

Impact of Obesity on Life Expectancy in South Australia

September 2024

Executive Summary

Australians, including South Australians, experience some of the highest rates of childhood obesity globally. Obesity in childhood translates to obesity in adulthood. And obesity at middle-age contributes to increased mortality and morbidity.

This report examines the projected impact of childhood obesity on the South Australian population, aiming to highlight the serious effects that unchecked obesity can have on life expectancy. This report specifically projects the impact of increasing childhood obesity on life expectancy.

Without action, current generations of South Australian children could see a reversal in life expectancy trends of around 7 months for children born in 2023 (compared to their pre-pandemic baseline life expectancy).

South Australians would need to reduce childhood obesity rates by 25% in order to restore the baseline life expectancy.

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Background

Australians, including South Australians, experience some of the highest rates of childhood obesity globally¹. The 2018 National Health Survey found that 25% of children and adolescents aged 2–17 in South Australia were classified as overweight or obese². The most recently released data³ finds this proportion has increased to 27.5%. That is, South Australian children are becoming more obese.

Obesity in childhood translates to obesity in adulthood. And obesity at middle-age contributes to increased mortality and morbidity. This means that the current cohort of South Australian children who will live with heightened risk factors would be expected to experience a decrease in their life expectancy (relative to previous cohorts). This report aims to assess the impact of high childhood obesity levels on life expectancy.

Typically, when aiming to reduce the prevalence or effects of a health risk factor, policymakers must balance the costs of prevention policies and programs against the benefits of reduced mortality and morbidity. For instance, improving road safety might consider expenses related to redesigning roads or lowering speed limits and weigh this up with the reduction in mortality. However, this is not the case with childhood obesity.

Recent studies by the George Institute⁴ highlight that many prevention programs are "dominant." Health economists use this term to describe programs that both save money and enhance health outcomes. Therefore, the programs outlined in Figure 1 present no such benefit-cost dilemma. Instead, they represent programs that save more money (in terms of reduced health expenditure) and save lives.

¹ Australian Institute of Health and Welfare 2020. Overweight and obesity among Australian children and adolescents. Cat. no. PHE 274. Canberra: AIHW.

² 2018 National Health survey, Table 16.3, National Health Survey: First Results, 2017–18 South Australia

³ ABS National Health Survey, 2022

⁴ 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.

School-based intervention to reduce sedentary behaviour
School-based intervention to increase physical activity
Restricting television advertising of unhealthy foods (mandatory)
Reformulation to reduce sugar in sugarsweetened beverages (voluntary)
Menu kilojoule labelling on fast food
Supermarket shelf tags on healthier products (voluntary)
Sugar-sweetened beverages tax (20%)
Alcohol price increase: uniform volumetric tax
Package size cap on sugar-sweetened beverages (mandatory)
National mass media campaign related to sugar-sweetened beverages
Restrictions on price promotions of sugar-sweetened beverages (mandatory)

Figure 1: Examples of dominant programs to address childhood obesity (Ananthapavan, Sacks and Brown, 2018)

Additional to the public health interventions listed in Figure 1, personal health interventions are also shown to be effective. The most recent and comprehensive review of the evidence for interventions for High BMI in children was the US Preventive Services Taskforce report⁵. They recommend that children with a high BMI (≥ 95 th percentile for age and sex) – accounting for roughly 20% of US children – ought to be referred to comprehensive behavioural interventions.

Given the extensive range of programs expected to reduce obesity, policymakers face the challenge of understanding why these initiatives are so difficult to implement.

One significant reason is the lack of broad community support—South Australians are not actively demanding these programs from their lawmakers. This lack of urgency in tackling childhood obesity may stem from the public's underestimation of the problem's seriousness. While obesity rates among children are gradually increasing, many believe that reversing this trend simply requires parents to be more vigilant about their children's diets. This perception frames childhood obesity as a "parental" issue rather than a societal one, making it difficult to garner the social and community backing necessary for systemic changes.

⁵ Nicholson, W. K., Silverstein, M., Wong, J. B., Chelmow, D., Coker, T. R., Davis, E. M., ... & US Preventive Services Task Force. (2024). Interventions for high body mass index in children and adolescents: US Preventive Services Task Force recommendation statement. *JAMA*, 332(3), 226-232.

Baker, Gill, and Friel et al. (2017)⁶ investigate why the interventions suggested in Figure 1 are challenging to implement in Australia. They conclude that *"despite two periods of sustained political attention, political priority for regulatory interventions did not emerge"* (page 142). They identified several factors that complicate the obesity debate in Australia, making regulatory changes hard to achieve. These factors include a lack of social cohesion and leadership regarding the appropriate response to obesity, the food industry's influence in shaping the narrative and stifling regulation, a lack of urgency within key Federal agencies, and the complexity of the issue⁷.

Therefore, obtaining "social license" for regulation is essential for any State or Territory to advance with the necessary regulations to reduce the obesogenic environment. To obtain this licence, policymakers must be aware of the potential "counter-framing" of the issues by those opposing regulations (Figure 2). For instance, in 2017, the Australian Food and Grocery Council argued against a sugar tax by claiming, *"Highly interventionist policies like banning certain foods and imposing new food taxes are like putting a bureaucrat in every kitchen, when we know that for most people the answer is simply to move a bit more and eat a bit less"*⁸. This is an example of "counter-framing," a tactic used by industry representatives to oppose regulatory efforts.

