned no significant difference between the most and least disadvantaged municipalities in patterns of consumption of such meals (Victorian Government, 2019).



Average weekly expenditure on selected food types: Australia (2014/15 Household Expenditure Survey)

Expenditure on takeaway foods and meals eaten out substantially exceeds funds spent on healthy food. The 2014/15 Household Expenditure Survey determined that average weekly household expenditure on eating out and takeaway food was $80.43 – nearly three times the combined weekly expenditure on fruit ($14.77) and vegetables ($15.32) (ABS, 2017A) (Accompanying diagram). This trend has been accentuated in recent times. In the 17 years since the 1998/9 Household Expenditure Survey, purchases of fruit, vegetables and nuts, declined by 11% as an average proportion of total household expenditure, while relative spending on takeaway meals and eating out rose 17% (ABS, 2017).

Notably, the *volume* of food consumed while eating out also appears to be rising, the 2011/12 National Nutrition and Physical Activity Survey disclosing that the size of takeaway portions had grown by 10-40% since an earlier, 2005 survey (cited in AIHW, 2017A). Rangan et al (2009) report that drink portions too have increased, from a standard 200 mls. in the 1950s, to a 375 ml. can, and to 600 ml. bottles popular in the present day. In a related and perhaps contributing trend, larger portions or volumes of drink are offered at takeaway outlets for a small cost – a practise termed ‘supersizing’ (Burns, 2004).

*Taste appeal of high-energy foods*

Higher-energy food and beverages are often more appealing and palatable to many people than fruit and vegetables (Adams, 2019; Swinburn, 2008), one commentator remarking that they are “…more satiating for less expense“ (Burns, 2004 :15). Like-minded, James (2008: 6) observes that fruit and vegetables “…are not sexy”, while others note that unhealthy food may be more appetizing than nutritious food (Dept. Health and Human Services, 2017). Explaining this tendency, Burns (2004) states that human beings have an intrinsic ‘taste preference’ for food containing little water, such as chocolate and butter.

Experience shows that the appeal of such tasty but unhealthy foods may readily subdue rational sensibilities or curtail informed judgement. Halpern (2016) describes a study where employees were informed that they had won a competition and were offered either a fruit platter or chocolate – three-quarters choosing the fruit. However, when their food was delivered, participants were advised that records of their selection had been misplaced and they were again presented with the original choice between fruit or chocolate. At this point, half switched their preference, with three-quarters now selecting the chocolate (State Government of Victoria, 2011B).

Aside from its often-pleasant taste, some add that intake of low-nutrient, high-energy food may also be sustained by prevailing customs and patterns of food consumption (Swinburn, 2008; Sheridan et al, 2016).

*Convenience of takeaway and other convenience foods*

Conditions which have reportedly contributed to an increasing reliance upon takeaway and convenience foods include lack of time (Harper et al, 2008) resulting from longer working hours and increasing rates of labour force participation (Rosier et al, 2011B), coupled with evolving patterns of meal consumption - with occupants of the same household often eating at different times and locations throughout the day (AIHW, 2017A). In an Australian survey, respondents mentioned competing demands upon their time as a reason for not preparing and consuming healthy meals (NSW Council of Social Service, 2018). Similarly, interviews of male apprentices determined that many ate takeaway food for lunch, owing in part, to its convenience (VicHealth, 2011A).

*Promotion of high energy foods.*

It is also held that advertising of unhealthy, energy-dense food contributes to its consumption (AIHW, 2008), with its marketing reaching children on-line, through television, at sports and other community settings, and on the street (Obesity Policy Coalition, undatedA). In 2008, the Australian Institute of Health and Welfare reported that the average Australian child was exposed to 35 hours of food advertising on TV each year – half dedicated to the promotion of unhealthy foods.

In a review of research on the exposure of children to food promotion, Bacholer et al (2018) concluded that those living in households of socioeconomic disadvantage were subjected to higher levels of such advertisements than others.

Some investigators maintain that evidence confirms the link between television advertising and sugary drink consumption among children (Rangan et al, 2009). Indeed, it is unlikely that marketers would invest in intensive advertising without the expectation of a favourable impact upon sales of their product. And in interviews with recent settlers, Cyril (2017) found that many parents perceived that unhealthy food promotion diverted their children from healthy food choices.

*Cost and accessibility of higher-energy foods.*

Some hold that the affordability of high-energy, nutrient-poor foods may also contribute to their popularity (AIHW, 2008). The lower cost per kilojoule of such foods appears convincingly corroborated by evidence. Burns (2004) determined that the cost of energy from potato chips was 20 cents/Mj. and of soft drinks 30 cents/Mj., compared with 95 cents/Mj. for carrots and 143 cents/Mj. for orange juice. The consequence, she maintains, is that higher energy food is often an inexpensive source of energy – aside from being tasty – resulting in obesity. The actual cost of an adequate diet however, as distinct from kilojoules, is a separate consideration, which is addressed elsewhere.

It is also maintained that high density of convenience food outlets makes them conveniently accessible (AIHW, 2008, Swinburn, 2008) – a circumstance which may favour the consumption of such foods.

FOOD INSECURITY

Food insecurity is a term generally applied to a lack of continuous, reliable access to nutritious food. Its contributing causes include low incomes; rising costs of housing and utilities; household financial crises; transport limitations; inadequate household storage or food preparation facilities; lack of skill or confidence in shopping, budgeting or preparing food; as well as psychological, physical or mental impairments.

At least one in twenty households are experiencing food insecurity at any given time, a persistent condition for some, and recurring or transient for others. Surveys indicate that food insecurity is most prevalent among low-income households, Aboriginal and Torres Strait Islanders, unemployed people, renters, refugees and asylum-seekers, those with chronic illnesses, mental health conditions or drug problems, homeless people and those living in remote communities.

‘\* \* \* \*

**Definitions of Food Insecurity**

Food security is generally regarded, at its minimum, as a circumstance where a person has access to adequate, nutritious food to enjoy a healthy existence (WHO 2015; McCrindle Consulting, 2018A; Lawrence et al, 2015; Burns, 2009). The UN Food and Agriculture Organisation for example, defines food security as when people “…have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life” (Lawrence et al, 2015: 1).

Others contend that food security also entails not having to obtain food from emergency services (Harper et al, 2008; Burns, 2009) nor experiencing uncertainty of, or anxiety about, food supply (Knowles, 2016; Burns, 2004), or having to consume insufficient or unhealthy food, owing to financial hardship (Rosier et al, 2011B).

The term ‘food insecurity’ therefore, has no universally-agreed definition, but instead may cover a variety of conditions (VicHealth, 2008; Kleve et al, 2018C; Rosier et al, 2011B), ranging from “…worrying about where the next meal may come from, to difficulty accessing adequate, nutritious food, or to severe levels of hunger or malnourishment”, as Lawlis et al (2018A) explain.

**Measurement of Food Insecurity**

In the conduct of Australian surveys[[4]](#footnote-4), the existence of food insecurity is generally verified by the single question: “In the past 12 months, have you or anyone in your household run out of food and not had enough money to afford more?” (Lawrence et al, 2015; Burns, 2004).[[5]](#footnote-5)

Notably, responses to this inquiry measure only the prevalence of a particular cause and effect of food insecurity. Responses to this question do not shed any light upon households *concerned* about being unable to afford an adequate diet or which consume an inferior diet to avoid running out of money for food. It also provides no insight into the consequences of running out of food, including whether household members actually experience hunger or obtained food from some other source. Temple, 2016 for example, makes the distinction between those who, lacking the funds to purchase food, experience starvation – which he estimates at approximately 40% of food security due to financial constraints - and those who are still able to secure food from some source. Finally, aside from financial constraints, other circumstances not within the scope of this survey question - such as difficulties in acquiring, transporting, storing or preparing food - may also prevent some people from securing a nutritious and adequate diet.

As a consequence, sequences of survey questions which apply a broader definition of food security or encompass a wider range of its causes and impacts, tend to yield higher estimates of the prevalence of food insecurity among the population (McKechnie et al, 2018; Kleve et al, 2018A). For example, a US-developed multi-item sequence of questions has generated estimates of the prevalence of food insecurity of 15% in New Zealand, 12% in Canada, 8% in Britain and 14% in the US (Kleve et al, 2018C) - levels two to three times higher than the Australian prevalence typically recorded by the single question.

A further alternative, the Radimer/Cornell Scale, inquiries about household hunger (including sufficiency of food supply for the household or household meals); the mother’s experience of hunger (including her opportunity to afford to eat ‘properly’ or ‘the way I should’ and whether hungry or eating less than ‘I think I should’); and child hunger (including whether not eating enough, or experiencing hunger, because the mother cannot afford more food). The survey thereby generates separate measures: those of household, mother and child hunger. A 1993 New York survey for example, yielded differing estimates: those of ‘household hunger’, at 47%, ‘women's hunger’ (26%) and ‘children's hunger’ (18%). According to its developers, the survey blends the sensitivity to discern hunger among people who may eat a regular but insufficient diet, with the specificity to omit households which may have exhausted their supply of food but whose members obtain sufficient food from other sources. (Welsh et al, 1993).

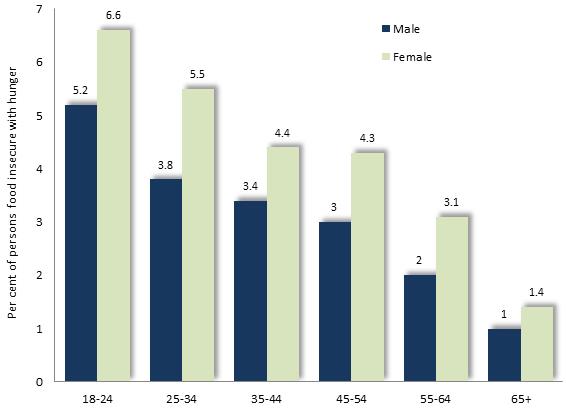
Another survey in wide use is the US Department of Agriculture Household Food Security Survey Module, which measures the severity of food insecurity (McKay et al, 2019).

The single question though, is at least, clear and specific, making it convenient to incorporate into a survey, easy to interpret, and its findings susceptible to comparison among different segments of the population. It does however, clearly underestimate the prevalence of food insecurity.

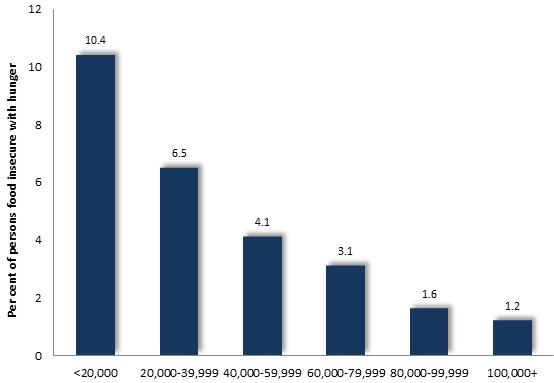
**Prevalence of Food Insecurity**

Surveys of food insecurity in Australian indicate that approximately one in 20 Australians runs out of food due to financial constraints in a 12-month period.[[6]](#footnote-6) The measures of prevalence arising from population surveys featuring this inquiry include 5.2% in 1995 (Australian Institute of Family Studies, 2018), 6.1% in the 2001 Child Health Survey, 5.2% in the Victorian VicLanes survey (Burns, 2009), and 4% in the 2011/12 National Health Survey. The 2014 Victorian Population Health Survey recorded a slightly lower rate, finding that 3.6% of adults had run out of food and could not afford more, including 3% of males and 4.1% of females – a condition characterised as ‘food insecurity with hunger’. Notably, a further 13% of Victorian adults were concerned about running out of food – termed ‘food insecurity without hunger’ by this author (Dept. Health and Human Services, 2017).

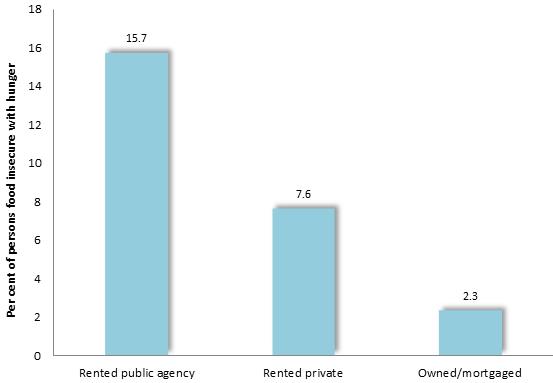
The prevalence of food insecurity with hunger was higher among younger people, declining from 6% among 18-24 year-olds to just over 1% among people aged 65 year or more.



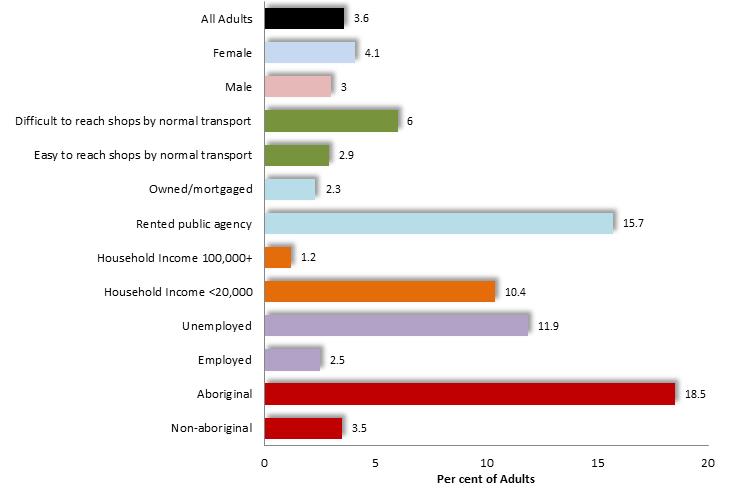
Prevalence of Food Insecurity by Age: Victoria, 2014 (Victorian Population Health Survey)

In relation to socioeconomic disadvantage, such food insecurity was recorded among 11.9% of unemployed people, compared with 2.5% of those in paid employment; 15.7% of people residing in government-owned accommodation, compared with 2.5% of those who owned or were purchasing their accommodation; and 10.4% of persons in households on annual incomes below $20,000, in contrast to 1.2% of those in households with incomes exceeding $100,000 (Accompanying diagrams).

Prevalence of Food Insecurity by Annual Household Income: Victoria, 2014 (Victorian Population Health Survey)

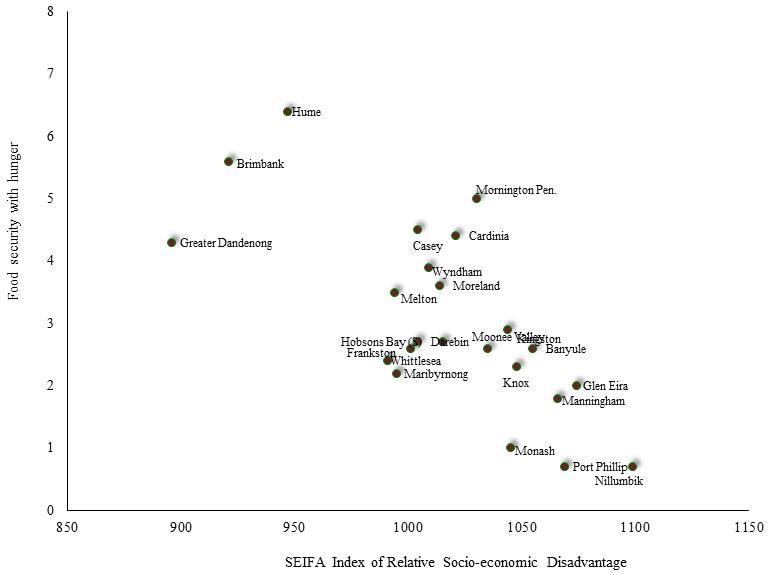


Prevalence of Food Insecurity by Housing Tenure Type: Victoria, 2014 (Victorian Population Health Survey)

The prevalence of food insecurity among selected segments of the community is illustrated at left.

Prevalence of Food Insecurity by Adults within Selected Segments of the Community: Victoria, 2014 (Victorian Population Health Survey)

Other evidence confirms a similarly high prevalence of food insecurity among disadvantaged segments of the community (Australian Institute of Family Studies, 2018; Ramsey et al, 2012; Burns, 2004; VicHealth, 2015; McCrindle Consulting, 2018A). This trend is illustrated among Melbourne metropolitan municipalities, the prevalence of food insecurity with hunger among adults is associated with the overall levels of socio-economic disadvantage in each community (Diagram, below).



Correlation between the Prevalence of Food Insecurity with Hunger, 2014, and the SEIFA Index of Relative Socio-economic Disadvantage 2016: (Dept. Health and Human Services., 2017, ABS, 2018)

Further reports also document a high prevalence of food insecurity and dietary insufficiency among refugees and asylum-seekers; sole-parent families; younger and older people; occupants of rental households; young mothers; homeless people; those with alcohol or other drug problems; people with HIV or other chronic conditions; and students (Australian Institute of Family Studies, 2018; Department of Health and Human Services, 2017; Daucher et al, 2002; Anema et al, 2011; Micevsky et al, 2014).

Food insecurity is prevalent in metropolitan growth areas, the Department of Health and Human Services (2017) ascribing this trend to high mortgages and the challenges of reaching food outlets with inadequate local public transport and retail infrastructure. Food insecurity also appears to be relatively widespread among people living in rural or remote communities (Dept. Health and Human Services, 2017; Foodbank, 2017), with McCrindle Consulting (2018A) finding that residents from rural areas were 33% more likely to experience such circumstances than those in major cities. Among the causes suggested by the National Rural Health Alliance (2015) are sparse public transport in some localities, coupled with relatively low incomes, limited understanding of healthy nutrition among some residents, further distances to travel to healthy food outlets and higher food prices.

*Frequency of Food Security Episodes*

Overseas evidence indicates that many households pass in and out of food insecurity. In one US study, approximately two-thirds of households classified as food insecure on the Federal Food Security Scale stated that they had experienced the condition as recurring, and one fifth as chronic (Nord et al, 2002). Similarly, a 2017 US survey of food insecurity, cited by the US Department of Agriculture (2019), found that 11.8% of respondents had experienced food insecurity at some time during the previous year, 6.3% during the previous month and 0.8% on the previous day.

The report also recounted findings about food insecurity among vulnerable households during the previous five years, which showed that approximately half of the participating households had been food insecure for one year, and about one in twenty for the whole five years. Reflecting upon these results, it observed: “…the fact that households move in and out of food insecurity also means that a considerably larger number of households experience food insecurity at some time over a period of several years, than in any single year.”

**Impact on Children**

Research indicates that children are affected by food insecurity in their households, to varying degrees. McCrindle Consulting, (2018B) cites the findings of the 2018 survey of Australian parents in food insecure households, which determined that 9% of their children passed a day each week without eating any food. Winicki and Jemeson on the other hand, maintain that children in most families experience adverse impacts “...even at the most marginal level of household food deprivation.” (2018: 1).

Documented impacts of malnourishment upon children include birth defects, iron-deficiency anaemia, asthma, malnutrition, increased rates of hospitalisation (Linberge et al, 2015); impaired development and behavioural problems such as aggression, anxiety, depression and suicidal behaviours (McKay et al, 2019); learning difficulties (Winicki and Jemeson, 2018; Rosier et al, 2011B); and unfavourable social and health outcomes (McKechnie et al, 2018).

An Australian survey, for example, determined that children in food insecure households experienced difficulty concentrating at school and completing homework; absence from, and behavioural problems at, school; sleeping disturbances; as well as lethargy, agitation, weight loss, nausea and general ill-health (McCrindle Consulting, 2018B).

**Impact on Adults, including Obesity**

Among the wider population, food insecurity is associated with adverse physical and mental health consequences (Linberge et al, 2015) with one investigation concluding that 48% of food insecure individuals experienced poor physical health, compared with 19% of others (Victorian Dept. Health and Human Services, 2014A).

Health detriments reportedly associated with food insecurity include higher rates of mortality, cardiovascular disease, depression, disturbances of sleep and mental health, as well as elevated blood lipid content, (Rosier et al, 2011B; Knowles, 2016). Among older people, malnutrition may detract from immune responses, muscle strength, wound healing and respiratory function, and is linked to an increased duration of hospitalisation and a rise in mortality (Milne et al, 2009).

Obesity is a further common consequence of food insecurity, for it is reported that many people experiencing such conditions consume high levels of relatively inexpensive, unhealthy food, high in fats and carbohydrates (McKay et al, 2019). Various causes are suggested, including the alleviation of depression, a propensity to over-eat when food becomes available after a period of forced starvation or under-nutrition, the satiation of hunger, or the perception that such food is cheaper (Burns, 2004; Rosier et al, 2011B; Swinburn, 2008; Adams et al, 2012). A survey of 402 people in NSW for example, found that many parents of food insecure families served increased amounts of carbohydrates to their families to save money (NSW Council of Social Service, 2018).

As a consequence, food insecurity is associated with a high prevalence of obesity (Swinburn, 2008) – a condition characterised as the “food insecurity-obesity paradox” (Dept. Health and Human Services, 2017). Burns (2004) reported that women who are food insecure are 20-40% more likely to experience obesity than others - a pattern which was relatively uniform among people of differing income and educational levels.

Conversely though, protracted food deprivation arising from food insecurity results in weight loss (Burns, 2004; McKay et al, 2019).

Food insecurity is also associated with psychological effects among adults, such as depression and anxiety (Linberge et al, 2015; Ramsey et al, 2012; McKay et al, 2019). One investigation determined that over half of adults experiencing food insecurity felt depressed (53%) or stressed (52%) when unable to afford food (McCrindle Consulting, 2017). Consistent results emerged from a 2018 survey of Australian parents in food insecure households, which disclosed that such conditions contributed to household stress in 48% of respondents, while 74% felt ashamed that they had to struggle to adequately feed their children (McCrindle Consulting, 2018B).

Such findings have also arisen from investigations of food insecurity upon refugees in Australia, one writer commenting that its consequences include “…an intensification of a sense of powerlessness and exclusion as well as an inability to maintain a sense of optimism” (Australian Institute of Family Studies, 2018: 8). Accordingly, Southcome (2008) report that anxiety, stress, shame and household conflict were the most widely-mentioned impacts of food insecurity by members of a sample of refugees in Australia.

**Causes of Food Insecurity**

Conditions which cause or aggravate food insecurity include limited incomes, rising household costs and financial crises; physical or transport limitations; and lack of confidence, skill, motivation or other means to prepare and consume a healthy diet.

*Financial hardship*

Financial hardship is a primary cause of food insecurity (Montague, 2008; Kleve et al, 2018C), with low incomes, welfare dependency and lack of paid employment among its predisposing conditions (Northeast Health Wangaratta, 2014; Harper et al, 2008, Lawlis et al, 2018A; Ostr, undated; VicHealth, undated I). McCrindle Consulting (2017) for instance, observed that 81% of Food Bank clients were in receipt of low incomes, and an examination of findings of successive Victorian Population Health Surveys by Davidson et al (2016) confirmed that food insecurity was largely caused by financial limitations.

The 2007/8 VicLanes project found that 5.2% of Victorian households experienced food insecurity arising from their inability to afford food. This investigation found that lower-income households were over five times more likely to experience food insecurity than those on high incomes: 16% of those with weekly incomes below $400 were food insecure, compared with just 3.7% of households with incomes above $1,500 pw (Burns, 2009).

In the course of interviews with women who had experienced food insecurity, Lawlis et al (2018A) concluded that their access to healthy nutritious food was impeded by financial hardship, as well as, in some instances, by limited education, gender inequality, single parenthood[[7]](#footnote-7), family violence or mental health concerns.

