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National FASD Program

Social Return on Investment

A REPORT PREPARED FOR

Foundation for Alcohol Research and Education

IMPACT ECONOMICS AND POLICY

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Authors

Dr Angela Jackson, LEAD ECONOMIST

Dr Angela Jackson is a health economist and has worked across tax, fiscal and social policy. Angela has authored a number of high-profile reports on health, aged care, disability, housing, and gender policy.

Angela holds a Masters in International Health Policy (Health Economics) with Distinction from the London School of Economics and Political Science, a Bachelor of Commerce (Hons) from the University of Melbourne and a Bachelor of Economics from the University of Tasmania. In 2021, she was awarded her PhD on the Economics of Disability in Australia from Monash University.

Clare Saunders, SENIOR MANAGER, ECONOMICS

As an economist for over fifteen years, Clare has extensive experience undertaking economic research, modelling and data analysis to provide economic insights and improve decision making.

Starting her career at the Australian Bureau of Statistics, Clare has worked at major consulting firms KPMG and Ernst and Young in the area of health economics and human services including undertaking a number of cost benefit analyses. Most recently Clare was a health economist at the National Heart Foundation responsible for providing economic and strategic analysis.

Nathan Blane, MANAGER, ECONOMICS

Nathan is an economist and public policy expert that has worked for the Commonwealth Treasury, the Grattan Institute and most recently UnitingCare Australia as a Senior Adviser, Economic Policy. In this role he advised on community services and economic inclusion policies.

Nathan obtained a Bachelor of Arts in Philosophy, Politics and Economics and a Bachelor of Laws from the University of Otago before completing Honours in Philosophy at the University of Melbourne.

Acknowledgement of Country

We acknowledge Aboriginal and Torres Strait Islander peoples as the Traditional Owners of Australia and their continuing connection to both their lands and seas. We also pay our respects to Elders – past and present – and generations of Aboriginal and Torres Strait Islander peoples now and into the future.

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Overview

There is no established safe level of alcohol consumption during pregnancy or breastfeeding. Despite this 28 per cent of Australian women continue to consume alcohol during pregnancy and 45 per cent during breastfeeding.[1]

The number of women consuming alcohol during pregnancy and breastfeeding is falling in Australia but continues to cause significant harm. In 2023 almost 90,000 children are estimated to have been born after exposure to the potentially harmful effects of alcohol during pregnancy.[2]

Alcohol consumption during pregnancy can lead to Fetal Alcohol Spectrum Disorder (FASD) including cognitive, behavioural, emotional and learning challenges and developmental disabilities. Alcohol use also increases the risk of complications during pregnancy including miscarriage, stillbirth and premature birth.

In this report Impact Economics and Policy has estimated that the lifetime economic and social costs of exposure to alcohol during pregnancy in Australia range between $2.7 billion and $6.4 billion per year[3], including:

- Between $2.4 billion and $6.1 billion due to FASD
- Between $19.9 million and $24.7 million due to miscarriage
- $244 million due to pre-term birth
- $8.8 million due to low birth weight
- $91 million due to early school leavers

Reducing the costs of alcohol harm during pregnancy and breastfeeding requires improved access to diagnosis and supports, and increased awareness of the harms.

In 2020, the Australian Government funded the first national campaign on alcohol, pregnancy and breastfeeding. The National FASD Program Campaign has successfully improved awareness and reduced the number of women that consume alcohol:

- The number of Australians that agree there is no safe level of alcohol consumption during pregnancy increased from 73.3 to 79.6 per cent.
- Among pregnant women that had seen the Campaign, there was a 14.2 per centage point increase in the number consuming no alcohol.

Impact Economics and Policy estimates that 16,554 fewer women consumed alcohol while pregnant in 2023 due to the Campaign, leading to:

- 2,002 fewer cases of Fetal Alcohol Spectrum Disorder
- 369 fewer low birth weight babies
- 958 fewer premature births
- 414 fewer miscarriages

1. These estimates are based on the latest National Drug Strategy Household Survey findings, but maybe below actual figures.
2. Impact Economics & Policy calculation, based on 2023 births data and NDSHS estimates that 28 percent of women continue consuming alcohol during pregnancy.
3. See Appendix for full workings and assumptions.

This modelling accounts for the pre-existing trend declines in alcohol consumption during pregnancy and the fact not all women saw the Study. 45.5 per cent of Australians aged 18 and over recognised the National Campaign and 65.2 per cent of women trying to conceive recognised the National Campaign.

Impact Economics and Policy modelling estimates that the Campaign reduced the economic costs of alcohol consumption during pregnancy by $236 million in 2023 (see Appendix for full workings).[4]

This means that **every $1 invested in the Campaign generated a $9 social return**.

This is a conservative estimate, and does not account for:

- Reduction in number of women consuming alcohol in future years
- Broader health and social benefits

However, these benefits are at risk with The National FASD Program Campaign due to end in June 2025 without further funding from Government.

4. South Australian Health and Medical Research Institute (2023). National Awareness Campaign on Alcohol, Pregnancy, Breast-feeding and Fetal Alcohol Spectrum Disorder. Evaluation Report: Post-Campaign National Survey Topline Results.

Recommendations

BASED ON OUR FINDINGS, WE MAKE THE FOLLOWING RECOMMENDATIONS.

RECOMMENDATION 1

Conduct a National Prevalence Study.

The Australian Government should undertake a comprehensive national prevalence survey of FASD and its economic costs.

A national prevalence and cost study would provide valuable insights into the prevalence across demographic groups and regions, informing targeted interventions.

RECOMMENDATION 2

Increase Funding for the Diagnosis of FASD.

Enhance funding to improve access to the diagnosis and assessment of FASD.

Addressing the underdiagnosis of FASD requires further investment in diagnostic training for clinicians and other professionals working closely with children.

RECOMMENDATION 3

Maintain Funding for The National FASD Program Campaign.

Maintaining funding for The National FASD Program Campaign will help to maintain momentum, reinforce messaging, and ensure continued engagement with the issue.

Introduction

Alcohol-related harm is a significant issue in Australia, affecting individuals, families, and communities. While 8 in 10 Australians are concerned about alcohol related harm,[5] there remains a lack of knowledge and awareness of the health implications from the consumption of alcohol.

- Less than half of Australians know that alcohol causes cancer.[6]
- Only 1 in 7 Australians are aware that alcohol is a cause of breast cancer.[7]

The consumption of alcohol at any stage of life comes with risks, including increased risk of cancer, cardiovascular disease, liver disease, stroke, and dementia.[8] This report focuses on the specific risks associated with alcohol consumption during pregnancy and breastfeeding.[9] This report draws on the most up-to-date research available at the time of publication, supplemented by foundational studies relevant to understanding the long-term impacts of alcohol consumption during pregnancy.

In 2009 the National Health and Medical Research Council determined that there was no safe level of alcohol consumption during pregnancy or breastfeeding. Despite this, 28 per cent of Australian women continue to consume alcohol during pregnancy and 45 per cent during breastfeeding.[10]

While there has never been a national prevalence study in Australia, based on international estimates, up to 1 in 20 Australians live with Fetal Alcohol Spectrum Disorder, with higher rates detected in remote Aboriginal and Torres Strait Islander communities and the youth justice system.[11]

FIGURE 1 As many as 1 in 20 Australians live with Fetal Alcohol Spectrum Disorder (FASD)

5. Alcohol Change Australia (2023). *Public Opinion on Alcohol in Australia: Knowledge, attitudes, and support for change.*
6. Alcohol Change Australia (2023). Public Opinion on Alcohol in Australia: Knowledge, attitudes, and support for change.
7. Alcohol Change Australia (2023). Public Opinion on Alcohol in Australia: Knowledge, attitudes, and support for change
8. National Health and Medical Research Council (2020). *Australian Guidelines to Reduce Health Risks from Drinking Alcohol.*
9. National Institute on Alcohol Abuse and Alcoholism (2020). *Fetal Alcohol Exposure*
10. Australian Institute of Health and Welfare (2024). *National Drug Strategy Household Survey 2022-23.*
11. Elliott, E. and Bower, C. (2022). *Fetal Alcohol Spectrum Disorder in Australia: From Fiction to Fact and to the Future.*

The Effects of Alcohol

Alcohol is a known teratogen, a substance that causes fetal abnormalities. During pregnancy alcohol crosses the placenta, and the fetus experiences a blood alcohol concentration similar to the mother. Similarly, when a breastfeeding woman consumes alcohol, it enters her breast milk at the same level as in her blood, passing it directly to the infant. The effects of alcohol consumption before and during pregnancy extend beyond the individual, with profound and lasting consequences for the child.

When a man consumes alcohol before conception it also impacts the development of sperm, and can result in issues with conceiving and increases the probability of cognitive, behavioural, emotional and learning challenges.[12]

With 40 per cent of pregnancies unplanned, many women and men unknowingly expose their developing children to the impacts of alcohol before being aware that they are pregnant.[13]

There are also mixed messages due to cultural norms around alcohol consumption and out of date medical advice about the impacts of alcohol pre-conception, during pregnancy, and while breastfeeding.

Trends in Alcohol Consumption During Pregnancy and Breastfeeding

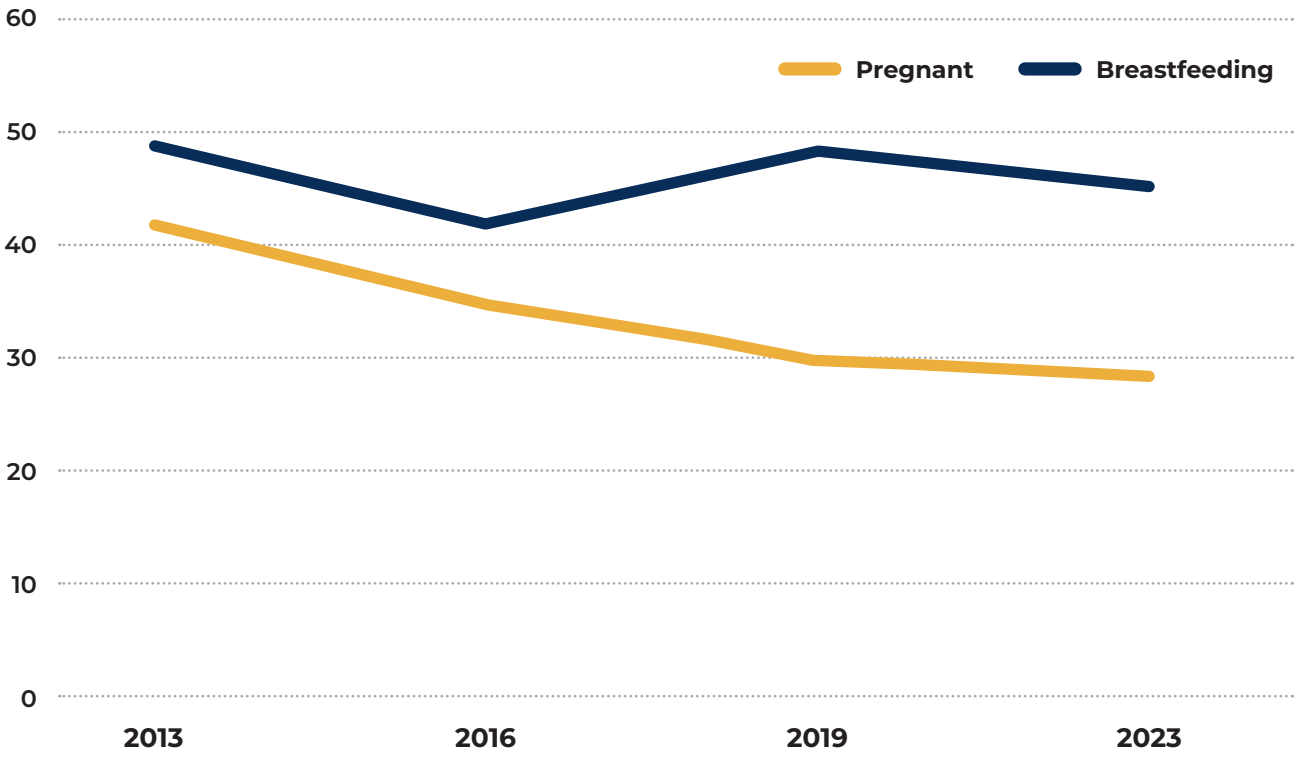
Australia has one of the highest rates of prenatal alcohol exposure in the world,[14] with 28 per cent of women continuing to consume alcohol during pregnancy.[15] This is a significant decline from 42 per cent in 2013 (see Figure 2), however still represents close to 90,000 children born each year after exposure to the harmful impacts of alcohol during pregnancy.