"Slippery slope"
• Industry is vulnerable • Regulation was a 'risk' that would reduce revenue and cost jobs • Half of the food manufacturing workforce was located in rural Australia
"Nanny State"
Economic case not compelling
• Productivity Commission stated that the economic externalities from obesity were complex, difficult to assess, and probably minor
Questioning the efficacy of interventions
• "On balance, the evidence to date suggests that while many interventions to prevent childhood obesity show promise in improving lifestyle behaviours, they have not been effective in stabilising or reducing obesity prevalence to any significant degree." Productivity Commission (2008)
Complex issue without single source of credible expertise

Figure 2: Counter-frames employed by people who oppose regulations to reduce obesity (Baker, Gill and Friel et al (2017)).

⁶ Baker, Phillip, et al. "Generating political priority for regulatory interventions targeting obesity prevention: an Australian case study." *Social science & medicine* 177 (2017): 141-149.

⁷ As recently as 2010, a Productivity Commission report on Childhood Obesity was arguing that there was "In summary, given the lack of firm evidence that childhood obesity prevention measures have been effective, policies should be designed based on cost-effectiveness, and implemented gradually, with a focus on evidence gathering, information sharing, evaluation and consequent policy modification" (page 90, Crowle, J. and Turner, E. 2010, *Childhood Obesity: An Economic Perspective*, Productivity Commission Staff Working Paper, Melbourne).

⁸ <https://www.sbs.com.au/news/article/sugar-tax-not-the-answer-to-obesity-hunt/7io0zib2m>

Securing public support for policies and regulations to combat childhood obesity requires South Australians to recognize the significant future consequences of this issue and understand that the solution lies not in individual self-control but in comprehensive and systemic reforms.

This report examines the projected impact of childhood obesity on the South Australian population, aiming to highlight the serious effects that unchecked obesity can have on life expectancy. This report specifically projects the impact of increasing childhood obesity on life expectancy. Such projections are crucial for several reasons.

Firstly, there is a common belief that life expectancy will continue to improve, as it has over the past century in Australia⁹. While a recent reduction in life expectancy has been recorded due to the increased mortality due to the covid pandemic, the assumption is that this is a temporary blip and that the broad gains in life expectancy experienced in the last decades will continue. A large portion of the recent improvement in life expectancy is attributed to reduced smoking rates, which took a major effort by policymakers including regulatory changes that were opposed by the tobacco industry. Similar efforts are necessary to combat obesity to sustain these improvements.

Quantifying the impact of obesity on life expectancy can help policymakers prioritise among various health policy goals. Despite pressing issues facing South Australia like the global health workforce shortage and the growing needs of an aging population, each issue must be carefully weighed to determine its priority in a crowded health policy agenda. Demonstrating the substantial threat of obesity to the healthcare system's structure can make anti-obesity regulations a crucial part of ongoing health reforms. As noted in The Conversation, *"Public health's long-term view disadvantages it within a three-year election cycle that favours fast outcomes, even if those outcomes are more expensive. It's easier and quicker to see the impact of treatment than prevention. Currently, the system is set up to fund personal (individual) health. It's harder to cut personal healthcare, if only because a real person missing out on surgery or drug therapy makes better headlines."*¹⁰

One of the caveats of this report is that we are unable to look at Aboriginal and Torres Strait Islander population separately. The reason is that the population is too small in South Australia, and there is insufficient data available. However, obesity rates amongst the ATSI population are considerably higher and we therefore would expect the need for anti-obesity regulation to be more urgent for

⁹ Lopez, Alan D., and Tim Adair. "Slower increase in life expectancy in Australia than in other high income countries: the contributions of age and cause of death." *Medical journal of Australia* 210.9 (2019): 403-409.

¹⁰ <https://theconversation.com/why-the-budget-should-treat-public-health-like-transport-vital-infrastructure-with-long-term-economic-benefits-180322>

that sub-population¹¹. A study of childhood obesity amongst South Australian children found that Aboriginal children were more likely to be overweight and obese when compared to non-Aboriginal peers by four years of age. Additionally, that the difference persisted even after controlling for rural/urban residence and socioeconomic status.

¹¹ Spurrier, Nicola J., et al. "South Australian four-year-old Aboriginal children: residence and socioeconomic status influence weight." *Australian and New Zealand Journal of Public Health* 36.3 (2012): 285-290.

Methodology for projecting life expectancy

Life expectancy is a synthetic quantity meant to provide a projection of how long – on average – a person born in a specific cohort is expected to live. For example, according to the baseline ABS calculations, a South Australia child born in 2021 is expected to live on average 81.0 years if they are male and 85.1 years if female.

The baseline ABS projections are calculated using a backward-looking profile of mortality by age. For example, the projected mortality for a cohort born in 2023 at age 10 will not be observed until 2033. However, because we want to project their life expectancy in 2023, baseline life expectancy projections *assume* that the mortality of a 50-year-old in 2073 (when the 2023 cohort is 50) is the same as the mortality of 50-year-olds observed now. Therefore, we can think of the ABS baseline life expectancy at birth as being a “best guess” of life expectancy, given the currently observed age-mortality profile.