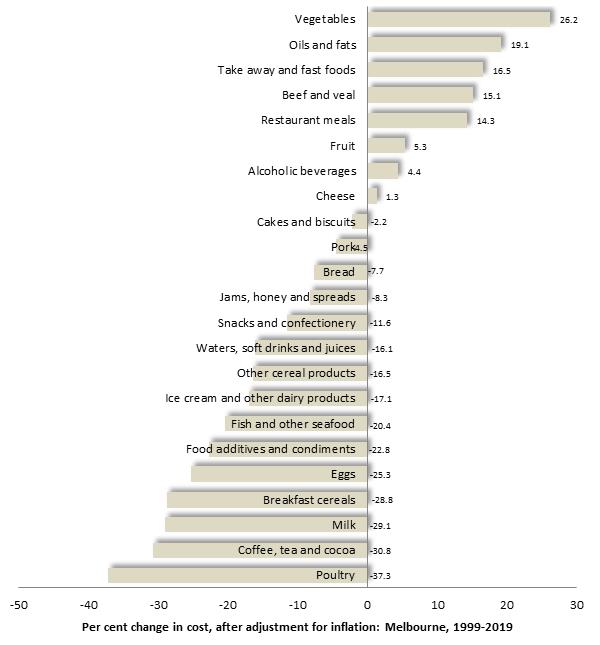
*Cost of healthy food*

The cost of healthy food is highlighted by some as a barrier to access to nutritious food, particularly for lower-income households (NSW Council of Social Service, 2018; Lawrence et al, 2015; Montague, 2008; Landrigan and Pollard, 2013; Cardinia Shire 2019).

In addition, some writers report that a significant proportion of people experiencing food insecurity perceive the cost of healthy food, *relative to take away or other discretionary food*, as an obstacle to their access to nutritious food (Lawrence et al, 2015; Dept. Health and Human Services., 2017; Northeast Health Wangaratta, 2014). The Ispos survey (2016) found that “…the typical, everyday shopper is still struggling to balance healthiness against…their budget” - an observation which holds the implication that healthy selection of food would entail a higher cost than otherwise. Smith et al (2017) note that the high cost of healthy food makes less nutritious food seem more affordable for many households, with a NSW study finding that 78% of respondents stated they would eat more healthy food if it were cheaper.

However, while it has been mentioned that high-kilojoule foods provide energy at lower cost than fruit and vegetables and other nutritious food, perceptions that healthy food is generally more expensive than less beneficial options are contested by some commentators. Comparing the cost of healthy and unhealthy food at outlets in a Victorian municipality, Love et al (2018) determined that a healthy diet would cost 31% of average household disposable income, compared with 39% for an unhealthy diet. Such conclusions are echoed by VicHealth, which asserts that fast food is not cheaper than nutritious meals prepared from fruit, vegetables and other healthy ingredients, despite popular misconceptions to the contrary (2012A). [[8]](#footnote-8)

These findings and commentary however, appear to compare the cost of a healthy home-cooked meal with one largely constituted of unhealthy, takeaway food. As such, they leave open the possibility that members of a household of limited financial means, which prepares its meals at home, might replace protein sources such as red meat, with higher-energy foods such as potato and rice, thereby achieving a cheaper, though less healthy, diet, to accommodate its budget.

A related issue is the rising cost of food. Some observe that increases in the price of food have exceeded inflation (Linberge et al, 2015; VicHealth, undatedE) raising the cost of a healthy diet beyond the reach of some lower-income households. Evidence concerning this trend is inconclusive however.

Changes in cost of foods by type, after adjustment for inflation: Melbourne, 1999 to 2019 (ABS, 2019b)

An inspection of price changes of major food categories shows that in the 20 years to June 2019 in Melbourne, the cost of fruit and vegetables rose 16% in real terms, beef increased 15%, bread and cereals declined 9%, and dairy produce (aside from cheese) fell by 17%.

Meantime, the cost of takeaway and restaurant food grew by 16.5% during the same period (ABS, 2019B), approximating the real rise in cost of fruit and vegetables.

Evidence points to the possibility of geographic differences in the cost of food. Landrigan and Pollard (2013) documented higher food costs in rural areas, a finding echoed in the results of a survey of food costs in 26 Victorian municipalities by Palermo et al (2016). In relation to socioeconomic differences, Crawford et al (2017) report on an investigation of food prices in Sydney supermarkets, which determined that prices were generally lower in more disadvantaged localities, though in a separate investigation, Palermo et al (2016) discerned no consistent pattern of association between municipal socioeconomic conditions and food costs.

It is reported in the literature that the cost of a healthy diet for lower-income households accounts for a higher proportion of their income than that expended by households in general (McCrindle Consulting, 2018A; NSW Council of Social Service, 2018; VicHealth, undatedE). The 2015/16 Household Expenditure Survey for instance, found that food and non-alcoholic drinks accounted for 18% of spending by the households on the lowest fifth of incomes, compared with 15% of expenditure by households on the highest incomes (ABS, 2017A).

Moreover, investigations show that even where a lower-income household expends a higher *proportion* of their income on food, such funds may not be enough to provide an adequate diet. VicHealth (undatedE) cites the findings of research which ascertained that a healthy diet would claim 16% of average household income, compared with 47% of the income of a typical household dependent upon welfare. On average however, only 20% of the household income of welfare-dependent families was expended on food, leaving a wide gulf between actual expenditure on food and the funds required to sustain an adequate diet.

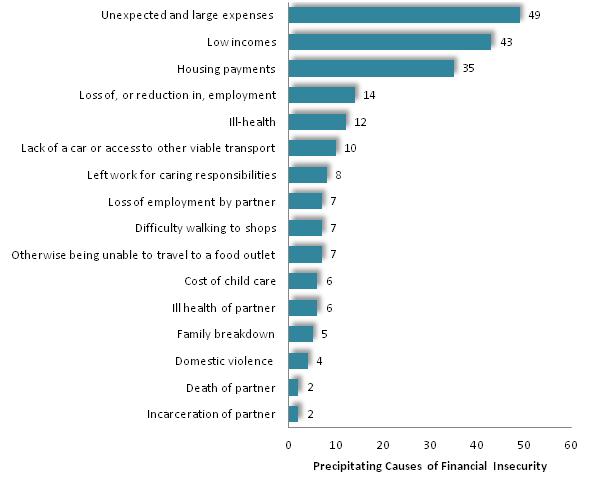
In the same vein, Lawrence et al (2015) estimate that welfare-dependent Australian households would have to spend 40% of their incomes to achieve a nutritious diet, compared with 20% of the income for the average family. As a consequence, they conclude, Newstart recipients may be left with as little as $25 p.w. after meeting the cost of rent and utilities, thereby placing a healthy, nutritious diet well beyond their financial means. This conclusion is echoed in the findings of Palermo et al (2016), who determined that the funds expended on food reported in the findings of a national survey did not match the cost of an adequate, healthy diet. Rather, the author maintained that lower-income households could not afford a diet that met national nutritional guidelines.

An inquiry into healthy food costs points to the same conclusion. In 2014, the cost of a basket of 49 healthy food and drink items was measured among various localities to determine the average weekly cost of a nutritious diet, and its affordability to various household types. The weekly cost of the healthy ‘food basket’ for one person at that time, was $63 (Queensland Government, 2015) equivalent to $69 in 2019 (adjusted for inflation). It was determined that for a selection of households, a healthy diet would cost approximately one-fifth of the Centrelink payments for which they would have been eligible at that time. [[9]](#footnote-9),

However, if the cost of rent in 2019 is taken into account, a single, welfare-dependent renter – receiving Centrelink benefits of $280 p.w. – would have $30 left for food and other expenses after paying the median rent for one-bedroom flat in Brimbank, of $250 – the cheapest units in metropolitan Melbourne in 2019.

*Deterioration in household financial circumstances*

An abrupt decline in financial fortune may aggravate food insecurity for lower-income households, and precipitate such conditions for some higher-income households. Indeed, researchers hold that, while surveys show that the prevalence of food insecurity is higher among people on lower incomes, many moderate or middle-income households may also experience such problems, often arising from abrupt and unforeseen changes in personal, health, financial or family conditions (Kleve et al, 2018B, 2018C; Davidson et al, 2016).

Examples of such financial setbacks include ill-health, injury, disability, job loss, bills, or changes in income or household composition, housing rental or mortgage payments, or housing tenure (Kleve et al, 2018C; Burns, 2004). In particular, the financial stringency imposed by already low incomes, exacerbated by unforseen and substantial expenses, appears to be a major cause of episodes of food insecurity (McCarthy and Chang, 2018).

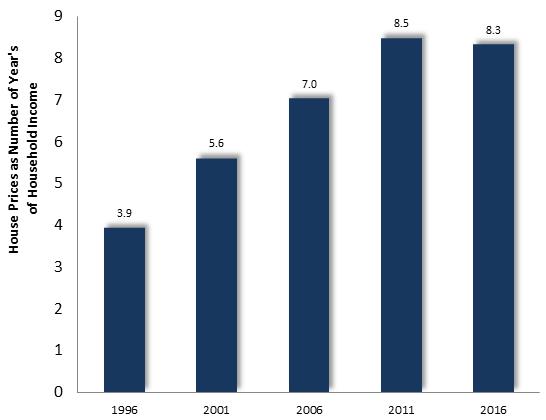
Precipitating causes of financial hardship occasioning food insecurity – per cent of all reasons given: Survey for Food Bank Hunger Report

In the 2018 ‘Survey for the Foodbank Hunger Report’, McCrindle Consulting reported that reasons given by people experiencing such difficulties include unexpected, major expenses (49%), as well as low incomes, ill-health, family caring responsibilities, lack of a car or other viable transport, and otherwise being unable to travel to a food outlet (2018A). (Accompanying diagram) [[10]](#footnote-10)

*Competing household costs*

Rising costs of housing (Montague, 2008; Davidson et al, 2016) and utilities in recent years may have contributed to a reduction in funds available for the purchase of food, thereby raising the prevalence of food insecurity.

In the past few decades, growth in housing and rental prices have outstripped inflation and wage rises. In the two decades to 2019, the cost of purchasing a house rose by 136% across Victoria after inflation (Department of Environment, Land, Water and Planning, 2018). Indeed, the findings of successive censuses show that the average cost of a separate house in Melbourne rose from 3.9 times the median household income in 1996, to 8.3 by 2016 – a 112% increase in cost, relative to incomes (ABS, 2019E). (Diagram below)

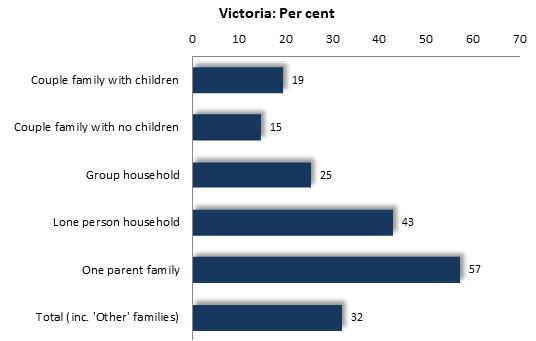


Median House Purchase Price, in Years of Median Household Income: metropolitan Melbourne, 1996 to 2016 (ABS, 2019E)

Data from the Victorian Office of Housing shows that meantime, the cost of renting a three-bedroom house (adjusted for inflation) rose by 35% in Victoria in the 20 years to 2019. For two-bedroom flats, median rental costs surged by 61% in real terms, during the same period (Department of Health and Human Services, 2018).

Younger adults and recent settlers are among those most acutely affected by such costs. Across Victoria, the proportion of people renting their accommodation rises to its peak among people aged 25-44 years (at 39%) before declining among older residents.

Substantial levels of dependency upon rental accommodation are also evident among many recent settlers, reaching 80% or more among those from Sudan, Iraq, Pakistan, Burma, Samoa, and Afghanistan (ABS, 2019A). Their financial stringencies are further aggravated by high rates of unemployment and low average incomes (ABS, 2017B).



Per cent of Households on Incomes below the Poverty Line, by Household Type: Victoria, 2016

Among renting households in Victoria, 32% are below the poverty line after payment of rent, including 57% of one-parent families and 43% of single-person households (ABS, 2019a).[[11]](#footnote-11)

Research from Melbourne’s Grattan Institute examined long-term trends in housing costs and their impact upon households of various income levels. Its investigation determined that rising housing costs are depleting disposable incomes, thereby reducing funds available for the purchase of food. It notes that the proportion of gross incomes expended by Australian households on housing rose from 22% in 1995, to 29% by 2018 (Fitzsimmons, 2019).

As it would appear, a persuasive abundance of evidence signifies that for many people living within financial constraints, housing costs may diminish their already limited disposable incomes, depriving some of the capacity to purchase a steady, sufficient supply of nutritious food.

*Rising utilities costs*

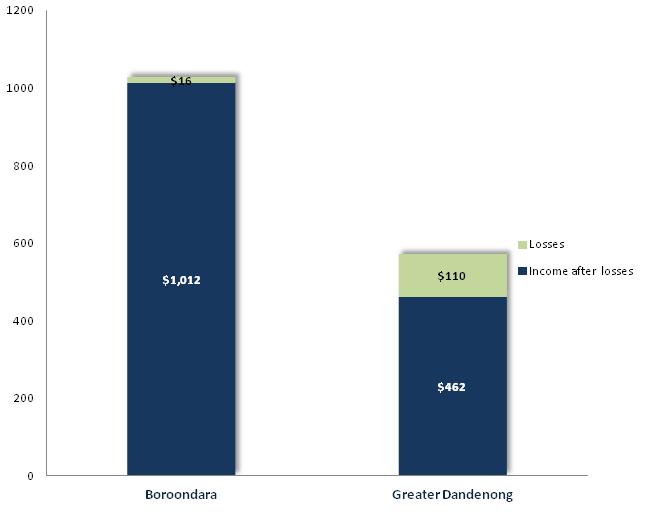
In addition to housing, rising costs of gas, water and electricity have strained household discretionary budgets, thereby reducing the funds available for a healthy diet (Knowles, 2016; Harper et al, 2008, McCrindle Consulting, 2017). In the 20 years to March 2019, the overall cost of such utilities in Melbourne rose 93% (after inflation) including 78% for water and sewage, 105% for electricity and 90% for gas (ABS, 2019B). Even the rising cost of cigarettes, being addictive, may divert funds from the purchase of food, aggravating the risk of food insecurity (Dept. Health and Human Services, 2017), with the two decades to 2019 witnessing a 260% escalation in the cost of tobacco (after inflation) (ABS, 2019B).

*The burden of gambling losses*

A further intrusion upon household discretionary budgets stems from gambling losses, which are largely borne by people on lower incomes, thereby compounding financial hardship for many low-income households. In 2016/17 (the latest data available on all gambling modalities at the time of writing), total legal gambling losses incurred by Victorians exceeded $5.5 billion (Queensland Government Statisticians office, 2018). Electronic gambling machines (EGMs) account for the largest share of these losses, representing approximately half all legal gambling expenditure in Victoria, and accounting for losses of $2.7 billion in 2018/19 – equivalent to $531 per adult.

Such losses were highest among the least affluent communities. For example, in that year, annual losses averaged $910 per adult in Greater Dandenong, the most disadvantaged municipality in Melbourne – over six times the corresponding average of $143 among residents of Boroondara – the most affluent community in the metropolitan area (Victorian Commission for Gambling and Liquor Regulation, 2019). Indeed, the $119 million in EGM gambling losses recorded in Greater Dandenong in 2018/19 would be sufficient to feed 47,900 children for one year.[[12]](#footnote-12)

Moreover, in 2016 (a year selected to permit a comparison between EGM losses and income levels, reported in the Census) average losses incurred by the 14% of adults who use EGMs, or 19% of median individuals incomes in Greater Dandenong - the most disadvantaged municipality in Melbourne[[13]](#footnote-13), and 1.5% of median incomes in affluent Boroondara. The impact of such losses upon food security among many low-income households is therefore likely to be substantial.



EGM losses as a proportion of median individual income, among EGM gamblers: Boroondara and Greater Dandenong: 2016/17

*Lack of food storage or cooking facilities*

Insufficient facilities for the preparation and storage of food, including refrigerators, may also hinder access to adequate nutrition (Harper et al, 2008, Montague, 2008; Kettings et al, 2009; Rosier et al, 2011B). Such conditions are reported in boarding houses, caravan parks, crisis accommodation, overcrowded dwellings and among homeless people (Lawrence et al, 2015). Lack of essential food preparation facilities is also documented among refugees, with McKay et al (2015) finding that 62% of a sample of refugees in Australia did not possess necessary kitchen facilities and 25% lacked adequate food storage space (cited in Lawlis et al, 2018B).

*Transport limitations*

It is reported that limited access to private or public transport, as well as personal mobility limitations, may make healthy food difficult to secure (McCrindle Consulting, 2018B; Burns, 2009; Rosier et al, 2011B).

Lack of access to private transport is widespread among some segments of the community, including people on low incomes, sole parents, families with young children and older persons (Smith et al, 2017; Montague, 2008; Northeast Health Wangaratta, 2014). Kettings et al (2009) cite an Australian study which found that 40% of low-income families had no car, and in 2016, 17.5% of couple families with children aged 15 years or less in Victoria had one or no cars, while 6.8% of sole parent families had no car. Among older people, the 2016 Census recorded that 29% of occupants of sole person households in Melbourne, and aged 65 or more, had no car, including 33% of women and 19% of men (ABS, 2019F).

In addition, the lack of access to public transport or distance from food outlets may impede access to fresh food (Obesity Policy Coalition, undated B; McCrindle Consulting, 2017). One survey found that among members of food-insecure households, about a third were unable to walk or take public transport to the shops (NSW Council of Social Service, 2018). Conversely, the 2014 Victorian Population Health Survey found that among adults who stated that they found travel to shops ‘easy’, 2.9% experienced food insecurity with hunger, compared with 6% of those who found such journeys ‘difficult’ (Victorian Dept. Health and Human Services, 2014A).

Transport barriers to health food access are prevalent in rural areas, according to McCrindle Consulting, (2018A) which reports on an investigation which found that 17% of people living in the country did not have convenient access to shops, compared with 10% in the cities. Similarly, a survey of residents at Diggers Rest – a community of about 2,000 people in the outer-Melbourne municipality of Melton – found that 88% had difficulty purchasing fruit and vegetables, 62% stating that they would purchase more such food if food outlets were in more convenient proximity (VicHealth, undated J).

Distance from local food outlets presents difficulties for residents of cities and regional centres too, in part due to residential growth – requiring people in recently-developed localities to travel further to established food outlets (AIHW, 2008). Lawlis et al (2018A) conducted interviews with 41 women, most of whom had sought food from charitable organisations, with many citing challenges in travelling to distant retail outlets as a barrier to food security. VicHealth and the Heart Foundation (undated) also maintain that disadvantaged communities in particular, tend to enjoy less ready geographic access to fresh food outlets than more affluent localities.

Such circumstances have spawned the notion of ‘food deserts’ in metropolitan areas and large towns, characterised by the NSW Council of Social Service (2018: 17) as “…areas with limited access to supermarkets, selling quality fresh fruit and vegetables, coupled with a high abundance of unhealthy takeaway and fast food options”. An investigation in the town of Wangaratta, for example, identified food deserts, where households were over 500 m. from a fresh food outlet or public transport (Northeast Health Wangaratta, 2014). A further inquiry, in inner-metropolitan Melbourne, also examined areas more than 500 meters from nutritious food outlets. Its findings showed that many of their residents experienced difficulty shopping for fruit and vegetables, owing to the burden of carrying them from the shops to their homes, or to and from public transport (VicHealth, undated J). The Australian Medical Association (2018) has urged that local councils, food retailers and developers strive to eliminate such ‘food deserts.

By contrast, easy access to relatively cheap fresh food outlets with a wide range of produce, may overcome such difficulties. In Melbourne’s south-east for example, community workers report that, for recent settlers, local bus routes provide a convenient link between their homes and local fruit and vegetable markets, offering a wide range of fresh vegetables, fruit, meat and fish – including traditional cultural produce – at decisively lower prices than nearby supermarkets.

*Ill-health and disability*

Many people experience limitations which restrict their mobility or other activities, resulting in difficulty accessing public transport, walking to food outlets or preparing food at home (Rosier et al, 2011B; McCrindle Consulting, 2017; Burns, 2009). The 2016 Census found that 5.5% of Victorians experienced a severe or profound disability requiring them to seek daily assistance with mobility, self-care or communication – a proportion which reached over half among people aged 85 years or more (ABS, 2019d). Moreover, many older people also experience digestive disorders, dental problems, diminished sense of taste or smell, poverty, loneliness, depression or dementia, the absence of a spouse, lack of family support or contact, or contraction of friendship networks, any of which may deprive them of the motivation or means to acquire or prepare healthy meals (Hickson, 2006).

A significant proportion of older residents therefore experience food insecurity or malnutrition, largely due to such chronic conditions and physical limitations, as well as low incomes. A review of data concerning 4,507 older adults from 12 counties found that 23% were malnourished, including 51% of those in rehabilitation, 14% of older rooming house occupants and 6% of those in the general community (Mathias et al, 2010). A further investigation, of 2,367 patients aged 65 years or more, identified malnutrition among 28% of them, due largely to ill-health and physical debilitation (Ulger et al, 2010).

Mention has been made that distance from home to fresh food outlets may set limits upon pedestrian or public transport access to healthy food outlets (Obesity Policy Coalition, undated B; McCrindle Consulting, 2017), an experience which may be prevalent among older or disabled residents. A survey of older Melton residents conducted by Monash University, found that 30% were unable to shop without assistance and 23% had obtained food relief in times of crisis (VicHealth, undated J).

In addition to physical limitations associated with older age, it is reported that mental health concerns or alcohol and other drug problems, may contribute to food insecurity or inadequate nutritional intake (Rosier et al, 2011B).

*Homelessness*

For reasons which may variously relate to mental health, income, lack of adequate housing or shelter and other circumstances, homeless people also face the prospect of food insecurity (Ostr, undated), reportedly accounting for a substantial proportion of Food Bank clients (McCrindle Consulting, 2017). The high prevalence of mental health concerns among homeless people (Department of Health and Ageing, 2013[[14]](#footnote-14)) may detract from their ability to obtain and prepare nutritious food. In addition, for many people residing in boarding houses and caravan parks do not have adequate facilities for storing and preparing food (Linberge et al, 2015; Chatindiara et al, 2019; McCrindle Consulting, 2018A). For others, low incomes, lack of car ownership, limited experience in cooking or incomplete understanding of nutrition, may reduce their access to healthy food.

*Advertising of unhealthy food*

The advertising of takeaway or high-energy foods on television, social media, public signage and elsewhere, may encourage the consumption of unhealthy foods (Harper et al, 2008). During a 2005 promotion, 5% of advertisements were for fruit and vegetables, compared with 81% promoting high-sugar or fat foods (VicHealth, undatedE). Rangan et al (2009) cite a New Zealand study which found that one-quarter of sports sponsorships was dedicated to the marketing of unhealthy foods, while only one in thirty were for healthy foods.

*Geographic density of convenience food outlets*

A related issue is the density of fast food and other convenience food outlets. Some maintain that such food outlets are highly concentrated and accessible, especially in lower-income and socioeconomically disadvantaged areas (Rosier et al, 2011B; VicHealth, 2012A, undatedE), thereby enticing many people to consume such foods in place of more nutritious alternatives. Burns (2004) for example, cites research by Riedpath (2001) who concluded that the density of fast food outlets was up to three times higher in disadvantaged areas than in more affluent communities. Similarly, Burns and Inglis (2007) contend that disadvantaged areas have a density of fast food outlets that is up to 2.5 that in more advantaged localities (cited in VicHealth, undatedA).

*Motivation and food preparation skills*

While limited cooking skills or motivation do not represent an absence of sufficient nutrition, McKay et al hold that food security also requires the “…physical, social and *human* resources to transform food into meals.” (2019: 1). Such personal resources may be unavailable to people who lack the knowledge, confidence or motivation to prepare regular, nutritious meals.

Limited motivation to obtain and prepare healthy food may contribute to consumption of a high-energy, unhealthy or insufficient diet, thereby aggravating food insecurity. In a study in Wangaratta, Victoria, Northeast Health Wangaratta, 2014) interviewed community workers and residents, one commenting that “Just because we know it, doesn’t mean we do it!” (Northeast Health Wangaratta, 2014: 25). Similarly, the Australian Institute of Family Studies (2004) recounts consultations in Frankston, where health workers reported that some residents lacked interest in cooking healthy food. However, this outlook was accompanied by other circumstances apparently, as many cited their limited knowledge of nutrition and cooking skills as an obstacle to the consumption of healthy food – a finding which points the way to constructive interventions.