There has also been a slight decline in alcohol consumption during breastfeeding from 49 to 45 per cent over the same period (see Figure 2).[16] Statistics are not available on the number of men that consume unsafe levels of alcohol pre-conception, however 39 per cent of men aged over 14 engage in risky drinking behaviours.[17]

> Alcohol exposure brings about brain injury which introduces a range of neurodevelopmental impairments, speech problems, mental health problems, behavioural problems, memory, and executive function problems. We also see birth defects occurring with first trimester exposure, introducing sensory problems in vision and hearing. All these problems have lifelong implications, and we still don't know the full extent because the data is still coming out.
>
> **SENIOR RESEARCHER,**
> **Child and Adolescent Health**

12. Thomas, K. et al (2023). *Preconception paternal ethanol exposures induce alcohol-related craniofacial growth deficiencies in fetal offspring.*
13. Rowe, H. (2016) *Prevalence and distribution of unintended pregnancy: the Understanding Fertility Management in Australia National Survey.*
14. Popova, S., Lange, S., Probst, C., Gmel, G., & Rehm, J. (2017). Estimation of national, regional, and global prevalence of alcohol use during pregnancy and fetal alcohol syndrome: A systematic review and meta-analysis. *The Lancet Global Health*, 5(3), e290–e299. https://doi.org/10.1016/S2214-109X(17)30021-9
15. Australian Institute of Health and Welfare (2024). *National Drug Strategy Household Survey 2022-23*. and Popova, S. et al. (2023). *Fetal alcohol spectrum disorders.*
16. Australian Institute of Health and Welfare (2024). National Drug Strategy Household Survey 2022-23.
17. Australian Institute of Health and Welfare (2024). National Drug Strategy Household Survey 2022-23.

FIGURE 2 **Rates of alcohol consumption during pregnancy and while breastfeeding**



Source: Australian Institute of Health and Welfare (2024). *National Drug Strategy Household Survey 2022-23.*

Risky Drinking

Research shows risky drinking patterns before pregnancy continue into pregnancy.

> It is easy to put this problem on one group, but alcohol consumption is a society wide issue, especially where the person has been bombarded with advertising.
>
> **Sydney Based Obstetrician and Gynaecologist.**

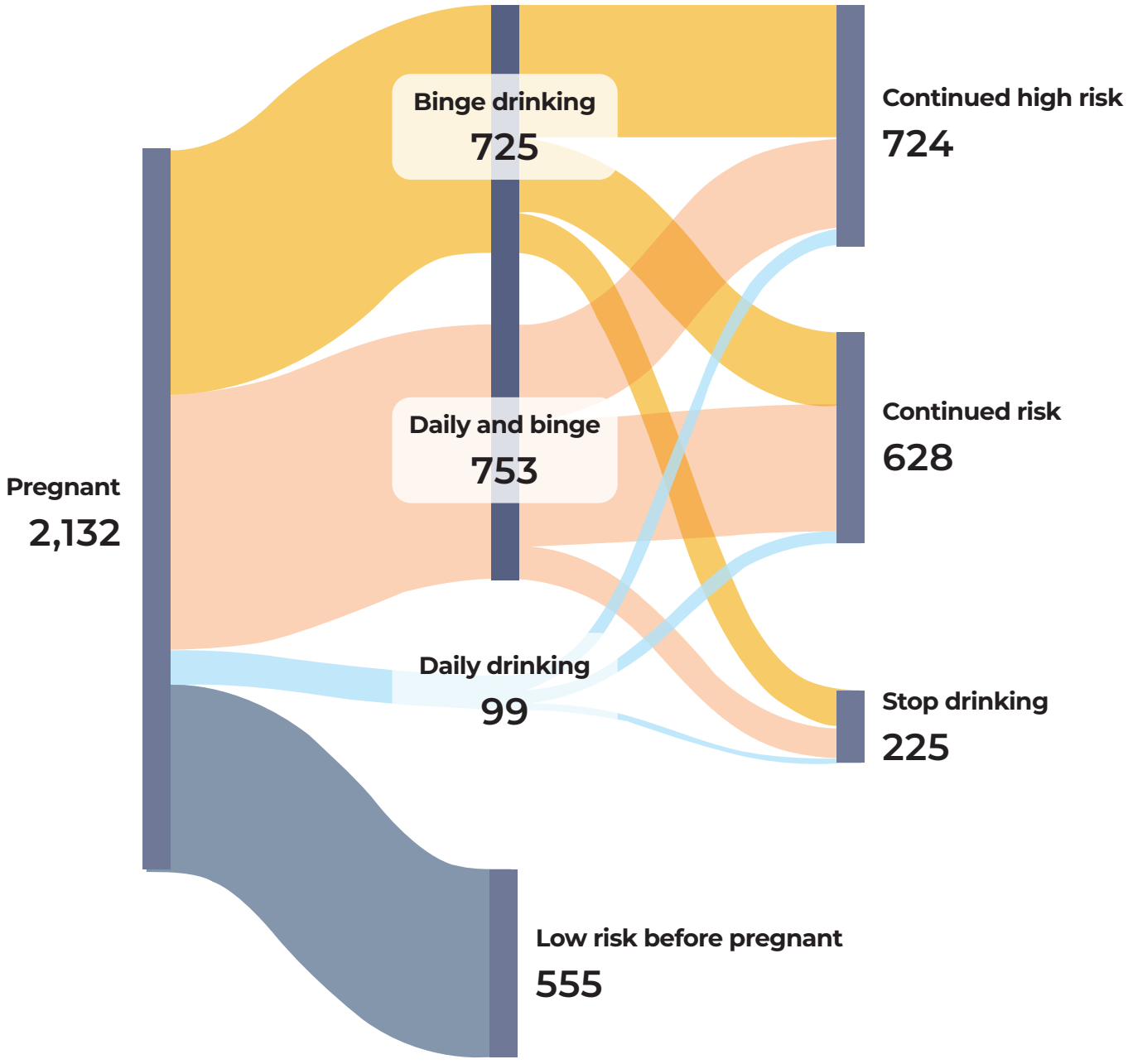
The Australian Longitudinal Study on Women's Health asks women about their drinking habits over time. Almost 75 per cent of women were classified as having risky drinking habits before they became pregnant, meaning they either drank every day or engaged in binge drinking.

When these risky drinkers were surveyed after becoming pregnant, only 14 per cent had stopped drinking. 46 per cent continued drinking at pre-pregnancy levels and 40 per cent continued but at a reduced level.[18]

18. Anderson A et al (2014). *Risky Drinking Patterns Are Being Continued into Pregnancy: A Prospective Cohort Study.*

FIGURE 3

People with risky drinking behaviours are likely to continue risky drinking into pregnancy



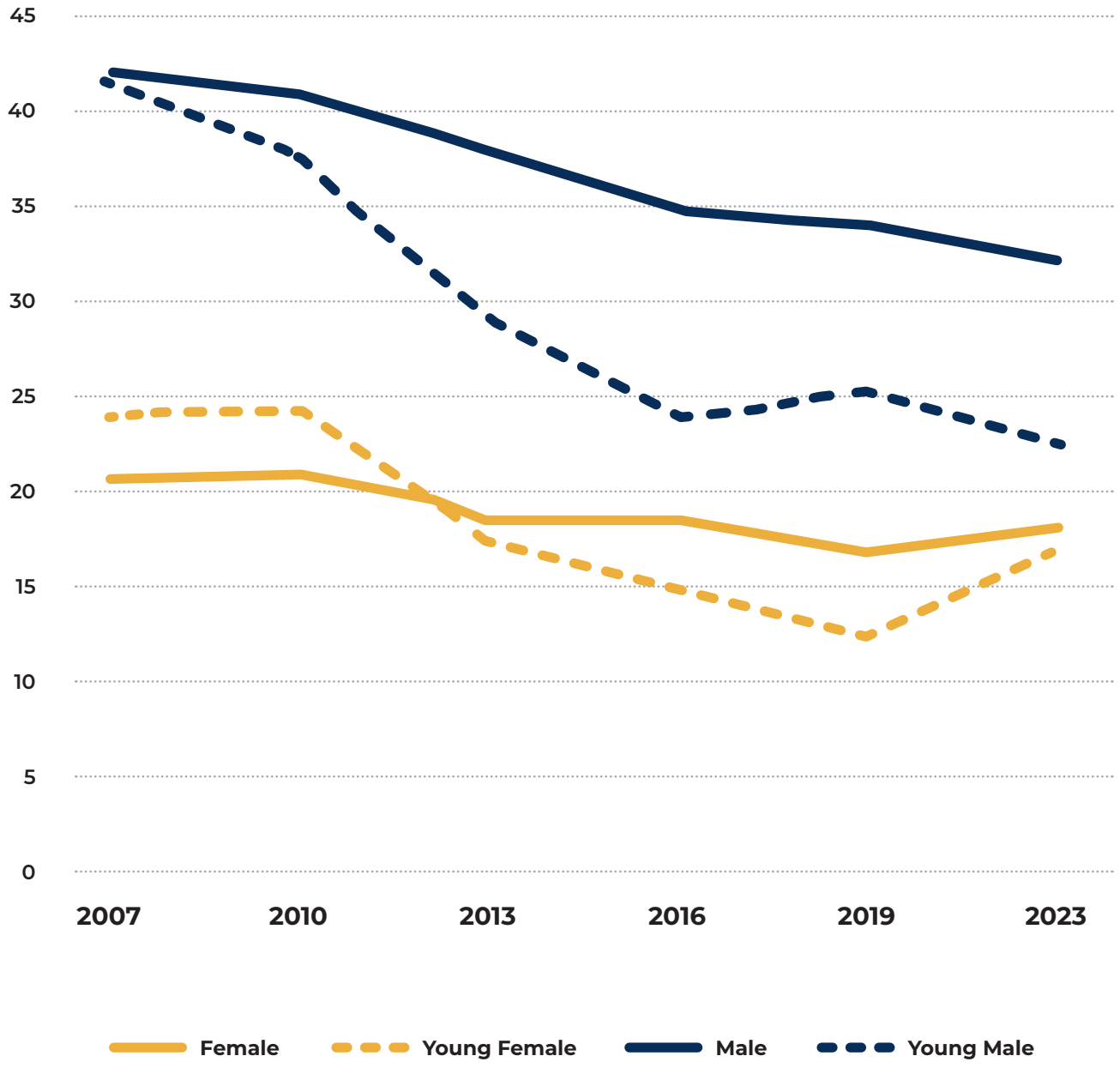
Source: Anderson A et al (2014) *Risky Drinking Patterns Are Being Continued into Pregnancy: A Prospective Cohort Study.*

Rates of risky drinking have been falling over the past two decades, as awareness of the health risks have increased, and societal attitudes change.[19] However, the decrease amongst females has been less than among males and the number of young women engaging in risky drinking showed indications of increasing in the latest tri-annual survey released by the Australian Institute of Health and Welfare.[20]

19. Australian Institute of Health and Welfare (2024). *National Drug Strategy Household Survey 2022-23.*
20. Australian Institute of Health and Welfare (2024). *National Drug Strategy Household Survey 2022-23.*

FIGURE 4

Consumption of more than 10 standard drinks per week by gender and youth status[a]



Note: a. Young males and female are aged 15-24 years.
Source: Australian Institute of Health and Welfare (2024). *National Drug Strategy Household Survey 2022-23.*

The higher rate of risky drinking among young women (relative to all women) heightens the risk of harmful alcohol consumption in the period before they become aware that they are pregnant, and also increases the chances that women will continue to drink during pregnancy.[21]

21. Anderson A et al (2014). *Risky Drinking Patterns Are Being Continued into Pregnancy: A Prospective Cohort Study.*

Attitudes to Drinking

Community attitudes towards alcohol consumption during pregnancy do not reflect the reality of the risks. A 2020 poll found that 46 per cent of Australians are unaware of the connection between stillbirth and alcohol consumption during pregnancy. 30 per cent are unaware of the connection between FASD and alcohol consumption during pregnancy.[22]

Concerningly even amongst individuals who are trying to conceive, are pregnant, or are breastfeeding there is often a lack of knowledge about the potential risks of consumption.