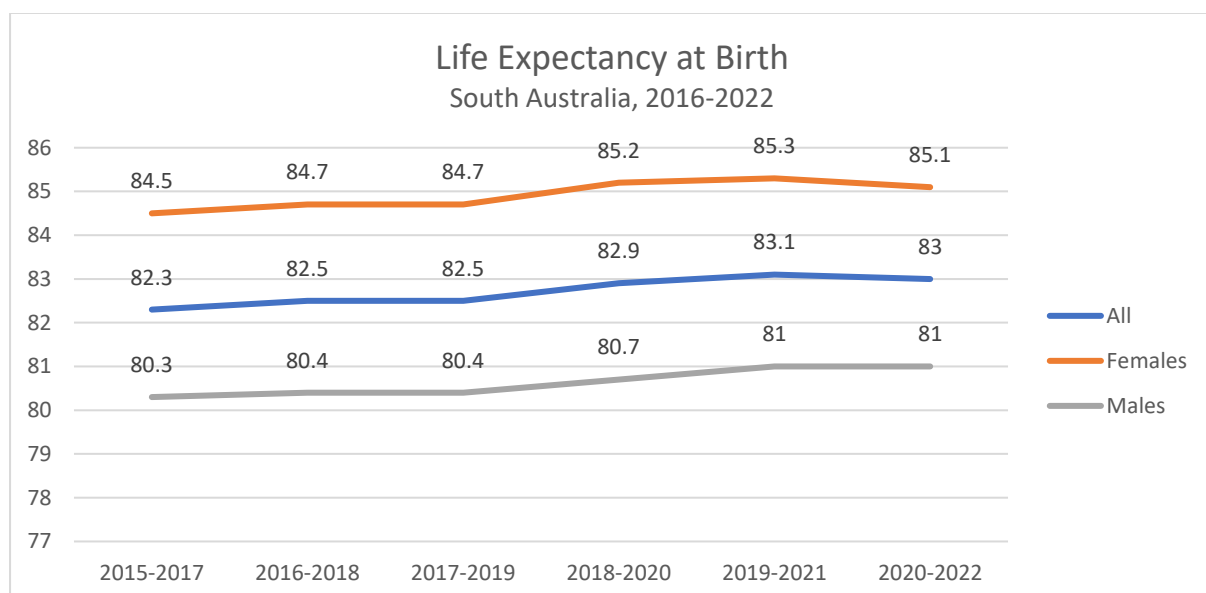


Figure 3: Life expectancy at birth for South Australians

Figure 3 shows the life-expectancy calculated by Australia Bureau of Statistics (ABS). The reduction in the life expectancy at birth for those born in 2020-2022 is *lower* because of the pandemic. This perfectly illustrates the backward-looking nature of life expectancy calculations. The ABS calculations have produced lower life expectancy calculations for children born *after* the pandemic. This is because the pandemic increased mortality rates, especially amongst the older population, and therefore it is assumed that when the 2022 cohort ages they too will die at higher rates. This is clearly unrealistic; it is highly unlikely that the current cohort will also experience a pandemic in their older years.

Indeed, we know that when the current birth cohort ages to 50 years, we would expect that they might have better treatments for cancer (increasing their life expectancy) but be more obese (decreasing their life expectancy). That is, the lifecycle mortality faced by the 2023 birth cohort is not the cross-sectional mortality that is used to calculate standard life expectancy.

When we look at South Australian obesity rates, we observe that the trend shows an increasing rate of obesity and overweight. The latest National Health Survey data reports that there are 953,400 South Australians who are obese or overweight. Over the 15 years of the National Health Survey (2007 to 2022), around 500,000 more South Australians became obese. This trend translates into 33,000 South Australians entering obesity every year. Of course, the South Australia population also grew, and Figure 4 plots the proportion of the adult population that were overweight and obese over this time.



Figure 4: Time trends in obesity and overweight amongst South Australians (2007-2022). Source: National Health Survey (2022), ABS.

However, it is not just the trend in overall obesity that is concerning. We also find that subsequent birth-cohorts are becoming more obese. We used various National Health Surveys (2001, 2011 and 2017) to try to reconstruct the obesity rates of different birth cohorts of South Australians born at different time periods.

