The Role of Diet in the Prevention and Management of Type 2 Diabetes

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The Dietitians Association of Australia (DAA) is the national association of the dietetic profession with over 6000 members, and branches in each state and territory. DAA is a leader in nutrition and advocates for food and nutrition for healthier people and healthier nations.

The Australian Diabetes Educators Association (ADEA) is the leading organisation for healthcare professionals with a special interest in diabetes education and management. ADEA's mission is to lead and advocate for best practice diabetes education and care. ADEA is committed to support its members' efforts to provide evidenced – based best practice diabetes education and care to people with or at risk of diabetes, their carers and families.

Position:	Professional Services Dietitian
Organisation:	Dietitians Association of Australia
Address:	1/8 Phipps Close, Deakin ACT 2600
Telephone:	02 6189 1217
Facsimile:	02 6282 9888
Email:	psdietitians@daa.asn.au

DAA / ADEA interest in this consultation

DAA / ADEA are concerned about the prevalence of type 2 diabetes in the Australian population, including in those living in Western Australia.

Accredited Practising Dietitians (APDs) provide medical nutrition therapy to all people with diabetes, including those with pre-diabetes, Type 1 diabetes, Type 2 diabetes, and gestational diabetes.

Credentialed Diabetes Educators (CDEs) provide self-management diabetes education, including general nutrition for people with type 2 diabetes and refer people with type 2 diabetes to APDs for medical nutrition therapy.

DAA and ADEA have a vested interest in advocating for the essential role of diet in the prevention and management of type 2 diabetes. The two professions have an integrated role in the management of type 2 diabetes, in fact many CDEs are APDs, and vice versa.

Recommendations

The DAA and ADEA appreciate the opportunity to submit our position on the role of diet in the prevention and management of type 2 diabetes by the Western Australian Legislative Assembly. DAA and ADEA recommend the following:

1. Diet and nutrition therapy are first line intervention in both the prevention and management of type 2 diabetes.
2. Governments should invest in long-term prevention and management diet and nutrition initiatives that are equitable across different populations. These should be delivered to individuals either in person or via telehealth, or in group settings.
3. In parallel to diet and nutrition initiatives that focus on the individual, governments should invest in public health initiatives that include long-term health messaging, food regulation and policy improvements, and changes to the environment that promote healthy food choices and physical activity.

Key messages

- DAA and ADEA are concerned about the extensive cost of type 2 diabetes (and its associated risk factors) to the Australian community. There needs to be greater investment in both prevention and management of type 2 diabetes to reduce the burden on the health system.
- DAA and ADEA recognise that the cost of type 2 diabetes to the Australian health system is greater as disease progresses, and therefore advocate for greater government support to enhance the capacity of primary care professionals such as APDs and CDEs. Specifically, greater government funding is needed in the following areas:
- Increased funding and number of sessions for Medicare Benefit Scheme (MBS) Items for allied health practitioners, including access of these items for those with pre-diabetes and gestational diabetes.
- Increased funding to allow for long-term intensive type 2 diabetes prevention and management programs
- Funding for allied health practitioners to use telehealth to communicate with patients that have barriers to service access (e.g. those living in rural and remote areas or with limited mobility)
- DAA and ADEA advocate for comprehensive and long-term prevention and management interventions, utilising both individual and community health strategies.
- DAA and ADEA support interventions that aim for weight reduction in participants with type 2 diabetes, however do not support an undue focus on weight when providing interventions.
- DAA and ADEA recognise diet as a key factor in weight management, and do not support a one-size-fits all approach to specific diets and their role in the prevention and management of type 2 diabetes.
- DAA and ADEA support a person-centred approach in the dietary prevention and management of type 2 diabetes. Practitioners should always consider individual factors such as environmental, social and cultural factors, age, and education, financial and mental or physical capacity.
- DAA and ADEA advocate for changes to regulation in the food industry, including advertising and food labelling, to improve the overall nutrition quality in the current Australian population and future generations to come.