A national attitudinal survey in 2020 of couples who were breastfeeding, pregnant or planning a pregnancy, found that almost one in three thought there was a safe time to drink alcohol during pregnancy and one in four thought there was a type of alcohol that was safe to drink during pregnancy.[23]

These results highlight the need to increase awareness of the harms of alcohol consumption, and how they can be avoided.

The National FASD Program Campaign

The National FASD Program Campaign was developed in response to recommendations from the National Fetal Alcohol Spectrum Disorder Strategic Action Plan 2018-2028 and a Senate Inquiry highlighting the need for effective public education. The Campaign targets general public awareness, supports high-risk groups, provides training for health professionals, and promotes health programs for Aboriginal and Torres Strait Islander communities.

An evaluation of the Campaign[24] found that it has increased awareness and reduced alcohol consumption among pregnant women. In this report we leverage this evaluation to assess the Campaign's Social Return on Investment (SROI).

The report commences by quantifying the economic and social costs of alcohol-related harms during these critical periods. The report then provides background to the Campaign's design, drawing on broader public health literature. This provides the basis for a comprehensive assessment on the value generated by The National FASD Program Campaign.

22. Foundation for Alcohol Research and Education (2020). *Annual Alcohol Poll: Attitudes and Behaviours.*
23. Foundation for Alcohol Research and Education (2020). *Annual Alcohol Poll: Attitudes and Behaviours.*
24. South Australian Health and Medical Research Institute (2023). *National Awareness Campaign on Alcohol, Pregnancy, Breastfeeding and Fetal Alcohol Spectrum Disorder. Evaluation Report: Post-Campaign National Survey Topline Results.*

Risks and Costs from Alcohol Consumption During Pregnancy and Breastfeeding

The consumption of alcohol during pregnancy and breastfeeding represents significant risks to child health. Alcohol consumption during pregnancy is the largest cause of preventable developmental disability in the western world.[25]

The risk of consuming alcohol when pregnant and breastfeeding depends on how much alcohol the woman who is pregnant drinks, the pattern of drinking, and the stage of development when the drinking occurs.

Drinking even low levels of alcohol can increase the risks of miscarriage, and behavioural issues (ie any alcohol at all).[26] Children exposed to even small amounts of alcohol during pregnancy are more likely to exhibit adverse psychological, behavioural and developmental outcomes.[27]

Drinking at higher levels has been linked to increased rates of premature birth, low birth weight, congenital conditions, and FASD.

FIGURE 4 Select risks caused by low level alcohol exposure and significant

Risks from low level prenatal alcohol exposure[28]	Risks from significant prenatal alcohol exposure
Miscarriage	Intellectual disability
Mental health concerns	Congenital cardiac defect
Cognitive difficulties	School attendance and achievement
Behaviour difficulties	Contact with the justice system

25. Popova, S. et al. (2023). *Fetal alcohol spectrum disorders.*
26. Lees B et al (2020). *Association of Prenatal Alcohol Exposure With Psychological, Behavioral, and Neurodevelopmental Outcomes in Children From the Adolescent Brain Cognitive Development Study.*
27. Lees B et al (2020). *Association of Prenatal Alcohol Exposure With Psychological, Behavioral, and Neurodevelopmental Outcomes in Children From the Adolescent Brain Cognitive Development Study.*
28. Low levels include studies that look at any alcohol consumption up to one standard drink per week; high alcohol exposure include study impacts from more than one drink per week.

Fetal Alcohol Spectrum Disorder

In Australia, Fetal Alcohol Spectrum Disorder (FASD) is a diagnostic term for neurodevelopmental impairments caused by prenatal alcohol exposure. It includes two subcategories: FASD with three sentinel facial features (similar to Fetal Alcohol Syndrome) and FASD with fewer than three facial features (covering Partial Fetal Alcohol Syndrome and Neurodevelopmental Disorder–Alcohol Exposed).[29]

Internationally, definitions of FASD differ, particularly in the United States, where terms like FAS are used as sub categories of FASD. This report includes analysis of the costs of FAS from FAS specific studies, but these are not incorporated into the primary cost estimate, as outlined in the Appendix.

Globally, prevalence of FASD and FAS has been estimated at between 1.1 and 5.0 per cent in western countries, with higher rate observed in some regions and sub-populations.[30]

Higher rates are observed amongst children in care, including in an Australian youth correctional service where prevalence was estimated at 36 per cent and in remote Aboriginal communities with prevalence of 19 per cent.[31, 32]

Determining the prevalence of FASD across Australia is difficult due to the absence of regular assessments and screenings, inconsistencies in data collection and reporting across the nation, and limited awareness regarding the full spectrum of disorders within FASD.[33]

Based on international prevalence the number of people living with FASD in Australia is estimated to range from between 250,000 and 1.3 million.[34] The vast majority live with their condition without understanding its cause.

There are lifelong consequences from living with FASD, including reduced rates of school completion, increased contact with the justice system, and increased use of the health system.[35]

In 2023 it is estimated that between 3,000 to 14,700 children were born in Australia with FASD. Based on international studies,[36] Impact Economics and Policy conservatively estimates the additional lifetime costs associated with these children are between $2.4 billion and $6.1 billion (see Appendix for full workings).[37]

The large range of these estimates reflects the lack of Australian based research. A national prevalence and cost study, as recommended by the 2021 Senate Inquiry into effective approaches to prevention, diagnosis, and support for FASD would provide valuable insights into the prevalence across demographic groups and regions, informing targeted interventions.[38]

RECOMMENDATION ONE

A National Prevalence and Cost Study

The Australian Government should undertake a comprehensive national prevalence survey of FASD and its economic costs.

29. Bower C and Elliott EJ on behalf of the Steering Group (2016). *Report to the Australian Government Department of Health: Australian Guide to the diagnosis of Fetal Alcohol Spectrum Disorder (FASD).*
30. Popova, S. et al. (2023). *Fetal alcohol spectrum disorders.*
31. Fast, D. (1999). *Identifying fetal alcohol syndrome among youth in the criminal justice system.*
32. Fitzpatrick, J. P. et al. (2017) *Prevalence and profile of neurodevelopment and fetal alcohol spectrum disorder (FASD) amongst Australian aboriginal children living in remote communities.*
33. Bonello, M. R., Hilder, L., & Sullivan, E. A. (2014). *Fetal Alcohol Spectrum Disorders: strategies to address information gaps.* Canberra: AIHW.
34. FASD prevalence estimates range from 1 up to 5 per cent. Popova, S. et al. (2023). *Fetal alcohol spectrum disorders.*
35. Nguyen X., Jonsson E. (2014). *Cost of health service utilization of people with fetal alcohol spectrum disorder by sex and age group in Alberta, Canada.*
36. Nguyen X., Jonsson E. (2014). *Cost of health service utilization of people with fetal alcohol spectrum disorder by sex and age group in Alberta, Canada.*
37. Nguyen X., Jonsson E. (2014). *Cost of health service utilization of people with fetal alcohol spectrum disorder by sex and age group in Alberta, Canada.*
38. Community Affairs Committee (2021). *Effective approaches to prevention, diagnosis and support for Fetal Alcohol Spectrum Disorder.*

Western Australian Studies

A series of important Western Australian studies linked records of women with alcohol use disorders with their child's hospital inpatient, education, child protection, developmental anomalies, and justice records.

When compared to children of women who do not have an alcohol use disorder, exposed children had double the risk of Sudden Infant Death; triple the risk of intellectual disability; material increase in the probability of cerebral palsy; lower academic achievement; and more contact with the criminal justice system.[39]

Children exposed to high levels of alcohol during pregnancy are nearly three times more likely to develop intellectual disabilities, this risk is higher again among Aboriginal and Torres Strait Islander children.[40]

Children exposed to high levels of alcohol during pregnancy have a 180 per cent higher likelihood of justice system contact.[41]

Binge drinking prior to pregnancy triples the child's risk of congenital cardiac defects.[42]

Children exposed to high levels of alcohol during pregnancy are more likely to have poor school attendance and lower academic performance across reading, writing, spelling, and numeracy.[43]

Increase Rate of Miscarriage

Miscarriage impacts around 1 in 5 pregnancies in Australia and is caused by a variety of factors unrelated to maternal or paternal behaviour. However, the risk of miscarriage increases with even small amounts of alcohol consumption.

Every additional drink per week during pregnancy increases the risk of miscarriage by 6 per cent.[44] Impact Economics and Policy estimates that based on current drinking rates between 1,800 and 2,300 miscarriages are attributable to alcohol consumption in Australia each year (see Appendix for full workings).[45]

Based on international studies that include the cost of treatment and absences from work, the economic cost of increasing rates of miscarriage due to alcohol consumption is estimated at between $20 million and $25 million per year. This does not include long term and psychological costs.

Premature Birth

Premature birth occurs due to a variety of factors and leads to a range of short and long term complications, including increased rates of infant mortality.[46]

Alcohol exposure has been linked to a 170 per cent increase in the risk of premature birth when occuring in the first trimester.[47] Impact Economics and Policy estimates that 4,800 premature births are attributable to alcohol consumption during pregnancy in Australia, including 260 extremely premature births (20-27 weeks), 420 moderately premature (28-31 weeks), and 4,200 late premature (32 to 36 weeks).

Estimates of the health and schooling costs associated with preterm birth through to 18 years are $280,000 for extremely premature births, $107,000 for moderately premature, and $30,300 for late premature.[48]

The resulting annual cost for alcohol related premature births in Australia is $244 million (see Appendix for full workings).