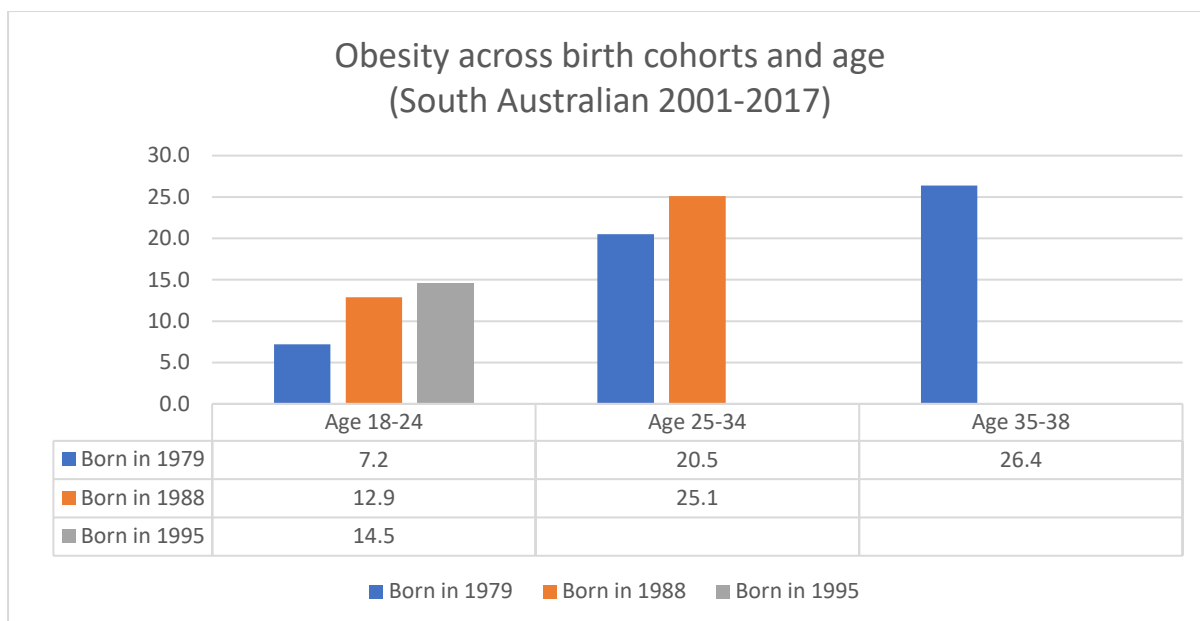


Figure 5: Obesity amongst South Australians across age and cohorts. Note: calculated from 2001, 2011 and 2017 National Health Survey data.

Figure 5 shows the obesity rates for selected cohorts. What is striking is how much higher obesity rates are for subsequent cohorts. For example, a child born in 1995 and who was therefore exposed to the highly obesogenic environment including advertising and availability of fast foods was *twice as obese* when they reached young adulthood (18-24 years) than a child born in 1979 when the environment was much less conducive to obesity. This shows why it could be that a child born in South Australia in 2023 will enter adulthood at far higher rates of obesity than is assumed in current life expectancy calculations, and additionally why this might indeed reduce life expectancy for this generation.

Reither, Olshansky, and Yang Yang (2011)¹² refer to this as the “third dimension” of predicting mortality in the face of growing obesity. They make the point that, as the current generation of children become adults, they will face a higher burden of obesity and mortality rates. Therefore, assuming that the risks they face as heavier adults are the same as the current adults (who were half their weight when they were children) is unrealistic. To illustrate their point, they undertake two approaches to the prediction of cardiovascular disease mortality – one which considers the growth of risk that is cohort specific (similar to what we do here) and one which does not (similar to the ABS projections). They show that their projected cardiovascular disease mortality is much closer to the actual mortality rate, whilst the one that doesn’t take into account this cohort specific growth

¹² Reither, Eric N., S. Jay Olshansky, and Yang Yang. "New forecasting methodology indicates more disease and earlier mortality ahead for today's younger Americans." *Health Affairs* 30.8 (2011): 1562-1568.

substantially under-estimates the CVD mortality rates. Simmonds, Mark, et al (2016)¹³ look at the correlation between childhood obesity and adulthood obesity. They undertake a systematic review of published data and conclude that obese children and adolescents were around five times more likely to be obese in adulthood than those who were not obese.

The purpose of the current study is to try to calculate how much that cohort effect of increase in obesity could contribute to the heightened mortality of a 50-year-old in 2073 compared with a 50-year-old in 2023. Note that this is clearly a pessimistic assessment which disregards the possibilities of such improvements as cancer treatments or management of diabetes.

There are three components to estimating the impact of increased childhood obesity on the life-expectancy of the 2023 cohort:

- (i) Project how increased childhood obesity for the 2023 cohort would translate into increased lifetime obesity and overweight in terms of increased average BMI.
- (ii) Calculate how the trajectory of BMI would increase mortality through the age groups.
- (iii) Calculate the impact of the increased mortality on the life expectancy at birth.

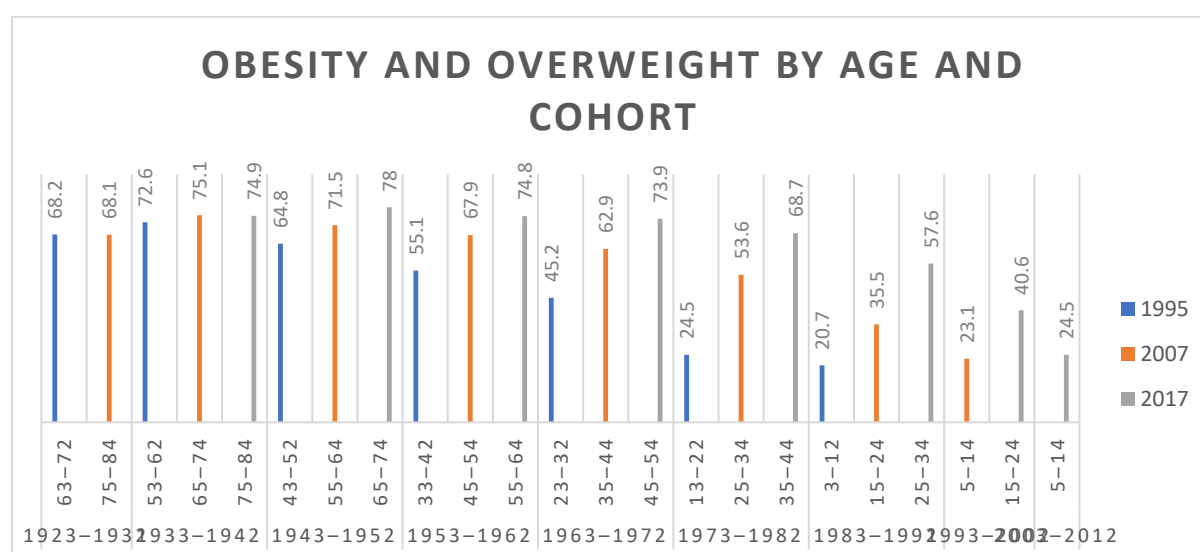


Figure 6: Cohort and age specific obesity rates (from National Health Surveys 2001,2011 and 2017)

