THE HOUSE OF REPRESENTATIVES STANDING COMMITTEE ON HEALTH, AGED CARE AND SPORT – PARLIAMENTARY INQUIRY INTO DIABETES

Reducing the impact of type 2 diabetes: Detection, prevention and remission

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REDUCING THE IMPACT OF TYPE 2 DIABETES: DETECTION, PREVENTION AND REMISSION

Introduction

Together Diabetes Australia, the Australian Diabetes Society and the Australian Diabetes Educators Association represent 1.5 million Australians living with known, diagnosed diabetes; 500,000 Australians living with silent, undiagnosed type 2 diabetes; around 2 million Australians living with prediabetes; as well as their families and carers, diabetes healthcare professionals and researchers.

We are dedicated to reducing the incidence and impact of diabetes on people, health systems and society. We work with people living with, or at risk of, diabetes, their families and carers, health professionals, researchers, funders, other diabetes organisations and the community to positively change people's lives.

The Parliamentary Inquiry into Diabetes is an opportunity to act decisively to reduce the impact of the diabetes epidemic, save lives and protect the sustainability of Australia's health system. We strongly encourage the Committee to recommend that the Australian Government adopt the recommendations contained herein.

Background

Type 2 diabetes is one of the fastest growing health conditions in Australia. According to National Diabetes Services Scheme data there were approximately 77,000 Australians living with type 2 diabetes and registered with the Scheme in 1993. Three decades later there are now 1.3 million Australians living with type 2 diabetes and registered with the Scheme, an increase of almost 1600%.[1] This does not include the estimated 500,000 Australians living with silent, undiagnosed type 2 diabetes.[2]

Unless we take urgent action the impacts of the type 2 diabetes epidemic, including its debilitating and costly complications, will overwhelm our health system. According to the Australian Institute of Health and Welfare (AIHW), over the past 20 years the direct healthcare costs relating to diabetes (all types) have increased by 289%, the cost to hospitals has climbed by 308% and the cost to the Pharmaceutical Benefits Scheme (PBS) has increased by 282%.[3] The majority of these costs accrue from care provided to people living with type 2 diabetes.

[1] National Diabetes Services Scheme. (11 Jul 2023) NDSS Snapshots – Type 2 diabetes [Fact Sheet]. https://www.ndss.com.au/wp-content/uploads/ndss-data-snapshot-202306-type2-diabetes.pdf
[2] Sainsbury, E. et al. (2020) 'The diagnosis and management of diabetes in Australia: Does the "Rule of halves" apply?', Diabetes Research and Clinical Practice, 170, p. 108524. doi:10.1016/j.diabres.2020.108524.
[3] AIHW. Australian Institute of Health and Welfare (2023) Diabetes: Australian facts, AIHW, Australian Government, accessed 01 August 2023.

Australia must take steps to:

- prevent more people from developing type 2 diabetes via both structured type 2 diabetes prevention programs and population health interventions,
- support people living with all types of diabetes and overweight or obesity to lose weight, and maintain weight loss, to support diabetes management, and
- provide programs to enable anyone who wants to attempt type 2 diabetes remission to do so.

A comprehensive approach will:

- Increase rates of screening for type 2 diabetes and ensure everyone living with the condition is diagnosed early, when remission is most achievable and complications prevention is most effective,
- Ensure people living with prediabetes can access type 2 diabetes prevention programs,
- Provide type 2 diabetes remission programs for all people who would benefit, and
- Be supported by population health measures that mitigate the impact of the obesogenic environment and support people's ability to make healthier choices.

What is driving the type 2 diabetes epidemic?

Australia's type 2 diabetes epidemic is being driven by an increasing number of people living with major risk factors including:

Non-modifiable

- Australia's ageing population,
- previous diagnosis of gestational diabetes,
- family history of type 2 diabetes and obesity, and
- ethnic background (i.e. people from non-Caucasian ethnic groups are at higher risk of developing the condition).

Modifiable

- obesogenic environment, and
- living with overweight or obesity
- smoking status.

Living with overweight and obesity or a previous diagnosis of gestational diabetes are the most significant risk factors that can be targeted to prevent type 2 diabetes. The risk posed by gestational diabetes must be mitigated before pregnancy. This is why behavioural interventions designed to support people to lose weight, which is the only modifiable risk factor of GDM, are at the heart of all type 2 diabetes prevention and treatment programs.

It is also important to note that while there are strong links between the development of type 2 diabetes and overweight or obesity, with obesity contributing to 55% of the type 2 diabetes disease burden, it is not a straightforward causal relationship.[4] Many people living with obesity and overweight do not develop type 2 diabetes. Similarly, there is a significant cohort who develop type 2 diabetes without overweight or obesity.

[4] Australian Institute of Health and Welfare (2021) Australian Burden of Disease Study 2018: Interactive data on risk factor burden, AIHW, Australian Government. Available from: https://www.aihw.gov.au/reports/burden-of-disease/abds-2018-interactive-data-risk-factors/contents/about

All policy approaches to address the impact of both the type 2 diabetes and the overweight and obesity epidemic must ensure they are not counter-productive by adding to the burden of stigma, and associated mental and emotional health impacts, that people living with these conditions experience. (For more information on the burden of stigma please see our submission: Diabetes in Australia).

The number of young people developing type 2 diabetes is increasing

While the onset of type 2 diabetes has traditionally developed later in life, the number of young people (aged <39) developing the condition is increasing. Over the past 10 years, the incidence of type 2 diabetes in this age group has increased by 37% from 30,775 in 2012[5] to 42,131 people in 2022.[6] Of particular concern is the dramatic increase in the number of children and young people (aged<20) being diagnosed with type 2 diabetes. There are now 1,155 children and young people living with the condition, an 18.3% increase in the past decade.[7] Thirty years ago, children and young adults living with type 2 diabetes was almost unheard of.

Type 2 diabetes that develops in young people is generally a much more serious condition that progresses faster. The aggressive onset of diabetes-related complications at a much younger age is widely observed both in Australia and internationally.

While this is largely linked to the impact of overweight and obesity, there are a number of other factors involved including the intergenerational impact of gestational diabetes and pre-existing type 2 diabetes in pregnancy. Children of mothers living with either condition are much more likely to develop type 2 diabetes.