39. See Hafekost, K. (2017). *Maternal Alcohol Use Disorder and Risk of Child Contact with the Justice System in Western Australia: A Population Cohort Record Linkage Study.* & Hafekost, K. (2017). *Maternal alcohol use disorder and subsequent child protection contact: A record-linkage population cohort study.* & Hafekost, K. et al (2017). *Maternal alcohol use disorder and child school attendance outcomes for non-Indigenous and Indigenous children in Western Australia: a population cohort record linkage study.*
40. O'Leary C et al (2013). *Intellectual disability: population-based estimates of the proportion attributable to maternal alcohol use disorder during pregnancy.*
41. Hafekost K et al (2017). *Maternal alcohol use disorder and subsequent child protection contact: A record-linkage population cohort study and Western Australia: A Population Cohort Record Linkage Study.*
42. Mateja W et al (2012). *The association between maternal alcohol use and smoking in early pregnancy and congenital cardiac defects.*
43. Hafekost K et al (2017). *Maternal alcohol use disorder and child school attendance outcomes for non-Indigenous and Indigenous children in Western Australia: a population cohort record linkage study* and Johnson S et al (2017). Maternal alcohol disorders and school achievement: a population cohort record linkage study in Western Australia.
44. Sundermann A et al (2019). *Alcohol Use in Pregnancy and Miscarriage: A Systematic Review and Meta-Analysis.*
45. See Appendix for calculations
46. March of Dimes. (2024). *Long-term health effects of preterm birth.* Retrieved from https://www.marchofdimes.org/find-support/topics/birth/long-term-health-effects-preterm-birth
47. Nykjaer, C. et al. (2014). *Maternal alcohol intake prior to and during pregnancy and risk of adverse birth outcomes: evidence from a British cohort.*
48. See Appendix for methodology

Low Birthweight

Low birthweight is, independent of premature birth, associated with a range of health and behavioural issues including higher probability of ICU and hospital admissions in the first year of life. Even low levels of alcohol consumption during pregnancy increases the risk of low birth weight.[49]

Elevated risk of low birth weight from alcohol consumption occurs only from consumption in the first trimester. An estimated 1,800 babies are born with low birth weight due to alcohol consumption during pregnancy each year, after accounting for premature birth to avoid double counting.

Babies that are born small for their gestational age have hospital costs 46 per cent higher than babies that with normal birth weight. Impact Economics and Policy estimates that the additional costs associated with low birth weight births due to alcohol consumption are approximately $8.8 million per year, in addition to the costs associated with premature births.

School Completion

Alcohol consumption during pregnancy lowers the rate of school completion. Non-completion of school is associated with lower lifelong earnings and higher health care costs.

Impact Economics and Policy estimates that the 1,100 children of mother's with alcohol use disorders born in 2023 will not complete their schooling, representing a loss of $91 million in productivity, health care and other costs.

Despite these potential life changing consequences impacting a significant proportion of the Australian population, there's limited awareness about the dangers of consuming alcohol during pregnancy and breastfeeding, with conflicting messages within the community and from health professionals.

While the risks of harm increase with higher levels of alcohol consumption, even low levels of consumption have potentially serious impacts.

Total Economic Costs are Substantial

In 2023, 87,000 births in Australia are estimated to have occurred after alcohol exposure during pregnancy (see Appendix for full workings).

The lifetime cost of alcohol consumption during pregnancy attributable to FASD, miscarriage, premature birth, low birth weight, and school completion is between $2.7 billion and $6.4 billion (see Appendix for full workings). Reducing the number of women that consume alcohol and the amount of alcohol consumed during pregnancy can reduce this cost.

49. Nykjaer C et al (2014). *Maternal alcohol intake prior to and during pregnancy and risk of adverse birth outcomes: evidence from a British cohort.*

Reducing the Harm

Reducing the harm from alcohol consumption during pregnancy and breastfeeding requires:

- Mitigating the harms from alcohol consumption; and
- Reducing the prevalence and severity of alcohol consumption.

Mitigating Harm from Alcohol Consumption

Mitigating harm from alcohol consumption is possible where early diagnosis is available. In recognition of the importance of early diagnosis additional funding was committed by the Australian Government in 2021, however it fell short on what experts had been seeking.

Very few Australians living with FASD have been diagnosed because of the barriers to diagnosis. These barriers include too few trained specialist practitioners, long waitlists, considerable fees, and social stigma.

Living with FASD – Fiona

I spent a decade grappling with my challenges before finally receiving a diagnosis of **Fetal Alcohol Spectrum Disorder** as an adult.

Throughout my journey, I encountered misdiagnoses, a lack of awareness about FASD among healthcare professionals, and a scarcity of information available to people living with this condition.

The diagnosis shed light on the root cause of my difficulties, particularly in executive functions like processing information, memory recall, time management, and working steadily through tasks. These challenges have significantly impacted my ability to study or maintain employment. Today, I rely heavily on extensive support to help me work toward my goals.

Despite my resilience, navigating social settings has been challenging due to my FASD, often leaving me feeling disconnected from my peers. By sharing my story and experiences, I aim to empower others facing similar challenges and spark positive change.

Diagnosis is a labour-intensive process requiring multiple assessments by a multidisciplinary team including, but not limited to, paediatricians or physicians, neuropsychologists, speech pathologists, and occupational therapists. When appropriately trained clinicians are available, diagnosis can take between two and three days.[50]

Families face long waits and high costs for an assessment. The average time for families with children with FASD is four years between symptom and diagnosis.[51] Advertised private costs for FASD assessment can be up to $7,700.[52]

Even when families can access services, accurate diagnosis can be elusive because there are not enough medical practitioners trained to diagnose FASD. NOFASD estimates that 4 in 5 people diagnosed with FASD were previously misdiagnosed with another disability or disorder.[53] Australia needs training and more multidisciplinary diagnostic centres according to the Royal Australasian College of Physicians.[54]

Regional and remote families, low-income families, and families with language or literacy barriers face additional challenges in accessing affordable diagnostic services.[55]

Addressing the underdiagnosis of FASD requires further investment in diagnostic training for clinicians and other professionals working closely with children.[56] In addition, there is a need to increase awareness of the harms of alcohol consumption during pregnancy, through ongoing campaigns such as The National FASD Program Campaign. Such investments can help address the underdiagnosis going forward.

RECOMMENDATION TWO

Increase Funding for the Diagnosis of FASD.

Enhance funding to improve access to the diagnosis and assessment of FASD.

The inadequacy of diagnosis and screening of FASD conceals the issue and undermines the wellbeing of individuals and their families. Improving diagnostic capabilities is essential for early identification and intervention, which can significantly improve outcomes for individuals affected by FASD.

50. VicFAS (2021). *Submission to Community Affairs References Committee on Effective approaches to prevention, diagnosis and support for Fetal Alcohol Spectrum Disorder.*
51. FASD Research Australia (2021). *Submission to Community Affairs References Committee on Effective approaches to prevention, diagnosis and support for Fetal Alcohol Spectrum Disorder.*
52. Impact Economics and Policy research.
53. NOFASD (2021). *Submission to Community Affairs References Committee on Effective approaches to prevention, diagnosis and support for Fetal Alcohol Spectrum Disorder.*
54. Royal Australasian College of Physicians (2021). *Submission to Community Affairs References Committee on Effective approaches to prevention, diagnosis and support for Fetal Alcohol Spectrum Disorder.*
55. Community Affairs Committee (2021). *Effective approaches to prevention, diagnosis and support for Fetal Alcohol Spectrum Disorder.*
56. Community Affairs Committee (2021). *Effective approaches to prevention, diagnosis and support for Fetal Alcohol Spectrum Disorder.*

Reducing the Prevalence and Severity of Alcohol Consumption

Raising awareness of the risks of alcohol consumption during pregnancy and breastfeeding in the general population can underpin a cultural shift that supports women abstaining from alcohol during pregnancy and breastfeeding.

However, changing the behaviour of women that are pregnant or breastfeeding requires a number of steps, which require well targeted and enduring public health campaigns.

MOVING FROM UNAWARENESS TO AWARENESS

The first step to changing behaviour is moving individuals from unawareness to awareness of the risks. Individuals will struggle to change their behaviour if they are unaware that it could be risky. Public health campaigns have an important role to play in this step, with campaign reach and frequency key to successful transition.[57]

Campaigns have more success when a larger proportion of the target audience is exposed to the campaign.[58] Without exposure people will not graduate to the awareness step because they have not been exposed to information about the risky behaviour.

Women that are pregnant and breastfeeding represent a transitory population, with women moving in and out of this life stage over time. This means that any successful campaign will need to continue so that it reaches the target audience.

INFORMATION SEEKING AND PERSONAL EVALUATION

The second and third steps involve individuals seeking information about the risk and evaluating whether it is relevant to them or not. Well targeted and accessible information is vital during the transition from information seeking to personal evaluation.[59]

This requires that there are accessible and trusted information sources, which should be part of any well designed public health campaign to change behaviours.

DECISION TO ACT AND ACTING

Once people decide the risk is relevant to them, they need to take the fifth and sixth step which require deciding to act and then acting to change their behaviour. At this point campaigns that provide individuals with support in the how of behaviour change can have more success.[60]

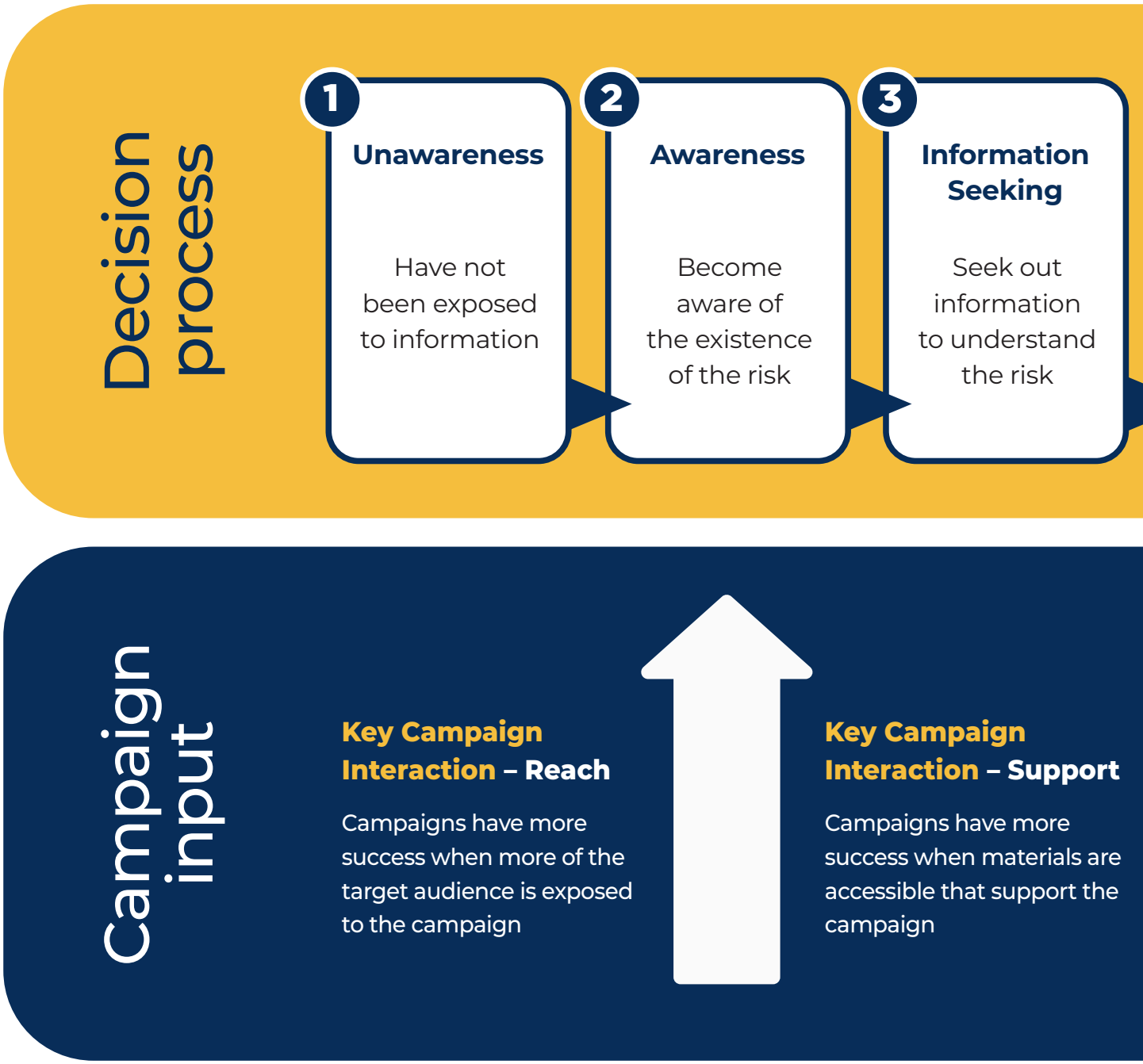
Where women have engaged in risky drinking behaviour before pregnancy or are alcohol dependent, this may require substantial support throughout pregnancy.[61] In order to change behaviour, there needs to be supports in place for women both before and during pregnancy and breastfeeding to reduce their alcohol consumption.[62]