The proposition that limited understanding of nutrition and practical skills in food preparation may deter people from preparing nutritious meals is widely repeated in the literature (Harper et al, 2008, Lawrence et al, 2015; Montague, 2008). A NSW study of over 400 people, of whom 39% had run out of food during the past 12 months and could not afford more, found that 29% of respondents felt that they lacked the skill to prepare health foods (NSW Council of Social Service, 2018). Inversely, Kleve et al (2018C) concluded that proficiency in the selection and preparation of food exerts a protective influence against food insecurity, even in many lower-income households.

Financial management is a further, relevant consideration. A survey of 51 recently-arrived refugees in Perth disclosed that budgeting skills were a contributing factor in circumstances where they had run out of food – a condition acknowledged by 71% of respondents (Gallegos et al, 2008).

*Environmental factors*

The condition of the natural environment, and therefore its capacity to sustain food production, may influence patterns of consumption and levels of food security, especially in the future. Among the ecological perils to food production identified in the literature are rising demand for water supply; dwindling river systems; depletion of biodiversity; policies which spur the growth of bio-fuels at the expense of food; increasing oil and fertilizer costs; population growth – resulting in an escalating of demand for food; soil erosion; the encroachment of residential development upon agricultural land – including at metropolitan peripheries; and climate change (Larsen, 2008; Harper et al, 2008, Linberge et al, 2015; VicHealth, undated E; Ostr, undated; Cardinia Shire, 2019).

In addition to such considerations, Lawrence et al (2015) comment that the crises ensuing from natural disasters may temporarily, though drastically, curtail food supply to affected communities.

**RESPONDING TO FOOD INSECURITY AND INADEQUATE NUTRITION**

I: SOURCES OF FOOD

Efforts to alleviate food insecurity include programs which seek to improve physical access to nutritious food, such as crisis assistance, delivery of food, transport to fresh food outlets, vouchers to meet the cost of meals at local outlets, access to private and public gardens, and alternative, affordable fresh food outlets such as food hubs, markets, farm gate sales and mobile food stalls.

‘\* \* \* \*

**Material Aid**

Food relief contributes to the alleviation of hunger, enhances health, improves concentration and strengthens capacity to plan life decisions (Kettings et al, 2009). The relevance of food relief to nutrition is illustrated by the findings of a 2018 study of 602 Australian parents living in food insecurity, which determined that 54% had sought assistance from a charity, including 40% in the previous year (McCrindle Consulting, 2018B).

In Wodonga, a food bank was established with council assistance in a warehouse donated by a local business, from which food was distributed to local material aid outlets, while volunteers received training in food services and warehousing (VicHealth, undated J). And in Greater Dandenong, the council supported the establishment of Avocare, a partnership in Melbourne’s south-east, which stores emergency relief provided by Foodbank, which is then collected by local agencies, while operating a cafe patronised by workers in the local industrial precinct which provides hospitality training for job seekers (VicHealth, undated Q; VicHealth, undated I).

The Minajalku Healing Centre in Thornbury was the site of a program in which staff and volunteers prepared packages of food from Secondbite to distribute to members of the local Aboriginal and Torres Strait Islander community, with about twenty local families assisted each week, some consuming their food at the centre and others taking it home. An essential feature of the program was the provision of support at a familiar and culturally-relevant location, thereby attracting community members who may otherwise not seek assistance from a mainstream service. The program faced the challenges of rising demand, coupled with limited access to food, extending requests for assistance to the limit of its capacity. Similarly, the Red Earth Food Bank, operating in Mildura, packaged donated food items for collection by community members, or delivery to those without means of transport. About fifteen families received one package every fortnight. Organizers drew attention to the challenge of meeting the needs of the relatively few families which received packages and acknowledged that others were also experiencing food insecurity and would benefit from similar assistance, if it were available (VACCIO, 2015)

Councils often play a role in supporting the provision of such emergency food relief to residents (VicHealth, undated Q) through funding, provision of premises or facilitation of communication and collaboration between providers. Rosier et al (2011B) also propose that councils may encourage food manufacturers and wholesalers to donate surplus food to such facilities.

Aside from the supply of food, refrigerators have been provided to low-income or welfare-dependent households. Swan Hill Rural City instituted a ‘rent-to-own’ scheme in which residents were supplied with refrigerators and other food storage and preparation facilities, at modest expense (VicHealth, 2018A).

An additional consideration relates to public awareness of the availability of such food assistance. Lawlis et al (2018A) relate that in interviews with women who had obtained emergency food assistance, many had not known about the availability of such support, instead learning of material aid outlets merely by chance.

However, the benefits of promoting food relief may be diminished if current supplies of food are insufficient to meet even existing requests for assistance. Indeed, limited levels of financial support to those without paid employment, coupled with rising costs of housing and utilities, set limits to the adequacy of nutrition which many low-income households may afford, thereby assuring food relief agencies of an enduring demand for their services.

Some commentators therefore maintain that the provision of food and other material aid, without addressing its causes, may not achieve an lasting solution to food insecurity. However, community and council community workers caution that many material aid providers lack the resources or trained staff to thoroughly assess clients and refer them to financial counselling, employment or other assistance - services which, for some, may foster financial self-sufficiency and thereby alleviate chronic financial hardship and its impact upon food security. On the other hand, since the complete elimination of unemployment is an unattainable objective, some writers also point to the desirability of increasing welfare benefits for those without paid employment, to provide them with the means to purchase healthy food and accommodate rising household costs (Smith et al, 2017; VicHealth, undated I; Lindberge et al, 2015).

**Low Cost Meals at Local Cafes**

Councils and food agencies have instituted programs which subsidise meals in cafes or restaurants to improve the diet of disadvantaged residents – often directed to those with limited cooking skills, motivation or access to food preparation facilities. Under the ‘Food for All’ Initiative, Greater Dandenong Council arranged subsidised meals at local cafes for residents referred to the program by local agencies (McKechnie et al, 2018), while Maribyrnong Council implemented a voucher system under its Home and Community Care budget, which enabled selected residents to receive daily meals from designated local cafes (VicHealth, undated Q).

Under a further program, conducted by Yarra Council, about 40 people from local rooming houses, or referred by community agencies, were provided with vouchers to purchase food from cafes selected for their prices and food quality, with the balance of the cost of each meal invoiced to council. Upon evaluation, it was determined that participants had enhanced their nutrition, replaced the solitude of their rooms for a social, outdoor activity, and enjoyed moderately improved physical health. The authors acknowledged that challenges to the implementation of the program included its cost, motivating participants, identifying suitable food retailers and providing administrative support (VicHealth, 2003).

In other programs, meals are prepared under the direction of agencies, and coupled with social activities and opportunities to connect with social services. A program for local members of the Aboriginal and Torres Strait Islander community in Frankston is described by VACCIO (2015). Here, a community health centre organized a free weekly lunch at a local church, attended by up to 50 community members, with transport available to those who required it. Aside from providing a safe, familiar place for people to meet, the lunches incorporated gardening, craft and other appealing activities, and were attended by local welfare professionals who informed participants about available services.

**Delivery of Food/Community Transport**

To improve access to a nutritious diet, Rosier et al (2011B) proposes food delivery to people experiencing difficulty transporting food from retail outlets, a role which Harper (2008) maintains may be discharged by local government. In such an initiative, Brimbank Council provided fresh food delivery to older residents, while Wodonga Council improved the quality and variety of food available under its Meals on Wheels program (VicHealth, 2018A).

The operation of food vans is also suggested as a means for helping to deliver food to communities which are geographically isolated from fresh food outlets, or to households with otherwise limited capacity to acquire healthy food. Melton established a van to make fruit and vegetables available to residents in isolated communities with limited availability of fresh food (VicHealth, 2018A), though the project lapsed due to insufficient resources and limited demand (VicHealth, undated J).

Alternately, VicHealth (undated Q) proposes that councils encourage local businesses to home deliver food to selected residents, while Rosier et al (2011B) submits that such services may be subsidised for residents with established transport limitations.

Co-operatives and delivery services have been developed to deliver low-cost, fresh food to disadvantaged local residents (Thorpe and Browne, 2009). Initiatives under the VicHealth ‘Food for All’ Program included the distribution of food to residents and community agencies in Casey and Cardinia (VicHealth, 2018A). In disadvantaged Frankston North, community groups and schools sold and delivered fresh fruit and vegetables to older and disabled people, under the auspices of a major local welfare agency and with the assistance of volunteers (VicHealth, undated J). A similar project operated in Maribyrnong where the Council partnered with a local organisation to store and donate food to older residents, rooming houses and public housing estates, delivered by volunteers.

Providing or facilitating transport to food outlets for residents with mobility limitations is proposed as a further means to alleviate food insecurity. (State Government of Victoria, 2011B; VicHealth, undated A, undated Q, undated M). Melton Council for instance, operated a community bus to take residents shopping, coupled with arrangements with selected store operators to deliver food to their homes (VicHealth, undated J). Swan Hill Shire, too arranged to transport residents to food outlets to help them shop for nutritious food (McKechnie et al, 2018).

**Private and Community Gardens**

Cultivation of fruit, vegetables and herbs in private gardens may improve access to nutritious food (Montague, 2008).

Community gardens are also commended in the literature for their benefits in providing residents with the opportunity to grow fresh fruit and vegetables; acquire skills in the cultivation of food; learn about nutrition; engage in physical activity; socialise with their neighbours; enjoy the personal fulfilment which many derive from gardening (State Government of Victoria, 2011B; Rosier et al, 2011B; Thorpe, 2009; VicHealth, undated E; Doenberg et al, 2016); and enable people of diverse cultural backgrounds to grow traditional foods (Sustainability Victoria, undated; VicHealth, undated S).

Community gardens may be established on land owned by councils, schools, churches, community centres, housing estates, rooming houses and elsewhere. Some are shared by participants while others are divided into discrete plots, each allocated to an individual. (Sustainability Victoria, undated). In a project conducted in Wangaratta for example, garden plots were rented to residents for a fee, and others donated to community groups and agencies for use by their clients (Northeast Health Wangaratta, 2014).

Councils may support community and private gardening, with the provision of land, funding or equipment, often in collaboration with local agencies (VicHealth, 2016A, undated A; undated K) and supplemented with training and guidance to local residents (VicHealth, undated S). Maribyrnong Council conducted ‘learn to garden’ workshops for about 50 people, offering advice about growing vegetables and gardening techniques, coupled with the establishment of a gardening network and webpage to extend the reach of this instruction (VicHealth, undated S). In Frankston, a community garden was established with support from the council and community agencies, coupled with funding from the Federal Government to meet the cost of irrigation and other equipment (VicHealth, undated J).

While some community gardens serve largely as a fulfilling outdoor activity and social outlet, others are specifically developed for the use of residents at risk of food insecurity. In Collingwood, a community garden was established on land belonging to rooming house, affording residents an opportunity to grow their own food and spend time outdoors and socialise with others, while imparting a sense of purpose and accomplishment to residents. A horticulturalist assisting the project observed: “As well as the benefit of having access to fresh produce, the project gave residents a healthy, social activity. It brought them outside to do physical work and they developed better relationships with each other.” Challenges faced by organisers of the project included enticing rooming house tenants to participate and quelling personal conflicts (VicHealth, 2003).

Supported by donations from a variety of sources, the Manatunga Garden in Robinvale grew fruit and vegetables, as well as obtaining eggs from their chickens. Swan Hill Shire supported its establishment, funding water tanks, greenhouses and other equipment, and conducting information sessions. Members of the community and volunteers tended the garden, which supplied food for community members, and generated funds for equipment through surplus sold at the local Robinvale Growers Market (VicHealth, undated S). The garden offered an opportunity for people to participate in gardening and to socialize in a quiet and safe place. One difficulty encountered in its operation though, was hot weather events and strong winds, which occasionally damaged equipment (VACCIO, 2015).

Another garden supplied vegetables and fruit for the community and presented opportunities for people to cultivate food, VACCIO (2015) remarking upon the satisfaction community members derived from the garden and the ‘new lease of life’ experienced by two of the project founders, underlining the lasting personal fulfilment which such projects may bestow upon their participants.

VicHealth though, draws attention to the onerous efforts entailed in developing community gardens, including identifying and acquiring a suitable site, obtaining approval of neighbourhoods, securing funding for the development and maintenance of the garden, establishing procedures for its management, and addressing technical considerations such as soil testing (VicHealth, 2003). It is cautioned that such local obstacles may stifle community garden initiatives, making necessary council efforts to marshal community support (VicHealth, undated I). It is therefore noted that such initiatives may require ongoing funding and other council assistance, and that the nature and extent of a council’s intended support for such projects should be clearly articulated in its policies and plans (VicHealth, 2003)

A related initiative is the cultivation of fruit, vegetables and nut trees in parks, public gardens, nature strips and other public places (State Government of Victoria, 2011B; VicHealth, undated S, undated N). For example, one venture recovers coffee chaff from a coffee retail chain and food waste from a nearby market, to nourish a vegetable garden in a Melbourne parking lot, with its produce distributed to people in need of assistance (Noone, 2019).

**Alternative Food Outlets**

Alterative avenues for improving access to nutritious food include food buses, markets, mobile fruit and vegetable stalls, farm gate sales and others (National Rural Health Alliance Inc., 2015; Northeast Health Wangaratta, 2014; State Government of Victoria, 2011B).

Food hubs engage paid or volunteer staff to co-ordinate the distribution of fresh, locally-grown food to residents, agencies and businesses (Australian Food Hubs Network, undated). A number of Victorian councils have supplemented such initiatives with funding or the use of municipal facilities (Open Food Network, 2014). A related measure entails the bulk purchase of food at discounted prices to supply affordable food to low-income families (Rosier et al, 2011B). Such an approach is also recommended by Southcome (2008), for reasons which include providing refugees with access to traditional foods at an affordable cost.

Food markets have also been established in some localities to extend access to fresh, local food to residents, while fostering community interaction, facilitating community fund-raising and informing consumers about local foods (Budge, 2010B). One market was established in Doveton in Melbourne’s south-east, to supply affordable, nutritious food to its disadvantaged residents and encourage contact among members of the local community (Author not stated, undatedC). And in rural Robinvale, near Swan Hill in Victoria’s north-west, a farmer’s market was founded to sell produce from local farms. Local community groups, businesses, the municipal library and children services established their presence at the market, which became a source of fresh local food, a point of contact with community services, a social outlet and a hub of community activity (VicHealth, undated J; Micevski et al, 2014).

In some instances though, the cost of produce at farmers’ markets exceeds its price elsewhere, with one investigator finding that prices were similar to competing outlets for fruit, vegetables and nuts, and more expensive for dairy and meat (Moore et al, 2018). Interviews with farmers though, conducted by Shojaei et al (2018), appear to confirm that many consumers are willing to pay a premium for fresh food.

Regardless of their wider community benefits though, farmers’ markets which command relatively high food prices are unlikely to alleviate local, finance-related food insecurity. Acknowledging further limitations of such markets, Budge (2010B) concedes that local food suppliers are inherently limited in the volume of food they can supply, concluding that they are a ‘niche market’ of ‘quite localised’ impact.

II: IMPROVING THE QUALITY OF RETAIL FOOD SUPPLY

Other initiatives have focused upon regulatory measures to encourage the establishment of nutritious food outlets in developing residential areas or other localities where they are sparse; encouraging retailers to stock and promote healthy food; and efforts to oblige food producers and retailers to supply more nutritious foods.

‘\* \* \* \*

**Regulatory Measures to Encourage Healthy Food Outlets**

Burns (undated) urges that urban environments be planned in a manner that encourages the consumption of healthy food, with some writers proposing that councils play a role at a local level in the establishment of fresh food retail premises, through regulatory measures, signage regulations, differential rates, financial incentives, planning initiatives or other means (State Government of Victoria, 2011B; VicHealth, undated N, undated O, undatedA).

The NSW Council of Social Service (2018) suggests that planning regulations be instituted wherein approval of any convenience outlet would depend upon an assessment of the existing density of takeaway stores and fresh food outlets, and an appraisal of the overall, nutritional health of residents. It also endorses zoning provisions to ease planning obligations for fresh food providers in disadvantaged neighbourhoods, thereby improving residents’ access to nutritious food. A further possibility canvassed in the literature is the use of planning provisions to establish fresh food precincts (State Government of Victoria, 2011B).

However, one commentator draws attention to the limited capacity of the Victorian Planning Scheme to weigh considerations of nutrition and food security in its decisions (VicHealth, undated I). In Hunt Club Commercial Ply Ltd v Casey Council (2013) and other determinations, VCAT has declared that broader public health concerns fall beyond the scope of the State Planning Scheme [[15]](#footnote-15), a perspective echoed by Dwyer (2010), of the Tribunal, who declared: “... it is difficult to use land-use planning provisions to reduce alcohol-related harm, because land use planning is "traditionally concerned with land use development" rather than with community wellbeing. It has been proposed though, that advocacy should be made to the State Government to amend the Planning and Environment Act to permit health implications to be weighed in reaching planning decisions (VicHealth, undated P).

A further planning consideration is the development of walking and cycling infrastructure to provide convenient opportunities for local residents to reach food outlets by active means (State Government of Victoria, 2011B).

Local governments have also advocated for improved public transport, especially in socioeconomically disadvantaged areas and localities isolated from food outlets (Harper, 2008; Northeast Health Wangaratta, 2014). Greater Dandenong Council for instance, lobbied the Public Transport Commission about the unfavourable impact of the planned removal of a bus stop outside a caravan park, which would have reduced its residents’ access to local healthy food outlets, while Maribyrnong Council induced a local bus company to amend its timetable to provide more convenient transport to the Footscray Market by residents of an area of low car ownership (VicHealth, undated P).

Many commentators envisage councils taking steps to include provision in new residential developments for community gardens, water collection and storage, and healthy food outlets, (Harper, 2008; VicHealth, undated O). A similar approach was recommended by the VicHealth Citizens Jury, which called for land to be set aside in developments for community gardens, public orchards and other ‘green spaces’ (VicHealth, 2016A). Wodonga Council for instance, developed guidelines to direct developers to include such features into new residential developments (VicHealth, undated L).

Other proposed local planning initiatives include encouragement of the establishment of shopping centres nearer to residents living away from town centres (VicHealth, undated O) and advocacy for public housing to be situated near transport routes and shopping facilities (VicHealth, undated P).

Food production in the cities may also include the development of rooftop gardens (VicHealth, undated I) and community gardens in medium- and high-density residential areas (VicHealth, undated O), with Maribyrnong Council endorsing rooftop gardens in its municipal strategic statement (VicHealth, undated L).

**Encouraging Supply and Promotion of Healthy Meals by Retail Providers**

A number of writers propose that fast food outlets, workplaces and sports facilities stock lower-energy food, in place of their sugary and high-fat menu items, both for the direct dietary benefits to customers and to set an example of healthy nutrition (WHO, 2017). To this end, it is suggested that such outlets be encouraged to offer affordable, healthy food items, and promote them conspicuously on menus and in their advertising (AIHW, 2008; State Government of Victoria, 2011A).

A number of local governments have instituted programs to induce food outlets to offer more healthy options (VicHealth, 2018A). Cardinia and Casey, in south-east Melbourne, established a scheme to recognise healthy food retailers, instruct participants about safe food handling, and encourage the introduction of nutritious food into their menus. Participating outlets which met healthy food criteria were presented with a prominent sticker to badge and distinguish their premises as a source of nutritious food (VicHealth, undated J).

Sugary drink sales were a subject of consideration of the Victorian Citizens Jury on Obesity, which proposed that such beverages be displayed less prominently at food outlets (Micevski et al, 2014). A relevant investigation, sponsored by VicHealth, determined that installing a screen to conceal the portion of the fridge with high-energy drinks, reducing the range of unhealthy drinks and replacing some with water, and displaying healthy beverages prominently, resulted in a decline in sugary drink sales (VicHealth, 2017). In a further example, the Alfred Hospital adjusted the display of drinks in the hospital cafeteria, attracting attention to healthy items and obscuring less healthy options, resulting in a 12% decline in sales of unhealthy drinks, though with little change in total drinks sales (Halpern, 2016). A similar outcome is reported by Belsen-Robinson, 2010) who relates that, following the introduction of its ‘Health choices policy guidelines for sport and recreation centres’, the YMCA found that sales of ‘red’ (unhealthy) drinks declined 41%, while sales of healthy drinks remained unchanged.

**Reformulation of Food**

In contrast to efforts to encourage retailers to sell nutritious food, other approaches propose to induce food manufacturers to produce more healthy options.

One contemporary example concerns efforts to reduce the high salt content of food products - a goal of nutritional authorities. The ‘Unpack the Salt’ initiative, led by VicHealth and the Heart Foundation – situated at [www.unpackthesalt.com.au](http://www.unpackthesalt.com.au) – seeks to encourage supermarkets to reduce the salt contents of their home brands.

Others too, urge that food producers be encouraged, or obliged by law, to reformulate the salt, sugar or fat content of food (Webster and Bolham, 2016; Malakellis et al, 2017; VicHealth, undated F, 2018B;) as a more effective measure than merely attempting to persuade food retailers to stock or serve healthy food – an unappealing step for many retailers, whose customers often favour less healthy fare.

III: ENHANCING CHILDREN’S ACCESS TO, AND UNDERSTANDING OF, FOOD

A variety of programs encourage children and young people to adopt and consolidate a healthy diet, through instruction, practical experience and the modelling of healthy nutrition by adults. In schools, such initiatives include nutritional education, gardening and cooking lessons, and the provision of healthy food at school canteens, in lunchboxes and at school events. Similarly, in sporting and other settings, children and young people may receive advice about nutrition, reinforced by the example of healthy food and drinks offered at club canteens.

‘\* \* \* \*

**Teaching Children about Food**

Commentators recommend that school children be educated at primary and secondary level about nutrition, practical aspects of food preparation and cooking, and social or cultural factors which influence diet and nutrition (AIHW, 2017A; WHO, 2017). Some propose that nutritional education be coupled with provision of healthy food at school canteens, cultivation of school vegetable gardens and other practices to reinforce the importance of a healthy diet (Ronto et al, 2018; Kassem, 2003).

School gardens, where pupils may cultivate fruit and vegetables, then prepare and eat their produce, are one means to foster an understanding of the nature and origin of food, and the value of healthy nutrition (VicHealth, undated E, 2018A; Sustainability Victoria, undated), with many established throughout the State (VicHealth, undated J). Councils may contribute to such developments, with Swan Hill Regional City supporting the establishment of a school garden to teach pupils how to grow fresh fruit and vegetables. Another was created at a special school, coupled with the development of a community kitchen, to enable its pupils to complete the process of growing and preparing nutritious food (VicHealth, undated S).

Other programs are focused upon young people in other community settings. VicHealth (2017) describes the example of nutritional education provided to sports coaches, from whom this knowledge was passed to children in sporting teams. These included a module delivered by the Australian Football League, coupled with videos and fact sheets, as part of its Junior Coaches Education Course, attended by over 400 coaches and designed to enable them to provide informed guidance about healthy nutrition to children.

A program for at-risk young people in a Victorian town, focusing upon creating nutritious, low-cost meals, as well as other issues of relevance to young people. An accompanying program directed to their parents, incorporated advice about the benefits and techniques for preparing healthy food (Northeast Health Wangaratta, 2014).

**Food in Canteens**

Food and drink available at school canteens may exert an influence upon attitudes towards, and choices of, food by children and adolescents (AIHW, 2017A; WHO, 2018), making them a promising setting for encouraging and modelling the consumption of healthy food and drinks (Stewart and Johnston, 2018; Rangan et al, 2009).