Obesity epidemic

Australia has one of the highest rates of obesity in the world. An estimated 67% of Australian adults are living with overweight or obesity (36% overweight but not obese and 31% obese).[8] Australia ranks fifth on rates of obesity amongst OECD countries.[9] This is also impacting children and young people with an estimated 25% of children and adolescents aged 2 – 17 being overweight or obese (17% living with overweight but not obese, 8% living with obesity).[10]

[5] National Diabetes Services Scheme. (25 Jul 2023) NDSS Snapshots – All Types of Diabetes [Fact Sheet]. National Diabetes Services Scheme. https://www.ndss.com.au/ wp-content/uploads/snapshots/2013/ndss-data-snapshot201312-all-types-diabetes.pdf

[6] National Diabetes Services Scheme. (30 Sept 2022) NDSS Snapshots – All Types of Diabetes [Fact Sheet]. National Diabetes Services Scheme. https://www.ndss.com.au/wpcontent/uploads/ndss-data-snapshot-202206-all-types-ofdiabetes.pdf

[7] National Diabetes Services Scheme. (30 Sept 2022) NDSS Snapshots – All Types of Diabetes [Fact Sheet]. National Diabetes Services Scheme. https://www.ndss.com.au/wpcontent/uploads/ndss-data-snapshot-202206-all-types-ofdiabetes.pdf

[8] Australian Institute of Health and Welfare. *Overweight and obesity*. https://www.aihw.gov.au/reports/overweight-obesity/overweight-and-obesity/contents/summary

[9] Organisation for Economic Co-operation and Development. Health at a Glance 2017: OECD Indicators (Overweight and obesity among adults) Paris: OECD Publishing 2017.

[10] AIHW. Australian Institute of Health and Welfare (2021) Childhood overweight and obesity – the impact of the home environment, AIHW, Australian Government, accessed 03 August 2023.

The most concerning increase has been in the percentage of Australians who are living with overweight or obesity. Since 1995 the percentage of Australians who are obese has increased by 61.2% from 19.1% of the population to 31%.[11]

The *National Obesity Strategy 2022 – 2032* describes the root causes of the epidemic as "complex and deeply embedded in the way we live. It is not simply a lack of self-control. Unhealthy food and drinks are often more convenient. They are heavily promoted, available almost everywhere and in some instances are cheaper than healthier alternatives. Advances in technology and the sedentary nature of modern living means we don't move as much as we used to. This creates unhealthy environments and conditions that make it harder for us to choose a healthy lifestyle".[12]

This underscores the need for a multi-pronged strategy to address the obesity epidemic.

Australian National Diabetes Strategy 2021-2030

Many key actions to support Australia's response to the type 2 diabetes epidemic are outlined in the *Australian National Diabetes Strategy 2021-2030 (ANDS).* This Strategy has bipartisan commitment yet lacks a current funded implementation plan. Consequently, many of the key recommendations remain unfulfilled. The Strategy outlines seven key goals, three of which relate directly to the prevention of type 2 diabetes:

- Goal 1: Prevent people developing type 2 diabetes
- Goal 2: Promote awareness and earlier detection of type 1 and type 2 diabetes
- Goal 5: Reduce the impact of diabetes among Aboriginal and Torres Strait Islander peoples.

The evidence for type 2 diabetes prevention

Large scale, randomised control trials of people living with prediabetes or at high risk of developing type 2 diabetes have shown that the condition can be prevented or delayed in up to 58% of people through behavioural change programs supporting weight loss, increasing physical activity and enabling healthier eating patterns. [13,14] Additionally, studies have shown these lifestyle interventions can have positive impacts lasting up to 20 years following the active intervention including reduced risk of cardiovascular disease, stroke, other chronic conditions and some cancers.[15] This makes type 2 diabetes prevention one of the most cost-effective interventions in chronic disease.

[11] Australian Institute of Health and Welfare. A picture of overweight and obesity in Australia. 2017, Supplementary table 8 AND Australian Bureau of Statistics, 4364.0.55.001 - National Health Survey: First Results, 2017-18. 2018, Table 1.3
[12] Commonwealth of Australia 2022. The National Obesity Strategy 2022-2032. Health Ministers Meeting.
[13] Tuomilehto J, Lindström J, Eriksson JG, Valle TT, Hämäläinen H, Ilanne-Parikka P *et al* Finnish Diabetes Prevention Study Group. Prevention of Type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance. *N Engl J Med* 2001; 344: 1343–1350.
[14] Diabetes Prevention Program Research Group . Reduction in the incidence of Type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med* 2002; 346: 393–403.
[15] An Y, Zhang P, Wang J, Gong Q, Gregg EW, Yang W, Li H, Zhang B, Shuai Y, Chen Y, et al. Cardiovascular and all-cause mortality over a 23-year period among Chinese with newly diagnosed diabetes in the Da Qing IGT and Diabetes Study.Diabetes Care. 2015; 38:1365–1371. doi: 10.2337/dc14-2498

Australian programs

There are a number of type 2 diabetes prevention programs currently operating in Australia. The most well established are state-based programs including:

- *Life! Victoria* (delivered by Diabetes Victoria for the Victorian Government, established in 2007, supported more than 80,000 people),
- *My health for life* in Queensland (delivered by Diabetes Australia as the lead contractor and funded by Health and Wellbeing Queensland, established in 2016, supported nearly 29,000 people), and
- *Get Healthy* in New South Wales (delivered by Diabetes Australia (since 2023) for the New South Wales Government, commenced in 2013, supported approximately 150,000).

There are also a number of privately funded programs including:

- Australian Unity's *Diabetes Action Program* is a four-to-six-month, telephone-based program, coordinated by Remedy Healthcare
- *Medicare Diabetes* Prevention *Program* is a health behaviour change program to prevent type 2 diabetes over six months with six-monthly follow-up sessions for maintenance advice.

It is estimated that these programs have helped more than 300,000 people reduce their risk of type 2 diabetes. While this is an important achievement, these programs are insufficient to the size of the type 2 diabetes epidemic at current funding levels.

Leading international programs

Healthier You NHS Diabetes Prevention Programme – United Kingdom

Jointly run by NHS England and Diabetes UK, this program identifies people at risk of developing type 2 diabetes and refers them into a nine-month, evidence-based lifestyle change program delivered either as a face-to-face group service or as a digital service. Participants receive personalised support for weight management, healthy eating, and to do more physical activity.