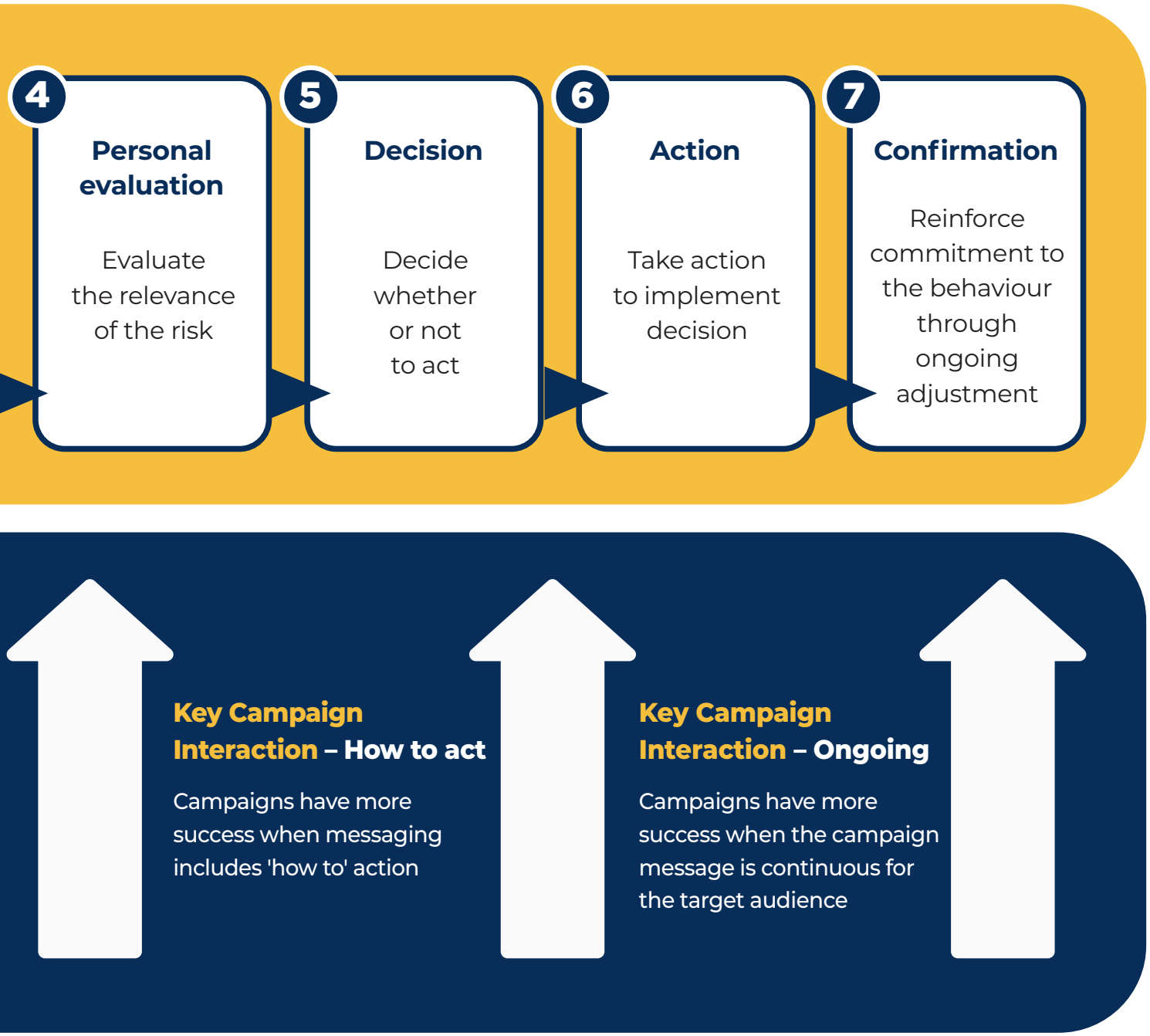
CONFIRMATION OF BEHAVIOUR

The final step in behaviour change requires confirmation of the behaviour until it is established, which requires maintaining campaign messaging to support people reconfirming their decision.

57. Abroms, L. and Maibach, E. (2008). *The effectiveness of mass communication to change public behavior.*
58. Abroms, L. and Maibach, E. (2008). *The effectiveness of mass communication to change public behavior.*
59. Desender, K. et al (2018). *Subjective Confidence Predicts Information Seeking in Decision Making.*
60. Pettigrew S et al (2021). *A randomized controlled trial of the effectiveness of combinations of 'why to reduce' and 'how to reduce' alcohol harm-reduction communications.*
61. Anderson A et al (2014). *Risky Drinking Patterns Are Being Continued into Pregnancy: A Prospective Cohort Study.*
62. Wakefield, M. et al (2010). *Use of mass media campaigns to change health behaviour.*

FIGURE 6 **Key campaign interactions and steps toward behavioural change.**




4
Personal evaluation
Evaluate the relevance of the risk
5
Decision
Decide whether or not to act
6
Action
Take action to implement decision
7
Confirmation
Reinforce commitment to the behaviour through ongoing adjustment
Key Campaign Interaction – How to act
Campaigns have more success when messaging includes 'how to' action
Key Campaign Interaction – Ongoing
Campaigns have more success when the campaign message is continuous for the target audience

Success is possible
Case Study

An Australian randomised control trial published in 2021 exposing participants to different messages on the harm of alcohol consumption saw a reduction of 0.87 standard drinks per week in the most successful intervention cohort.[63]

The report was published by academics from 6 institutions including the George Institute for Global Health and the Centre for Behavioural Research in Cancer.

The study used combinations of a 'why to reduce' advertisement and three 'how to reduce' messages. The three 'how to reduce' messages were *keep count of your drinks, decide how many drinks and stick to it*, and *it's okay to say no.*

EIGHT GROUPS RECEIVED EIGHT DIFFERENT MESSAGE COMBINATIONS:

1. Why to reduce message.
2. How to reduce message: keep count of your drinks.
3. How to reduce message: decide how many drinks and stick to it.
4. How to reduce message: it's okay to say no.
5. Why to reduce message & how to reduce message: keep count of your drinks.
6. Why to reduce message & how to reduce message: decide how many drinks and stick to it.
7. Why to reduce message & how to reduce message: it's okay to say no.
8. No message (control group).

Participants in groups 1 (Why to reduce) and 5 (Why to reduce and keep count of your drinks) both reported increases in attempts to reduce alcohol consumption across the 6 week study. Only group 5 showed a reduction in alcohol consumed.

This shows that well executed messaging incorporating a 'how to reduce' strategy can help people cut back drinking.

Campaign Duration

Public awareness campaigns compete with product marketing and established social norms to change attitudes and behaviours. Over long periods public health campaigns and restrictions on advertising have successfully changed intentions and behaviours on other harmful behaviours such as tobacco use and drink driving.[64]

A summary of health awareness campaigns by the University of Adelaide noted that some behaviours that are difficult to change may require several years of campaign implementation, with multi-faceted and developmentally sequenced campaign approaches.[65]

Campaigns have been shown to be most effective where they include messaging about both 'why to reduce' (e.g. Alcohol harms your child) and 'how to reduce' (e.g It's okay to say no).[66]

Some behaviours that are difficult to change may require several years of campaign implementation.[67] The National Tobacco Campaign is one of Australia's longest running public health campaigns. Launched in 1997, it aims to reduce smoking rates and saw a 3.7 per cent reduction in adult smoking over its first 5 years.[68] The effectiveness of campaigns is influenced by factors such as their reach, intensity, duration, and message type.[69]

These lessons on what works and what doesn't in public health campaigns underpinned The National FASD Program Campaign that sought to raise awareness of the harms of alcohol consumption during pregnancy and breastfeeding and reduce its prevalence.

63. Pettigrew S et al (2021). *A randomized controlled trial of the effectiveness of combinations of 'why to reduce' and 'how to reduce' alcohol harm-reduction communications.*
64. See Durkin E et al (2012). *Mass media campaigns to promote smoking cessation among adults: an integrative review* and Elder R et al (2004). *Effectiveness of Mass Media Campaigns for Reducing Drinking and Driving and Alcohol-Involved Crashes A Systematic Review.*
65. Bailey T et al (2019). *Evaluating behaviour change communication campaigns in health and safety: A literature review.*
66. Pettigrew S et al (2021). *A randomized controlled trial of the effectiveness of combinations of 'why to reduce' and 'how to reduce' alcohol harm-reduction communications.*
67. Bailey T et al (2019). *Evaluating behaviour change communication campaigns in health and safety: A literature review.*
68. Department of Health and Aged Care (2024). *National Tobacco Campaign.*
69. Durkin E et al (2012). *Mass media campaigns to promote smoking cessation among adults: an integrative review.*

The National FASD Program Campaign

The National FASD Program Campaign launched in November 2021 and ran until September 2024. It was a nation-wide awareness campaign sharing the latest evidence-based information about alcohol during pregnancy and breastfeeding across television, radio, digital, and out-of-home channels, including GP clinics and pharmacies.

It followed findings from the National Fetal Alcohol Spectrum Disorder Strategic Action Plan 2018-2028 and a Senate Inquiry that both concluded that a public education campaign was needed.[70]

The National FASD program was developed by the Foundation for Alcohol Research and Education, NOFASD and NACCHO with the support of health professionals and communities across Australia. The Campaign's objectives are to increase awareness about the risks of alcohol use and, provide women with information to successfully reduce alcohol consumption during pregnancy. Every Moment Matters was developed under Stream 1 of the Program.

> **We get more inquiries to our help line now around adult FASD.**
>
> SENIOR EXECUTIVE, NOFASD.