Discussion

The cost of type 2 diabetes to the community

DAA and ADEA highlight that the prevalence of diabetes has been escalating over the last three decades, with rates tripling over this period [1]. Type 2 diabetes affects over 1.1 million Australians according to the current National Diabetes Services Scheme *Australian Diabetes Map* [2].

DAA and ADEA understand, from 2014-15 self-reported data from the National Health Survey [1], that rates of type 2 diabetes are generally similar among men and women (6% and 5%, respectively), increase with age and are higher among the elderly, Indigenous Australians and those that are socioeconomically disadvantaged. Surprisingly, type 2 diabetes was relatively similar across major cities, regional and remote areas (5%, 6%, and 6% respectively), though this was not the same when all types of diabetes were considered.

DAA and ADEA highlight recent research by the Boden Institute of Obesity [3] estimates that a further 350,000 Australians are living with undiagnosed type 2 diabetes. While increasing incidence of type 2 diabetes is one of the reasons that prevalence is increasing, improvements to medical science have potentially increased longevity of people with type 2 diabetes [4].

DAA and ADEA recognise that the cost of type 2 diabetes to the Australian community is significant. Lee et al. estimated the total annual cost of diabetes in 2010 for Australians aged ≥30 years to $14.6 billion [5], with a 2013 report by Diabetes Australia reporting that type 2 diabetes alone costs up to $16 billion per year (including healthcare, carers, and Commonwealth government subsidies) [6].

Costs were substantially higher in people with micro- and macrovascular complications that resulted from long-standing diabetes and inadequate management [5]. Nerve damage in the lower limbs affects around 13% of people with type 2 diabetes and diabetic retinopathy (eye damage) occurs in over 15% of people with type 2 diabetes. Diabetes is the leading cause of end stage kidney disease in Australia. Cardiovascular Disease (CVD) is the primary cause of death, with around 65% of all CVD deaths in Australia occurring in people with diabetes or pre-diabetes [6].

DAA and ADEA highlight the cost of life lost by diabetes in Australia. Evidence from the 2014-15 national health study indicates that diabetes is ranked in the top 10 leading causes of death in Australia, contributing to 10% (n=16,400) of deaths in 2015. Of this, 55% (n=9,000) of deaths were due to type 2 diabetes [1] (please note, this is self-reported data).

The adequacy of prevention and intervention programs

DAA and ADEA recognise that type 2 diabetes is the most common form of diabetes and, in many cases, is preventable by achieving a healthy lifestyle [1]. DAA and ADEA agree that interventions aimed to improve both physical and mental health in patients with type 2 diabetes are of key importance to the successful prevention and management of the disease [7].

DAA and ADEA acknowledge that there are lifestyle intervention programs offered in Australia. These are aimed at the prevention and management of type 2 diabetes through weight reduction, healthy eating, regular physical activity and smoking cessation. However, DAA and ADEA advocate that more are required to ensure equity in initiatives across at-risk populations and demographics [1,6,8].

DAA and ADEA note that women with Polynesian, Asian, Middle Eastern and Aboriginal and Torres Strait Islander (ATSI) background have significantly higher risks of gestational diabetes and type 2 diabetes (by up to 44% in South Asian women) [8- 10].

DAA and ADEA are aware of the link between that Gestational Diabetes Mellitus (GDM) and the risk of developing type 2 diabetes and associated complications in the future [11-13]. GDM is a condition that develops in up to 30% of pregnancies in Australia and worldwide [14].

Type 2 diabetes prevention interventions

The European Evidenced Based Guidelines for the Prevention of Type 2 Diabetes [15] indicate that lifestyle interventions resulting in 5-7% body weight loss can reduce the risk of developing type 2 diabetes by 50%, with a *European Diabetes Prevention Study* finding that sustained weight loss of 5% after three years demonstrating a reduced risk of type 2 diabetes by up to 89% [16]. *The Diabetes Prevention Program (DPP) Trial* [17] in the United States provided similar findings, suggesting that, for every kilogram of body weight lost, there was a relative risk reduction of type 2 diabetes by 16%. Participants in the 'Lifestyle Change Group' in the DPP trial showed continued benefits related to delayed diabetes progression 15 years after the trial. It is worth noting that during the initial program they were well supported in person and/or via phone.