A recent observational study found rates of diabetes were 6.2% lower in general practices that were participating in the program compared to practices that did not.[16]

National Diabetes Prevention Program – United States

The National Diabetes Prevention Program is a public-private partnership aimed at driving behaviour change through improving healthy eating and physical activity. Launched in 2010 it has supported more than 450,000 people.[17]

Medicare Diabetes Prevention Program – United States

A Government funded program launched in 2018 involving 6 months of weekly group sessions with education and support covering healthy eating, increasing physical activity and weight

[16] McManus, E. et al. (2022) 'Population level impact of the NHS diabetes prevention programme on incidence of type 2 diabetes in England: An observational study', The Lancet Regional Health - Europe, 19, p. 100420. doi:10.1016/j.lanepe.2022.100420.

[17] Cannon, M.J. *et al.* (2022) 'Delivering the National Diabetes Prevention Program: Assessment of enrolment in in-person and virtual organizations', *Journal of Diabetes Research*, 2022, pp. 1–9. doi:10.1155/2022/2942918.

management. Eligibility criteria for the program include HbA1c in a prediabetes range, a BMI above 25 and no history of diabetes. An evaluation found that participants lost an average of 5.1% of their body weight with 53% of participants reaching the 5% weight loss goal.[18]

National Type 2 Diabetes High-risk Prevention Program

Australia should prioritise the implementation of a comprehensive National Type 2 Diabetes High-risk Prevention Program that includes the following strategies to drive awareness of the risk of type 2 diabetes and motivate people to take action:

- Systematic identification of people at high-risk including using the AUSDRISK tool
- Targeted interventions based on the individual:
  - Intensive lifestyle/behaviour change programs (face-to-face groups, telephone, webinar groups, commercial programs). These programs must incorporate the lived experiences of people living with diabetes and obesity to be effective
  - Medication (GLP1-RAs and twincretins)
  - Bariatric surgery (for people living with obesity and type 2 diabetes)
- Funding to develop referral pathways and embed these pathways within primary care
- A comprehensive national marketing campaign directing people to a National Diabetes Prevention Line (1800-PREVENT) to help coordinate referrals between healthcare professionals and funded type 2 diabetes prevention programs.

Recommendation: Implement a comprehensive National Type 2 Diabetes High-risk Prevention Program that drives awareness of the risk of type 2 diabetes and motivates people to take action

Leveraging existing investment through better coordination and promotion

As outlined above there is already a reasonable amount of existing investment in type 2 diabetes prevention via State Government funded programs and some private programs. However, there are opportunities to increase participation by establishing clear referral pathways for GPs and other primary care providers.

Funded referral pathways must be established to ensure that if people are identified as living with prediabetes or are at high risk of type 2 diabetes either via opportunistic screening or in primary care, that they can be promptly directed to appropriate programs and support.

A National Type 2 Diabetes Prevention Line (1800-PREVENT) would give health professionals and people at risk of type 2 diabetes an easy way to evaluate a range of potential prevention approaches and make an informed choice about their health.

Modelled on other successful helplines including 1800-RESPECT and 13 QUIT, it is a cost-effective way of optimising existing investments in type 2 diabetes prevention. It would also ease workload pressures on GPs by simplifying referrals for people requiring expert-led behaviour

[18] Hoeger, T.J. *et al.* (2022) *Evaluation of the Medicare Diabetes Prevention Program, Second Evaluation Report*.rep. Research Triangle Park, North Caroline: RTI International.

change support. Diabetes Australia has the existing infrastructure to deliver this low cost solution.

The ANDS recommends implementing education and social media campaigns to encourage people to increase levels of healthy eating and physical activity.

Recommendation: Develop referral pathways and establish a 1800-PREVENT telephone line to assist primary care providers and people at risk of type 2 diabetes in connection with appropriate type 2 diabetes prevention programs

Scaling up existing prevention efforts

Existing public type 2 diabetes prevention programs are State Government funded, in part because they reduce pressure on State hospital systems. However, under the National Health Reform Agreement the Federal Government provides significant funding to public hospitals as well as funding primary care. Preventing people developing type 2 diabetes can ease the burden on both primary and tertiary care which is why a Federal Government contribution is critical.

The Federal Government should incentivise and enhance State-funded type 2 diabetes prevention by matching State Government funding allocations. This would more than double the number of people able to access the programs and maximise the investment.

Additionally, private health insurers have a clear motivation to support type 2 diabetes prevention which is much more cost-effective than providing funding for costly and complicated hospital procedures. The Federal Government should explore public private partnerships with private health insurers to provide options for members to enrol in programs that not only reduce their risk of type 2 diabetes but a range of other chronic and musculoskeletal conditions.

The type 2 diabetes epidemic is too significant and too important for the responsibility for prevention to rest solely with State Governments.

Recommendation: Provide matching funding for State Government-funded type 2 diabetes prevention programs to expand capacity and incentivise investment

Recommendation: Explore public private partnerships with private health insurers to deliver type 2 diabetes prevention programs to members

Recommendation: Require private health insurers to cover structured diabetes education delivered by a CDE for people living with prediabetes

Opportunistic Screening

As outlined above an estimated 500,000 Australians are living with silent, undiagnosed type 2 diabetes.[19] Many people live for an average of seven years before the condition is detected, often after a complication has developed.[20,21] Australia needs to do more to better detect people living with silent, undiagnosed type 2 diabetes to ensure people are in the best position to attempt type 2 diabetes remission and prevent complications when they are most treatable.

In addition to encouraging screening amongst all Australians aged 40+, with a particular focus on people with significant risk factors, Australia should implement opportunistic screening initiatives to support earlier diagnosis. There are already a number of programs that could be scaled up nationally including models employed by Western Sydney Diabetes and Austin Health.