The Campaign has four streams that focus on:

1. General public awareness campaign
2. Support for priority groups including women at higher risk of alcohol-exposed pregnancies
3. Information and online training for health professionals
4. Health promotion programs with regional and remote Aboriginal and Torres Strait Islander peoples

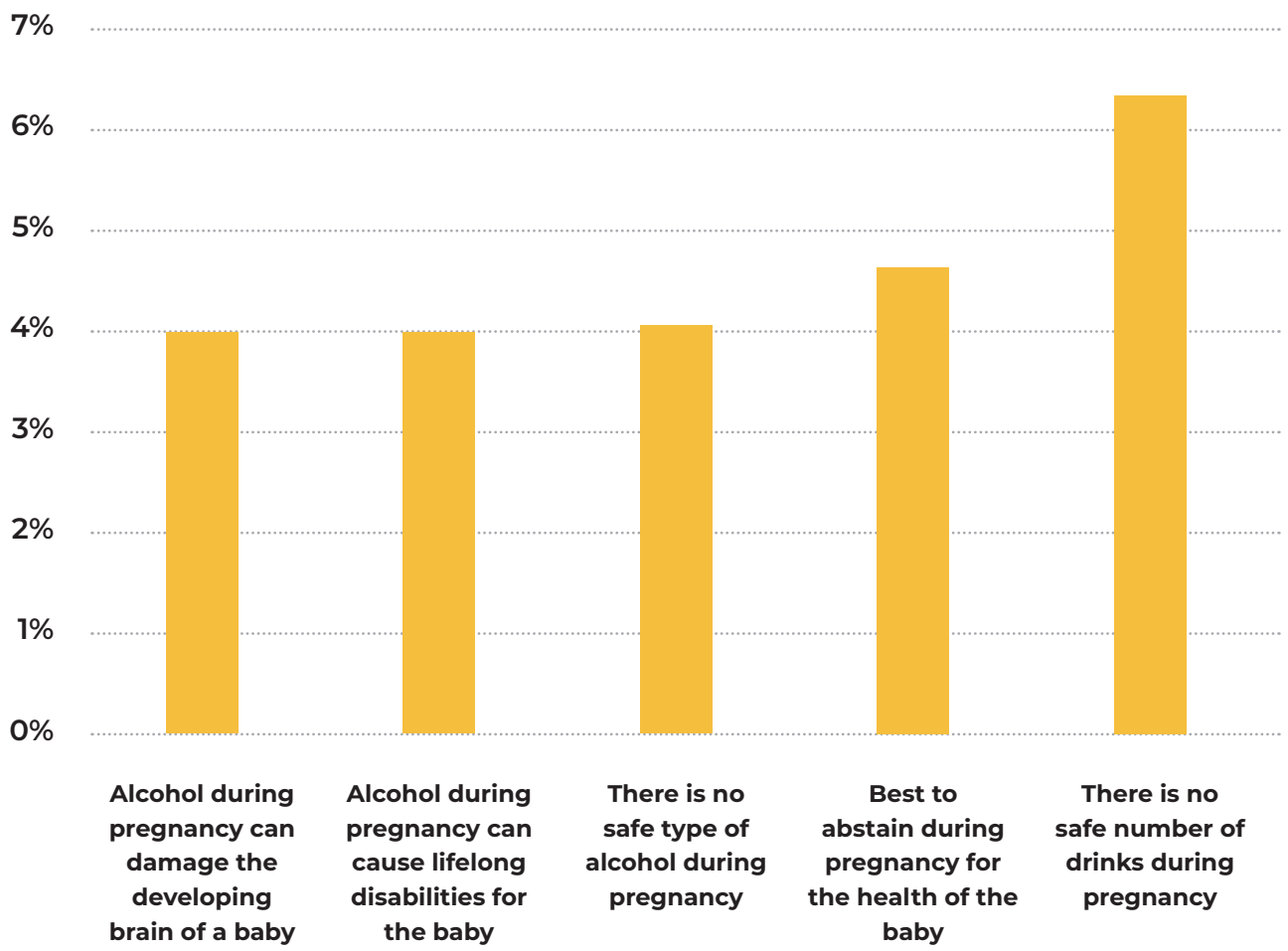
An evaluation of The National FASD Program Campaign by the South Australian Health and Medical Institute found that two years after launch 45 per cent of Australians recognised the Campaign. This was higher among target audience groups of pregnant and breastfeeding women (55.5 per cent) and people trying to conceive (65.2 per cent).[71] The proportion of all Australians who have heard of FASD increased 2.9 per cent (51.4 per cent to 54.4 per cent).

70. Department of Health (2018). *National Fetal Alcohol Spectrum Disorder Strategic Action Plan*. & Community Affairs Committee (2021). *Effective approaches to prevention, diagnosis and support for Fetal Alcohol Spectrum Disorder.*
71. The target audience of the campaign were women aged 18-44 years, women who were pregnant/breastfeeding, trying to conceive/planning a pregnancy (within the next 2 years), and partners of these women.

There has been a simultaneous improvement in knowledge of key campaign messages across those surveyed:

- Agreement that drinking alcohol during pregnancy can damage the developing brain of a baby is up 3.9 per cent (40.6 to 44.5).
- Acknowledgement that drinking can cause lifelong disabilities for the baby increased 3.9 per cent (38.1 to 42.0).
- Appreciation that there is no safe number of standard alcoholic drinks a pregnant woman can consume on any one day to avoid harm to the developing baby rose by 6.3 per cent (73.3 to 79.6).

FIGURE 7 Awareness of key campaign messages has increased throughout the Campaign



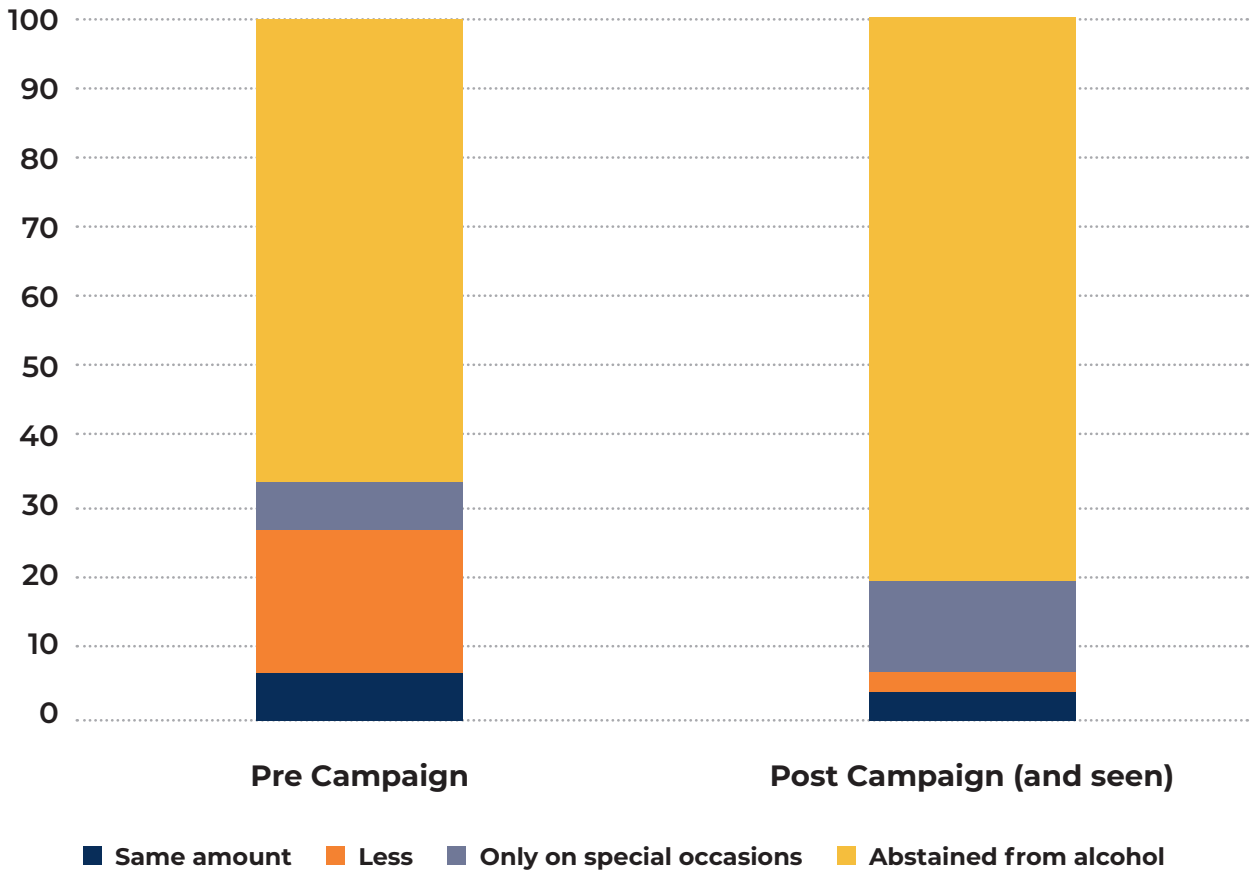
Source: South Australian Health and Medical Research Institute (2023). *National Awareness Campaign on Alcohol, Pregnancy, Breastfeeding and Fetal Alcohol Spectrum Disorder. Evaluation Report: Post-Campaign National Survey Topline Results.*

Decline in Alcohol Consumption

Reflecting the increased awareness of the harms of alcohol during pregnancy, there has been a decline in alcohol consumption during pregnancy. After the Campaign there was a 14.2 percentage point increase in the proportion of pregnant women abstaining from alcohol (after confirmation),[72] driven from a decrease in the proportion of women that, before the Campaign, drank the same, or slightly less during their pregnancy.

FIGURE 8

Pattern of alcohol consumption during (confirmed) pregnancy, pre and post Campaign



Source: South Australian Health and Medical Research Institute (2023). *National Awareness Campaign on Alcohol, Pregnancy, Breastfeeding and Fetal Alcohol Spectrum Disorder. Evaluation Report: Post-Campaign National Survey Topline Results.*

Impact Economics and Policy Modelling estimates that 16,554 fewer women consumed alcohol while pregnant in 2023 due to the Campaign. This modelling accounts for the pre-existing trend decline in alcohol consumption during pregnancy, and the fact not all pregnant women were exposed to the Campaign (see table A4 in the Appendix).

72. The difference is statistically significant at the 10% level.

Social Return on Investment

A Social Return on Investment measures the value of social, environmental, and economic results produced by an organisation, project, or policy.

By assigning monetary values to these results, a Social Return on Investment offers a more complete perspective on the impact achieved by the investment, allowing stakeholders to evaluate the efficacy and productivity of decisions across different investment options.

The National FASD Program Campaign involved four streams with a total investment of $27 million.[73] As noted, while public health campaigns are expected to take up to 10 years to generate behaviour change, The National FASD Program Campaign is associated with changed behaviour in its first 2 years.

16,554 fewer women consumed alcohol during pregnancy in 2023, leading to:

- 2,002 fewer cases of Fetal Alcohol Spectrum Disorder (including FAS)
- 369 fewer low birth weight babies
- 958 fewer premature births
- 414 fewer miscarriages

These are the benefits that can be directly estimated based on the existing literature, however there are broader benefits from the reduction in alcohol consumption during pregnancy and breastfeeding, including the improved health of the mother and the avoidance of physical health challenges, speech challenges, mental health challenges, behavioural challenges, memory, and executive function challenges for the baby.

Quantifying a Social Return on Investment

Impact Economics and Policy has estimated that the selected benefits from the observed reduction in FAS/FASD, low birth weight babies, premature births and miscarriages reduced the lifetime economic costs of alcohol consumption during pregnancy by $521 million in 2023 (see Appendix for full workings).

Based upon the primary estimate, the Campaign has reduced the lifetime economic costs of alcohol consumption during pregnancy by $236 million in 2023 (see Appendix for full workings).

73. Note the direct costs of the public awareness campaign was $17 million over four years, but we have chosen to use the higher total campaign figure of $27 million over four years to be conservative in our estimates. Using the cost of the public awareness campaign generates a higher SROI of 17.01.

FIGURE 9 **Harms avoided by The National FASD Program Campaign**

Avoided harm	Cases	Total social saving ($m)
Primary Estimate		
FASD[74]	1,775	$181
Miscarriage	414	$4
Preterm birth	958	$48
Low birth weight	369	$2.0
Total Primary Estimate		**$236**
Expanded Estimate		
FAS[75]	247	$286
Total Expanded Estimate		$521

Source: Impact Economics and Policy analysis.