In 2011, the National Healthy Canteens project suggested that canteen staff be encouraged to provide more healthy food and beverages (AIHW, 2017A). However, by 2016, a Victorian survey of primary and secondary school canteens found that only 16%, or one in seven, complied with national guidelines, with most selling products such as pies, chocolate, confectionary and soft drinks, accompanied by a pricing structure in which salads were often more expensive than pies, thereby establishing a financial disincentive to the consumption of healthy food (AIHW, 2017A). A similar finding emerged from a study of 83 Australian school canteens by Wyse et al (2017), who found that ‘green’ (healthier) items were more expensive than ‘amber’ items in the main meal categories, potentially deterring students from making healthy choices at these canteens

Most schools in Australia though, have adopted the progressive step of instituting a simple ‘traffic light’ system, alluded to above, marking healthy food as green, unhealthy as red and others amber. And a project in Canberra phased out sugary drinks at school canteens (VicHealth, 2014A). In succeeding years, this initiative attracted growing support for healthier food provision among canteen managers and school communities (Bateup, 2018) – foreshadowing the prospect of approval for such measures elsewhere. A similar change in New Zealand also garnered strong support among parents and schools (Mansoor et al, 2017).

Initiatives of this kind also appear to exert a constructive influence upon food choices. Delaney (2018) examined the impact of highlighting healthy food in the menus and, promotion and display of food in NSW school canteens, finding that these steps were accompanied by a rise in the sale of nutritious foods, compared with a comparable group of schools where these measures were not implemented (Delaney, 2018).

Having school students pre-order their meals from canteens may also favour healthier food choices Halpern, (2016) observes that in one trial, such initiatives raised the proportion who selected nutritious meals from 15% to 29%.

**Breakfast Programs**

The 2011/12 National Nutrition and Physical Activity survey found that 14.8% of 12-19 year-old girls and 11.8% of boys, skipped breakfast on one day, while 3.8% of girls and 1.4% of boys did so on two successive days. Omitting breakfast was associated with living in one-parent families, socioeconomic disadvantage, lesser levels of physical activity and obesity, and being underweight (Smith et al, 2017). A number of writers therefore endorse the provision of breakfast at school to students where families may be experiencing food insecurity (Rosier et al, 2011B; Stiglitz, 2013).

The Victorian Government School Breakfast Clubs Program was launched in 2016, providing 50,000 nutritional breakfasts to pupils each week. Schools in more disadvantaged areas exhibited the highest levels of participation, with 51% providing breakfasts every day (MacDonald, 2019). By 2019, the State Government was funding School Breakfast Programs at 500 disadvantaged schools, under the management of Food Bank Victoria (Department of Education and Training, 2019B). An earlier review of the program reported that, in addition to its nutritional benefits, it had highlighted to school communities the importance of breakfast and nutrition among pupils, and improved relationships between teachers and pupils (MacDonald, 2019).

Other programs have been initiated and conducted outside of school premises. At Lake Tyres, a Children’s Breakfast Program operated out of the local health service, serving breakfast to an average of 20 children each workday morning, as well as providing each child with a packed lunch, thereby ensuring that they had enough food for every school day (VACCIO, 2015).

However, it is asserted that a range of such school programs has yielded equivocal findings (Mansoor et al, 2017). Malakellis et al (2017) report on a three-year school program in Canberra directed at obesity, which compared schools featuring the program with comparison schools, reporting a ‘lack of overall intervention effect’.

Even if such findings were repeated though, it is possible that a blend of complementary initiatives – variously addressing knowledge and understanding of nutrition and food preparation, affordability and quality of food supply, and food promotion – may exert mutually-reinforcing effects, collectively generating the impact necessary to shift patterns of food preferences and consumption among school pupils. Such a possibility however, would have to be verified by evidence.

IV: FOSTERING PUBLIC UNDERSTANDING OF NUTRITION

Education about nutritious foods may help people reach more informed and healthy food choices, giving them the means to confidently prepare nutritious meals. Relevant initiatives include public information programs, practical lessons for small groups of individuals in the selection and preparation of nutritious food, and training to enable social and community workers to advise their clients about healthy nutrition.

‘\* \* \* \*

**Public Promotion of Nutrition**

Some commentators urge that governments fund publicity campaigns to cultivate an appreciation of the benefits of nutrition, spur demand for fruit, vegetables and other healthy food (Harper, 2008; Rosier et al, 2011B; Morgan, 2008; James 2008) and reduce the prevalence of obesity (AIHW, 2017A). Others propose that such efforts be directed to disadvantaged localities or vulnerable segments of the population (Cyril, 2017). The Australian Medical Association (2018) for example, urges governments to “...invest in programs that seek to improve nutrition literacy, including community-wide and more targeted programs”. And efforts to “Improve Healthy Eating” form one of the ten priorities, a focus area, in the 2019-23 Victorian Health and Wellbeing Plan (Victorian Government, 2019B).

In 2013, Australia and other members of the United Nations committed to strive for a 30% reduction in salt consumption, with subsequent efforts including a program to raise public awareness of the adverse impacts of excessive salt, among other measures (Webster and Bolham, 2016). Accordingly, Malakellis et al (2017) propose that such programs be conducted in Australia to encourage reduced salt consumption.

Added sugar is a further focus of public awareness campaigns. It has been mentioned that young people are the highest consumers of sugary beverages; and patterns of food and drink consumption, once established, may prove resistant to change. In 2014, VicHealth launched the H3O campaign to encourage the consumption of water in preference to sugary drinks among young people and inform them of the benefits of such a healthy choice (VicHealth, 2016B, 2014C).

Promotion of healthy infant and maternal nutrition, including breast feeding, is also strongly supported in the literature (Harper, 2008; NHMRC, 2013), and forms a long-standing objective of governments. The Victorian Government Achievement Program supports improvement in early childhood nutrition (AIHW, 2017) while through its maternal and child health program, local government plays a role in promoting breast feeding and instructing parents about early childhood nutrition (VicHealth, 2018A).

Websites have been established to broaden public understanding of nutrition. The National Good Food Network - situated at ngfn.org - provides resources, guides and tips about healthy nutrition and techniques for its promotion among the public, as well as presenting opportunities to participate in discussions and learn about current and forthcoming healthy food promotions.

It is proposed that councils may help to inform their residents about the means and benefits of achieving a healthy diet, through websites, local media and newsletters, events and forums, as well as advocating for relevant government reform (VicHealth, undated M, undated P).

However, some evidence casts doubt upon the efficacy of efforts to persuade the public to make healthier choices. Burns (2004) cites research which signifies that knowledge about the benefits of nutrition and of cooking healthy food does not necessarily translate into a healthier diet, particularly among socioeconomically disadvantaged groups. A Queensland study investigated the impact of a health campaign directed at Aboriginal and Torres Strait Islanders, finding that, while recall of the campaign was extensive, it did not generate any rise in fruit and vegetable consumption (Thorpe and Browne, 2009). Similarly, Kennedy and Ling (1998) examined the impact of a community education program about nutrition, determining that participants did not adopt the beneficial advice urged upon them. The authors concluded that the reason was not ignorance but remaining obstacles, such as low incomes, limited access to healthy food and lack of choice in food (Burns, 2004).

Of relevance is the contention that interventions to alter nutritional choices may exert little impact if such foods are difficult to access, prohibitively expensive to low-income households, or if existing social habits and customs favour unhealthy food (VicHealth, undatedT). Other researchers are of the same accord, declaring that publicity campaigns may alter will or intention, but are unlikely to be effective if the means, skill or inclination to acquire or prepare healthy food are not present as well. (Dept. Health and Human Services, 2017; VicHealth, undatedE).

**Government Supply of Healthy Food**

Some commentators urge that governments supply healthy food at schools, workplaces, sport and recreational facilities, hospitals, and public events to inspire similar practises by other institutions and promote healthy food options as an example to the public (AIHW, 2017B; NSW Council of Social Service, 2018; VicHealth, undated E, 2014B; State Government of Victoria, 2011B).

Councils may support such efforts by providing healthy, locally-sourced food to their staff, as well as at public functions, through its early years, aged and disability services, and at sporting clubs (VicHealth, undatedA). For example, in the recent past, VicHealth encouraged Victorian councils to promote and provide healthy food and drink (VicHealth, 2017) while another, more contemporary, program features the promotion of water at sports facilities in place of sugary drinks (City of Frankston, 2019).

In the sports sector, Laurence (2018) reports efforts by recreational facilities to increase promotion and sales of healthy drinks; encourage their canteens to stock healthy food and drinks; make tap water readily available; and repudiate sponsorships which entail promotion of unhealthy food, especially those directed to children and young people (Victorian State Government, 2016).

A further measure is the installation of water fountains (State Government of Victoria, 2011B). An example is those established at Etihad Stadium and throughout the Melbourne CBD in 2015, providing access to fresh, healthy and free water, and enabling users to refill their water bottles (Halpern, 2016).

**Training in Nutrition**

A survey of Australians who had experienced food insecurity found that 49% – including 69% of 25-34-year-olds – would be more inclined to consume healthy food if they had the skills and confidence to prepare nutritious meals (NSW Council of Social Service, 2018). Accordingly, many writers propose teaching adults about nutrition, including the selection of healthy ingredients and preparation of meals, supplemented by guided shopping tours, practical cooking classes and budgeting advice (Cyril, 2017; VicHealth, undated E; Burns, 2009). The Victorian Citizens Jury, formed of everyday residents, similarly endorsed programs to encourage healthy cooking, including practical programs for ill-fed, low-income or otherwise vulnerable sections of the community (VicHealth, 2016A). It is proposed that councils could seek funding for, and either conduct or facilitate, local shopping tours and classes in nutrition, as well as developing resources about shopping and cooking with fruit, vegetables and other nutritious ingredients (VicHealth, undated N).

Community kitchens have enabled programs to provide guidance and practical experience in the preparation of meals to community groups. Such programs may be conducted in any local venue with a registered kitchen, where a small group of people may receive instruction then prepare and consume a meal. Participants often contribute a small fee, and are advised by paid staff or volunteers in nutrition, budgeting, shopping, food storage and preparation. It has been urged that councils develop and maintain kitchens in local community facilities for such use (VicHealth, undated N), an approach already adopted in many municipalities (VicHealth, 2018A, undated M).

Frankston Council used community kitchens as a venue for providing guidance to residents about nutrition (VicHealth, undated J), including training in planning, shopping for, and preparing, nutritious meals. Instruction was provided by both paid facilitators to older, disadvantaged and young people, as well as recent settlers and others, with 6-8 people at each session, learning, cooking and eating a meal together, at a modest cost to each participant. Aside from its ostensible purpose, a further benefit was the social contact, which helped alleviate isolation among its participants. (Rosier et al, 2011B).

Yarra Council arranged a sequence of fortnightly trips to the Preston Market for small groups of disadvantaged residents, selected by local agencies, transported from rooming houses and elsewhere, and accompanied by a dietician who provided advice about nutrition, selection and cooking. Each excursion was followed by the preparation and enjoyment of a meal at a community kitchen in a supportive social setting. Overall, 25 people participated in the program (VicHealth, 2003).

In Orbost, eleven weekly cooking classes were held for young Aboriginal and Torres Strait Islanders, to foster self-sufficiency in cooking and an understanding of nutrition, in anticipation of their departure from home to pursue tertiary education or other commitments. In a second program, for young mothers, organizers teamed up with the local TAFE college to conduct weekly sessions of cooking, meal planning, budgeting and nutrition. The women were also provided with access to the community garden to learn about, and enjoy, growing fruit and vegetables. At the culmination of this program, the young women prepared a special dinner for the community Elders, each participant receiving a formal certificate upon completion (VACCIO, 2015).

Russell et al (2018) evaluated a 6-week cooking program featuring over 170 people in 12 groups, reporting that it had improved understanding and skills among participants while providing supportive social interaction.

It is unknowable though, based on the contents of such reports, whether any initial improvement in knowledge and understanding resulted in an enduring change in dietary practices, especially in light of the possible financial obstacles to the attainment of a healthy diet faced by many households.

In a further initiative, some councils have distributed maps and other guides to local markets and other low-cost sources of fresh food (Rosier et al, 2011B; Isis Primary Care, undated).

A related local activity involves the preparation of cookbooks, some directed to, and in the languages of, particular cultural groups. In Melbourne’s south-east, a cultural community organisation distributes a cookbook featuring a variety of inexpensive, nutritious recipes, to its members. And in 2019, one metropolitan council assembled a range of recipes submitted by culturally diverse residents, resulting in a final selection which encompassed a variety of cultural traditions, which was then edited and slightly modified by a dietician before its distribution throughout the region and placement on the internet.

As a further means to reach recent settlers, Radcliffe and Perkins (2018) stress the value of incorporating information about nutrition and access to food into migration support services and English language curricula.

Advice about money management and budgets is provided and organised by a variety of local agencies. In Greater Dandenong, a community agency arranges for financial counsellors to advise residents on budgeting, so that they can afford necessities, including good food. And throughout Victoria, Gambler’s Help has helped to facilitate presentations to community groups about budget management, with likely implications for food security.

*Aboriginal and Torres Strait Islander Initiatives*

VicHealth (undatedE) reports that nutrition-related ill-health accounts for 20% of the burden of disease experienced by Aboriginal and Torres Strait Islanders, while Crosland et al (2019) observe that dietary factors are responsible for 9.7% of disability adjusted life years (DALYs) among them, and obesity for 8.2%.

Moreover, food insecurity is relatively widespread among Aboriginal and Torres Strait Islanders (Adams, 2019; McCarthy and Chang, 2018). A New South Wales survey found that 19% experienced food insecurity – nearly three times the corresponding proportion of 6.9% recorded among the general population (NSW Health, 2015), while an 2004/5 national survey obtained a figure of 21%. The 2014 Victorian Population Health Survey yielded a similar result, with 18.5% of adult Aboriginal and Torres Strait Islanders experiencing food insecurity.

In a related finding, the 2014/15 National Aboriginal and Torres Strait Island Social Survey determined that 72% had run out of money for basic living expenses during the previous 12 months (ABS, 2016), presumably exposing them to the prospect of food insecurity.

In a review of the progress of a variety of initiatives, Thorpe and Brown (2009) stressed that consultation and empowerment has proven to be a constructive feature of many of these programs. They also highlight the importance of the views and preferences of community members in shaping such programs.

A variety of activities have been conducted to foster food security and improve nutrition among Aboriginal and Torres Strait Islanders, including programs involving community members in preparing meals and learning about nutrition, breakfast programs for school children, provision of meals coupled with contact with local service providers, community gardens, food crisis relief and others (Black et al, 2015, 2013; VicHealth, undated J; Adams, 2019). Some of these are reviewed here.

The Victorian Aboriginal Community Controlled Health Organization (hereafter ‘VACCIO) (2015) describe a selection of programs dedicated to instruction about cooking. In Bairnsdale, Victoria, a playgroup operating through the local Aboriginal Co-operative engaged a dietician to prepare a meal for the mothers to eat at the conclusion of each session, encouraging them to participate in preparing the meal with her. In this way, playgroup participants received guidance in cooking, coupled with advice about purchasing and preparing food, in a congenial, familiar environment. A program with similar features operated in western Melbourne, in which about five members of a local Aboriginal community were provided with transport to a community kitchen, where a facilitator supervised the preparation of a meal, teaching nutrition and food preparation in a pleasant, social setting. In a program operated by a community health centre in Knox, Aboriginal residents participated in regular meals of bush tucker attended by welfare workers, thereby affording its participants with an opportunity to learn about cooking, socialise and become familiar with local services (VACCIO, 2015).

The supply of breakfast for local school children was the focus of a program initiated by the Gippsland Aboriginal Co-operative, which founded a breakfast club at a local neighborhood house opposite the bus stop where children assembled to take the bus to school, with meals served in time for them to eat before catching the school bus. Funding limitations though, restricted the agency to the provision of two meals per week. Participation by children from the Aboriginal community was promoted by a staff member from the neighborhood house, who took time to become acquainted with community members, resulting in a gradual rise in participation by Aboriginal and Torres Strait Islander children (VACCIO, 2015).

Some initiatives have coupled the provision of meals with opportunities to learn about relevant, local services. In one program, a weekly barbeque was conducted in park in inner-metropolitan Collingwood, organized by local agencies concerned with the wellbeing of homeless people in the area, and attended by a selection of welfare workers. Each week about 30 homeless people enjoyed an appetizing meal and the opportunity to connect with relevant services, advice and assistance in an informal and familiar local setting. The Dandenong and District Aborigines Co-operative conducted a monthly barbeque, attended by local community members, including many children, who enjoyed a meal of lean meats and salads, thereby introducing participants to nutritious food, and setting an example of healthy eating for the children (VACCIO, 2015).

A community garden was established in Albury-Wodonga by the Aboriginal Health Service. Cultivated by individuals, as well as community groups who use the service, the garden grew seasonal vegetables which were cooked by groups that work the garden, prepared for other events at the service, or taken home by community members. Attributes of the garden included the opportunity it offered for learning about horticulture, the fulfillment of growing and consuming food, social contact in a peaceful setting, and the engagement of community members in its planning and operation. Another garden had its origin with members of the community who expressed the desire to grow food, and was promoted among Aboriginal organizations in the region, with families invited to sign up. Each family was assigned a garden bed to cultivate, receiving soil, mulch and tools; instruction on gardening three times a year; new seedlings on occasion; and advice about gardening when required (VACCIO, 2015).

Other programs have addressed the need for emergency relief. In Melbourne, a community agency with existing links with the local Aboriginal and Torres Strait Islander community packed food from Second-Bite into boxes for weekly collection or delivery to about 30 local women experiencing food insecurity. The delivery of food by outreach support workers enabled them to become acquainted with Aboriginal households and to help them access other services. A similar program operated from the Banyule Health Service in Melbourne, though with community members collecting the food parcels, based on donations from Second-Bite and prepared with volunteer assistance. A significant benefit was that the collection of the parcels enabled health centre staff to become familiar with local community members, the better to understand and address their needs (VACCIO, 2015).

The Dandenong and District Aborigines Co-operative operate a food bank, providing food and food vouchers for community members, donated by Foodbank Victoria. The program sought to ensure their children did not go hungry, while enabling staff to assess the wider needs of local families. Notably, the uptake of food assistance outstripped supply, with the work involved in operating this service ‘immense’, according to its founder and manager.

Further initiatives have focused upon reaching a larger number of people though public information, without accompanying practical, hands-on instruction. The 2009-14 Victorian Aboriginal Nutrition and Physical Activity Strategy for instance, presented carefully-crafted messaging to impart information about nutrition and preparation of healthy food. However, Thorpe and Browne (2009) recount the findings of the evaluation of a Queensland program which included messages about healthy nutrition, observing that while many recalled the campaigns, it had exerted little influence upon their food consumption – a result which suggests that opportunities to prepare and cook food may be a desirable ingredient of any program intended to achieve enduring change in dietary practises. Thorpe and Brown also maintain that improvements in diet may depend upon the outcome of efforts to address wider aspects of their lives including education, employment, incomes and housing.

More broadly, the report ‘Life is Health is Life: taking action to close the gap’ draws attention to the sparseness of evidence about the efficacy of programs to improve access to affordable, nutritious food among the Aboriginal and Torres Strait Islander community (Kelly, 2011). In a hopeful tenor though, it adds that practical experience appears to confirm that educative programs may improve their prospects of a favourable outcome where they are accompanied by other actions. In addition, Kelly urges rigorous trialling and evaluation of food security programs; advocacy and policy development in this field; partnerships between the Aboriginal community and local agencies in program delivery; and efforts to document food security issues and relevant conditions.

*Refugee and Recent Settler Initiatives*

A selection of reports recount evidence of high levels of food insecurity among recent settlers, including refugees and asylum-seekers (Knowles, 2016; Burns, 2004).

Such people may differ in many respects; nor are their experiences, circumstances and needs uniform. In a Melbourne survey of refugees for instance, the prevalence of food insecurity ranged from 56% among those from African communities to 6% among refugees from the Middle East (Australian Institute of Family Studies, 2018). A semi-structured interview study of refugees in Fairfield, Sydney, generated similar findings, determining that the proportion of households experiencing food insecurity varied from over 80% among those of African birthplaces to none of those with members born in the Middle East Southcome (2008). Accordingly, the concerns and circumstances of refugees and other recent settlers may vary widely, across cultural groups and among individuals.

However, reports provide some general suggestions, indicating that several experiences related to the settlement experiences of refugees and asylum-seekers often contribute to food insecurity; among them:

* Limited familiarity with budgeting, local foods, location of local retail outlets and preparation of Australian food.
* Low incomes, often aggravated by large bills, rental costs, late welfare payments or the obligation to remit funds to family members.
* Lack of necessary refrigeration, other storage, kitchen facilities or appliances.
* Overcrowding or poor-quality accommodation.
* Lack of social support and sources of advice about local conditions.
* Limited availability, or high cost, of traditional foods.
* Ready access to, and prominence of, convenience foods.

(Lawlis et al, 2018B; Gallegos et al, 2008, Isis Primary Care, undated; VicHealth, undated R; Montague, 2008; Radcliffe and Perkins, 2018; Southcome, 2008).

The Strategic Inter-governmental Nutrition Alliance (2001) for example, recounts the testimony of residents from Africa, Afghanistan, Burma, India and other nations, which established their limited familiarity with public transport routes, food outlets and nutritious local foods, and identified competing priorities relating to housing, employment, incomes and education of their children. All of these factors potentially impeded their access to sufficient and nutritious food (Cyril, 2017). In addition, high levels of joblessness among recent settlers[[16]](#footnote-16) means that many are dependent upon welfare payments, which, in the absence of other financial support, practically assures them of the experience of food insecurity. As one asylum-seeker observed, in a separate consultation: “With no income, I cannot buy food for my family, and when we first arrived I did not speak English or know how or where to shop for food.” (VicHealth, 2003: 5).

Difficulty with transport is a further challenge highlighted in interviews with refugees in Sydney, conducted by Southcome (2008). She relates that over half of the refugees with whom she spoke walked to shops to purchase food, with a third of them struggling to carry food and manage children on such trips.

Perhaps in part due to these factors, some refugees and other recent settlers may become habituated to a diet with an excessive content of fats, sugar and salt, and deficient in fibre, fruit and vegetables, making them susceptible to obesity (Isis Primary Care, undated; Cyril, 2017; Lawlis et al, 2018B).

Moreover, for many settlers, dietary deficiencies compound health problems already evident upon their arrival in Australia (Australian Institute of Family Studies, 2018). An inquiry into the health of Sudanese and Liberian refugees in Perth documented vitamin D and iron deficiency, dental disease, inadequate vaccination and infectious conditions such as gastrointestinal disease, tuberculosis and schistosomiasis (Tiong et al, 2006). Other research found that a quarter of the clients of the NSW Refugee Health Service were affected by malnutrition-related illnesses, including parasitic infections of the gastro-intestinal tract, anaemia, rickets and dental conditions (Australian Institute of Family Studies, 2018).

Consultations with recent settlers conducted by Isis Primary Care (undated) established that many women were anxious to learn about the selection and cooking of nutritious meals for their families. Accordingly, Rosier et al (2011B) recommend education in nutrition for people who may be susceptible to food insecurity, including refugees, asylum-seekers and some other recent settlers. Such efforts, it is proposed, may help to acquaint settlers with local shopping outlets and food options, sources of culturally familiar food, and local cooking techniques. Similar programs, including shopping tours, coupled with cooking classes in community kitchens, were proposed by Southcome (2008) following her inquiries into conditions affecting refugees in Australia.

The participation of local government in conducting, facilitating or funding programs directed toward settlers, is favoured by some commentators (Adams, 2019; VicHealth, undated P).

After consultation with cultural communities, Brimbank Council prepared a colourful, pictorial resource in selected community languages, about nutrition, cooking, kitchen appliances and utilities (VicHealth, undated R). Feedback from community members revealed particular interest in sections dealing with the selection and preparation of vegetables and fruit.