DAA and ADEA support that, to adopt healthy behaviour that is conducive to reducing weight, individuals require interventions that provide the appropriate tools and education to make improved food choices and enable self-management of their disease [18]. Referral to an APD for individualised nutrition advice is indicated [19].

DAA and ADEA highlight further evidence from the Look AHEAD trial in the United States that suggests early intensive lifestyle intervention (i.e. as soon as diabetes is diagnosed) with a dietitian, psychologist and/or exercise specialist may induce type 2 diabetes remission [20]. Likewise, the *US Community Preventive Services*

Task Force evidence summary and recommendations for intensive lifestyle interventions for patients with pre-diabetes and type 2 diabetes concludes that intensive lifestyle interventions providing ongoing counselling, coaching, and individualised guidance to patients are associated with more weight loss and a lower risk of developing type 2 diabetes in the future [21]

Type 2 diabetes management interventions

DAA and ADEA recognise that type 2 diabetes is a common disease in Australia [1], and that it requires comprehensive, long-term interventions that educate and support individuals on the importance of managing their condition appropriately.

DAA and ADEA highlight evidence to indicate that it is more common for patients living in rural and remote communities to attend individual counselling sessions than group sessions. This may be due to the in difficulty engaging sufficient patient numbers at any particular time in these locations [22]. DAA and ADEA highlight that scoping of travel distance should be considered when targeting diabetes management intervention programs at these populations.

DAA and ADEA highlight that there is research into why group classes may be effective in diabetes management [23], suggesting that group classes tend to be longer in duration than individual visits, and the information received from group classes is rated as more 'useful' by participants than that received at individual counselling. Patients also value being able to share problems with similarly affected individuals [23].

The current workforce

One systematic review and meta-analysis [19] indicated that referral to a dietitian for nutrition therapy (rather than dietary advice provided by other professionals) has demonstrated to produce greater effects on HbA1c, weight, and LDL cholesterol. The same study also highlighted the importance of dietetic advice being included as part of a lifestyle intervention, rather than as a stand-alone treatment.

DAA and ADEA indicate that, according to Pekarsky [24], the current CDE workforce is able to serve approximately 57% of patients in Australia with diabetes, not including people with pre-diabetes. DAA does not have similar statistics on APDs, but many APDs are also CDEs, or would work closely with one in their multidisciplinary team. ADEAs *CDE Map* [25] indicates CDEs are concentrated in major cities and are less prevalent in rural and remote areas, indicating the need for governments to increase initiatives that bring practitioner to these communities, or support access such as funding for allied health telehealth items in the MBS.

DAA and ADEA are concerned that the current model of care in the Medicare Benefits Scheme (MBS) Chronic Disease Management plans do not allow for appropriate education and follow-up by allied health practitioners in patients, including those with type 2 diabetes.

DAA and ADEA have both provided submissions to the government to advocate for greater recognition of the role of APDs and CDEs in Chronic Disease Management plans (See Attachment 1. DAA Pre-Budget Submission Medicare 2013). Key points have been summarised below.

- DAA and ADEA highlight that the current Annual Cycle of Care program [26] through GPs should be individualised so that self-management is best able to be supported by the appropriate health professional. DAA and ADEA are concerned that, while this program provides a detailed set of patient management steps that GPs can use to provide patients diabetes management through Medicare, there is no guarantee that the plans are completed in consultation with other health care providers or the patient. Person-centred care is important to encourage diabetes self-management [27,].
- DAA and ADEA highlight that MBS Chronic Disease Management plans include 5 referrals per annum for each patient [28]. These must be chosen from 11 possible health professionals. DAA and ADEA advise that this limited number of appointments within this system is vastly inadequate to ensure effective ongoing support and education to promote self-management. As a result, there is a potential for visits to be wasted, or excessive visits to be used (which in turn impacts clinicians who then are not reimbursed for their services). DAA and ADEA identify that the system is challenging for both patients and health professionals.