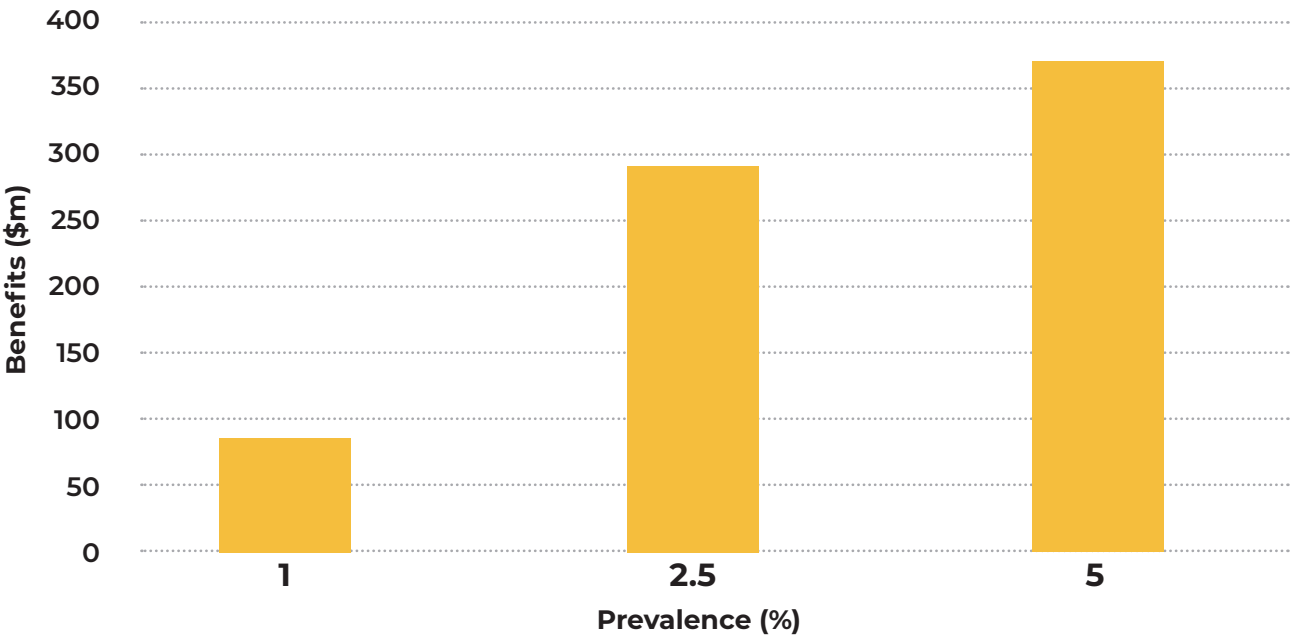
Combined with the total costs of running The National FASD Program Campaign over its 3 year period, the Social Return on Investment in 2023 is estimated at 9 – meaning that for every $1 invested in the Campaign it generated a $9 return.

This is a conservative estimate, and does not account for reduction in number of women consuming alcohol in future years and broader health and social benefits (including improved school attendance). Our expanded results give an indication of the potential broader benefits when the cost of FAS are included, with an estimated social and economic benefit of $521 million, and a social return on investment of $19 for every $1 invested.

74. The prevalence of FASD ranges from 1-5%. Results for the midpoint (3%) presented. See Appendix for range. Some FASD estimates include FAS, others do not.
75. FAS is excluded from the primary estimate because it is partly based upon an American study that is dated, and therefore may not be an accurate reflection of the cost of FAS in Australia.

FIGURE 10

Total benefit of The National FASD Program Campaign with varying FASD prevalence.



Source: Impact Economics and Policy analysis.

Given the experience of other public health campaigns, continuing The National FASD Program Campaign can be expected to maintain and increase the behavioural change observed in the first 2 years, and increase the economic benefits over time.

Combined with increased services to support women with risky drinking behaviours and alcohol dependency during pregnancy, Australia can drastically reduce the estimated $4.5 billion economic cost of alcohol consumption during pregnancy every year.

Sustaining The National FASD Program Campaign will help to maintain momentum, reinforce messaging, and ensure continued public engagement.

RECOMMENDATION THREE

Maintain The National FASD Program Campaign.

The Government should continue The National FASD Program Campaign beyond June 2024, to maintain and build on the Campaign's early success at raising awareness and reducing the harm from alcohol consumption during pregnancy.

Public awareness of FASD and alcohol related harms during pregnancy and while breastfeeding, while improved, is still too low. Ongoing awareness efforts are crucial for educating the public.

Appendix

Methodology for Estimating the Social Return on Investing in the Campaign

The Social Return on Investment (SROI) methodology is a well-established approach to understanding and quantifying the broader impact of interventions, particularly in the social sector. It involves assigning monetary values to outcomes that do not have a direct financial measure, thereby providing a comprehensive view of an initiative's value. The SROI framework typically includes stages such as stakeholder engagement, mapping outcomes, and assigning financial proxies to measure the value of these outcomes.[76] This method ensures that the full range of benefits, including those that are less tangible or harder to quantify, are considered in evaluating the success of a program.

While a literature review doesn't typically form part of the SROI framework, one was undertaken to inform the SROI with the latest, and highest quality of evidence available. The literature review focussed on three related but distinct areas: the prevalence of alcohol consumption during pregnancy; the harm caused by drinking alcohol during pregnancy; and public health campaigns changing awareness and behaviour.

The literature review provided the evidence basis to demonstrate the pathways through which a public health campaign like The National FASD Program can change behaviours, through to how changes in alcohol consumption during pregnancy can reduce FASD and other harms.

The specific impact of the Campaign on alcohol consumption during pregnancy was derived from the evaluation of the Campaign, undertaken by SAHMRI. That is to say, how many additional women have abstained from alcohol during their pregnancy. A counterfactual was established to estimate how many women would have abstained from alcohol consumption during pregnancy in the absence of the Campaign. The impact was compared to the counterfactual to ensure that the impact of the Campaign was neither over nor understated.

The literature review provided a comprehensive range of harms. A further review of literature and data sources was undertaken to assess the feasibility of

76. The SROI Network (2012), *A Guide to Social Return on Investment.*

quantifying and monetising the identified harms. We specifically targeted those impacts that could be robustly quantified and monetised, adhering to the principle that only those harms supported by evidence with ascertainable lifetime costs could be included. This approach ensures that the valuation of outcomes in our analysis reflects a comprehensive and credible monetary representation of the benefits derived from preventing alcohol consumption during pregnancy without overstating the impact.

This produced a short list of harms that were quantified and monetised, that were then compared to the cost of the National FASD Program Campaign to establish the SROI.

Stakeholder consultations were undertaken to provide information about the scale of the problem, incorporate an understanding of lived experience, and to review our conclusions.

Separate to the SROI, total economic cost of FASD were estimated for 2023.

Impact of the Campaign

Pre and post Campaign surveys were undertaken of the Australian population as part of the evaluation of the Campaign. Women that were currently pregnant, or had been within the previous 12 months were asked whether their alcohol consumption had changed since finding out they were pregnant. Prior to the Campaign 66 percent of women said they abstained once becoming aware of their pregnancy. After the Campaign, and for people that reported seeing the Campaign, this increased to 80.2 percent – an increase of 14.2 percentage points (the change is statistically significant at the 90 percent confidence level).

TABLE A1 Amount of alcohol pregnant women drank after pregnancy confirmation compared to how much they usually drank[a]

Date	Pre Campaign	Post Campaign	Difference (ppts)
Same amount	6.6	3.7	-2.9
Less	20.5	3.1	-17.4
Special occasions	6.9	13	6.1
Abstained	66	80.2	14.2

Note: a. Reflects the subset of respondents that have seen the Campaign

Source: Caruso J. et al (2024) *National Awareness Campaign on Alcohol, Pregnancy, Breastfeeding and Fetal Alcohol Spectrum Disorder (FASD): Evaluation Report: Post Campaign National Survey Topline Results.*

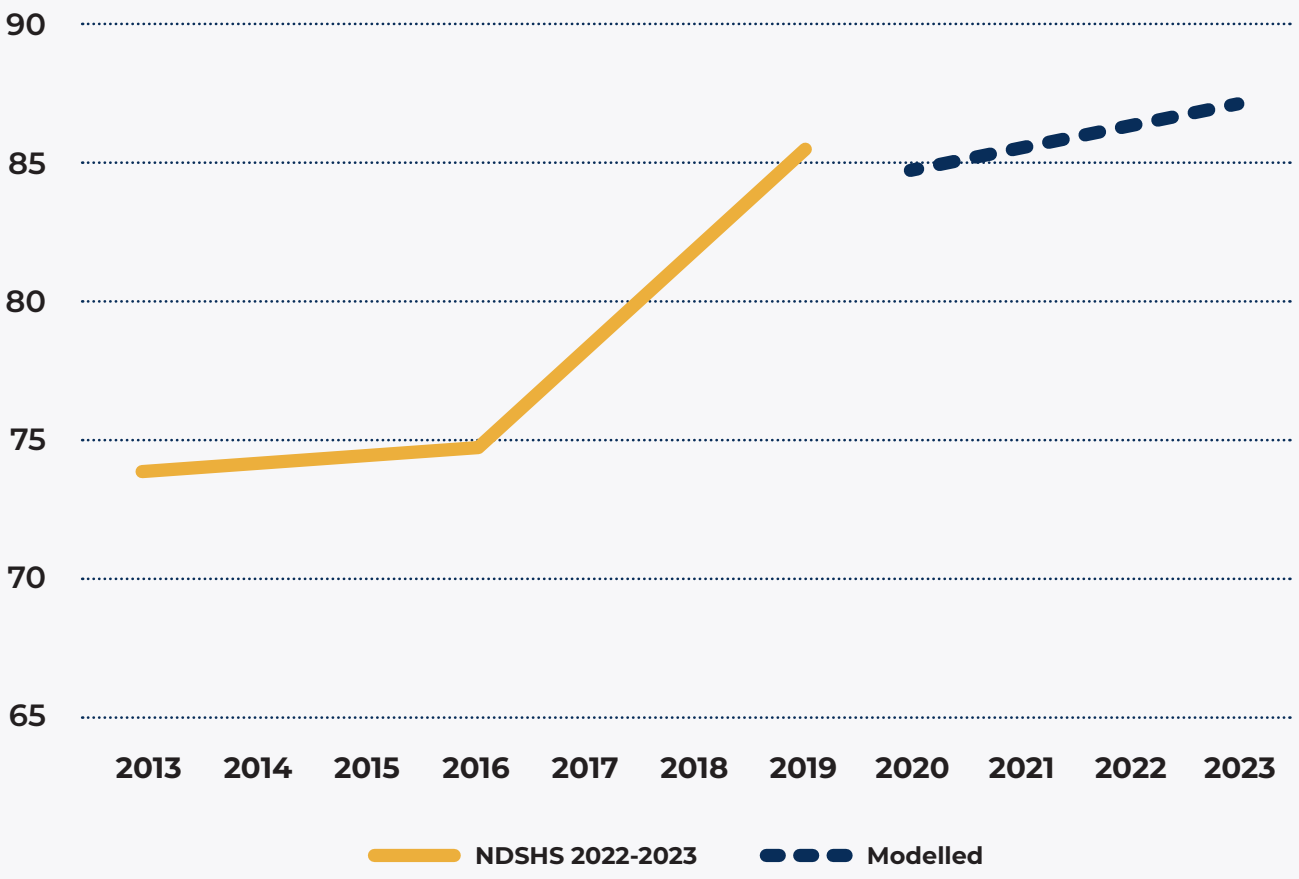
Counterfactual

Next, we establish the counterfactual or baseline. This is supposed to represent what we expect would have happened without the Campaign.