Greater Dandenong Council selected 22 peer educators with intimate connections to their cultural communities and experience working in the early year’s sector, training them in breastfeeding and introduction of solids, nutritional principles, and in practical steps for storing and preparing healthy food. Peer educators supplemented their instruction to community members with distribution of the resource developed by Brimbank Council (VicHealth, undated J).

A further program was directed towards children. Called ‘Kids in the Kitchen’, it was delivered in western Melbourne by a dietician and bilingual staff to 6-12-year-olds of refugee backgrounds, enabling them to prepare and cook a meal with other children (Promoting Health Outcomes for Refugees, 2018).

Reflecting upon the impact of a nutrition program for refugees in western Melbourne, the Australian Institute of Family Studies urges the involvement of refugees in selecting the content and nature of such programs as a means for “…creating a strong sense of community ownership and control of the program…” (2018: 10). In addition, bilingual facilitators are recommended by Cyril (2017) and their benefits confirmed by common practical experience.

A further notable lesson is related by Isis Primary Care (undated), which observes that once settlers receive information and practical instruction in such matters, they are inclined to share that information with other members of their community, thereby amplifying the impact of such programs.

**Training Community Workers in Nutrition**

The staff of community agencies may be trained in elements of nutrition, as well as the selection and preparation of healthy food, to enable them to advise their clients about such issues (Strategic Inter-governmental Nutrition Alliance, 2001; Rosier et al, 2011B). A number of projects have been conducted throughout Victoria to inform community workers about food security issues (VicHealth, 2018A; Thorpe and Browne 2009). The Fairfield Refugee Nutritional Project for example, included training to enable settlement workers and others to inform refugees about nutritional issues (Australian Institute of Family Studies, 2018). Similarly, Yarra Council provided two-hour workshops for local community workers to impart the knowledge required to advise clients experiencing food insecurity (VicHealth, 2003).

In a relevant consideration, it is proposed that workers who provide financial counselling be instructed in nutrition so that they may offer guidance and practical tips to help their clients achieve a healthy, affordable diet (Rosier et al, 2011B; Burns, 2009).

V: THE PROMOTION OF HEALTHY FOOD

Unhealthy foods are ceaselessly marketed to the public, including children. Lack of effective government regulation enables producers to profit at the expense of public health, with food formulated to be appetising rather than healthy, and marketed to accentuate its appeal and obscure its liabilities. While food producers and retailers, as well as Federal governments to date, generally favour voluntary regulation of such advertising, many nutritional authorities instead urge more decisive government control.

Meantime, government measures to label foods, and thereby guide consumers toward healthy options, are of limited scope and uncertain impact.

‘\* \* \* \*

**Food Advertising and Children**

Much of the food advertising directed to children features foods of low nutrient value, including high levels of salt, fats and added sugar (VicHealth, 2011 A, 2012B). Moreover, evidence suggests that such efforts are lamentably effective in encouraging the consumption of such unhealthy foods. One study, conducted by the Centre for Behaviour Research in Cancer, determined that positive nutrient content claims raised the probability of children favouring an item by up to 80%, while celebrity endorsement of unhealthy products elevated the likelihood of them being preferred to healthy alternatives by up to 65% (VicHealth, 2013B). The Obesity Policy Coalition (undatedD) notes that Australian sport too, is sponsored by unhealthy food brands, with the resulting promotion reaching children as well as adults.

The food industry however, has sought to dispel public concerns about marketing of unhealthy food to children. In 2007, several fast food outlets developed and endorsed principles to guide the marketing of food to children, termed the ‘Australian Quick Serve Restaurant Industry Initiative for Responsible Advertising and Marketing to Children’, incorporating a provision that foods which do not meet specified nutritional standards shall not be marketed specifically to children or accompanied by toy offers.[[17]](#footnote-17)

The prospective benefit of such initiatives is discounted by the Obesity Policy Coalition though, which maintains that advertisers do not uniformly adhere to such principles, remarking: “Fast food advertisers…are not taking concerns about obesity seriously. They have developed these so-called regulatory initiatives to appear socially responsible, but they are not even complying with their own rules.” (cited in VicHealth, 2010). Indeed, King et al (2013) monitored food advertising on Sydney TV between 2006 and 2011, finding that pledges of self-regulation had not been fulfilled in food product marketing, and concluding that: “The current study illustrates the value of independent monitoring as a basic requirement of any responsive regulatory approach.” Their conclusions match a widely-held view that the largely self-regulated marketing of food, guided by its voluntary rules and codes of precise, has not lessened the exposure of Australians to unhealthy food promotion (AIHW, 2017A; Watson et al, 2018).

Some nutritional authorities therefore urge the introduction of constraints upon the marketing of food to children (VicHealth, 2014 B; Backholder et al, 2018; Obesity Coalition, undated A; AIHW, 2017B). WHO (2017) proposes that regulations be instituted to set restrictions upon food advertising directed toward children, coupled with steps to ensure that advertisers acceded to such restraints, while the NSW Council of Social Service (2018) has endorsed a ban on food promotion in children’s sport. The Victorian Citizens Jury on Obesity, a VicHealth initiative, also urged the prohibition of advertising of unhealthy food to children under the age of 16 (VicHealth, 2016A). In addition, other commentators propose that limits also be imposed upon the promotion of unhealthy food to the wider public (Kleve, 2018B; Obesity Policy Coalition, undated D; AIHW, 2017A).

**Labelling of Food**

Accurate labelling of the nutrient content of foods is proposed to moderate health claims presented on food and drink to enable shoppers to make healthy, informed choices (Harper, 2008; AIHW, 2017). Prof. Swinburn, Co-director of the WHO Collaborating Centre for Obesity Prevention at Deakin University, expresses the view that clear labelling of food, identifying its nutrient qualities, is an important measure for preventing obesity (Cited in VicHealth, 2014D).

Some researchers favour labelling of foods with their kilojoule content (VicHealth, 2012B), with a Victorian study by the Centre for Behavioural Research in Cancer reporting that such information, coupled with traffic light labelling, may be effective in prompting customers to select more nutritious, lower-energy foods (VicHealth, 2013C).

The impact of food labelling may depend largely on how conscientiously such measures are implemented. Food standard 1.2.7 requires that items displaying information about their nutritional content meet the Nutrient Profile Scoring Criteria (NPSC) (Australian Government, 2019). However, Wellard-Cole et al (2018) recount the findings of one study which monitored nutritional claims on drinks and cereals before and after the introduction of rules intended to improve the accuracy of nutritional claims featured on food labels, recording no decline in the prevalence of inaccurate claims. Accordingly, the authors endorse more strict enforcement of the intent of food labelling rules.

The Five Star Rating system is a national mechanism established by the Commonwealth Government in 2014 for clearly specifying the nutrient content of foods, (Obesity Policy Coalition, undatedC), with the number of stars denoting the health level of each food product relative to others in the same food category, on a scale ranging from half a star for the least healthy option to five stars for the most nutritious. By 2019 it was displayed by 7,000 food products nationally (mpConsulting, 2019).

One investigation concluded that a stringent adherence to such a system might be effective. Anathapavan (2018) reported on the evaluation of a two-year experiment in which foods eligible for a Five Star Rating of 4.5 or 5 were conspicuously labelled at four major Australian supermarket chains, resulting in a 9% reduction in the energy density of purchased packaged foods. She estimated that the health benefits of this change in purchasing patterns approached $100 million, well in excess of the $1.5 million cost of the initiative. A review of the system found that one in six people changed their shopping preferences based on the system, most (79%) persisting in their revised product selection (Australian Medical Association, 2017).

On the other hand, the Ispos (2016) survey found that many consumers found the selection of healthy food difficult, despite the Five-Star system. Moreover, the Obesity Policy Coalition (undatedC) cautions that, as a voluntary system, it has not yet proven effective in guiding consumers toward healthy choices.

Further misgivings were expressed in submissions to the review of the system. These included the observation that whole fruits and vegetables did not score well; discretionary foods, and other products high in salt, sugar or fat, often attracted a high rating – some due to a single, added healthy ingredient; that on occasion, high ratings were based on the mere assumption that the product might be eaten in combination with a healthy food (e.g.: cereal with skim milk); that more food products should display the rating; and that a campaign be conducted to inform the public about the use and interpretation of the labels (Dieticians Association of Australia, 2017; Choice, 2017; mpConsulting, 2017).

In 2019, the five-year review of the system presented a number of recommendations; among them:

* increased ratings for fruit, vegetables and dairy products;
* reduced ratings for products with high levels of sodium or sugar, and for some discretionary foods; and
* Improved monitoring of the system.

The authors of the review refrained from imposing a mandatory requirement for food producers to adopt the system (mpConsulting, 2019).

VI: ECONOMIC INCENTIVES & ECOLOGICAL CONSIDERATIONS FOR ACCESS TO FOOD

Some measures are intended to adjust financial incentives which influence the selection of, and access to, healthy food. These include the idea of imposing of taxes upon sugary drinks and other unhealthy food, and subsidizing healthy food, which share the goal of generating incentives which favour the consumption of a nutritious diet.

Other proposals include steps to alleviate poverty and thereby place a healthy diet more securely within the financial reach of lower-income earners.

At the same time, health, environmental and animal rights concerns have spurred the growth of vegetarian and similar diets, and fuelled efforts to use taxation measures to improve nutritional quality and ease the environmental impact of food production.

‘\* \* \* \*

**Subsidies and Taxes**

Proposals to introduce subsidies for fruit, vegetables and other nutrition – at least for low-income earners or in remote areas (Right to Food Coalition, 2016; Binns et al, 2016; VicHealth, 2016A) - coupled with taxes on unhealthy food and drinks, have been commended by WHO and others, to lower the price of nutritious food relative to unhealthy food, thereby establishing an economic incentive to select nutritious food and beverages (AIHW, 2017A, 2017B; VicHealth, 2014 B; Wellard et al, 2015). The Australian Medical Association (2018) submits that: “It is vital that fresh, minimally processed foods, such as fruit and vegetables, are affordable for all (including those on low or fixed incomes), even if it contradicts market demands.”

As one writer explains:” The interventions likely to be the most effective are those that increase the economic incentive for healthy choices” and “…decrease the…affordability of unhealthy options.” (VicHealth, undatedT: 6) The NSW Council of Social Service (2018) adds that the combination of tax and subsidy may minimise the extent to which any money saved on the purchase of healthy subsidised food would be expended on less nutritious food.

To this end, WHO (2018) notes that over 40 countries have either introduced, or are actively considering, similar measures. The United Kingdom, Mexico, France, Hungary and Chile, have imposed taxes on unhealthy beverages or foods with high fat, sugar or salt content, occasionally coupled with subsidies for healthier foods (NSW Council of Social Service, 2018; AIHW, 2017A). In the United Kingdom, a sugar tax was instituted in 2018 and applied to drinks containing more than 5 grams of sugar per 100 ml. (The Conversation, 2018). In Mexico, a tax on sugary drinks and an 8% impost on discretionary energy-dense foods was followed two years later by a 9.7% decline in consumption of drinks covered by the tax (Tamir et al, 2018; Colchero et al, 2016), WHO (2018) adding that the impact of the tax upon consumer demand was most pronounced among residents in more disadvantaged communities.

Tamir et al (2018) cites another instance, where a French sugar tax was followed by a 6.7% decline in demand for regular cola. In Berkeley, California, sugary drink consumption in lower-income and urban neighbourhoods declined 21% in a year after imposition of a tax on sugary beverages. A further study, surveying 17 investigations of the impact of taxes on sugary drinks, found that most (except those in two US states) were succeeded by an increase in the purchase of healthy, alternatives (Redondo et al, 2019).

The World Health Organisation recommends the imposition of a tax on sugar-sweetened drinks in Australia (WHO, 2017) with the expected prospect of duplicating the favourable impact of similar arrangements overseas. The Australian Medical Association has also endorsed a sugar tax, declaring in its 2018 nutritional statement that: “A tax on sugar sweetened beverages should be introduced as a matter of priority.” Like-minded, Deakin University epidemiologist, Prof. Peters, favours a sugar tax to improve health outcomes and lower the prevalence of obesity (cited in Author not stated, 2017). According to Prof Tim Gill, from the Sydney-based Boden Institute of Obesity, Nutrition, Exercise & Eating Disorders in Sydney, a sugar tax is practically feasible, remarking: “It’s easy to identify sugary drinks and their manufacturers, and you can tax them at their production,” By contrast, he cautions, implementing a tax all sugary products would be a more exacting task. (cited in Davey, 2018).

Bourne (2018) though, maintains that such a tax would have a limited impact upon community health – though arguably, such an objection could be raised against any single proposal, regardless of its merit. The sugar producers’ peak body, the Sugar Research Advisory Service (2016), maintains that such a tax would inflict a disproportionate share of its cost upon socioeconomically disadvantaged people, and constitutes an unwarranted intrusion into the province of personal choice.

Pettinger (2017) on the other hand, counters that governments are entitled to discourage unhealthy lifestyles whose medical consequences inflict a burdensome cost upon the wider community and that people may readily avert such a tax in any case, by switching to any of a range of non-sugary alternatives. Such conclusions are supported by the findings of Research by Lal et al (2017) of Deakin University Global Obesity Centre, who conducted economic modelling on the impact of a 20% tax on sugary beverages, concluding that lower-income earners would be most responsive to the price increase entailed by the tax, with the implication that their reduction in consumption of such drinks after the introduction of a tax would largely permit them to evade its financial impact.

Establishment of a sugar tax, of any level and degree of impact, might at least serve to demonstrate its deterrent effect, verify the cost-effectiveness of its impact upon community health and garner in-principle public acceptance of such measures. By 2018 though, such a tax was opposed by the Morrison Federal Government and Labour Federal opposition (Davey, 2019).

**Addressing Education, Employment, Incomes and Other Structural Issues**

Halpern (2016) observes that many of the circumstances which influence access to a nutritious diet fall beyond the scope of health planning. Accordingly, some writers urge that structural barriers to the consumption of healthy food be addressed, including constraints stemming from conditions related to educational attainment, unemployment, incomes and housing circumstances (Smith et al, 2017; Ostr, undated; Linberge et al, 2015) – all of which may exert an impact upon the means to acquire and prepare healthy food. VicHealth cites food security expert Leah Galvin, of St Luke’s Anglicare, who observes that food security cannot be addressed effectively without confronting such issues (undated I).

The Right to Food Coalition and others focus upon income, urging consideration by the Federal Government of an increase in the real value of welfare benefits, to place the purchase of food and other necessities of day-to-day existence within reach of people without paid employment. Like-minded, Noble laureate and author, Joseph Stiglitz warns of the destructive impact of excessive income disparity upon western societies (2013), while Linberge et al (2015) cautions that the widening gulf between high and low-income households may accentuate food insecurity, presumably by depriving lower income-earners of the means to purchase an adequate supply of healthy food. [[18]](#footnote-18) In particular, soaring housing costs appear to be aggravating disparities in disposable income, as research by Fitzsimmons (2019), discussed earlier, confirms.

Such perspectives are consistent with the practical observation recounted earlier, that a dependable supply of nutritious food may be unattainable for recipients who lack the means to purchase nutritious food in the first place.

**Preservation of Natural Resources**

Ecological considerations extend from local circumstances to global implications, and largely concern the widening gulf between limited natural resources and the needs and wants of a burgeoning population. Circumstances such as a depletion in the supply of agricultural land, climate change, destruction of biodiversity, rising world population and demand for food, and the expense entailed in sustaining western diets, may result in a marked decline in agricultural output relative to demand, thereby raising food costs and aggravating food insecurity.

An objective of relevance to food insecurity is the preservation of agricultural land and an adequate water supply for the irrigation of crops (Budge et al, 2010A). VicHealth (undated W) observes that 25% of the value of Australia’s food is grown near its major cities, with local production conferring the benefit of reduced transport costs, a lesser environmental impact, and enhanced access to fresh food. Moreover, while farming land around Melbourne is among the most suitable in terms of its balance of fertility, climate and rainfall, much of it is being lost at the metropolitan fringe due to residential growth - a subject of concern (VicHealth and Heart Foundation, undated). In 1981, the Melbourne Metropolitan Board of Works (MMBW) report ‘Metropolitan Strategy Implementation’ stressed the importance of “…permanent retention of wedges of countryside…to help satisfy people’s needs for fresh vegetables and other primary products...” and to “…eliminate urban expectations from rural areas…” The document added that its strategy would “…encourage rural enterprises…” and “…aids their survival.” (1981: 85). The promise which this report made to the future was not fulfilled, with 50 suburbs added to Melbourne since 2006 alone, and the metropolitan population expected to rise from 5 million in 2019, to 7.7 million by 2051. More than three decades after the MMBW report, the limits of metropolitan growth remained at issue, Carolyn Whitzman, Professor of Urban Planning at the University of Melbourne, affirming: “A first step is to do what other cities have done: set a growth boundary and stick to it.” (Cited in Milman, 2015).

Agricultural land around Melbourne presently accounts for two-fifths of metropolitan food requirements, according to Carey et al (2016). However, they forecast that if metropolitan growth matches current trends – including low-density residential expansion at its periphery – then the capacity of regional agriculture to meet metropolitan requirements may plunge to 18% by 2050, accompanied by a decline in vegetable production from 81% to 21% of metropolitan requirements. The report warns of ensuing rises in food costs, which may accentuate food insecurity. Its authors therefore propose that Victorian governments set restraints upon residential growth at the urban fringe; improve recycling of water to ease the impact of drought; and institute policies to preserve farmland, enhance water supply and reduce food wastage. Morgan (2008) also endorses anti-waste campaigns to reduce food waste and lessen the demand for food production.

The current and impending impact of climate change may further compromise food production and supply. A rise in the frequency and intensity of extreme weather events – a predicted impact of climate change – may result in scorching of crops and their incineration in bushfires (Serdeczny et al, 2017; Altieri, 2017). Climate change is also expected to result in a decline in rainfall; increased evaporation of rain on the ground - thereby depleting catchments; and changes in the range and volume or pests and weeds. Rosenszweig et al (2001) explain: “Altered weather patterns can increase crop vulnerability to infection, pest infestations, and choking weeds.” All of these circumstances may detract from agricultural output.

Biologists have long recognised the value of biodiversity to the environment, including to agriculture, the report ‘Australia’s Strategy for Nature’ observing: “…biodiversity is important because it plays a critical role in maintaining the natural function of ecological systems. Losing biodiversity can change the way the natural world functions, and can have severe, unpredictable impacts that are sometimes irreversible” (Commonwealth of Australia, 2017).

An illustration is provided in the recent decline of the bee population, due to a parasitic infection – the varroa mite – which, it is believed, has been aggravated by the debilitating effect upon bees of certain pesticides, the impact of climate change and a decline in available flower meadows (Deakin University, 2019). This depletion of the bee population, if protracted, may impair plant pollination, inflicting grievous damage to future crop yields. As Dr Anna Veenstra of Deakin University informs us, bees are “…essential pollinators – pollinating 70 of the around 100 crop species that feed 90% of the world.”

A similar caution is afforded by the example of the dwindling number of birds – which prey on pest insects, making them essential to agriculture (Railsback and Johnson, 2014). US research has documented a 29% depletion of the estimated bird population across that nation since 1970 – a reduction in numbers approaching three billion. The authors of the research warn of an “…urgent need to address threats to avert future avifaunal collapse and associated loss of ecosystem integrity…” (Rosenberg et al, 2019). The decline in bird numbers may be due in part to the impact of certain pesticides which, in sublethal doses, may impair reproduction, inhibit migration and interfere with metabolism (LePage, 2019).

Under current trade arrangements, Australia sells much of the food it produces overseas. Rising demand for local food - fuelled by a swelling overseas population, increasing affluence among Australia’s trade partners and adverse impacts of climate change upon overseas agricultural production - may increase demand for locally-grown food and raise the price of imported products, thereby elevating local food prices and making a nutritious diet less affordable to lower-income earners. Coupled with rising housing and utilities costs, such circumstances may aggravate finance-related food insecurity.

A further consideration is the efficiency and sustainability with which limited resources are employed in generating society’s food supply. According to VicHealth (undated I) approximately one-third of the world’s carbon footprint is generated by food production, predominantly through the creation of food, rather than its transport. In addition, much of this food, whose production exacts a substantial toll upon the environment, is wasted (Heart Foundation, undated).

In particular, the production of meat for human consumption contributes substantially to the ecological impact and costs of agriculture, yet is considered unnecessary for health by some, at least at current levels of consumption. Indeed, the production of meat is resource-intensive (VicHealth, undated I) and massive in scale. Each year, approximately 70 billion animals are slaughtered for food across the world, representing an economic value of $1.3 trillion p.a. (Jeremy Coller Foundation, 2019). Rangan et al (2009) report that livestock account for 14.5% of world CO2 emissions, with processing and transporting representing just 6% of this amount, or 0.9% of emissions. Consequently, some maintain, the production of meat exacts an inordinate cost from the environment (Sadegholvad et al, 2017). A 2019 open letter bearing the signatures of 15,364 scientists across the world, urges steps to preserve the environment including: “…promoting dietary shifts towards mostly plant-based foods…” (Ripple et al, 2019).

The CSIRO concludes that demand for alternative sources of protein is driven by “...cultural, religious and dietary factors...” (2019: 19), including high domestic and export demand; ecological benefits to the scale of reduced carbon emissions and water usage of $5.4 billion p.a. by 2030; and reduced land use – with the cultivation of alternative protein sources requiring less than one-tenth as much land as livestock products.

Such ecological considerations, supplemented by concerns for personal health and for animal welfare, have kindled support for public initiatives to reduce reliance upon red meat, in favour of other sources of protein. Advocates contend that such steps would enhance the efficiency of food production, thereby furthering the goal of an ecologically sustainable and affordable food supply, reducing water consumption and curtailing greenhouse gas emissions (Morgan, 2008; Public Health Association, 2018).

Giving expression to such aspirations, a tax on meat was under consideration in Germany in 2019 with the intention of reducing greenhouse gas emissions (Uncited, 2019B; Spring Mann et al, 2017) while also curbing the mistreatment of animals. Similar recent developments in Denmark and Sweden (Author not stated, 2018B, 2018A) may foreshadow a shift in consumer demand towards poultry, marine products, vegetarian options and meat substitutes (Knotey-Ahulu, 2019; Fitch Solutions, 2019).

Such a trend appears well underway, with successive surveys revealing a rise in the proportion of Australian adults whose diet is wholly or largely vegetarian, from 9.2% in 2012 (Roy Morgan Research, 2016) to 12.1% in 2018 (Animals Australia, 2019). On the other hand, a US study found 84% of vegans or vegetarians abandon their diet, 34% after three months or less and 53% after less than 12 months, most doing so due to health concerns – though many expressed an intention to resume their earlier dietary pattern (Faunalytics, 2016).

At all events, the Jeremy Coller Foundation (2019) forecasts a rise in consumer demand for alternative protein sources, such as those originating from plants, generated through fermentation or manufactured using cell-culture technology. In response to such demand, major United Kingdom food retailer, Sainsbury, sells a variety of meat-alternative products such a vege-burgers, sausages and mince, from the meat section of their stores. This step was promoted by a 65% rise in demand for plant-based products, a Sainsbury spokesperson explaining: “We’re seeing increasing demand from plant-based products…” and are “…exploring further way to make popular meat free options more available.” (Marks, 2019). Similarly, the CSIRO (2019B) forecasts growth in the development and sales of plant and insect-based protein foods as alternatives to the consumption of meat.

Aside from its ecological attributes and implications for animal rights, a decline in meat consumption may also deliver health benefits, as the Heart Foundation (2019B) advises that the average level of red meat consumption in Australia is almost twice the recommended maximum, predisposing to cardiovascular disease. In addition, the consumption of vegetables and fruit as a source of protein, in preference to meat, may reduce risk of diabetes, cardiovascular disease and other chronic conditions (Marsh et al, 2013). Wong (2019) sounds a note of caution though, observing that the public is often not provided with balanced, accurate information about the benefits of specific foods. Claims of the benefits of various grains are often dubious, he remarks, with published assertions about their attributes often predating scientific inquiry, slipshod investigations invalidating comparisons between different types of grain, research often funded by the producers of the crop under investigation, and few clinical trials of the effects of adding particular grains to the human diet – “…the holy grail of nutritional research.”