Telehealth

DAA and ADEA highlight evidence to support the use of telehealth in the management of patients with type 2 diabetes [29], and advocate for telehealth facilities to be made available to all people with diabetes to ensure appropriate access to health professionals, this is particularly important for those with access barriers, such as those living rurally or remotely or with limited mobility. While developments in telehealth initiatives exist, limits are applied by Medicare's eligibility criteria and focus on medical consultations, rather than allied health [28]. For CDEs and APDs there is no MBS item for telehealth.

Use of group education

DAA and ADEA view group education as an important preventative and management strategy for type 2 diabetes. It has shown significant benefits and positive outcomes for people with type 2 diabetes and pre-diabetes [22] and has been supported as a superior intervention than individual counselling [29]. However, DAA and ADEA are aware that some studies have indicated poor outcomes in regards to attendance or completion of group programs. DAA and ADEA therefore highlight that consideration needs to be given to improving access to these programs and making them more appealing to people with, or at risk of developing diabetes. Below is a summary from some group education programs aimed at the prevention or management of type 2 diabetes.

- The *Life!* Program is a lifestyle modification program for pre-diabetes. A 2015 Victorian study reported that, from 2007 to 2011, *Life!* received 29,000 referrals. Only 8412 (29%) individuals commenced the program, and of these only 3114 (37%) completed sessions 1 to 6 [30].
- A study in the UK [31] reported a 4% attendance rate to a structured self-management diabetes education program. The authors collected data from potential participants on reasons for non-attendance. Results showed that 65-70% of respondents believed that their diabetes was well-controlled or that they already knew enough about diabetes. Almost 50% of respondents thought that their diabetes was "mild" and that they were not at risk of developing complications. Respondents identified a range of barriers to their participation, including lack of information about the programs, time, cost (related to both travel and time off work), living too far away from where the program is held, physical disability, language problems, and difficulty in understanding the content of the programs.
- Another study from the UK also found that younger people, particularly those who are overweight/obese and are smokers were less likely to be engaged in group education programs, as well as those from lower socioeconomic areas [32].
- In 2016 DAA, ADEA and ESSA co-authored a submission advocating for the government to extend eligibility to include pre-diabetes under Medicare items for 'Allied Health Group Services for patients with Type 2 Diabetes Mellitus'. The purpose of this was to allow patients with pre-diabetes to utilise group programs facilitated by private practitioners for prevention of type 2 diabetes. DAA and ADEA support that private practitioners can be flexible in program delivery and timing of education sessions which may assist in reducing barriers to attendance (see Attachment 2. Type 2 Diabetes Medicare group Services Information Pack).

Early life nutrition for prevention of type 2 diabetes

DAA and ADEA are founding members of the early life nutrition coalition (ELNC). The ELNC is a subcommittee of Perinatal Society of Australia and New Zealand (PSANZ). The ELNC is working to improve long-term health in Australia and New Zealand by harnessing the power of the First 1,000 Days of life. As outlined in the research [33, 34], many factors during gestation and early childhood can have an impact on type 2 diabetes for future generations. This includes maternal and paternal nutrition, body weight pre-conception, body weight during pregnancy, breast feeding, and caregiver mealtime modelling.

The use of restrictive diets to eliminate the need for type 2 diabetes medication

The Royal Australian College of General Practitioners provide evidence to support that [8]. They also highlight that

DAA and ADEA support the importance of focusing resources into the prevention of type 2 diabetes, and advocate that diet and nutrition therapy must be part of first line treatment in the prevention and management of type 2 diabetes. The role of diet cannot be underestimated in the management of type 2 diabetes co-morbidities such as CVD, obesity, metabolic syndrome, insulin resistance and renal impairment. [8].

DAA and ADEA support a flexible approach to the role of diet in the prevention and management of diabetes. There are several dietary patterns that may reduce the risk of type 2 diabetes. These include:

- The Mediterranean diet [35-38]
- Dietary Approach to Stop Hypertension (DASH) diet [39]
- Plant-based; Vegetarian or vegan diets [40]
- The Nordic healthy diet [41]
- Moderate carbohydrate restriction [42]

DAA and ADEA do not support that restrictive diets can eliminate the need for type 2 diabetes medication for all individuals with type 2 diabetes. DAA and ADEA highlight that not every person can stick to a restrictive diet, and self-efficacy in adherence to a diet is likely to predict positive outcomes for dietary interventions, rather than the type of dietary strategy itself [43-47].