We assume that the 2023 cohort reaches age 18 with the same rate of overweight and obesity as is currently observed in the South Australia population. We then project their obesity and overweight

¹³ Simmonds, Mark, et al. "Predicting adult obesity from childhood obesity: a systematic review and meta-analysis." *Obesity reviews* 17.2 (2016): 95-107.

rates by applying currently observed cohort specific growth rates. We start by assuming that obesity and overweight rates for 18-24 years olds are the same as in the 2017 survey. We then look at the average observed growth rate of obesity and overweight rates for the 1995, 2007 and 2017 AIHW surveys¹⁴ across the age groups.

For example, to estimate the growth from the 18-24 age group to 25-34, we observe that for the 1973-1982 cohort, the growth rate was 2.19 (53.6/24.7) and for the 1983-1992 cohort the growth rate was 1.62 (57.6/35.5), yielding an average growth rate of overweight and obesity prevalence from the 18-24 age group to the 25-34 group of 1.9. Table 1 provides the estimated growth rate for each of the age groups.

Age Group	Estimated growth trajectory
18-24	
25-34	1.9
35-44	1.3
45-54	1.2
55-64	1.1
65 years and over	1.1

Table 1: Calculated growth rates in obesity and overweight prevalence across age groups (based on whole of Australia data)

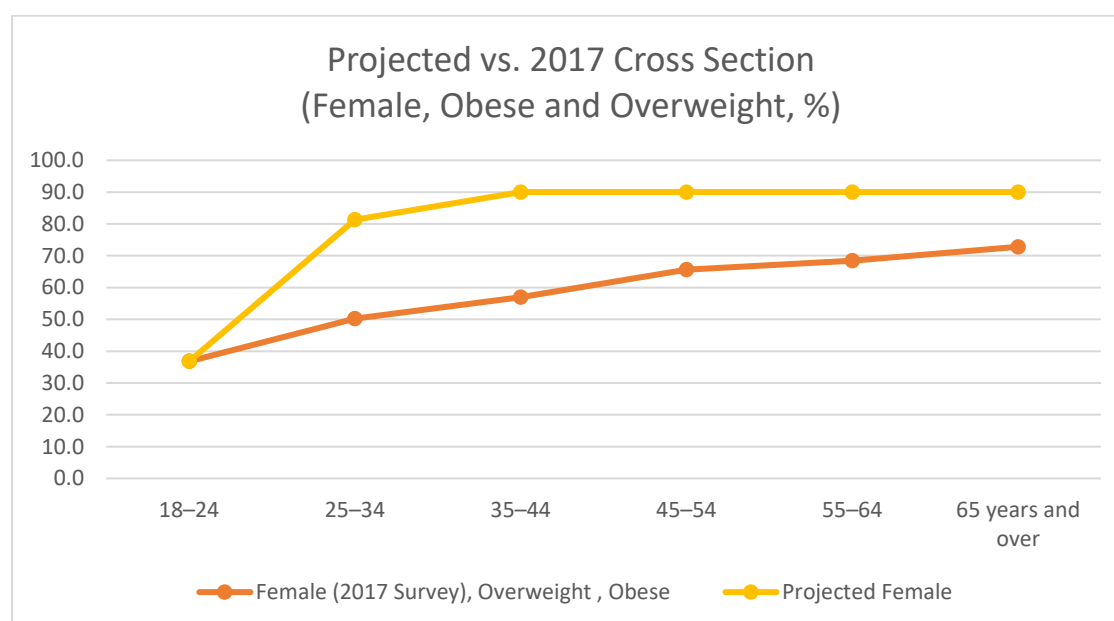


Figure 7: Projected vs. Cross Section Female, Obese and Overweight, %

¹⁴ See Supplementary data for Overweight and obesity: an interactive insight, 2020, S16.