Austin Health

Diabetes Discovery Initiative

The Diabetes Discovery Initiative performed HbA1c checks (via blood samples) on all admitted patients aged 54 years and over. The initiative found that one third of patients had diabetes, including approximately 5% who had undiagnosed, silent type 2 diabetes. Another third were found to be living with prediabetes.[22]

Western Sydney Diabetes (WSD)

Emergency Department Screening

All people admitted to Emergency at Blacktown-Mt Druitt Hospital, part of the Western Sydney Local Health District (WSLHD), have a HbA1c check as part of their routine clinical assessment. This supports both opportunistic diagnosis of silent, undiagnosed type 2 diabetes as well as improving care and treatment for people living with diabetes. This screening has detected extensive previously undiagnosed type 2 diabetes with one study finding 38.4% of people admitted to Emergency were living with type 2 diabetes, almost one-third of whom (32.2%) were previously undiagnosed. An additional 27.4% were also found to be living with prediabetes.[23]

GP Screening

WSD also worked with 11 GP medical centres throughout the WSLHD to run an opportunistic type 2 diabetes screening program that found 30% of people visiting GPs had prediabetes and 18% were living with diabetes.[24]

Blacktown Workers

[19] Sainsbury, E. et al. (2020) 'The diagnosis and management of diabetes in Australia: Does the "Rule of halves" apply?', Diabetes Research and Clinical Practice, 170, p. 108524. doi:10.1016/j.diabres.2020.108524.
[20] Porta M, Curletto G, Cipullo D, Rigault de la Longrais R, Trento M, Passera P et al. Estimating the delay between onset and diagnosis of type 2 diabetes from the time course of retinopathy prevalence. Diabetes Care 2014; 37: 1668–1674.
[21] Harris MI, Klein R, Welborn TA, Knuiman MW. Onset of NIDDM occurs at least 4–7 yr before clinical diagnosis. Diabetes Care 1992; 15: 815–819.
[22] Nanayakkara, N. *et al.* (2015) 'Inpatient hba1c testing: A prospective observational study', *BMJ Open Diabetes Research & Care*, 3(1). doi:10.1136/bmjdrc-2015-000113.
[23] Hng T-M, Hor A, Ravi S, et al. Diabetes case finding in the emergency department, using HbA1c: an opportunity to improve diabetes detection, prevention, and care. BMJ Open Diabetes Research and Care 2016;4:e000191. doi:10.1136/bmjdrc-2015-000191
[24] Gideon Meyerowitz-Katz, Shanthini Seelan, Pankaj Gaur, Rona Francisco, Shahana Ferdousi, Thomas Astell-Burt, Xiaoqi Feng, Stephen Colagiuri, Glen Maberly, Tien-Ming Hng; (2019) "Detecting the hidden burden of pre-diabetes and diabetes in Western Sydney", Diabetes Research and Clinical Practice, doi: https://doi.org/10.1016/j.diabres.2019.04.019

WSD has entered into a five-year partnership with the Blacktown Workers Club. As part of the partnership the Club's 55,000 members can access diabetes health checks and lifestyle change programs at the Club.

Recommendation: Australia needs to urgently increase opportunistic type 2 diabetes screening at both primary and tertiary care levels and outside health settings. This could include making it mandatory for all public hospitals to conduct HbA1c checks on all patients aged 40 years and over. Primary health networks should be funded to conduct opportunistic screening programs that are tailored to local communities

New Obesity Treatments

A new generation of obesity medicines is revolutionising the treatment of obesity by contributing to unprecedented levels of weight loss. Supporting appropriate access to these medicines will be a major challenge for the Pharmaceutical Benefits Advisory Committee (PBAC) over the next decade. The medicines include semaglutide (Ozempic and Wegovy) and tirzepatide (Mounjaro) with a number of other medications being developed including some in late-stage clinical trials.

Semaglutide

Semaglutide has been shown to support substantial weight loss. One trial of Wegovy (the stronger formulation) found it led to an average weight loss of 15% to 17% of the person's starting body weight.[25] This is more than sufficient to reduce many people's risk of type 2 diabetes. Another trial found that at least 70% of participants achieved weight loss of at least 10% and approximately 50% achieved a weight loss of at least 15%.[26]

Ozempic is indicated by the PBS for use in people living with type 2 diabetes; however, it is widely used off label as a weight loss therapy and to assist with the management of a number of weight-related conditions.

Wegovy will be considered by the PBAC later this year for the second time for the treatment of severe obesity for people whose participation in lifestyle weight management intervention proved ineffective. The PBAC has previously not recommended Wegovy for listing, citing "very uncertain implications for the PBS and broader health budget".

Tirzepatide

Clinical trials have shown tirzepatide improves glucose management and supports weight loss. For instance, the SURPASS-3 trial found reductions in HbA1c between 1.93% and 2.37% and body weight of between 8.1% and 13.9% depending on the formulation.[27] The PBAC has declined to list Mounjarao on the PBS saying "the financial impact was extremely high at the requested price and uncertain."

[25] Jastreboff AM, Aronne LJ, Ahmad NN, et al; SURMOUNT-1 Investi-gators. Tirzepatide once weekly for the treatment of obesity.N EnglJ Med2022;387:205-216.
[26] Wilding, J., Batterham, R., Calanna, S., Davies, M., Van Gaal, L., Lingvay, I., McGowan, B., Rosenstock, J., Tran, M., Wadden, T., Wharton, S., Yokote, K., Zeuthen, N. and Kushner, R., 2021. Once-Weekly Semaglutide in Adults with Overweight or Obesity. *New England Journal of Medicine*, 384(11), pp.989-1002.
[27] Ludvik, B. et al. (2021) 'Once-weekly tirzepatide versus once-daily insulin degludec as add-on to metformin with or without SGLT2 inhibitors in patients with type 2 diabetes (surpass-3): A randomised, open-label, parallel-group, phase 3 trial', The Lancet, 398(10300), pp. 583–598. doi:10.1016/s0140-6736(21)01443-4.

Concerns

There are concerns amongst health professionals about the long-term impacts of these medicines including the lack of long-term data on the effects of these medicines, questions about the impacts of coming off these medicines, as well as the financial impact of including these medicines on the PBS.

The future

The concerns cited above notwithstanding, the evidence strongly suggests that these medicines can play a major role in reducing the impact of the obesity epidemic, preventing type 2 diabetes and helping people to manage type 2 diabetes. It is essential that the people who would most benefit from these medicines are able to access them.

Recommendation: Next generation obesity medicines must be part of Australia's response to the obesity epidemic. To ensure the financial sustainability of the PBS it will be essential to define the cohort of people who will benefit the most

Bariatric surgery

Bariatric surgery refers to a number of surgical procedures designed to support and maintain weight loss by either reducing the size of the stomach, delaying digestion, or inducing satiety. Most bariatric surgery is performed via keyhole surgery.