The rapidly accumulating lessons of practical experience appear to affirm that thoughtful consideration of the impacts of human activity upon nature, informed selection of food by the public, and improved efficiency of food production, may help preserve agricultural output and favour the ready availability of affordable food in the future. Whether governments are equal to the task of responding with resolution, promptness and foresight is uncertain.

[](https://www.google.com/imgres?imgurl=https%3A%2F%2Fwww.policymedical.com%2Fwp-content%2Fuploads%2F2015%2F05%2FHealthcare-Policy-.jpg&imgrefurl=https%3A%2F%2Fwww.policymedical.com%2Fwhat-is-the-best-way-to-edit-a-healthcare-policy%25E2%2580%258B%2F&docid=agoACwDREOx7PM&tbnid=IaULMEQS6PqHfM%3A&vet=12ahUKEwjUtdPmxKTlAhVb6nMBHTueBAg4ZBAzKCMwI3oECAEQJA..i&w=1642&h=1217&bih=962&biw=1920&q=policy&ved=2ahUKEwjUtdPmxKTlAhVb6nMBHTueBAg4ZBAzKCMwI3oECAEQJA&iact=mrc&uact=8)VII: GOVERNMENT POLICY RESPONSES

**Effective Policy**

Concerns about the progress of initiatives to improve food security and the quality of nutrition include misgivings about the lack of effective state and federal policies (Harper, 2008; VicHealth, undatedE). VicHealth asserts that impediments to reform include “…conflicting agendas among stakeholders, competing priorities within governments, lack of evidence of effectiveness of some initiatives, and the complexity, cost and long-term commitments required…to achieve significant change” (undatedT: 6). Russell et al (2018) add that Federal governments have tended to favour the interests of the food industry by supporting ineffectual, voluntary formulation and advertising controls, rather than the compulsory measures many believe are required to achieve substantial impact. Halpern (2016) contends that a further impediment to legislative or policy change is the hesitancy of politicians to jeopardize electoral support by implementing worthy and well-substantiated proposals.

**Local Government Policy and Planning**

Some writers stress the importance of informed, enduring, council-wide engagement in nutrition issues, cemented in local government policy and plans.

Local information forms a crucial foundation to council advocacy, planning and policy in relation to food security (VicHealth, undated H). Efforts to assemble such data have included monitoring of food cost and availability (Burns, 2009), incorporation of food security questions in surveys (VicHealth, undated K), preparation of food security profiles to inform council and the community on this subject (VicHealth, undated I) and mapping ‘food deserts’ (VicHealth, undated K). Other useful information may include national and state policy; demographic and social data bearing upon the level of food security in the municipal area; information about local demand for material aid; and documentation of relevant welfare agencies, details of transport routes and fresh food outlets, community groups, food hubs, markets, community gardens and other initiatives (VicHealth, undated K). However, such efforts alone, offer no guarantee of the effectiveness of subsequent, local programs, or assurance of their longevity.

Commentators urge that local governments incorporate food security considerations into their policies and plans (VicHealth, 2018A; State Government of Victoria, 2011B) enlisting the involvement of business units, such as human services, planning, business development, sustainability and infrastructure planning (VicHealth, undated L) and guided by staff with health promotion experience and strategic skills (VicHealth, undated G). Maribyrnong Council for instance, incorporated considerations of food security into its Municipal Strategic Statement, addressing access to shopping precincts (VicHealth, undated L). To prompt consideration of food issues in planning resident’s developments, Wodonga Council developed a community gardens policy and program. And food security roles have been established within councils, variously in environmental health, community planning, and aged and disability units (VicHealth, undated K).

It is cautioned though, that the work required to incorporate food security into the policies and operations of a council is “…an enormous task” (VicHealth, undated G: 1). A council officer at Swan Hill Rural City aptly added that long-term planning and commitment is essential, to accommodate protracted local government policy and planning processes (VicHealth, undated I). The importance of establishing a lasting involvement in such issues is underscored by the observation of an Aboriginal and Torres Strait Islander community member, who lamented that: “There’s been many programs that have even run over the years and then the funding stops and it all just drops off” (Thorpe and Browne, 2009). Reviewing the ‘Food for All’ Program, conducted between 2005 and 2008, Montague (2008) perceived a lack of evidence of its lasting impact in the incorporation of food security into local government planning. Indeed, the abrupt and permanent suspension of food programs following the expiry of their external funding, suggests that, in the absence of more secure and enduring arrangements, the hope that such time-limited efforts would become assimilated into the routine functions of councils may have proven to be an unrealistic expectation.

In place of short-term local initiatives of questionable efficacy, rigorous and reliable evaluation may be required to identify programs of sufficient merit to warrant enduring local government support, or attract lasting State or Federal funding, to enable programs to be consolidated widely throughout the community, so that those which had shown initial promise may be brought to lasting fulfilment.

Bibliography

ABS (Australian Bureau of Statistics (2019a). Customised tabulation: Household income level, by rental cost, by household type by municipality, 2016. ABS, Canberra

ABS (Australian Bureau of Statistics (2019c). Customised Tabulation: Number of cars in household by household type, Victoria, 2016. ABS, Canberra

ABS (Australian Bureau of Statistics (2019d). Customised Tabulation: Disability by age and sex, Victoria, 2016. ABS, Canberra.

ABS (Australian Bureau of Statistics) (2012). Australian Health Survey: Nutrition First Results – Foods and Nutrients, 2011–12. ABS. Canberra. Accessed at: [www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4364.0.55.0072011-12?OpenDocument](http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4364.0.55.0072011-12?OpenDocument) on 1 August 2019

ABS (Australian Bureau of Statistics) (2013). Australian Aboriginal and Torres Strait Islander Health Survey: First Results, Australia, 2012-13. ABS, Canberra. Accessed at: [www.abs.gov.au/ausstats/abs@.nsf/Lookup/A07BD8674C37D838CA257C2F001459FA?opendocument](http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/A07BD8674C37D838CA257C2F001459FA?opendocument) on 30 August, 2019

ABS (Australian Bureau of Statistics) (2016). National Aboriginal and Torres Strait Islander Social Survey, Australia 2014/15. Accessed at: [www.abs.gov.au/AUSSTATS/abs@.nsf/mf/4714.0](http://www.abs.gov.au/AUSSTATS/abs@.nsf/mf/4714.0) on 27 August, 2019

ABS (Australian Bureau of Statistics) (2017A). Household Expenditure Survey, Australia: summary of results 2015-16. Commonwealth Government, Canberra

ABS (Australian Bureau of Statistics) (2017B). Census 2016, Customised tabulation: Employment Status by Age by Gender by Birthplace: Victoria, 2016

ABS (Australian Bureau of Statistics) (2018). Socio-economic Indexes for Areas 2016. Accessed at: [www.abs.gov.au/ausstats/abs@.nsf/mf/2033.0.55.001](http://www.abs.gov.au/ausstats/abs@.nsf/mf/2033.0.55.001) on 29 August, 2019

ABS (Australian Bureau of Statistics) (2019A). Housing Tenure Type by Age: Victorian Suburbs and Towns, 2016 – Customised Tabulation from the 2016 Census.

ABS (Australian Bureau of Statistics) (2019B). Consumer Price Index, Jun 2019. Accessed at: [www.abs.gov.au/ausstats/abs@.nsf/mf/6401.0](http://www.abs.gov.au/ausstats/abs@.nsf/mf/6401.0) on 27 August, 2019

ABS (Australian Bureau of Statistics) (2019E). Median Housing Cost Relative to Median Household Income: metropolitan Melbourne – Customised Tabulation from the 1996, 2001, 2006, 2011 and 2016 Censuses and Land Data.

ABS (Australian Bureau of Statistics) (2019F). Number of Cars: Dwellings Occupied by a Lone Person, by Sex: Metropolitan Melbourne, 2016 – Customised Tabulation based on the findings of the 2016 Census.

ABS (Australian Bureau of Statistics) (2019G). Median Weekly Individual Gross Incomes, 2016 – Calculated from the findings of the 2016 Census.

ABS (Australian Bureau of Statistics) (2019H). National Health Survey 2018 ABS, Canberra. Accessed at: [www.abs.gov.au/ausstats/abs@.nsf/mf/4364.0.55.001](http://www.abs.gov.au/ausstats/abs@.nsf/mf/4364.0.55.001) on 1 August 2019

Access Economics (2008). The Growing Cost of Obesity in 2008. Access Economics, Canberra

Adams, K. (2019). Forthcoming project announcement. VicHealth. Accessed at: [www.vichealth.vic.gov.au/search/Sharon-thorpe-karen-adams on 15 July 2019](http://www.vichealth.vic.gov.au/search/Sharon-thorpe-karen-adams%20on%2015%20July%202019)

Adams, K., Burns, C., Liebzeit, A., Ryschka, J., Thorpe, S., and Browne, J. (2012). Use of Participatory Research and Photo-voice to Support Urban Aboriginal healthy Eating. Health Soc. Care Community, Vol. 20, pp: 497-505

Altieri, M. (2017). The adaptation and mitigation potential of traditional agriculture in a changing climate. Climatic Change January 2017, Vol. 140, [No. 1](file:///\\sprsvr1\apps\CommunityContactList\Z%20Projects%20Food%20security%20references\Report\No.%201), pp 33–45 Accessed at: [https://link.springer.com/article/10.1007/s10584-013-0909-y](https://protect-au.mimecast.com/s/eozhCmO5X8T1v01sGgK5-?domain=link.springer.com)

Anathapavan, J., Cameron, A., Marshall, J., Steele, T., Robinson, E., Sacks. G. and Moodie, J. (2018). Potential Cost-effectiveness of Supermarket Shelf Tags Promoting Healthier Products. Food Futures Conference 2018. Public Health Association

Anema, A., Weiser, S. D., Fernandes, K. A., Ding, E., Brandson, E. K. and Palmer, A. (2011). High Prevalence of Food Insecurity among HIV-infected Individuals Receiving HAART in a Resource-rich Setting. AIDS Care: Psychological and Socio-medical Aspects of AIDS/HIV Vol. 23, Issue 2

Animals Australia (2019). Surge in Aussies Eating Vegetarian Continues. Accessed at: [www.animalsaustralia.org/features/study-shows-surge-in-Aussies-eating-veg.php](http://www.animalsaustralia.org/features/study-shows-surge-in-Aussies-eating-veg.php) on 1 September, 2019

Australian Food Hubs Network (undated). What are Food Hubs? National Good Food Network

Australian Government (2019). Australia New Zealand Food Standards Code - Standard 1.2.7 - Nutrition, Health and Related Claims. Accessed at [www.legislation.gov.au/Details/F2013L00054 on 22 August 2019](http://www.legislation.gov.au/Details/F2013L00054%20on%2022%20August%202019)

Australian Institute of Family Studies (2004). Frankston Community Kitchens Pilot Project. Australian Institute of Family Studies, Canberra

Australian Institute of Family Studies (2018). Fairfield Refugee Nutrition project. Australian Institute of Family Studies, Canberra

Australian Institute of Health and Welfare (2015). Australian Burden of Disease Study 2015: Interactive data on risk factor burden. AIHW. Accessed at: www.aihw.gov.au/reports/burden-of-disease/interactive-data-risk-factor-burnd/contents/dietary-risk -factors on 10 August, 2019

Australian Institute of Health and Welfare (2015). Australian Burden of Disease Study 2015: interactive data on risk factor burden. Accessed at: www.aihw.gov.au/reports/burden-of-disease/interactive-data-risk-factor-burden/contents/dietary-risk-factors on 25 August, 2019

Australian Institute of Health and Welfare (2017). A Picture of Overweight and Obesity in Australia 2017. AIHW, Canberra

Australian Institute of Health and Welfare (2017). Overweight and Obesity in Australia: a birth cohort analysis. Australian Institute of Health and Welfare, Canberra.

Australian Institute of Health and Welfare (2018). Australia’s Health 2018. AIHW, Canberra. Accessed at: [www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/table-of-contents](http://www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/table-of-contents) on 26 August, 2019

Australian Institute of Health and Welfare (2018). Nutrition across the Life Stages. Australian Institute of Health and Welfare, Canberra

Australian Medical Association (2017). AMA Submission to Five Year Review of Health Star Rating System

Australian Medical Association (2018). Nutrition – 2018. AMA, Canberra. Accessed at: [https://ama.com.au/position-statement/nutrition-2018 on 1 November 2019](https://ama.com.au/position-statement/nutrition-2018%20on%201%20November%202019)

Australian Taxation Office. (2019). GST-free Food. Accessed at [www.ato.gov.au/Business/GST/In-detail/Your-industry/Food/GST-and-food/?anchor=GSTfreefood](http://www.ato.gov.au/Business/GST/In-detail/Your-industry/Food/GST-and-food/?anchor=GSTfreefood) on 23 August, 2019

Author not stated (2017). Federal Government Faces New Calls to Introduce a Sugar Tax by 2019. Accessed at: https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=2ahUKEwjvvpyHtarkAhVVSX0KHc8SByoQFjAAegQIAhAB&url=https%3A%2F%2Fwww.news.com.au%2Flifestyle%2Fhealth%2Fhealth-problems%2Ffederal-government-faces-new-calls-to-introduce-a-sugar-tax-by-2019%2Fnews-story%2F0152a91b11ac76f2ece40755ed12af91&usg=AOvVaw0mztBZI8wI8OErin62HIdT on 30 August, 2019

Author not stated (2018). Danish Environmental Economics Council Calls for Tax on Cows – Cars are off the Hook. Clean Technica. Accessed at: https”//cleantechnica.com/2018/03/01/Danish-enviornmental-economics-council-calls-tax-cows-cars-off-hook/

Author not stated (2018). Farmers Up in Arms over Proposed Methane Tax on Cows. CPH Post Online, Feb 28th 2018

Author not stated (undatedB). Growing Robinvale Community Growers Market

Author not stated (undatedC). The Myuna Market Story: addressing food security with a community enterprise.

Backholer, K., Bennett. T., Huse, O., Orbas, C., Chung, A., Isaacs., A, Kelly, B., Golds, G. and Peeters, A. (2018). Differential Exposure to, and Impact of, Unhealthy Food Advertising: a systematic review. Food Futures Conference 2018. Public Health Association

Banks, E., Jorm, L, Rogers, K., Clements, M. and Bauman, A. (2011). Screen-time, Obesity, Ageing and Disability: findings from the 91,266 participants in the 45 and Up Study. Public Health Nutrition Vol. 14, pp: 34-43

Barry, S. (2019). No. Bacon isn’t going to kill you, but experts say you should eat less meat. The Age. 2 October, 2019

Bateup, K. (2018). Changing the Culture of School Canteens. Food Futures Conference 2018. Public Health Association

Bawadi, H., Khataybeh, T., Obeidat, B., Kerkadi, A., Reema Tayyem, R., Banks, A. D. and Subih, H. (2019). Sugar-Sweetened Beverages Contribute Significantly to College Students’ Daily Caloric Intake in Jordan: Soft Drinks Are Not the Major Contributor. Nutrients, Vol. 11. Pp. 1-11.

Bes-Rastrollo, M., Schule, M., Ruiz-Canela, M. and Martine-Golzalez, M.A. (2013). Financial Conflicts of Interest and Reporting Bias Regarding the Association between Sugar-Sweetened Beverages and Weight Gain: a systematic review of systematic reviews PLOS Medicine, Dec. 31, 2013

[Binns](https://onlinelibrary.wiley.com/action/doSearch?ContribAuthorStored=Binns%2C+Colin), C., Howat, P., Smith, J. A. and Jancey, J. (2016). Children, poverty and health promotion in Australia. Health Promotion Journal of Australia, Dec. 2016.

BIS Shrapnel (2007). Australian Foodservice Survey 2007. BIS Shrapnel, Sydney

Black, A., Vally, H., Morris, P.S., Daniel, M., Esterman, A.J., Smith, F.S. and O’Dea, K. (2013). Health Outcomes of a Subsidised Fruit and Vegetable Program for Aboriginal Children in Northern New South Wales. Medical Journal of Australia, Vol. 199, No. 1, pp: 46-50

Borodulin, N., Laatikainen, T., Joulevi, A. and Jousilahti, P. (2008). Thirty-year Trends of Physical Activity in Relation to Age, Calendar Time and Birth Cohort in Finnish Adults. European Journal of Public Health, Vol. 18, Issue 3, pp: 339-344 Accessed at: <https://academic.oup.com/eurpub/article/18/3/339/518507> on 19 August, 2019

Bourne, R. (2018). Why Sugar Taxes Won’t Dent Obesity. Cato Institute, United Kingdom

Brownson, R. C., Boehmer, T. and Luke, D. A. (2005). Declining Rates of Physical Activity in the United States: what are the contributors? Annual Review of Public Health, Vol. 26, pp: 421-443 Accessed at: <https://www.annualreviews.org/doi/10.1146/annurev.publhealth.26.021304.144437> on 29 August, 2019

Budge, T. (2010A). Impacts of Localised Food Supply: what is the evidence? VicHealth, Melbourne Accessed at: [www.vichealth.vic.gov.au/-/media/ResourceCentre/PublicationsandResources/healthy-eating/Impacts\_LocalisedFoodSupply.pdf?la=en&hash=A42D9B6236BF90D492BD00419FFD6352644F7855](http://www.vichealth.vic.gov.au/-/media/ResourceCentre/PublicationsandResources/healthy-eating/Impacts_LocalisedFoodSupply.pdf?la=en&hash=A42D9B6236BF90D492BD00419FFD6352644F7855) on 10 July, 2019

Budge, T., Butt, A., Fraser, K., Hunder, A., Kennedy, M., Lehmann J., Rudner, J., Slade, C. and Buxton, M. (2010B). The Impacts of a Localised Food Supply: what is the evidence? VicHealth and LaTrobe University.

Burns, C. (2004). A Review of the Literature Describing the Link between Poverty, Food Insecurity and Obesity with Specific Reference to Australia. VicHealth, Melbourne

Burns, C. (2009). Food Insecurity: what do we know? Deakin University and WHO Collaborating Centre for Obesity Prevention, Melbourne

Burns, C. and Inglis, A.D. (2007). Measuring Food Access in Melbourne: access to healthy and fast food by bus, car and foot in an urban municipality in Melbourne. Health and Place, Vol. 13, No. 4, pp. 377-885)

Cardinia Shire (2019). Community Food Strategy. Shire of Cardinia.

Carey, R., Larsen, T., Sheridan, J. and Candy, S. (2016). Melbourne’s Food Future: planning a resilient city foodbowl. Victorian Eco-Innovation Lab. The University of Melbourne

Chan, M. (2014). Food Safety Must Accompany Food and Nutrition Security. The Lancet: Letters. World Health Organisation, Geneva.

Chatindiara, I., Williams, V., Sycamore, E., Richter, M. and Allen. A. (2019). Associations between Nutrition Risk Status, Body Composition and Physical Performance among Community-dwelling Older Adults. Australia and New Zealand Journal of Public Health, Vol. 43, Issue 1

Choice (2017). Making Health Stars Work for You. Choice

City of Frankston (2019). Frankston Promotes Healthy Drink Options. accessed at: <https://www.frankston.vic.gov.au/Your_Council/Media_and_Publications/Latest_News/Frankston_City_promotes_healthy_drink_options?BestBetMatch=frankston%20city%20health%20and%20wellbeing%20research|8e168698-f3aa-4c4b-89d5-f3648773c670|bd8b025c-07ee-45a9-ba7e-a1da00e5c6d8|en-AU> on 30 July 2019

Colchero, A., Popkin, B., Rivera, J. A. and Ng, S. W. (2016). Beverage purchases from stores in Mexico under the excise tax on sugar sweetened beverages: observational study. British Medical Journal Vol. 352.

Coles-Rutishauser, I. and Penm, R. (1996). Monitoring food habits and food security: Australia 1995-1996. Food and Nutrition Monitoring Unit Working Paper 96.3 AHHW Canberra

Commonwealth of Australia (2017). Australia’s strategy for nature (Draft) 2018-2030. Accessed at: <https://www.environment.gov.au/system/files/consultations/4601b513-c4dc-4bc1-808a-b8cfa0755b3b/files/strategy-nature-draft.docx>

Community Council for Australia (2019). The Australia we Want. CCA, Canberra.

Crawford, B., Byun, R., Mitchell, E., Thompson, S., Jalaludin, B. and Torvaldsen, S. (2017). Socioeconomic Differences in the Cost, Availability and Quality of Healthy Food in Sydney. Australia and New Zealand Journal of Public Health, Vol. 41, Issue 6

Crosland, P., Anathapavan, J., Davison, J. and Lambert, M. (2019). The Health Burden of Preventable Disease in Australia: a systematic review. Australia and New Zealand Journal of Public Health. Vol. 43, Issue 2

Crowley, S., Antioch, K., Carter, R., Waters, A.M., Conway, L. and Mathers, C. (1992). The cost of diet-related disease in Australia: a discussion paper. Australian Institute of Health and Welfare, Canberra: National Centre for Health Program Evaluation

CSIRO (2019A). Gut Health and Weight Loss. CSIRO, Canberra

CSIRO (2019B). Growth Opportunities for Food and Agribusiness: Economic Analysis and Market Sizing. CSIRO, Canberra

Cyril, S., Nicholson, J.M., Agho, K., Polonsky, M. and Renzaho, A.M. (2017). Barriers and Facilitators to Childhood Obesity Prevention among Culturally and Linguistically Diverse (CALD) Communities in Victoria, Australia. Australia and New Zealand Journal of Public Health, Vol. 41, Issue 3

Darmon, N., Briend, A. and Drewnowski, A. (2004). Energy-dense Diets are Associated with Lower Diet Costs: a community study of French adults. Public Health Nutrition, Vol. 7, No. 1, pp: 21-27

Daucher, N. and Tarasuk, V. (2002). Homeless ‘squeegee kids’: food insecurity and daily survival. Social Science and Medicine Vol. 54, No 7, pp. 1039

Davey, M. (2019). Sugar Tax: why health experts want it but politicians and industry are resisting. The Guardian, 10 January 2019

Davidson, .E., Gearon, E., Booth, S. and Palermo, C. (2016). Are Low-to-middle-income Households Experiencing Food Insecurity in Victoria, Australia?: an examination of the Victorian Population Health Survey, 2006-2009. Australian Journal of Primary Health, Vol. 23, Issue 3, pp: 249-256

Davidson, Z. E., Gearon, E., Booth, S. and Palermo, C. (2016). Are Low-to-Middle Income Households Experiencing Food insecurity in Victoria, Australia? An examination of the Victorian Population Health Survey, 2006-2009. Australian Journal of Primary Health Vol. 23 No. 3, pp: 249-256

Deakin University (2019). What does the Bee Decline Mean for Civilisation? Accessed at: <https://this.deakin.edu.au/society/what-does-the-bee-decline-mean-for-civilisation> on 20 September, 2019

Delaney, T., Wolfenden, L., Yoong, S. L., Sutherland, R., Wiggers, J., Ball, K., Campbell, K., Rissel, C. and Wyse, R. (2018). Improving Healthy Food Purchases from Online Canteens: a cluster RCT. Food Futures Conference 2018. Public Health Association

Department of Education and Training (2019A). Victorian Child Health and Wellbeing Survey: Summary of findings. State Government of Victoria. Melbourne

Department of Education and Training (2019B). School Breakfast Clubs. Victorian Government, Melbourne. Accessed at: [www.education.vic.gov.au/about/programs/Pages/breakfastclubs.aspx](http://www.education.vic.gov.au/about/programs/Pages/breakfastclubs.aspx) on 25 August, 2019

Department of Environment, Land, Water and Planning (2018). Property Prices. Accessed at: [www.propertyandlandtitles.vic.gov.au/property-information/property-prices](http://www.propertyandlandtitles.vic.gov.au/property-information/property-prices). Customised Tabulation: Dwelling and land prices in Victorian municipalities, 1985 to 2018, adjusted for inflation

Department of Health and Ageing (2013). National Mental Health Report 2013: tracking progress of mental health reform in Australia 1993 – 2011. Commonwealth of Australia, Canberra

Department of Health and Human Services (2014A). Food Insecurity with Hunger, by Age and Gender. Tabulation from data presented in ‘Challenges to healthy eating: findings from the Victorian Population Health Survey 2014’. Victorian Government, Melbourne

Department of Health and Human Services (2016). Victoria’s Health: the Chief Health Officer’s report 2014. State Government of Victoria. Melbourne

Department of Health and Human Services (2017). Challenges to Healthy Eating: food insecurity in Victoria, findings from the 2014 Victorian Population Health Survey. Victorian Government, Melbourne

Department of Health and Human Services (2018). Rental Report: Customised tabulation - Rental Costs for Metropolitan Municipalities: June 1999 to 2018 (adjusted for inflation)

DeVille-Almond, J., Tarani, A. A., Grant, J., Gray, M., Thomas, G. N. and Taheri, S. (2011). Awareness of Obesity and Diabetes: a survey of a subset of British male drivers. American Journal of Men’s Health, Vol. 5, No. 1, pp: 30-37

Dieticians Association of Australia (2017). Five Year Review of the Health Star Rating System.