DAA and ADEA align with the position of Diabetes Australia, in that no one diet is suitable for all individuals [48].

DAA and ADEA support the Australian Dietary Guidelines (ADGs) [49] as an effective tool to assist healthy individuals meet their nutritional requirements. However, DAA and ADEA acknowledge that they may not be suitable for

individuals with type 2 diabetes. This is because individuals with diabetes were not included in the studies that formed the body of evidence for the ADGs, and may have different nutritional requirements to those without diabetes. DAA and ADEA advocate for individuals with type 2 diabetes to be referred to an APD for individualised nutrition advice [19]. DAA and ADEA highlight the DAA role statement for APDs working in the area of diabetes (see Attachment 3. DAA Diabetes Role Statement 2018). DAA and ADEA support the referral of individuals with type 2 diabetes to a CDE for tailored advice on managing all other factors of their disease [50].

Restrictive Carbohydrate diets

DAA and ADEA highlight restricting carbohydrate may not be an appropriate solution for all individuals with type 2 diabetes but do identify it as a potential strategy for suitable individuals to self-manage their diabetes. This may/may not lead to a reduction in diabetes medication [51].

DAA and ADEA advise that one challenge of recommending a restricted carbohydrate diet is that there is no clear definition of what that is [52, 53]. It could be useful to determine one definition to be applied across all health disciplines [53, 54]. DAA and ADEA support the definitions adopted by Diabetes Australia on page 7 of their recent *Position Statement – Low carbohydrate eating for people with diabetes [55]*.

Table 1: Common definitions of carbohydrate intake [2,4]

Carbohydrate content	Grams/percentage of daily intake
High carbohydrate	More than 225g of carbohydrate daily/ more than 45% of total daily energy intake
Moderate carbohydrate	130g–225g of carbohydrate daily/ 26%–45% of total daily energy intake
Low carbohydrate	Less than 130g of carbohydrate daily/ less than 26% of total daily energy intake

NOTE: Gram values are based on a 2,000 calorie diet

DAA and ADEA highlight that the evidence for people with type 2 diabetes consuming a low carbohydrate diet is still in its infancy. Recent systematic reviews and meta-analyses have shown low carbohydrate diets are safe and effective in the short term (up to six months), with potential benefits in managing blood glucose levels, and reduced risk of heart disease [53, 54]. However, DAA and ADEA quote the UK Guidelines [56] that state, on page 30: "*there are no studies reporting the efficacy or safety of very low carbohydrate diets over the long-term in people with type 2 diabetes*". The Guidelines [56] report that the main health benefits of reducing carbohydrate intake arise from incidental total calorie restriction. A challenge highlighted in interpreting much of the research used to develop these Guidelines is that many studies rely on self-reported intakes, which may result in reporting bias for quantity and types of carbohydrates consumed.

Low fat diets

DAA and ADEA indicate that there is some evidence to support a low-fat diet in reduction of weight [57, 58] and HbA1C [59] for individuals with type 2 diabetes. This research does not extend to its impact on reducing diabetes medication.

Very Low Energy Diets (VLED's)

DAA and ADEA note that there is adequate evidence to support the use of VLEDs to support weight loss in type 2 diabetes. However, the long-term use of this method is not supported as the recommended use of these products, and its impact on reducing diabetes medication has not been directly reviewed [56].

DAA and ADEA support that VLEDs could be considered a tool to use in combination with other diabetes management strategies, and patients should be transitioned onto an individualised dietary plan after 12 weeks [59-64]. DAA and ADEA recognise that, in order to ensure nutritional adequacy of the diet during a VLED, the use of meal replacement products is considered safe and effective for the management, and even potential remission of type 2 diabetes for a period of up to 12 weeks [65-69].

Regulatory measures to encourage healthy eating

DAA and ADEA support regulatory measures that include clear messaging and labelling to ensure appropriate information and education is available to consumers. DAA and ADEA agree that this has the potential to encourage healthy eating and enable consumers to make safe choices relevant to their individual health status.