It is important to note it is a major surgical intervention and once completed, cannot be easily reversed. The support of a comprehensive multidisciplinary team including surgeons, dietitians, psychologists, specialists and GPs is essential.

There is considerable evidence that bariatric surgery is an effective treatment for some people, particularly those living with severe obesity. Diabetes Australia, the Australian Diabetes Society and the Australian Diabetes Educators Association support bariatric surgery as a treatment option for people with type 2 diabetes with a BMI of at least 30 and comorbidities, where dietary, physical activity and medical interventions for obesity or diabetes have been unsuccessful.[28]

Bariatric surgery has also been shown to be a successful treatment to achieve type 2 diabetes remission (see below).

Despite its benefits and cost-effectiveness (from a public health perspective) access to bariatric surgery via public health services is very limited. The majority of procedures are performed in private hospitals. There is an identified need for more funding for people living with severe obesity and type 2 diabetes to be able to access procedures via the public health system.

Recommendation: Bariatric surgery, supported by a multidisciplinary service, should be available through public hospitals for a clearly identified cohort of people who would receive the greatest benefit from the procedure

[28] Australian Diabetes Society. (2016) The Australian Obesity Management Algorithm. Retrieved (11 October 2021) from https://diabetessociety.com.au/ documents/ObesityManagementAlgorithm18.10.2016FINAL.pdf

Type 2 diabetes remission

Type 2 diabetes remission is an emerging area of diabetes research and treatment that presents significant opportunities to improve the health of Australians with type 2 diabetes.

Diabetes Australia, the Australian Diabetes Society and the Australian Diabetes Educators Association define type 2 diabetes remission as a person previously diagnosed with type 2 diabetes achieving an HbA1c of under 6.5% (48mmol/mol) and sustaining it for three months without the need for glucose lowering medication.[29] This is the same definition as the American Diabetes Association, the European Association for the Study of Diabetes and Diabetes UK.[30] Type 2 diabetes remission occurs after significant weight loss generally achieved through intensive dietary changes or bariatric surgery.

Remission does not mean diabetes is cured or reversed and over time, or if weight returns, type 2 diabetes may return. However, any amount of time a person spends in remission lowers their long-term risk of developing diabetes-related complications.

The foundational study into type 2 diabetes remission was the Diabetes Remission Clinical Trial (DiRECT) which supported participants to achieve approximately 15kg weight loss through a primary care nurse or dietitian-led intervention including 12 to 20 weeks of low kilojoule meal replacement shakes, gradual food reintroduction and long-term weight loss maintenance.[31] The trial found 46% of participants were in remission at one year, with 36% in remission at two years.[32] A five-year follow up found 23% of people were still in remission.[33]

The feasibility of Type 2 Diabetes Remission in Australia has been explored by the Type 2 Diabetes Remission Service run by the South Western Sydney Local Health District. An evaluation of participants in the Service's program found 93.8% of people were in remission after 12 weeks while 63% were still in remission after 52 weeks.[34]

Remission is clearly an emerging therapeutic approach that is beneficial for some people. People wishing to attempt type 2 diabetes remission should be appropriately supported. This will reduce the number of people living with type 2 diabetes, delay that development for some people, and reduce the incidence of diabetes-related complications.

Real-world applications of remission

There are currently a range of private, for-profit providers operating in Australia and internationally that are supporting people to achieve type 2 diabetes remission.

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[29] Diabetes Australia. (2021) Position Statement: Type 2 diabetes remission. Retrrieved (3 August 2023) from https://www.diabetesaustralia.com.au/wp-content/uploads/2021_Diabetes-Australia-Position-Statement_Type-2-diabetes-remission_2.pdf

[30] Riddle, M.C. *et al.* (2021) 'Consensus report: Definition and interpretation of remission in type 2 diabetes', *Diabetes Care*, 44(10), pp. 2438–2444. doi:10.2337/dci21-0034.

[31] Leslie, W.S. *et al.* (2016) 'The diabetes remission clinical trial (direct): Protocol for a cluster randomised trial', *BMC Family Practice*, 17(1). doi:10.1186/s12875-016-0406-2.

[32] Lean M, Leslie W, Barnes A, et al. Primary care-led weight management for remission of type 2 diabetes (DiRECT): an open-label, cluster-randomised trial. The Lancet, 2018; 391(10120): 541-551.

[33] Lean M, Taylor R. Findings from the three-year extension of the Diabetes Remission Clinical Trial (DiRECT). 2023 Diabetes UK Professional Conference, Liverpool, United Kingdom.

[34] Chimoriya, R, Mitlehner, K, Osuagwu, U, Lean, M, Simmons, D and Plya M. Evaluation of the DIRECT-Australia Type 2 Diabetes Remission Service. Findings presented at the Australasian Diabetes Congress. Adelaide. 2023. Unpublished.

Generally, people pay a subscription to access lifestyle support.

Defeat Diabetes

Defeat Diabetes is an Australian for-profit program that has had more than 9,200 people complete its program. A recent member study found that 41% of people reported reducing or discontinuing diabetes medication, 88% reported improved blood glucose levels while 92% of people achieved an average weight loss of 8kg.[35]

Diabetes Wellness Australia

Diabetes Wellness Australia offers a 26-week online program delivered by health professionals. Personalised support and health behaviour goals are central to the program, which was formed in January 2019.

International examples

NHS Type 2 Diabetes Path to Remission Programme is delivered by the NHS and Diabetes UK, providing eligible participants with low kilojoule, total diet replacement products including soups and shakes for 12 weeks. To be eligible a person must be aged 18 to 65 years, have been diagnosed with type 2 diabetes within the last six years, and have a BMI >27 (for people from Caucasian ethnic groups) or >25 (for people from backgrounds other than Caucasian). A 2018 study found that the program would cost around £1,067 per person or around £2,564 for each person successfully achieving type 2 diabetes remission.[36]

Virta Health is a for-profit subscription model weight-loss program that uses a low-carb/ketogenic dietary approach supported by app-based telehealth. A two-year non-randomized clinical trial observed reductions in HbA1c, blood pressure, cholesterol and weight with 17.6% achieving remission after two years.[37]

Recommendation: Establish a series of Type 2 Diabetes Remission Pilots in priority communities to determine the most cost-effective models to roll out a National Type 2 Diabetes Remission program, delivered in-person and digitally, that will enable any person recently diagnosed with type 2 diabetes to attempt remission

Population health measures

A comprehensive response to Australia's obesity epidemic, and rising numbers of people developing type 2 diabetes, must include population health measures that support people to make healthier choices. Experts have described our social environment as obesogenic. This means that the environment itself promotes weight gain.