Dieticians Association of Australia (2017). Should I be worried about Trans-fats? Accessed at: <https://daa.asn.au/smart-eating-for-you/smart-eating-fast-facts/nourishing-nutrients/should-i-be-concerned-about-trans-fats/> on 13 September, 2019

Doenberg, A., Zaeda, I., Bruszewska, K., Skoczowski, B. and Piorr, A. (2016). Potentials and Limitations of Regional Organic Food Supply: a qualitative analysis of two food chain types in the Berlin metropolitan region. Sustainability, Vol. 8, No. 11, pp: 1125. Accessed at: [www.mdpi.com/207111050/8/11/11125/htm](http://www.mdpi.com/207111050/8/11/11125/htm)

Dwyer, M. (2010). Planning to Reduce Alcohol-related Harms (Victoria). In M. Boyd and B. Rosen (2010), Victorian Planners Guide: writing and effective licensed premises policy. ICLEI, Melbourne

Eddie, R. (2019). ‘Dictatorship’: Council’s New ‘Meat-free Mondays’ to Cop BBQ Protest. The Age, August 16, 2019

Fauntalytics (2016). Accessed at: fanalytics.org

Fitch Solutions (2019). Global Food and Drink Report. Accessed at <http://store.fitchsolutions.com/global-food-drink-report>

Fitzsimmons, C. (2019). Soaring Cost of Housing for Poorest Australians is Driving Inequality: Grattan Institute. Sydney Morning Herald. Sept. 8, 2019

Food Bank Australia (2017). Food Bank Hunger Report 2016. Accessed at: [www.foodbank.org.au/hunger-in-australia/the-facts/](http://www.foodbank.org.au/hunger-in-australia/the-facts/)

Gallegos, D., Pernilla, E. and Wright, J. (2008). Still there’s No Food: food insecurity in a refute population in Perth, Western Australia. QUT. Nutrition and Dietetics, Volume 65, Issue 1. Accessed at: [www.onlinelibrary.wiley.com/doi/abs/10.1111/j.1747-0080.2007.00175.x](http://www.onlinelibrary.wiley.com/doi/abs/10.1111/j.1747-0080.2007.00175.x)

Halpern, D. (2016). Behavioural Insights and Healthier Lives: VicHealth’s inaugural leading thinker’s residency. VicHealth, Melbourne

Hare, S. (2015). Study of Gambling and Health in Victoria. Victorian Responsible Gambling Foundation and Victorian Department of Justice and Regulation

Harper, T. (2008). Food for All Program and VicHealth’s Strategies to Promote Healthy Eating: Food for All, learning from the field forum. VicHealth, Melbourne

Health Monitor (2012). Obesity. Accessed at: www2.health.vic.gov.au/about/publications/researchandreports/Victorian-Health-Monitor-report

Heart Foundation (2019A). High Protein Foods. Accessed at: [www.heartfoundation.org.au/healthy-eating/food-and-nutrition/protein-foods](http://www.heartfoundation.org.au/healthy-eating/food-and-nutrition/protein-foods) on 30 August, 2019

Heart Foundation (2019B). Meat, Poultry and Seafood. Accessed at [www.heartfoundation.org.au/healthy-eating/food-and-nutrition/protein-foods/meat-poultry-and-seafood](http://www.heartfoundation.org.au/healthy-eating/food-and-nutrition/protein-foods/meat-poultry-and-seafood) on 30 August, 2019

Heart Foundation (undated). How to Eat Healthily. Heart Foundation, Melbourne

Hendrie, G., Baird, D., Syrette, J., Barnes, M. and Riley, M. (2016). Beverage Intake of Australians. Conference paper, delivered to the 40th Annual Scientific Meeting of the Nutrition Society of Australia, Melbourne Australia, Nov 29 - Dec 2, 2016. CSIRO, Melbourne. Accessed at: <https://publications.csiro.au/rpr/pub?list=ASE&pid=csiro:EP17497&expert=false&sb=RECENT&n=8&rpp=10&page=55&tr=1121&dr=all&csiro.affiliation%7Ccsiro.projectBusinessUnit=50012450> on 25 August, 2019

Hickson, M. (2006). Malnutrition and Ageing. Postgraduate Medical Journal. Vol. 82(963), pp. 2-8 Accessed at: [www.ncbi.nlm.nih.gov/pmc/articles/PMC2563720/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2563720/) on 15 Sept. 2019

Holyrod, J. (2014). Average Australian Eats Fast Food Nearly Every Week. State-Plus. Accessed at: [www.goodfood.com.au/eat-out/news/average-australian-eats-fast-food-nearly-every-week-20140311-34k15](http://www.goodfood.com.au/eat-out/news/average-australian-eats-fast-food-nearly-every-week-20140311-34k15) on 28 August, 2019

Hunt Club Commercial Ply Ltd v Casey CC (includes Summary) [2013] VCAT 725 (20 May 2013)

Isis Primary Care (undated). Issues and Solutions to Improving Food Security for New Arrivals and People of a Refugee Background: learning from the field’s forum. Isis Primary Care, Brimbank Council and VicHealth, Melbourne

Ispsos (2016). Hard Facts, Fiction and Fads: How Australia eats, thinks about and shops for food. Ipsos. Accessed at: [www.ipsos.com/en-au/food-facts-fiction-and-fads-how-australia-eats-thinks-about-and-shops-food](http://www.ipsos.com/en-au/food-facts-fiction-and-fads-how-australia-eats-thinks-about-and-shops-food) on 29 August, 2019

James, I. (2008). Food for All: address to learning from the field forum. Publisher not stated.

Jeremy Coller Foundation. (2019). Appetite for disruption: how leading food companies are responding to the alternative protein boom. Accessed at: [www.fairr.org/article/apeitite-for -disruption-how-leading-food-companies-are-repsonding-to-the-alternativer-protein-boom/](http://www.fairr.org/article/apeitite-for%20-disruption-how-leading-food-companies-are-repsonding-to-the-alternativer-protein-boom/) on 15 July, 2019

Kassem, N. O., Lee, J. W., Modeste, N. N. and Johnston, P. K. (2009). Understanding Soft Drink Consumption among Female Adolescents using the ‘Theory of Planned Behaviour’ Health Educ Res, Vol. 18, No. 3, pp: 278-291

Kelly, M. (2011). Life is Health is Life: taking action to close the gap. Victorian Aborginal evidence-based resource. VicHealth and State Government of Victoria

Kettings, C., Sinclair, A. J. and Voevodin, M. (2009). A Healthy Diet Consistent with Australian health Recommendations is too Expensive for Welfare-dependent Families. Australia and New Zealand Journal of Public Health, Vol. 33, Issue 6, Dec. 2009

King, L., Hebden, L., Grunseit, L. Kelly, B. and Chapman, K. (2013). Building the Case for Independent Monitoring of Food Advertising on Australian TV. Public Health Nutrition 16: 2249-54

Kleve, S., Booth, S., Davidson, E. and Palermo, C. (2018C). Walking the Food Security Tightrope: exploring the experiences of low-to-middle Income Melbourne Households. International Journal of Environmental Research and Public Health, Vol. 15, No. 10

Kleve, S., Gallegos, D., Ashby, S. and Palermo, C. (2018A). Preliminary Validation and Piloting of a Comprehensive Measure of Household Food Security in Australia. Public Health Nutrition, Vol. 21, Issue 3, pp: 526-534

Kleve, S., Palermo, C., Davidson, T. and Booth. S. (2018B). Exposing Food Insecurity in Low-to-middle-income Melbourne Households: now what? Food Futures Conference 2018. Public Health Association

Knotey-Ahulu, O. (2019). Red Meat could be Next in Line for a Sin Tax After Sugar, Fitch Says. Sydney Morning Herald, 14 August, 2019

Knowles, A. (2016). Food Insecurity in Australia: A hidden problem. Future Directions International

LaPage, M. (2019). Pesticides could be Partly to Blane for Bird Decline. New Scientist 21 September 2019 pp. 14-15

Lal, A., Mantilla-Herrera, A. M., Veeman, L., Backholer, K., Sachs, G., Moodie, M., Siapush, M., Carter, R. and Peeters, A. (2017). Modelled Health Benefits of a Sugar-Sweetened Beverage Tax across Different Socioeconomic Groups in Australia: A cost-effectiveness and equity analysis. PLOS Medicine, June 27, 2017 Accessed at: <https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1002326> on 25 August, 2019

Landrigan, T. and Pollard, C. (2010). Food Access and Cost Survey, Western Australia, Perth. Department of Health, Government of Western Australia, 2011

Larsen, K. (2008). Sustainability and Food Security: you can’t have one without the other. Victorian Eco Innovation Lab, Melbourne.

Laurence, S., Kempler, J. and Graham, V. (2018). Transforming Food environments in Sport and Recreation Facilities. Food Futures Conference 2018. Public Health Association

Lawlis, T., Devine, A. and Upton, P. (2018A). Vulnerable, Single and Living in Poverty: Women’s Challenges to Accessing Food in the Australian Capital Territory. Australian and New Zealand Journal of Public Health, Vol., 42, Issue 6.

Lawlis, T., Islam, W. and Upton, P. (2018B). Achieving the Four Dimensions of Food Security for Resettled Refugees in Australia: a systematic review. Nutrition and Dietetics, Vol., 75, Issues 2

Lawrence, R., Linderg, R., Gold, L. and Pegram. O. (2015). Food Insecurity in Australia: implications for general practitioners. Australian Family Physician Vol. 44, No. 11, pp: 859-862

Linberge, R., Lawrence, M., Gold, L., Friel, S. and Pegram, O. (2015). Food Insecurity in Australia: Implications for general practitioners. Australian Family Physician, Vol 44, No. 11, pp: 859-862

Love, P., Whenlan, J., Lewis, M. and Lee, A. (2018). Food Price and Affordability in Rural Victoria: are healthy diets more expensive? Food Futures Conference 2018. Public Health Association

Luger, M., Laftontan, M., Bes-Rastrollo, M., Winzer, E., Yumuk, V. and Farpour-Lambert, N. (2017). Sugar-sweetened Beverages and Weight Gain in Children and Adults: a systematic review from 2013 to 2015 and a comparison with previous studies. Obes Facts, Vol, 10, No., 6, pp: 674-693

MacDonald, D., (2019). Evaluation of the School Breakfast Clubs Program: Final report. Victoria University and Food Bank, Melbourne.

Machado, P., Steele, E., Scrinis, G. and Monteiro, C. (2018). Ultra-processed Food Consumption and Chronic Non-Communicable Disease-related Dietary Nutrient profile in Australia. Food Futures Conference 2018. Public Health Association

Malakellis, M., Hoare, E., Sanigorski, A., Allender, S., Swinburn, B., Chikwendu, C., Kelly, P.M., Petersen, S. and Millar, L. (2017). School-based System Change for Obesity prevention in Adolescents: outcomes of the Australian Capital Territory ‘It’s Your Move!’ Australia and New Zealand Journal of Public Health, Vol. 41, Issue 5

Mansoor, O. D., Ali, R. and Richards (2017). Regional Survey Supports National initiative for ‘Water-only’ Schools in New Zealand. Australia and New Zealand Journal of Public Health, Vol. 41, Issue 5

Markes, N. (2019). Sainsbury’s to be first UK supermarket to sell meat-alternatives in its meat, fish and poultry aisles. Food Innovation Network, Melbourne.

Marsh, K., Munn, E. A. and Baines, S. K. (2013). Protein and Vegetarian Diets. Medical Journal of Australia. 199 (4)

Mathias, J., Kaiser, M. D., Bauer, J. M., Ramsch, C., Uter, W., Guigoz, Y., Cederholm, T. and Thomas, M.D. (2010). Frequency of Malnutrition in Older Adults: a multinational perspective using the Mini Nutritional Assessment. Journal of the American Geriatrics Society. Accessed at <https://onlinelibrary.wiley.com/doi/abs/10.111/j.1532-5415.2010.03016.x> on 10 August, 2019

Matthews, C. E., Chen, K. C., Freedson, P. S., Buchowski, M. S., Beech, B. M., Pater, R. R. and Triano. (2008). Amount of Time Spend in Sedentary behaviours in the United States: 2003-2004 Accessed at: <https://doi.org/10.1093%2Faje%2Fkwm390> on 29 August, 2019

Mayo clinic (2019). Dietary fibre: essential for a healty diet. Accessed at: www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/fiber/art-20043983

McCarthy, L. and Change, A. B. (2018). Household Food Security Experiences among Indigenous Australians in a Northern Australian Setting. Food Futures Conference. Public Health Association

McCrindle Consulting (2017). Food Bank Hunger Report, 2017. Food Bank.

McCrindle Consulting (2018A). Food Bank Hunger Report 2018. Food Bank.

McCrindle Consulting (2018B). Rumbling Tummies: child hunger in Australia. Food Bank.

McKay, F. H., Haines, B. C. and Dunn, D. (2019). Measuring and Understanding Food insecurity in Australia: a systematic review. Journal of Environmental Research and Public Health, Vol. 16, pp. 476

McKay, F.H. and Dunn, M. (2015). Food security among asylum seekers in Melbourne. Australian and New Zealand Journal of Public Health 2015, Vol 39, pp. 3344-389

McKechnie, R., Turrell, G. and Giskes. K. (2018). Single-item Measure of Food Insecurity Use in the National Health Survey may Underestimate Prevalence in Australia. Australian and New Zealand Journal of Public Health, Vol. 42, Issue 4

Melbourne and Metropolitan Board of Works (1981). Metropolitan Strategy Implementation. Victorian Government, Melbourne. Accessed at: [www.planning.vic.gov.au/policy-and-strategy/planning-for-melbourne/melbournes-strategic-planning-history/metropolitan-strategy-implementation-1981](http://www.planning.vic.gov.au/policy-and-strategy/planning-for-melbourne/melbournes-strategic-planning-history/metropolitan-strategy-implementation-1981) on 27 August, 2019

Merema, M. R., Sullivan, D. L., Pollard, G. M., Abraham, J. A., Tomlin, S. M. and Radomiljac., A.L. (2016). Parents’ Perception of their Child’s Weight Status and Intention to Intervene: a Western Australian cross-sectional population survey, 2009-2012. Australia and New Zealand Journal of Public Health, Vol. 40, Issue 1

Micevski, D. A., Thornton, L. E. and Brockington, S. (2014). Food Insecurity among University Students in Victoria: a pilot study. Nutrition and Dietetics, Vol. 71, No. 4, pp: 258-264. Accessed at: <http://dro.deakin.edu.au/view/DU:30068978> on 27 August, 2019

Milman, O. (2015). Melbourne’s Urban Sprawl: just how big can the city get? The Guardian. 3 Sept., 2015 Accessed at: [www.theguardian.com/australia-news/2015/sep/03/melbournes-urban-sprawl-just-how-big-can-the-city-get](http://www.theguardian.com/australia-news/2015/sep/03/melbournes-urban-sprawl-just-how-big-can-the-city-get) on 29 August, 2019

Milne, A. C., Potter, J., Vivanti, A. and Avenell, A. (2009). Protein and Energy Supplementation in Elderly People at Risk from Malnutrition. Cochrane Systematic Review – Intervention.

Montague, M. (2008). Learning from the Evaluation of the Food for All Programs. VicHealth, Melbourne

Moore, J., Why, S., Guise, A., Gibson, K. and Task, A. (2018). Famers’ Markets Food Price Research Project. Food Futures Conference 2018. Public Health Association

Morgan, E. (2008d). Fruit and Vegetable Consumption and Waste in Australia: recommendations towards a food supply system framework that will deliver healthy food in a sustainable way. VicHealth, Melbourne.

mpConsulting (2017). Report on Submissions to the Five Year Review of the Health Star Rating System. Report prepared for the Department of Health October 2017

mpConsulting (2019). Health Star Rating System: Five Year Review Report. mpConsulting

National Rural Health Alliance Inc. (2015). Food Security. National Rural Health Alliance Inc.

NHMRC (2011). 2010 Australian National Infant Feeding Survey: indicator results. Supplementary data tables. Accessed at: [www.aihw.gov.au/reports-data/behaviours-risk-factors/food-nutrition/data](http://www.aihw.gov.au/reports-data/behaviours-risk-factors/food-nutrition/data) on 25 August, 2019

NHMRC (National Health and Medical Research Council) (2011). Australian National Infant Feeding Survey, 2010. Tables. Canberra, NHMRC. Accessed at: [www.aihw.gov.au/reports-data/behaviours-risk-factors/food-nutrition/data](http://www.aihw.gov.au/reports-data/behaviours-risk-factors/food-nutrition/data) on 25 August, 2019

NHMRC (National Health and Medical Research Council) (2013a). Australian Dietary Guidelines. Department of Health and Ageing, Canberra.

NHMRC (National Health and Medical Research Council) (2013b). Healthy Communities: Overweight and Obesity Rates across Australia, 2014/15. Department of Health and Ageing, Canberra

NHMRC (National Health and Medical Research Council) (2013c). Clinical Practice Guidelines for the Management of Overweight and Obesity in Adults, Adolescents and Children in Australia. Canberra, NHMRC

NHMRC (undated). Dietary Fibre. Accessed at: [www.nrv.gov.au/nutrients/dietary-fibre](http://www.nrv.gov.au/nutrients/dietary-fibre) on 13 September, 2019

No author cited (2019). Soft Drinks, Juice and Sweet Drinks – Limit Intake. Better Health

Noone, Y. (2019). This car park turned urban farm has grown 300kg of produce for people in need. SBS Online Accessed at: <https://www.sbs.com.au/food/article/2019/08/28/car-park-turned-urban-farm-has-grown-300kg-produce-people-need> on 23 September, 2019

Nord, M. Andrews, M. and Winicki, J. (2002). Frequency and Duration of Food Insecurity and Hunger in US Households. J Nutr Educ Behav Vol. 34, No. 4, pp: 194-200

Northeast Health Wangaratta (2014). Wangaratta Food Security Report 2014: scoping healthy food access in Wangaratta. Ovens and King Community Health Service

NSW Council of Social Service (2018). Access to health Food: NCOSS cost of living report. NCOSS, Sydney

NSW Health (2015). Food Insecurity, Persons aged 16 Years and Over, NSW 2002 to 2014. HealthStats NSW.

Obesity Policy Coalition (undatedA). Over-branded, Under-protected. Obesity Policy Coalition, Melbourne

Obesity Policy Coalition (undatedB). Pricing Measures. Obesity Policy Coalition, Melbourne

Obesity Policy Coalition (undatedC). Food Labelling. Obesity Policy Coalition, Melbourne

Obesity Policy Coalition (undatedD). Advertising and Marketing. Obesity Policy Coalition, Melbourne

Open Food Network (2014). Sustainable Living Festival. Open Food Network

Ostr, A., (undated). Food Security in Canada with a Focus on British Columbia. University of Victoria, British Columbia

Palermo, C., McCartan, J., Kleve, S., Sinha, K. and Shiell, A. (2016). A Longitudinal Study of the Cost of Food in Victoria Influenced by Geography and Nutritional Quality. Australia and New Zealand Journal of Public Health, Vol. 40, Issue 3

Parrry, S. and Straker, L. (2013). The Contribution of Office Work to Sedentary Behaviour Associated Risk. BMC Public Health, Vol. 13 Accessed at: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-13-296> on 29 August, 2019

Pedisic, Z., Shrestha, N., Kovalcik, S., Stamatakis, E., Liangruenrom, N., Grgic, J., Titze, S., Biddle, S., Bauman, S., and Oja, P. (2019). Is running associated with a lower risk of all-cause, cardiovascular and cancer mortality, and is the more the better? A systematic review and meta-analysis. British Journal of Sports Medicine, Vol. 53, No. 22.

Pettinger, T. (2017). Sugar Tax Debate. Economics Help. Accessed at: [www.economichelp.org/blog/14884/economics/sugar-tax-debatte/](http://www.economichelp.org/blog/14884/economics/sugar-tax-debatte/) on 6 August 2019

Pollard, C., Meng, X., Hendrie, G. A., Sullivan, D., Pratt, I. S. and Scott, J. A. (2016). Obesity, Socio-demographic and Attitudinal Factors Associated with Sugar-Sweetened Beverage Consumption: Australian evidence. Australia and New Zealand Journal of Public Health, Vol. 40, Issue 1

Promoting Health Outcomes for Refugees (2018). Fairfield Refugee Nutrition project (2015-2017). Melbourne.

Public Health Association (2018). Ecologically Sustainable Diets: policy position statement. Public Health Association, Canberra

Queensland Government (2015). Food and Nutrition Reports: healthy food access basket. Qld. Govt., Brisbane Accessed at: <https://www.health.qld.gov.au/research-reports/reports/public-health/food-nutrition/access> on 9 September, 2019

Queensland Government Statisticians office (2019). Australian Gambling Statistics, 1990–91 to 2016–17. Accessed at: [www.qgso.qld.gov.au/products/reports/aus-gambling-stats/](http://www.qgso.qld.gov.au/products/reports/aus-gambling-stats/) on February 10, 2019

Radcliffe, B. and Perkins, K. (2018). Determining Nutrition Strategies for Refugee Communities Using an Equity and Access Framework. Food Futures Conference. Public health Association

Railsback, S. F. and Johnson, M. D. (2014). Effects of land use on bird populations and pest control services on coffee farms. [Proceedings of the National Academy of Science U S A](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4000777/). Vol. 111 No. 16 pp. 6109–6114

Ramsey, R., Giskes, K., Turrell, G. and Gallegos, D. (2012). Food insecurity among Adults Residing in Disadvantaged Urban Areas: potential health and dietary consequences. Public Health Nutr 2012; Vol 15, pp. 227-237

Rangan, H. D., Louie, J., Flood, V. and Gill, T. (2009). Soft Drinks, Weight Status and Health: a review. NSW Centre for Public Health Nutrition

Redondo, M., Hernandez-Aguado, I. and Lumbreras, B. (2019). The Impact of the Tax on Sweetened Beverages: a systematic review. The American Journal of Clinical Nutrition. Vol, 108, No. 3 pp: 548-563

Richardson, T.E., Yanada, B.A., Watters, D., Stupart, D., Lamichhane, P. and Bell, C. (2019). What Young Australians Think about a Tax on Sugar-sweetened Beverages. Australia and New Zealand Journal of Public Health, Vol. 43, Issue 1

Right to Food Coalition (2018). Do We Really Have Food Security in Australia? Accessed at: <https://righttofood.org.au/>

Ripple, W. J., Wolf, C., Newsome, T. M., Galetti, M., Alamgir, M., Crist, E., Mahmoud, M. and Laurence, W. F. (2019). World Scientists Warning to Humanity: A Second Notice. BioScience, Volume 67, Issue 12, December 2017, pp. 1026–1028

Robinson, T., Jerebine, A., Kureme, A., Orellana., L, Backholder., K., Gilham, B., Cifone, S., Chung, S. and Peeters, A. (2010).-Removing Soft Drinks from YMCA Aquatic and Recreation Centres: results and reflections. Food Futures Conference 2018. Public Health Association

Ronto, R., Ball, L., Pendergast. D. and Harris, N. (2018). Adolescents’ View on High School Food Environments. Food Futures Conference 2018. Public Health Association

Rosenberg, K. V., Dokter, A. M., Blancher, P. J., Sauer, J. R., Smith, A. C., Smith, P. A., Stanton, J. C., Panjabi, A., Helft, L., Parr, M. and Marra, P. P. Decline of the North American Avifauna. Science. Vol. 365, No. 6459

Rosenzweig, C., Iglesias, A., Yang, X.B., Epstein, P. R. and Chivian, E. (2001). Climate Change and Extreme Weather Events; Implications for Food Production, Plant Diseases and Pests. Global Change and Human Health December 2001, Vol. 2, No. 2, pp 90–104 Accessed at: <https://link.springer.com/article/10.1023%2FA%3A1015086831467?LI=true>

Rosier, K. (2011). Food Insecurity in Australia: What it is, who experiences it and how can child and family services support families experiencing it? Australian Institute of Family Studies, Australian Government, Canberra.