DAA and ADEA acknowledge the importance of progressive monitoring and evaluation of fast food menu labelling schemes to assess their impact, make improvements, be transparent and provide qualitative and quantitative evidence to inform policy decisions. DAA and ADEA highlight some food regulation and policy initiatives that have been introduced into Australia. It is worth noting that many of these are yet to be mandated by the Australian government. DAA and ADEA support mandatory food policy that encourages innovation and progression within the food industry.

Health Star Rating

DAA and ADEA support the Health Star Rating (HSR) as a useful Front of Pack (FOP) labelling measure, however it is a complex system and is not mandatory on all packaged foods (See Attachment 4. DAA Health Star Rating submission 2017). DAA and ADEA acknowledge that there are some limitations to this tool:

- the HSR was not designed for either the prevention or management of diabetes but is a tool to assist consumer make healthy food choices.
- The algorithm used is not able to separate added sugars from the total carbohydrate content, and scores oils high in poly- and mono-unsaturated fats as less healthy. This skews the rating system for some foods.
- As it stands, the HSR does not align with the Australian Dietary Guidelines [40], in that it does not encourage the consumption of core food groups, including whole foods such as fruit, vegetables, nuts and seeds.

DAA and ADEA highlight that there is some evidence to support the HSR as a preferred FOP labelling tool over others [62]. Despite the limitations, DAA and ADEA support it as a useful tool to assist individuals to make healthier food choices. This include those with, or at risk of developing type 2 diabetes. Individual situations need to be considered when recommending its use.

Sugar, fats and oil labelling for packaged foods and drinks

DAA and ADEA support a regulated approach to the labelling of added sugars, fats and oils on packaged foods and drinks particularly to allow greater information provision to consumers that aligns with the HSR. DAA support the clear messaging of different types of added sugars, fats and oils on the Nutrition Information Panel. DAA and ADEA acknowledge that there is a growing body of evidence for FOP warning labels [70-73], and Dixon et al. [74] indicated that warning messages may allow parents to more accurately assess the nutritional value of packaged foods. However, DAA and ADEA note the evidence is limited to sugar sweetened beverages only [71]. Therefore, DAA does not support warning labels on other products at this time until further trials and studies can be undertaken to build the evidence. If proven effective, FOP warning labels on foods high in sugars, and saturated fats and oils, should be implemented. This should again be combined with appropriate evaluation (for further information, please see Attachment 5).

Menu Labelling

DAA and ADEA support regulated menu labelling in Australia and encourage a consistent approach to labelling style for all food outlets, including the use standardised units and language (i.e. kilojoules instead of calories). This will ensure consumers are able to receive education around reading menu labelling and make informed choices when selecting off menus. There is strong evidence to support that menu labelling is an effective strategy to improve nutrition choices [75, 76], and that consumers do choose meals with fewer kilojoules [77].

Voluntary food reformulation targets for added sodium, saturated fats and sugars.

DAA and ADEA are aware that there is currently a review being undertaken on setting voluntary food reformulation for the nutrient's sodium, saturated fat and added sugars [78]. DAA and ADEA support that, if the government were to regulate these targets, it would drive innovation within the food industry to find alternatives that consider both food safety and consumer acceptance [79, 80].

DAA and ADEA agree that all measures, regulatory or not, need to be rolled out in conjunction with appropriate public health messaging and education, to facilitate consumer behaviour change.

Social and cultural factors affecting healthy eating

DAA and ADEA agree that social and cultural factors affect healthy eating, which in turn could impact on an individual's likelihood of developing type 2 diabetes or lead to disease progression for those who already have type 2 diabetes.

DAA and ADEA acknowledge that socially and economically disadvantaged people are more likely to purchase cheaper, energy-dense foods rather than low energy-dense foods such as fruit and vegetables. People in more highly educated and higher socio-economic groups are more like to select food based on health rather than cost [81].

Among Australian seniors with chronic disease, those with cancer or diabetes were more likely than others to face a heavy burden from out-of-pocket-expenses relative to income [82]. Specifically, to Western Australia, low-income earners in Perth access GPs regularly, but their access to other professionals such as dietitians and podiatrists is very limited [83].