[35] Defeat Diabetes member study, Accessed at: https://www.defeatdiabetes.com.au/

[36] Xin, Y., Davies, A., McCombie, L., Briggs, A., Messow, C. M., Grieve, E., Leslie, W. S., Taylor, R., & Lean, M. E. J. (2019). Within-trial cost and 1-year cost-effectiveness of the DiRECT/Counterweight-Plus weight-management programme to achieve remission of type 2 diabetes. *The lancet. Diabetes & endocrinology*, *7*(3), 169–172. https://doi.org/10.1016/S2213-8587(18)30346-2

[37] Athinarayanan, S.J. et al. (2019) 'Long-term effects of a novel continuous remote care intervention including nutritional ketosis for the management of type 2 diabetes: A 2-year non-randomized clinical trial', Frontiers in Endocrinology, 10. doi:10.3389/fendo.2019.00348.

There are a range of widely adopted evidence-based policies and initiatives that can help make the environment healthier. These include:

- A 20% levy on sugar sweetened beverages
- Restrictions on marketing unhealthy foods to children
- Front-of-pack labelling to assist consumers with making healthier choices
- Improvements to planning and the built environment to make it easier for people to incorporate physical activity into their life.

While there is no silver bullet, a raft of policies introduced together could translate into population-level weight loss and a corresponding reduction in the number of people developing type 2 diabetes, as well as supporting improved diabetes management in people living with all types of diabetes.

One example of this coordinated approach is the United Kingdom's *Tackling Obesity Strategy* which incorporates a number of measures including:

- A public health campaign to encourage people to lose weight which is supported by accessible evidence-based tools and digital apps to educate people on losing weight and maintaining weight loss
- An expansion of weight management services including more support for health professionals, more funding for obesity prevention and more incentives for GPs and referral pathways for people to access weight management services
- Ban on advertising unhealthy food on TV and online before 9pm
- Introduction of kilojoule labelling in large restaurants and cafes
- New restrictions on promoting unhealthy foods in shops and online such as restrictions on 'Buy One, Get One Free' and similar promotions
- Consultation on kilojoule labelling on alcohol and other food and drink products.

This followed the introduction of a tax on sugar-sweetened beverages in 2018.

Importantly there is widespread public support for these population health measures.

Health levy on sugary drinks

Diabetes Australia, the Australian Diabetes Society and the Australian Diabetes Educators Association strongly support the introduction of a 20% health levy on sugar-sweetened beverages (SSBs), as part of a comprehensive approach to decreasing rates of overweight and obesity. The revenue raised from this levy should be reinvested in public education campaigns and initiatives to prevent chronic conditions and address childhood obesity.

Sugary drinks are the largest source of free sugars in the Australian diet.[38] The Australian Medical Association estimates Australians drink at least 2.4 billion litres of sugary drinks every year – the equivalent of 960 Olympic-sized swimming pools.[39] Consumption is highest amongst

[38] Australian Bureau of Statistics, Australian Health Survey: Consumption of Added Sugars. Australia. 2011-12. 4364.0.55.011. 2016, ABS: Canberra.

[39] Australian Medical Association (2021). A tax on sugar-sweetened beverages: Modelled impacts on sugar consumption and government revenue. Retrieved 19/07/2023 from: https://www.ama.com.au/articles/tax-sugar-sweetenedbeverages-what-modelling-shows-0

young people, Aboriginal and Torres Strait Islanders and people from socially disadvantaged groups.[40]

Research has found that a health levy could deliver around $1.7 billion in healthcare savings, while costing as little as $11.8 million to implement.[41]

Widely supported in Australia

A health levy on sugary drinks is widely supported by health organisations including Diabetes Australia, the Australian Diabetes Society, the Australian Diabetes Educators Association, the Australian Medical Association, Royal Australian College of General Practitioners, Nutrition Australia, the Heart Foundation, Kidney Health Australia and the Grattan Institute.[42]

Australians support a levy on sugar-sweetened beverages with one survey finding 69% of people who buy groceries support a levy if the revenue is used to reduce the cost of healthy foods.[43] A separate survey of 1,200 people found that 85% supported levy revenue being used to fund programs reducing childhood obesity, and 84% supported funding for initiatives encouraging children's sport.[44]

Evidence of impacts

According to the World Health Organisation, more than 85 countries have implemented levies on SSBs at a national or local level.[45] Consequently, there is a significant body of evidence highlighting their effectiveness in reducing consumption of these beverages and associated free sugars. For instance, a recent systematic review and meta-analysis found that a 10% levy leads to a 15.9% reduction in consumption of the SSBs on which the levy is applied.[46]

Studies have found that levies based on the amount of sugar in a beverage, like those in place in Portugal, South Africa and the United Kingdom, have led to reduction in consumption and reformulation of products which also reduces consumption.[47] In the United Kingdom the amount of sugar in beverages purchased by individual households decreased by 29.5 grams per week which was the equivalent of removing 45 million kilograms of sugar from beverages each year.[48]

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[40] Australian Bureau of Statistics. 4364.0.55.007 - Australian Health Survey: Nutrition First Results - Foods and Nutrients, 2011-12. Consumption of Sweetened Beverages. 2015 October 2016]; Available from: http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/4364.0.55.007~2011 - 12~Main%20Features~Consumption%20of%20Sweetened%20Beverages~710.

[41] Ananthapavan J, Sacks G, Brown V, Moodie M, Nguyen P, Barendregt J, Veerman L, Mantilla Herrera A, Lal A, Peeters A, Carter R. Assessing cost-effectiveness of obesity prevention policies in Australia 2018 (ACE-Obesity Policy). Melbourne: Deakin University, 2018. Available at: aceobesitypolicy.com.au

[42] https://www.obesityevidencehub.org.au/collections/prevention/the-case-for-a-tax-on-sweetened-sugary-drinks

[43] Morley, B., et al., Public opinion on food-related obesity prevention policy initiatives. Health Promot J Austr, 2012. 23(2): p. 86-91.