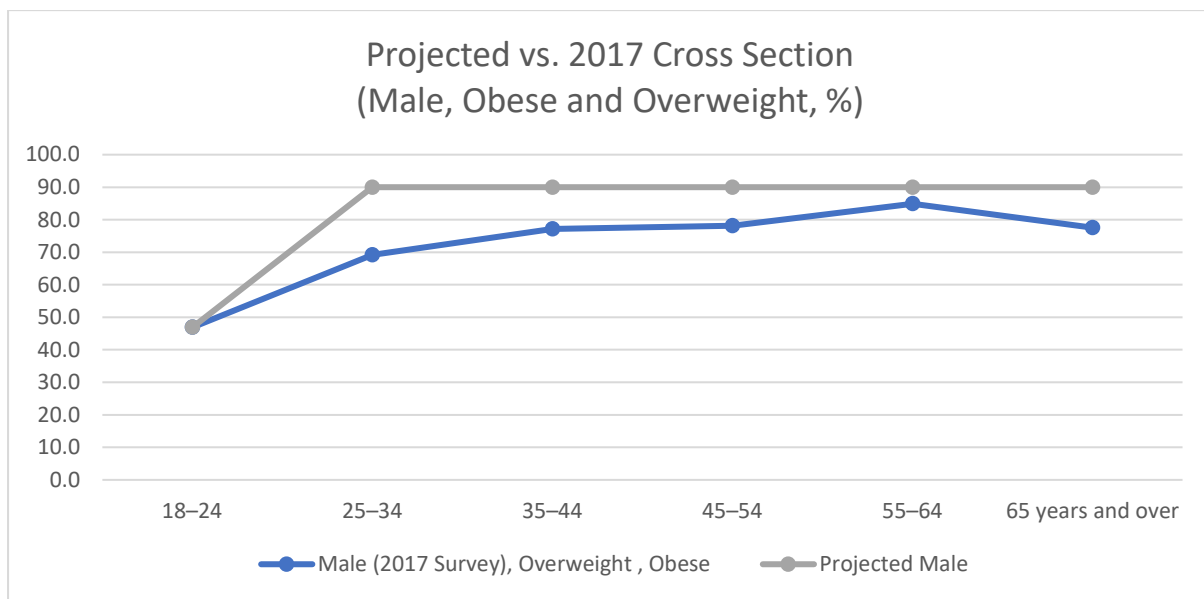


Figure 8: Projected vs. Cross Section Male, Obese and Overweight, %

Figure 7 and Figure 8 show the projected prevalence for males and females compared to that which is observed in the cross-section for South Australia. These show the higher rates of overweight and obesity that are expected for the 2023 birth cohort when they become say 35-44 compared to the 35-44-year-olds observed in 2017.

Calculating relative mortality risk from obesity

Using the projected age-profile for BMI from our projections, we apply a factor that calculates the increased relative mortality risk from the increased BMI. To calculate this, we use the figures provided by the Prospective Studies Collaboration (2009).¹⁵

Age at risk	Annual hazard ratio for All-Cause Mortality p.a. (For obese and overweight)
35-59	1.37
60-69	1.32
70-79	1.27
80-89	1.16

Table 2: All-cause mortality hazard rates used for modelling age-specific mortality (source: Prospective Studies Collaboration. (2009))

Table 2 provides the hazard rates used in the model. Note that the estimated hazard rates relate to an increase of 5 kg/m². For a typical Australian female aged 35-59 with a height of 1.61m, gaining 5kg of weight if they were overweight would mean they had approximately 14% higher chance of mortality each year. For an overweight male of height 1.75m, gaining 10kg in weight would increase their risk of death by almost 25%. Using these hazard rates on the projected BMI that we calculated yields a new estimated average age-specific mortality rate for a new South Australia life table. This then can be used to adjust the ABS baseline life expectancy to calculate an adjusted life expectancy which takes the higher BMI and mortality rates into account.

¹⁵ Body-mass index and cause-specific mortality in 900 000 adults: collaborative analyses of 57 prospective studies. The Lancet, 373(9669), 1083-1096.

Results

For the South Australia 2023 birth cohort, we estimate that the projected obesity could wipe 7 months off the life expectancy of South Australians born in 2023 compared with the pre-pandemic baseline. Note that we used the pre-pandemic baseline because, as discussed above, the post-pandemic life expectancy has embedded in it the unrealistic assumption that the 2023 birth cohort will also face a pandemic.