Our food culture is driven by advertising.

DAA and ADEA are concerned that the foods advertised in Australia are inconsistent with the ADGs [49]. The majority of recorded advertisements are for foods classified as 'discretionary foods', there are low levels of advertising for fruit and vegetables, and there are no social marketing messages to support healthy eating [84].

DAA and ADEA are aware that there is a positive association between time spent watching television and an increase in the prevalence of childhood overweight and obesity. Television watching is associated with an increase in consumption of fast food and energy-dense snacks [85].

Children adopt eating habits from an early age

DAA and ADEA highlight that studies [33] have indicated epigenetic programming during foetal development may be influenced by maternal intake of protein, fat

and carbohydrate during pregnancy. These studies observed that the same nutrients, particularly protein and fat, are consumed later in childhood (assessed at 10 years of age). Offspring of mothers exposed to extreme hunger in early gestation were twice as likely to consume a high-fat diet in later life.

DAA and ADEA support that improving health and nutritional status of both men and women before pregnancy improves long term health outcomes for mothers and children across generations. Improving women's nutritional status and weight management during pregnancy also impacts on long term health outcomes for offspring across the lifespan [34].

Ethnic groups at greater risk of developing diabetes

DAA and ADEA acknowledge that people from the Pacific Islands, Indian subcontinent, or Chinese backgrounds are at greater risk of developing diabetes for several reasons, including language barrier, changes to their food supply, [86, 87]. As mentioned above, Indigenous Australian adults are four times more likely to have diabetes, than those who are non-indigenous [1].

People in rural and regional areas

DAA and ADEA identify those individuals living in rural and remote areas as at risk of food security [88], which in turn could impact on healthy eating choices and diabetes prevention or management. Statistically, there is not a large difference between individuals living in metro vs rural and/or remote areas, and self-reported incidence of type 2 diabetes only [1].

Behavioural aspects of healthy eating and effective diabetes self-management

DAA and ADEA acknowledge that dietary behaviour is linked to the prevention and management of type 2 diabetes and is complex and multifactorial.

DAA and ADEA are concerned that many public health policies put too much emphasis and onus on an individuals' capacity for behaviour change. DAA and ADEA highlight literature that supports the importance of large-scale change to social, food and built environments to enable greater type 2 diabetes management by individuals in the community [89-92]. Hence, DAA and ADEA support that environmental factors are equally important to facilitate behavioural change, as individual choice and will.

DAA and ADEA acknowledge that health promotion campaigns need to be sustained over time to impact behaviour change [93], just as it has been demonstrated that sustained exposure to food product marketing such as

television advertising was found to influence food choices and eating behaviours in certain populations [94]. DAA and ADEA acknowledge that this would require financial and resource commitment of governments to keep these campaigns running.

DAA and ADEA highlight that mental health conditions such as anxiety, depression and eating disorders can negatively impact the self-management of individuals with type 2 diabetes [95-100]. Women with type 2 diabetes are at greater risk of developing mental health conditions than men [98]

DAA and ADEA advocate for individuals to be encouraged to engage in healthy behaviours (such as healthy consumption of food and drink, regular exercise, adequate sleep and smoking cessation) with a goal of weight management as an important factor in preventing or managing Type 2 diabetes [56, 95].

Despite the clear link between weight management and type 2 diabetes prevention and management, it is important to acknowledge that there is also a strong link between mental health conditions and type 2 diabetes. DAA and ADEA do not support an undue focus on weight management as part of an intervention strategy for individuals with type 2 diabetes. DAA and ADEA encourage that individual circumstances are considered, and goals are set collaboratively when developing preventative or management plans with patients that have type 2 diabetes.

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Attachments

1. Attachment 1 DAA Pre-Budget Submission Medicare 2013
2. Attachment 2 Type 2 Diabetes Medicare group Services Information Pack
3. Attachment 3 DAA Diabetes Role Statement 2018
4. Attachment 4 DAA Health Star Rating submission 2017
5. Attachment 5 DAA Sugar labelling submission 2018