[44] Obesity Policy Coalition, Obesity Prevention Consensus (unpublished). 2016, Obesity Policy Coalition: Melbourne.

[45] WHO manual on sugar-sweetened beverage taxation policies to promote healthy diets. Geneva: World Health Organization; 2022. Licence: CC BY-NC-SA 3.0 IGO.

[46] Andreyeva T, Marple K, Marinello S, Moore TE, Powell LM. Outcomes Following Taxation of Sugar-Sweetened Beverages: A Systematic Review and Meta-analysis. JAMA Network Open. 2022;5(6):e2215276-e. 10.1001/jamanetworkopen.2022.15276. Available from: https://doi.org/10.1001/ jamanetworkopen.2022.15276.

[47] Bandy LK, Scarborough P, Harrington RA, Rayner M, Jebb SA. Reductions in sugar sales from soft drinks in the UK from 2015 to 2018. BMC Medicine. 2020;18(1):20. 10.1186/s12916-019-1477-4. Available from: https://doi.org/10.1186/s12916-019-1477-4.

[48] Pell D, Mytton O, Penney TL, Briggs A, Cummins S, Penn-Jones C, et al. Changes in soft drinks purchased by British households associated with the UK soft drinks industry levy: controlled interrupted time series analysis. BMJ. 2021;372. Available from: https://doi.org/10.1136/bmj.n254

Recommendation: Introduce a 20% health levy on sugar-sweetened beverages and reinvest the revenue in public education campaigns and initiatives to prevent chronic disease and address childhood obesity

Junk Food Advertising

Limiting the exposure of children to marketing of unhealthy food has been implemented by a number of countries. Discretionary foods, containing saturated fat, added salt and added sugars, comprise almost 40% of Australian children's energy intake, while less than 5% of Australian children are consuming the amount of fruit and vegetables recommended by the Australian Dietary Guidelines.[49]

This consumption is driven, in a large part, by the well-resourced and successful marketing campaigns of food manufacturers. In a single year, Australian children who watch 80 minutes of television a day are likely to see 800 junk food advertisements on free-to-air television.[50] Evidence shows that existing self-regulatory initiatives, like those introduced by the Australian Food and Grocery Council, are insufficient and lack meaningful incentives to comply or monitoring of compliance.[51]

Economic modelling of restrictions on marketing unhealthy food to children has demonstrated that it is one of the most cost-effective policy levers for addressing obesity. One study found that for every $1 invested, approximately $38 could be saved.[52] Internationally, there is a growing appetite for restrictions on marketing unhealthy food to children with both Chile and Quebec (Canada) taking steps to limit exposure.[53] There is also broad support amongst the Australian public for this measure. Two studies have found that restrictions on marketing unhealthy food to children are supported by an overwhelming majority of Australians.[54,55]

Reducing the exposure of children to marketing for unhealthy products is identified as an area of action in ANDS.

Recommendation: Restrict advertising for unhealthy foods on television, radio and the internet from 6am to 9:30pm and ban junk food marketing on social media and other appropriate online forums

[49] Australian Institute of Health and Welfare, Australia's health 2016. Australia's health no. 15. Cat. no. AUS 199. 2016, AIHW: Canberra.
[50] Smithers, L.G., et al., Food advertising on Australian television: Frequency, duration and monthly pattern of advertising from a commercial network (four channels) for the entire 2016. J Paediatr Child Health, 2018.
[51] King L, Hebden L, Grunseit A et al. Building the case for independent monitoring of food advertising on Australian television. Public Health Nutr 2013;16(12):2249–54
[52] Magnus, A., et al., The cost-effectiveness of removing television advertising of high-fat and/or high-sugar food and beverages to Australian children. Int J Obes (Lond), 2009. 33(10): p. 1094-102
[53] Sacks Gary for the Food-EPI Australia project team 2017. Policies for tackling obesity and creating healthier food environments. Scorecard and priority recommendations for Australian governments. Melbourne: Deakin University.
[54] Lockie S and Pietsch J (2012). Public Opinion on Food Security. Australian National University.
[55] Hughes C (2014). 73 per cent of NSW adults support banning junk food advertising targeted to kids. Cancer Council New South Wales.

Food labelling

Front-of-pack labelling is a powerful tool to educate consumers and support healthier food choices. It has also been shown to drive reformulation of products to attain healthier rating. The Health Star Rating system was introduced in Australia and New Zealand in 2014 to assist consumers in making more informed and healthier decisions about the food they purchase.

An analysis of the impact of front-of-pack labelling in the Netherlands concluded that labelling was a significant driver of product reformulation with manufacturers opting to make their products healthier to obtain more favourable labels.[56] The ANDS recommends the expansion of the implementation of the Health Star Rating system.

International experience

Front of pack labelling has been introduced in more than 30 countries including the European Union, the United Kingdom and New Zealand.[57] Ten countries including Finland, Mexico and Chile have made the labelling mandatory. In Chile, for instance, certain products are required to have black warning labels shaped like stop signs.

Algorithm

One analysis of Australia's Health Star Rating system found that technical weaknesses, design flaws and governance limitations result in 75% of ultra-processed foods displaying at least 2.5 health stars.[58] The analysis found that the existing Health Star Rating system could be misrepresenting the healthiness of new packaged food products and inadvertently encouraging people to choose foods with little nutritional value.

Recommendation: Make the existing Health Star Rating system mandatory and adapt the algorithm to ensure the credibility of Australia's Health Star Rating system

Recommendation: Implement education campaigns to enhance consumer awareness of the Health Star Rating system and its appropriate use

[56] van der Bend, D.L.M. *et al.* (2020) 'The influence of a front-of-pack nutrition label on Product reformulation: A ten-year evaluation of the Dutch choices programme', *Food Chemistry: X*, 6, p. 100086. doi:10.1016/j.fochx.2020.100086.
[57] Jones A, Neal B, Reeve B, Ni Mhurchu C, & Thow AM (2019). Front-of-pack nutrition labelling to promote healthier diets: current practice and opportunities to strengthen regulation worldwide. *BMJ Global Health, 4*(6), e001882.
[58] Dickie, S., Woods, J.L. and Lawrence, M. (2018) 'Analysing the use of the Australian health star rating system by level of food processing', *International Journal of Behavioral Nutrition and Physical Activity*, 15(1). doi:10.1186/s12966-018-0760-7.