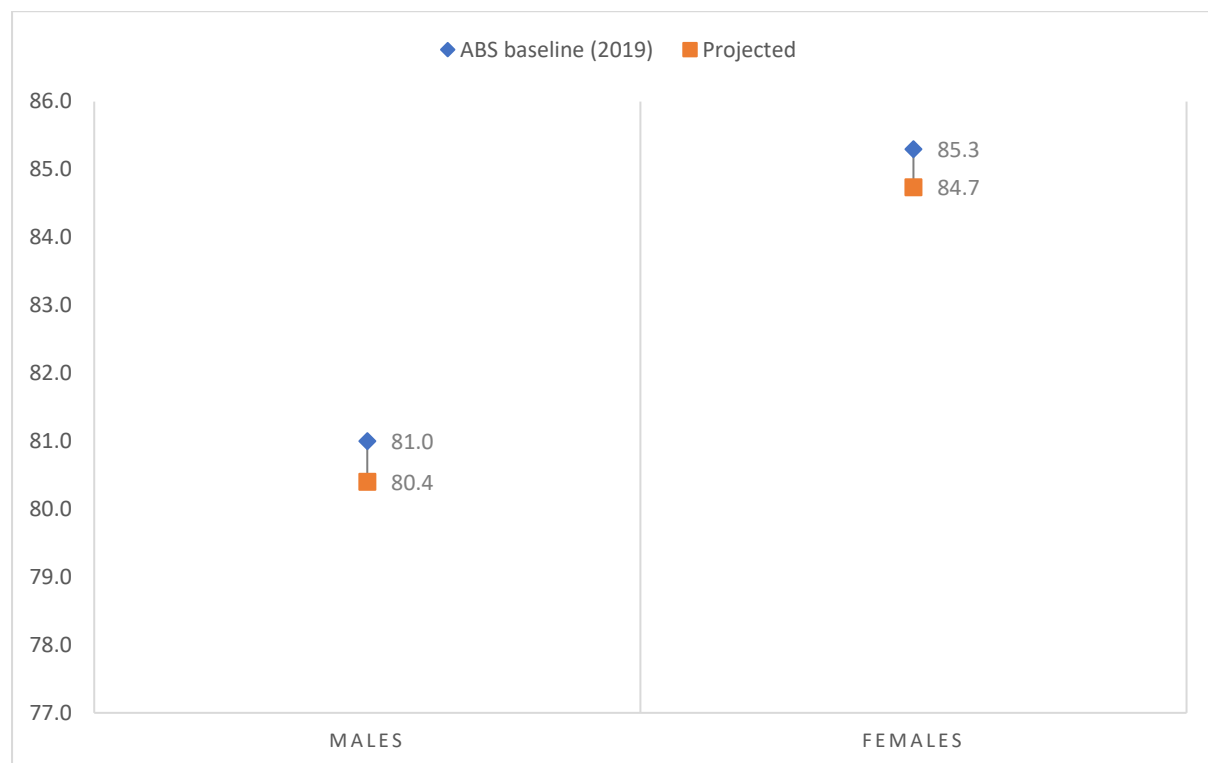


Figure 9 : Estimated loss in Life Expectancy for South Australians born in 2023 compared with pre-pandemic ABS Baseline.

South Australia conducts its own population survey called the South Australian Population Health Survey (SAPHS). Figure 10 provides a comparison between the results of the SAPHS for 2018-2023 and the ABS National Health Survey in 2022. Overall, the results are reasonably congruent.

We re-estimated life expectancy for the 2023 cohort using this alternative source of data. The male life expectancy for the 2023 cohort using the SAPHS data is slightly higher at 80.59 (compared to 80.4 using ABS data). The female life expectancy for the 2023 cohort is expected to be 85.25 (compared to 84.74 using ABS data). The reason for the difference is that the South Australian survey data shows lower obesity rates for 18–24-year-olds when compared with ABS data. And since the modelling assumptions are particularly sensitive to the obesity rates in this young population, the lower obesity rates observed in the SAPHS data produce higher life expectancies.

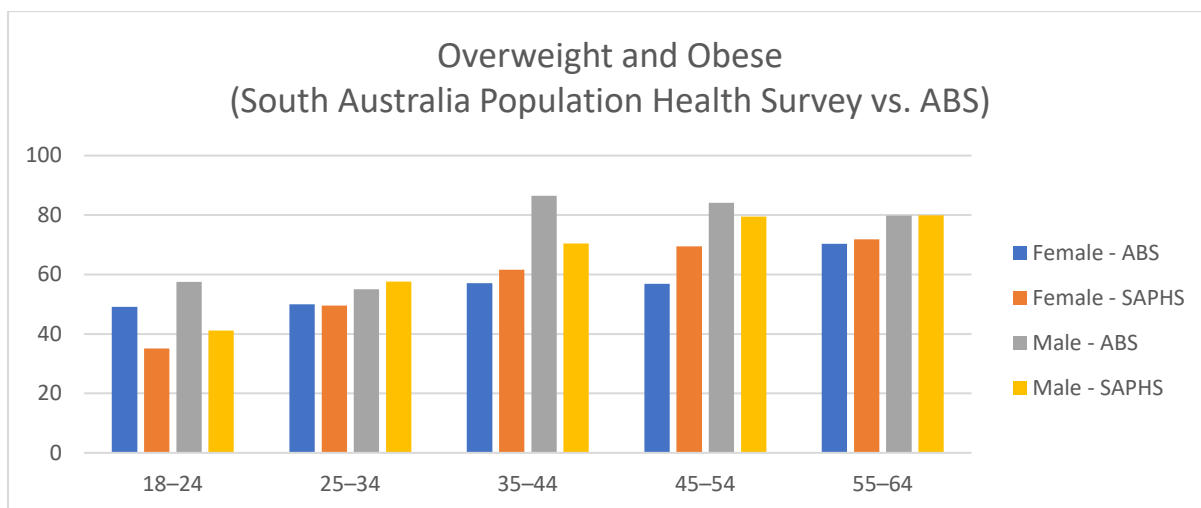


Figure 10: Obese and Overweight SAPHS vs ABS (Note: SAPHS, 2018-2023 and ABS is 2022).

Policy Implications

We undertook policy simulations to calculate what it would take to restore life expectancy to the baseline. Figure 11 shows the projected life expectancy under various scenarios. It shows that we need to reduce childhood obesity rates by 25% in order to achieve the ABS baseline life expectancy.