Roy Morgan Research (2016). The Slow but Steady Rise of Vegetarianism in Australia. Accessed at: <http://www.roymorgan.com/findings/vegetarianisms-slow-but-steady-rise-in-australia-201608151105> on 1 September, 2019

Russell, J., Wright-Pedersen, S., Franse, B., Hayes, B. and Condon-Paoloni, D. (2018). Risks, Benefits and Efficacy of Food Reformulation within the Healthy Food partnership. Food Futures Conference 2018. Public Health Association

Sadegholvad, S., Yetman, H., Parrish, A. and Worsley, A. (2017). Exerts’ Views Regarding Australian School-leaver’s Knowledge of Nutritional and Food Systems. Australia and New Zealand Journal of Public Health, Vol. 41, Issue 5

Sheridan, J., Carey, R. and Candy, S. (2016). Melbourne’s Foodprint: what does it take to feed a city? University of Melbourne

Shojaei, H., Pauli, N., Haslam-McKenie, F. and Payet, J. (2018). Farmer’ Markets: Producer and community insights into an alternative food supply model. Food Futures Conference 2018. Public Health Association

Smith, K. J., Breslin, M. C., McNauthton, S. A., Gall, S. L., Blizzard, L. and Venn, S. J. (2017). Skipping Breakfast among Australian Children and Adolescents: findings from the 2011/12 National Nutrition and Physical Activity Survey. Australia and New Zealand Journal of Public Health, Vol. 41, Issue 6

Southcome, F. (2008). Feeding the Family in an Unfamiliar Environment: food insecurity among recently-settled refugees. NSW Refugee Service

Springmann, M., Mason-D’Croz, D., Robinson, S., Wiebe, K., Godfray, C., Rayner, M. and Scarborough, P. (2017). Mitigation Potential and Global Health Impacts from emissions Pricing of Food Commodities. Nature Climate Change, Vol. 7 pp: 69-74

State Government of Victoria (2011). Healthy Food Charter: creating a vibrant, healthy eating culture. State Government of Victoria, Melbourne

State Government of Victoria (2011). Healthy Food Connect: a support resource. State Government of Victoria, Melbourne

Stewart, C. and Johnston, A. (2018). 2018 Queensland Tuckshop Survey: creating a profile from healthy food and drinks. Food Futures Conference 2018. Public Health Association

Stiglitz, J. (2013). The Price of Inequality. W.W. Norton Company

Strategic Inter-governmental Nutrition Alliance of the National Public Health Partnership (2001). Eat Well Australia: a strategic framework for public health nutrition. Signal.

Sugar Research Advisory Service (2016). Pros and Cons of a Sugar Tax. Accessed at: [www.srasanz.org/sras/news-media-faq/current-news/pros-and-cons-sugar-tax/](http://www.srasanz.org/sras/news-media-faq/current-news/pros-and-cons-sugar-tax/) on 25 August, 2019

Sustainability Victoria (undated). Community Gardens. Accessed at [www.suustaiability.vic.gov.au/You-and-your-home/Live-sustanably/Grow-your-own-food/Community-gardens](http://www.suustaiability.vic.gov.au/You-and-your-home/Live-sustanably/Grow-your-own-food/Community-gardens)

Swinburn, B. (2008). Food Security: why should we care: Links with obesity. Deakin University and WHO Collaborating Centre for Obesity Prevention, Melbourne

Serdeczny, O., Adams, S., Baarsch, F., Coumou, D., Robinson, A., Hare, A., Schaeffer, M., Perrette, M. and Julia Reinhardt (2017). Climate change impacts in Sub-Saharan Africa: from physical changes to their social repercussions. [Regional Environmental Change](https://link.springer.com/journal/10113) August 2017, Volume 17, [Issue 6](https://link.springer.com/journal/10113/17/6/page/1), pp 1585–1600 Accessed at: <https://link.springer.com/article/10.1007/s10113-015-0910-2>

Tamir, O., Cohen-Yogev, T., Fuman-Assaf, S. and Endevelt, R. (2018). Taxation of Sugar-sweetened Beverages and Unhealthy Foods: a qualitative study of key opinion leaders’ views. Israel Journal of Health Policy Research Vol. 7 No. 43. Accessed at: [www.ncbi.nim.nih.gov/pmc/articles/PM6069556/](http://www.ncbi.nim.nih.gov/pmc/articles/PM6069556/) on 29 July, 2019

Temple, A.B. (2016). Severe and Moderate Forms of Food Insecurity in Australia: are they distinguishable? Australian Journal of Social Issues, Vol. 43, Issue 4, pp: 649-668

The Conversation (2018). Sugar Tax: what you need to know. Accessed at [https://theconversation.com/sugar-tax-what-you-need-to-know-94520 on 1 August 2019](https://theconversation.com/sugar-tax-what-you-need-to-know-94520%20on%201%20August%202019)

Thorpe, S. and Browne, J. (2009). Closing the Nutrition and Physical Activity Gap in Victoria: Victorian Aboriginal Nutrition and Physical Activity Strategy. Victorian Aboriginal Community Controlled Health Organisation, Melbourne

Tiong, A., Patel, M., Gardiner, J., Ryan, R., Linton, K., Walker, K., Scopel, J. and Biggs, B. (2006). Health Issues in Newly-arrived African Refugees Attending General Practice Clinics in Melbourne. Medical Journal of Australia, Vol. 185 (11/12), pp. 602-606

Turrell, G., Hewitt, B., Patterson, C., Oldenburg, B. and Gould, T. (2002). Socioeconomic Differences in Food Purchasing Behaviour and Suggested Implications for Diet-related Health Promotion. The Official Journal of the British Dietetic Association, Vol. 15, Issue 5, pp: 355-364

Ulger, Z., Halil, M., Kalan, I., Yavuz, B. B., Cankurtaran, M., Gungor, E. and Ariogoul, S. (2010). Comprehensive Assessment of Malnutrition Risk and Related Factors in a Large Group of Community-dwelling Older Adults. Clinical Nutrition, Vol, 29, No. 4, pp: 507-511

UN Food and Agriculture Organisation (2017). Food and Agriculture Report. Accessed at: [www.fao.org/3/i3437e/i3437e03.pdf](http://www.fao.org/3/i3437e/i3437e03.pdf) on 19 August, 2019

Uncited (2019). Climate Change: German MPs want higher meat tax. BBC News 8 August, 2019

University of Sydney, Faculty of Chemistry (2019). Daily Energy Intake and Expenditure. Accessed at https://scilearn.sydney.edu.au/fychemistry/calculators/food\_energy.shtml

US Department of Agriculture (2019). Frequency of Food Security. Accessed at: [www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/frequency-of-food-insecurity/](http://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/frequency-of-food-insecurity/) on 1 September, 2019

VicHealth (2003). Food For All?: food insecurity community demonstration projects, Maribyrnong City Council and North Yarra Community Health. VicHealth, Melbourne.

VicHealth (2008). Too Little and Too Much: exploring the paradox of food insecurity and obesity in disadvantaged populations. VicHealth, Melbourne

VicHealth (2010). Fast Food Advertising Proves Self-regulation is a Charade. VicHealth, Melbourne

VicHealth (2011A). Young Victorian Tradesmen have Poor Diet Research Shows. VicHealth, Melbourne

VicHealth (2011B). OPC Urges Fast Food Chains to Stop Selling Kids Toys. VicHealth, Melbourne

VicHealth (2012A). Extreme Weight Loss Programs Not Reality. VicHealth, Melbourne

VicHealth (2012B). Obesity Crisis in Victoria Grossly Underestimated. VicHealth, Melbourne Accessed at: [www.vichealth.vic.gov.au/search/obesity-crisis-in-vic-gorssly-underestimated](http://www.vichealth.vic.gov.au/search/obesity-crisis-in-vic-gorssly-underestimated)

VicHealth (2013). Killer-joules and Traffic Lights on Menus Make for Healthier Choices. VicHealth, Melbourne

VicHealth (2013A). Parents Call for More Green in School Canteens. VicHealth, Melbourne

VicHealth (2013B). Sports Star Endorsement Works A Treat On Junk Food Packaging. VicHealth, Melbourne

VicHealth (2014A). ACT Government Action on Sugary Drinks in Schools a Win for Children’s Health. VicHealth, Melbourne

VicHealth (2014B). Disadvantaged Australians Most at Risk of Obesity. VicHealth, Melbourne

VicHealth (2014C). Victorians Challenges to Switch to Water and Reap the Rewards. VicHealth, Melbourne

VicHealth (2014D). New SHO Guidelines Should be a Call to Industry to Stop Sugar Coating Kids’ Foods. VicHealth, Melbourne

VicHealth (2015). VicHealth Indicators Survey 2015. VicHealth, Melbourne

VicHealth (2016A). Victorian Citizens’ Jury on Obesity Insights Report 2016. Victorian Health Promotion Foundation, Melbourne

VicHealth (2016B). The H3O Challenge. VicHealth, Melbourne

VicHealth (2017). Healthy Food and Drink Choices in Community Sport: building on success. VicHealth and La Trobe University, 2017

VicHealth (2018A). Food for All: the accessibility, affordability and sustainability of healthy food choices is essential for good health. VicHealth, Melbourne

VicHealth (2018B). Supermarkets Must Do More to Prevent Obesity. VicHealth, Melbourne

VicHealth (undatedA). Supporting Healthy Eating: local Government action guide No. 7. VicHealth, Melbourne

VicHealth (undatedB). Supporting Healthy Eating: local Government action guide. VicHealth, Melbourne

VicHealth (undatedC). Food Alliance. VicHealth, Melbourne

VicHealth (undatedD). Overall Logic model for the Health Food partnership. VicHealth, Melbourne.

VicHealth (undatedE). The VicHealth Seed Challenge: background document. VicHealth, Melbourne

VicHealth (undatedF). The State of Salt: the case for salt reduction in Victoria. VicHealth, Melbourne

VicHealth (undatedG). Allocate Responsibility: identify who carries the food security agenda. VicHealth, Melbourne

VicHealth (undatedH). Building a Local Picture: establish an evidence base. VicHealth, Melbourne

VicHealth (undatedI). Food for All, Making a Difference: highlights from the Food for All final forum, 2010. VicHealth, Melbourne

VicHealth (undatedJ). Food for All: how local government is improving access to nutritious food. VicHealth, Melbourne

VicHealth (undatedK). Ten Ways Local Government Can Acton Food Security. VicHealth, Melbourne

VicHealth (undatedL). Policy and Plans: incorporate food security into council policy and plans. VicHealth, Melbourne

VicHealth (undatedM). Setting a Good Example: model food access in council-run activities, facilities and programs. VicHealth, Melbourne

VicHealth (undatedN). Regulatory and Fiscal Power: use council’s regulatory and fiscal powers to drive change. VicHealth, Melbourne

VicHealth (undatedO). Land Use Planning: influence land use, business mix and the built environment. VicHealth, Melbourne

VicHealth (undatedP). Advocacy: Get your voice heard – advocate on food security. VicHealth, Melbourne

VicHealth (undatedQ). Getting Food and Residents Together. VicHealth, Melbourne

VicHealth (undatedR). Healthy Eating for Residents: supporting residents to adopt healthy eating practices. VicHealth, Melbourne

VicHealth (undatedS). Growing Food Locally: Supporting residents to grow and harvest food. VicHealth, Melbourne

VicHealth (undatedT). Negative Growth: the future of obesity in Australia. VicHealth, Melbourne

VicHealth (undatedU). Supporting Healthy Eating: local government action guide, No. 7. VicHealth, Melbourne

VicHealth (undatedV). Salt Reduction in Victoria. VicHealth, Melbourne. Accessed at: [www.vichealth.vic.gov.au/programs-and-projects/salt-reduction](http://www.vichealth.vic.gov.au/programs-and-projects/salt-reduction)

VicHealth (undatedW). Food Insecurity in the Land of Plenty? VicHealth, Melbourne

VicHealth and Heart Foundation (undated). Food –sensitive Planning and Urban Design: a conceptual framework for achieving a sustainable and health food system. VicHealth, Melbourne

Victorian Commission for Gambling and Liquor Regulation (2019). Gaming Expenditure by Local Area. Accessed at: [www.vcglr.vic.gov.au/resources/data-and-research/gambling-data/gaming-expenditure-local-area](http://www.vcglr.vic.gov.au/resources/data-and-research/gambling-data/gaming-expenditure-local-area) on 1 September, 2019

Victorian Department Education and Training (2018). Maternal and Child Health Indicators: Victorian municipalities, 2001-2017. Customised tabulation of data Accessed at: [www.education.vic.gov.au/childhood/professionals/health/Pages/mchannualreport.aspx](http://www.education.vic.gov.au/childhood/professionals/health/Pages/mchannualreport.aspx)

Victorian Department of Health and Human Services (2014B). Food Insecurity with Hunger, by Income and by Housing Tenure Type. Tabulation from data presented in ‘Challenges to healthy eating: findings from the Victorian Population Health Survey 2014’. Victorian Government, Melbourne

Victorian Government (2015). Victorian Population Health Survey. State Government of Victoria, Melbourne

Victorian State Government (2016). Healthy Choices: policy guidelines for sport and recreation centres. Victorian Government, Melbourne. Accessed at: <https://www2.health.vic.gov.au/Api/downloadmedia/%7B7EF29993-EEC4-414F-B942-ADF75729E734%7D> on 27 August, 2019

Victorian Government (2019). 2016 Victorian Population Health Survey. Accessed at: <https://www2.health.vic.gov.au/public-health/population-health-systems/health-status-of-victorians/survey-data-and-reports/victorian-population-health-survey> on 11 September, 2019

Victorian Government (2019B). Victorian Public Health and Wellbeing Plan. Victorian Government, Melbourne

Watson, W., Wellard-Cole, L., Richmond, K. and Hughes, C. (2018). Building a Case for Food Marketing Regulation Over the Last 10 Years. Food Futures Conference 2018. Public Health Association

Webster, J. and Bolam, B. (2016). The State of Salt: how state-based initiatives can drive national action on salt reduction in Australia. Australia and New Zealand Journal of Public Health. Vol. 40, Issue 6

Wellard, L., Havill, M. and Watson, W. L. (2015). Energy-dense Fast Food Products Cost Less: an observational study of the energy density and energy cost of Australian fast foods. Australia and New Zealand Journal of Public Health. Vol. 39, Issue 6

Wellard-Cole, L., Watson, L. and Hughes, C. (2018). Nutrition Content and Health Claims on Labels in Australia Pre- and Post-regulation. Food Futures Conference 2018. Public Health Association

Welsh, K. J., Mock, N. and Netrebenko, O. (1993). Measuring Hunger in the Russian Federation Using the Radimer/Cornell Scale. Accessed at: <https://academic.oup.com/jn/article-pdf/125/11/2793/23044917/jn1250112793.pdf> on 1 September, 2019

WHO (World Health Organisation) (2003). Physical Inactivity a Leading Cause of Disease and Disability, Warns WHO. WHO, Geneva. Accessed at: [www.who.int/mediacentre/news/releases/release23/en/](http://www.who.int/mediacentre/news/releases/release23/en/) on 30 August, 2019

Winicki, J. and Jemison, K. (2018). Food Insecurity and Hunger in the Kindergarten Classroom: its effect on learning and growth. Contemporary Public Policy

WHO (World Health Organisation) (2017). Report of the Commission on Ending Childhood Obesity: implementation plan. WHO, Geneva. Accessed at: <https://apps.who.int/iris/bitstream/handle/10665/259349/WHO-NMH-PND-ECHO-17.1-eng.pdf?sequence=1> on 20 June 2019

WHO (World Health Organisation) (2018). Taking Action on Childhood Obesity. WHO, Geneva

WHO (World Health Organisation) (1998). Obesity: Preventing and Managing the Global Epidemic. Report of a WHO Consultation on Obesity. Geneva 3-5 June 1997, WHO Geneva

Wong, J. (2019). The Truth about Ancient Grains. New Scientist. 28 September, 2019. P. 25

Wyse, R., Wiggers, J., Delaney, T., Ooi, J. Y., Marshall, J., Clinton-McHarg, T. and Wolfenden, L. (2017). The Price of Healthy and Unhealthy Foods in the Australian Primary School Canteens. Australia and New Zealand Journal of Public Health, Vol. 41, Issue 16

Yu, M. and Baxter, J. (2016). Australian Children’s Screen Time and and Participation in Extra-curricular Activities: LSAC Annual Statistical Report — September 2016. Australian Institute of Family Studies, Canberra. Accessed at: <https://growingupinaustralia.gov.au/research-findings/annual-statistical-report-2015/australian-childrens-screen-time-and-participation-extracurricular?_ga=2.196549226.799864629.1569295356-1530022594.1569295356> on 24 September, 2019

1. Bes-Rastrollo et al (2013) sound a note of caution in relation to research about this topic – and one that is pertinent to nutritional research in general. In a review of findings about the impacts of sugary drinks, they determined that where no conflict of interest existed between researchers and the subject of their inquiries, 83% concluded that sugar-laden drinks contribute to obesity. By contrast, where a conflict of interest did exist – as for example, if the researcher was sponsored by the food industry – 83% of their research findings contended that the available evidence *did not* establish a link between sugary drinks and obesity, or at least, was insufficient to reach such a conclusion with finality. [↑](#footnote-ref-1)
2. The five most disadvantaged communities are those with the lowest measures in Victoria on the SEIFA Index of Relative Socio-economic Disadvantage, based on the findings of the 2016 Census: Brimbank, Central Goldfields, Greater Dandenong, Latrobe and Mildura. The least disadvantaged municipalities, on this index, were Bayside, Boroondara, Nillumbik, Stonnington and Surf Coast. [↑](#footnote-ref-2)
3. Approaching this issue from a different perspective, it is observed that 44% of energy intake stems from consumption of ultra-processed foods (Machado et al, 2018) – not strictly equivalent to ‘discretionary’ food (AIHW, 2018B). [↑](#footnote-ref-3)
4. Such as the Australian Bureau of Statistics Population Survey Monitor, the 1995 National Health Survey and the 2014 Victorian Population Health Survey [↑](#footnote-ref-4)
5. Alternative approaches do exist, and include sequences of questions which inquire into the adequacy of available food, reductions or changes to food consumption by the household members in general or by children in particular (52). [↑](#footnote-ref-5)
6. The findings of population surveys featuring this inquiry include 5.2% in 1995 (Australian Institute of Family Studies, 2018), 6.1% in the 2001 Child Health Survey, 5.2% in the Victorian VicLanes survey (Burns, 2009), and 4% in the 2011/12 National Health Survey. [↑](#footnote-ref-6)
7. The 2016 Census determined that 82% of the heads of sole parent families in Victoria were women [↑](#footnote-ref-7)
8. Notably, James (2008) relates that vegetable growers operating in an economic environment where the production of nearly identical goods exposes them to price determination by buyers, with the result that vegetable growers can provide substantial supplies of food at a relatively modest price. [↑](#footnote-ref-8)
9. One person household: Cost per fortnight: $126 or 21% of Centrelink fortnightly payment of $612 for a single person on unemployment benefits.

   Two person household: Cost per fortnight: $234 or 17% of Centrelink payment of $1,398 for an older, childless couple.

   Three-person household: $328 or 21% of Centrelink payment of $1,546 for a single parent with two dependent children.

   Four-person household: $453 or 21% of Centrelink payment of $2,137 for a household of two parents and two dependent children. [↑](#footnote-ref-9)
10. Similar findings emerged from a 2018 survey by the same author, of over 600 food insecure parents, which found that aggravating circumstances included unexpected expenses (52%), housing payments (38%), injury (11%), family breakdown (8%) and dissipation of funds on alcohol, other drugs or gambling (8%) (McCrindle, 2018). [↑](#footnote-ref-10)
11. Rental costs were deducted from household incomes for various types of one-family households – both figures derived from the findings of the 2016 Census. Then the modified OECD equivalence scales (in which the 1st adult incurs a weighting of 1; further adults of 0.5 each; and children of 0.3 each) were applied to determine the number and percentage with an income, after paying rent, that represents a standard of living equivalent to that of a single person household on an income of $354 – the June 2016 Henderson Poverty Line for a single person without housing costs - after deducting any housing costs. [↑](#footnote-ref-11)
12. Based on the findings of the Food Basket Survey, which concluded that in 2014 the cost of providing a balanced, nutritious diet to an adult was $126 per fortnight - which has been adjusted here by the Melbourne CPI to $137 in 2019 – equal to $69 per week. The weekly cost for a child has then been estimated at $48 p.w, or $2,493 per annum - based on the proposition that the cost of living for a child is 70% that of an adult – in accord with the OECD equivalence scales used to estimate the prevalence of poverty. Finally, 2018/19 EGM gambling losses of $119.4 million in Greater Dandenong are divided by $2,493 to give 47,859 – the number of children whom these gambling losses could feed for a year, a figure which is rounded to the nearest 100 in the comment above. [↑](#footnote-ref-12)
13. Calculated as losses per adult x 100/17 (to accommodate for the fact that approximately 17% of Victorian adults use EGMs (Hare, 2015), divided by median individual weekly gross incomes, reported in the 2016 Census [↑](#footnote-ref-13)
14. The authors cite findings which range from 12 to 82% of homeless people, including a survey of 4,300 case histories published by the Australian Institute of Health and Welfare which resulted in an estimated prevalence of 31% [↑](#footnote-ref-14)
15. In Hunt Club, VCAT declared: “At its heart, planning is about the use, development and protection of land. Town planning does not involve itself in moral judgements … it is not the role of town planning to address all issues of public health, nor to …manage the health and well being of a society.” [↑](#footnote-ref-15)
16. The 2016 Census recorded an unemployment rate of 18% among residents who had settled in Australia in the previous 4.5 years, including rates of over 20% among those from Malaysia, Cambodia, Vietnam, China and Afghanistan and more than 30% among settlers from Indonesia, Burma, Iraq and Iran. [↑](#footnote-ref-16)
17. On the subject of offers of toys to promote convenience food, research by the Cancer Council Victoria found that most Australian grocery buyers favoured prohibition of the use of free toys to promote unhealthy food among children (VicHealth, 2011B). In 2011, Kentucky Fried Chicken announced that it would no longer promote its food by giving away toys with children’s meals (VicHealth, 2013A). [↑](#footnote-ref-17)
18. However, overall income distribution appears to have shifted slightly towards equality in recent years, the Community Council of Australia (2019) commenting that between 2013/14 and 2015/16, income distribution became slightly more equal in Australia, with the Gini coefficient – which measures income inequality with a scale of 0 for perfectly equal incomes and 100 for complete inequality – declining from 33.3 to 32.3 during this period, while the Victorian coefficient declined also, from 34.5 to 34.1. [↑](#footnote-ref-18)