Planning and other initiatives to increase rates of physical activity

Multiple studies have shown that while rates of leisure-time physical activity have remained relatively stable, physical activity accrued via daily work-related activity, transport activity and home-based activity have all declined. Sedentary activities, however, have increased.[59]

According to AIHW data more than half (56%) of all Australians did not meet physical activity guidelines with people in low socio-economic areas being less likely to meet the guidelines (63%) than people in the highest socio-economic areas (40%).[60] Concerningly, rates were even lower in children with less than one-quarter (23%) of children aged 5-14 undertaking the recommended 60 minutes of daily physical activity. Additionally, children aged 5-14 spent more than 2 hours sitting or lying down for screen-based activities.[61]

Factors contributing to the decrease in physical activity include a lack of time, a lack of opportunities to get physically active and environments that promote inactivity or car-based transport.

How to increase rates of physical activity?

We can boost physical activity by ensuring our built environment makes it easier for people to be active. The Australian Obesity Strategy 2022-2032 outlines a number of activities relating to planning that would help combat Australia's obesity epidemic.

These include:

- Improving land use planning and policy coordination to ensure all Australians have access to natural environments, public open space and active transport networks,
- Increasing investment in public transport infrastructure and services,
- Increasing investment to encourage walking and other forms of active transport including more shaded, safe, connected and well-maintained pathways,
- More bikeways, and
- Providing health advice on local and state development policies plans and proposals.

These recommendations are supported by the ANDS which in Goal 1 calls for supporting the development of health-promoting environments that encourage people to increase their physical activity including active travel and to embed physical activity in everyday life including workplaces, schools and communities.

These issues are complex and require commitment and buy in from all three levels of Government as well as the private sector.

Additionally, they closely resemble a number of globally endorsed strategies for increasing physical activity including the International Society for Physical Activity and Health's *Eight*

[59] National Centre for Biotechnology Information, "Sedentary Lifestyle: Overview of Updated Evidence of Potential Health Risks," https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7700832/
[60] Australian Institute of Health and Welfare 2018. Australia's health 2018. Australia's health series no. 16. AUS 221. Canberra: AIHW.
[61] Australian Institute of Health and Welfare 2020. Australia's children. Cat. no. CWS 69. Canberra: AIHW.

investments that Work for Physical Activity[62] and the Heart Foundation's *Blueprint for an Active Australia*.[63] They are also enshrined as goals in the *National Preventive Health Strategy 2021-2030*.

Recommendation: Implement a suite of policies to support the creation of built environments and communities more geared towards all types of physical activity

Australian Dietary Guidelines

The existing Australian Dietary Guidelines were developing in 2013 by the National Health and Medical Research Council with the support of other leading experts and the Australian Government. A review of the Guidelines is currently underway.

While they provide sound advice for healthy eating at the population level, there is an identified need for specialised dietary advice for people living with diabetes, including advice specific to the different types, as well as advice for people living with prediabetes and those at high risk of developing type 2 diabetes.

Goal 1 of the ANDS identifies regular reviews of the Dietary Guidelines to ensure they align with the best available and most up-to-date evidence as a key area of action.

Recommendation: Develop, either as part of the Australian Dietary Guidelines or as standalone Guidelines, clear advice for healthy eating for people living with different types of diabetes, prediabetes and those at high risk of developing type 2 diabetes

[62] International Society for Physical Activity and Health (ISPAH). ISPAH's Eight Investments That Work for Physical Activity. November 2020. Available from: www.ISPAH.org/Resources

[63] National Heart Foundation of Australia. Title. Blueprint for an active Australia: National Heart Foundation of Australia, 2019.

SUMMARY OF RECOMMENDATIONS

1. Implement a comprehensive National Type 2 Diabetes High-risk Prevention Program that should include a number of key strategies to drive awareness of the risk of type 2 diabetes and motivate people to take action. This should include:
    a) A 1800-PREVENT telephone line to assist primary care providers and people at risk of type 2 diabetes to connect with appropriate type 2 diabetes prevention program
    b) Matching funding for State Government-funded type 2 diabetes prevention programs to expand capacity and incentivise investment
    c) Public private partnerships with private health insurers to deliver type 2 diabetes prevention programs to members
    d) Require private health insurers to cover structured diabetes education delivered by a CDE for people living with prediabetes
    e) Increased opportunistic type 2 diabetes screening at both primary and tertiary care levels and outside health settings. Hospitals should be strongly encouraged to conduct HbA1c checks on all patients aged 40 years and over and primary health networks should be funded to conduct opportunistic screening programs that are tailored to local communities
    f) Next generation obesity medicines must be part of Australia's response to the obesity epidemic. To ensure the financial sustainability of the PBS it will be essential to define the cohort of people who will benefit the most
    g) Bariatric surgery, supported by a multidisciplinary service, should be available through public hospitals for a clearly identified cohort of people who would receive the greatest benefit from the procedure
    h) Establish a series of Type 2 Diabetes Remission Pilots in priority communities to determine the most cost-effective models to roll out National Type 2 Diabetes Remission program, delivered in-person and digitally, that will enable any person recently diagnosed with type 2 diabetes to attempt remission
2. Introduce a health levy on sugar-sweetened beverages and reinvest the revenue in public education campaigns and initiatives to prevent chronic disease and address childhood obesity
3. Restrict advertising for unhealthy foods on television, radio and the internet from 6am to 9:30pm and ban junk food marketing on social media and other appropriate online forums
4. Make the existing Health Star Rating system mandatory and adapt the algorithm to ensure the credibility of Australia's Health Star Rating system
5. Implement education campaigns to enhance consumer awareness of the Health Star Rating system and its appropriate use
6. Implement a suite of policies to support the creating of communities more geared towards all types of physical activity
7. Develop, either as part of the Australian Dietary Guidelines or as standalone Guidelines, clear advice for healthy eating for people living with different types of diabetes, prediabetes and those at high risk of developing type 2 diabetes