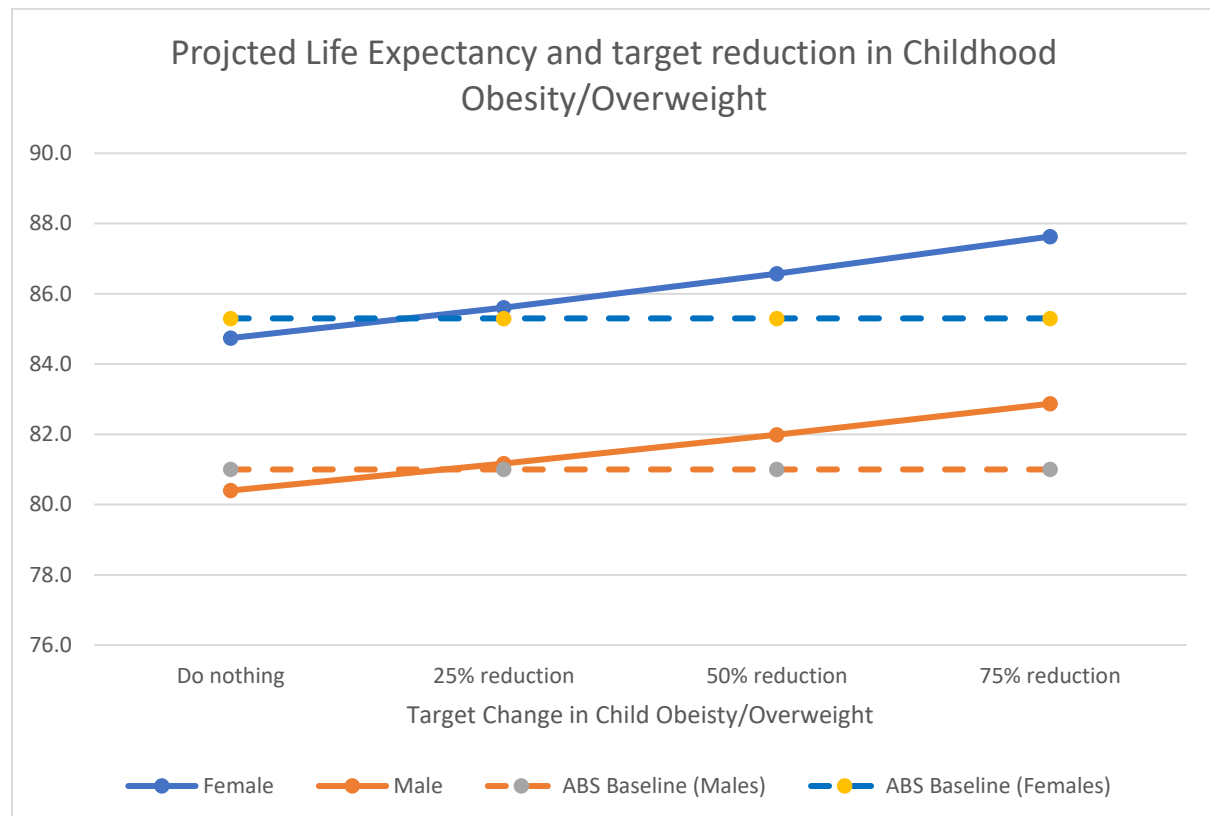


Figure 11 : Projected life expectancy under different obesity targets (South Australia population)

How realistic is it to achieve a 25% reduction? Swinburn et al¹⁶ (2011) provide a useful schema describing what it takes to reduce obesity at the population level. Their point is that the population level drivers are the hardest to change and therefore require the greatest social licence for action. Unfortunately, scientific evidence seems to have a minimal impact on policy reform in the obesity space. A recent case study is a report and publication which showed large¹⁷ benefits to banning trans-fatty acids in Australia. The report authors estimated that over the lifetime of the adult population, around 40,000 deaths due to ischemic heart disease could be prevented, and around 100,000 health-adjusted life years could be gained. Yet, despite this information being reported in

¹⁶ Swinburn, B. A., Sacks, G., Hall, K. D., McPherson, K., Finegood, D. T., Moodie, M. L., & Gortmaker, S. L. (2011). The global obesity pandemic: shaped by global drivers and local environments. *The Lancet*, 378(9793), 804-814.

¹⁷ Marklund, Matti, et al. "Estimated health benefits, costs, and cost-effectiveness of eliminating industrial trans-fatty acids in Australia: A modelling study." *PLoS medicine* 17.11 (2020): e1003407.

the media and the report being published in a high impact journal, there has been little done to ban trans-fatty acids. Indeed, according to a WHO report, Australia has one of the highest disease burdens from trans fats and yet have lax regulations, along with countries such as Egypt, Iran, Mexico, Azerbaijan, Ecuador, Pakistan, Republic of Korea, Bhutan, and Nepal¹⁸. This shows that even high-quality evidence of harm is not enough to motivate policy or political will.

Baker et al (2017) argue that the correct framing of the issue is crucial. They advise that an initial *“focus on children (child obesity), framing the determinants of obesity as ‘obesogenic environments’, and the deployment of ‘protecting kids’, ... and ‘economic costs’ frames generated political attention”*.¹⁹

Concentrating on how the obesogenic environment impacts parenting is needed to counter the framing of childhood obesity as a responsibility of parents. Rather, it is the environmental factors that are making unreasonable demands on parents, and like anti-smoking legislation which made it easier to quit and to not take up smoking, we need to regulate the environment so that it is easier for parents to maintain a child’s healthy weight.

Key Takeaways

- If nothing is done to reverse childhood overweight and obesity rates, current South Australia birth cohorts could see a *reversal* in their life expectancy.
- A framing of the issue as one of personal responsibility or responsible parenting must be countered. Parenting in today’s highly obesogenic environment poses challenges that are beyond parents’ ability to navigate.
- Alerting the community to the need for system-wide regulatory reform is important.

¹⁸ <https://www.reuters.com/markets/commodities/poor-nations-lag-removing-unhealthy-trans-fat-food-who-report-2021-12-07/>

¹⁹ Baker, Phillip, et al. "Generating political priority for regulatory interventions targeting obesity prevention: an Australian case study." *Social science & medicine* 177 (2017): 141-149.