To establish the counterfactual or baseline for the level of abstinence we have used the 2022-23 National Drug Strategy Household Survey (NDSHS) on drug (including alcohol) behaviours before and after knowledge of pregnancy. While the NDSHS represents actual behaviours, it serves as a proxy for the counterfactual by capturing trends during a time frame that includes the Campaign period. Because the survey period includes the Campaign period, we have used the data to construct the trendline, and have used the latter to estimate the counterfactual.

CHART A1

Proportion of women abstaining from alcohol once aware of pregnancy, 2013-2023



Notes: y=9.5616Ln(x)+72.356

Source: *Table 10.21: Drug taking behaviours before and after knowledge of pregnancy, pregnant women, aged 14 to 49, 2013 to 2022-23,* NDSHS 2022-23.

This chart shows that abstinence from alcohol during pregnancy (once aware) has been increasing over time. This highlights the importance of the counterfactual, as without it, we would potentially overstate the impact of the Campaign.

To reflect the underlying trend towards greater abstinence from alcohol during pregnancy, we subtract the counterfactual from the change over time in our survey data. This is reflected below in table A2.

TABLE A2 Comparing evaluation data to the counterfactual

Date	Prior to Campaign (2021)	After Campaign (2023)	Difference (ppts)
Evaluation sample	66.0	80.2	14.2
Counterfactual	84.8	86.4	1.6
Difference (ppts)	-18.8	-6.2	12.6

As presented earlier, over time, there has been a 14.2 ppt increase in the proportion of pregnant women abstaining from alcohol during pregnancy. However, given the underlying increase in abstinence, an increase of 12.6 ppts can be attributed to the Campaign.

Cohort

Thus far we have established the increase in the proportion of women abstaining from alcohol during pregnancy due to the Campaign. In this final step to establish the magnitude of the impact of the Campaign we convert the proportion figure to a 'number of women' figure.

To do this we need to estimate the number of women, aged 18 to 44, who typically drink alcohol, and that gave birth during the Campaign period, as this is the group of women the Campaign seeks to influence. It's also important to do this to account for the fact that some women abstain from alcohol already, and that the Campaign is not the reason for this abstinence. Failing to do so would overstate the impact of the Campaign.

To do this we take the latest birth data (2022) and combine it with survey data on alcohol consumption patterns. We break it down by age group to account for different patterns of alcohol consumption across age groups.

TABLE A3

Women that typically consume alcohol when not pregnant/breastfeeding, by age group

Age group	Proportion of women that consumed alcohol within previous 12 months (%)	Women that gave birth (no.)	Women that gave birth that typically consume alcohol (no.)
18-24	82.8	32,802	27,160
25-34	78.6	186,003	146,198
35-44	79.4	79,736	63,310
18-44	79.3	298,541	236,669

Source: Impact Economics and Policy analysis of Australian Institute of Health and Welfare (2024). *National Drug Strategy Household Survey* and Australian Bureau of Statistics (2023). Births, by nuptiality, by age of mother.

Of the approximate 240,000 women that typically consume alcohol and gave birth in 2022, just over half were aware of the Campaign (see Table A3). This leads us to reduce the size of the cohort to 131,000.

TABLE A4 Prompted recognition of The National FASD Program on any platform by Campaign target audience subgroup

Group	Recognition
Australia	45.5
Pregnant/breastfeeding	55.5
Trying to conceive	65.2
Planning a pregnancy	51.9
Women (18-44 years)	43.0
Rest of population	45.1

Source: Caruso J. et al (2024) *National Awareness Campaign on Alcohol, Pregnancy, Breastfeeding and Fetal Alcohol Spectrum Disorder (FASD): Evaluation Report: Post Campaign National Survey Topline Results.*

Based on over 131,000 mothers who typically consume alcohol, and were aware of the Campaign, a 12.6 ppt increase in abstinence due to the Campaign, equates to an additional 16,554 women abstaining from alcohol.

Assuming singleton births, we use this figure to estimate that 16,554 babies are not exposed to prenatal alcohol consumption due to the Campaign. This forms the basis of the avoided cost calculations discussed next.

Cost of Avoided Harm

The benefit of the Campaign is the avoided harm from prenatal alcohol consumption. At the most acute end of the spectrum is Fetal Alcohol Syndrome (FAS). Across the world, it is estimated that 0.146 percent of the population has FAS.[77] With an estimated prevalence of alcohol consumption of 9.8 percent for pregnant women,[78] it follows that for every 67 women that drink alcohol when pregnant, one baby will be born with FAS.

With 16,554 less babies exposed to prenatal alcohol consumption due to the Campaign, this means that there will be less cases of FAS (16,554/67).

Estimates for the lifetime cost of FAS range from just over $150,000, which reflects lifetime health service utilisation costs, to over $1.1 million, which includes medical care and productivity loss.

TABLE A5 Cost of FAS, original and adjusted (for inflation and exchange rates) lifetime costs

Source of estimate	Original estimate	NPV of lifetime costs[a,b]	Date
Harwood and Napolitano	596,000	654,220	1980
Alaska State Legislature	1,373,836	1,158,030	1988
Nguyen XT and Jonsson E	505,764	151,918	2014

Note: 4 percent discount rate; b. assumes a uniform distribution of original estimate over lifetime.

Source: Impact Economics and Policy analysis; Lupton, C. et al (2004) *Cost of fetal alcohol spectrum disorders;* Nguyen, XT. et al (2014). *Cost of health service utilization of people with fetal alcohol spectrum disorder by sex and age group in Alberta, Canada.*

The Alaskan figure is understood to be larger than the US national figure constructed by Harwood and Napolitano because of medical inflation between 1980 and 1988, the higher medical costs in Alaska and the inclusion of additional costs (e.g. child and youth services, developmental disability services and adult vocational services).

While Alaska is not considered to be a reliable representation of national US costs, it is still considered conservative because it excludes some important costs (i.e. some medical care up to age 1, welfare payments, mental health services, criminal justice costs, services for mild physical problems, learning disabilities or lost productivity of carers and persons with FAS.)

While acknowledging its limitations, we use the Alaskan estimate because it captures the broadest spectrum of costs. Based on 247 less cases of FAS, the Australian economy will avoid over $286 million in costs. While this reflects the most severe end of FASD many cases of FASD are milder, but still have significant harm and cost associated with them. Presumably because of the heterogeneity of FASD and the paucity of data, there is no current study which reflects the full scope of the lifetime cost of FASD. However, a Canadian study has measured the health service utilisation for FASD (in addition to FAS, presented above).[79]

This study reported that in 2014, lifetime health service utilisation for a person with FASD was CAD 244,657. Converting to AUD,[80] inflating to current prices,[81] and discounting to a present value (4 percent discount rate), lifetime health service costs of FASD in 2024 is an estimated $80,550 for each case of FASD.

How many cases can be avoided through an increase in abstinence depends on the current prevalence of FASD, which is unknown. Estimates range from one to five percent of births.[82] Based on the mid-point of 3 percent, 1,755 cases of FASD will be avoided and $181.4 million in health care costs.

TABLE A6 Cost of FASD by prevalence of FASD

Prevalence	Avoided cases of FASD	Cost ($ million)
1%	585	60.5
3%	1,755	181.4
5%	2,925	302.3

In addition to the lifetime costs of FAS and health service utilisation costs of FASD we have also taken a 'bottoms up' approach, looking at specific outcomes that can be linked to prenatal alcohol consumption, and monetised these outcomes.

77. Popova, S. et al (2017). *Estimation of national, regional, and global prevalence of alcohol use during pregnancy and fetal alcohol syndrome: a systematic review and meta-analysis.*
78. Popova, S. et al (2017). *Estimation of national, regional, and global prevalence of alcohol use during pregnancy and fetal alcohol syndrome: a systematic review and meta-analysis.*
79. Nguyen, X. et al (2014). *Cost of health service utilization of people with fetal alcohol spectrum disorder by sex and age group in Alberta, Canada.*
80. Reserve Bank of Australia (2024). Historical Exchange Rates.
81. Australian Bureau of Statistics (2024).
82. McLean, S. et al (2022) *Fetal alcohol Spectrum Disorder (FASD): An update on policy and practice in Australia, Child Family Community Australia Information Exchange.*

Miscarriage

Consumption of alcohol during pregnancy has been shown to increase the risk of miscarriage.[83] Baseline risk of miscarriage for Australian women ranges from 12 to 15 percent.[84] The relative risk of miscarriage for women that consume alcohol compared to those that abstain is approximately 1.163. This means that women who consume alcohol have about 16.3 percent higher risk of miscarriage compared to those that abstain.

Based upon the estimated impact of 16,554 additional mothers abstaining from alcohol, we first estimate the number of pregnancies and miscarriages had they not abstained. We then compare this to the rate of miscarriage after abstinence, with the difference between the two being the avoided miscarriages due to the Campaign. Given that the baseline risk of miscarriage is a range, we undertake the analysis for the bottom, top and midpoint of the range.

TABLE A7 Miscarriages avoided from greater abstinence

16,554 live births	Baseline risk		
	12%	13.5%	15%
	Pregnancies		
	18,811	19,137	19,475
	Miscarriages		
Mothers that consume alcohol	2,626	2,998	3,380
Mothers that abstain	2,257	2,584	2,921
Avoided miscarriages	369	414	459

Taking the midpoint of the range, we estimate that 414 miscarriages will be avoided by the increase in abstinence.

The next step is to estimate the avoided cost of miscarriage. A UK study in 2018 found that miscarriage in the UK cost their economy 471 million GBP.[85] Given that an estimated 12.5 percent of pregnancies end in miscarriage in the UK,[86] and there were 65,706 live births in 2018,[87] this equates to an estimated 5,018 GBP per miscarriage. This largely reflect the cost of miscarriage treatment procedures and some productivity costs associated with absences from work. This cost does not reflect the long-term cost associated with miscarriage or the psychological costs.

Converting to AUD, and inflating to current prices, the estimated cost is $10,693 per miscarriage. On the basis of 414 avoided miscarriages, this equates to an avoided cost of $4,426,768 due to the increase in abstinence attributed to the Campaign.

83. Sundermann, A. et al (2019). *Alcohol Use in Pregnancy and Miscarriage: A Systematic Review and Meta-Analysis.*
84. Magnus, M. et al (2022). *Pre-pregnancy lifestyle characteristics and risk of miscarriage: the Australian Longitudinal Study on Women's Health.*
85. Quenby, S (2021). *Miscarriage matters: the epidemiological, physical, psychological, and economic costs of early pregnancy loss.*
86. National Health Service (accessed 2024). *Miscarriage overview.*
87. Office for National Statistics (accessed 2024). *Births in England and Wales: 2018.*

Preterm Birth

Preterm birth (before 37 weeks) can lead to a wide range of complications at birth and in the subsequent months and years. Preterm birth is relatively common, with around 8.2 percent of births before 37 weeks in Australia.[88]

Prenatal alcohol consumption increases the risk of preterm birth. A British study looking at the volume/frequency and timing of maternal alcohol consumption prior to and during pregnancy, and its impact on preterm birth[89] found that consumption of alcohol during the first trimester elevated the risk of preterm birth relative to abstinence, even for 'low' levels of alcohol consumption.

The study found that women consuming less than 2 units of alcohol per week in their first trimester had an odds ratio (OR) of 4.6 for preterm birth relative to women abstaining. Somewhat confounding, the odds ratio fell to 3.5 for women consuming more than 2 units of alcohol in the first trimester. Nonetheless, the study highlights that maternal alcohol consumption during the first trimester (and possibly later, but the study didn't show statistical significance) elevates the risk of preterm birth.

To reflect that the risk of preterm birth is elevated by alcohol consumption in the first trimester, but not the subsequent trimesters, we've constructed a weighted relative risk for the whole pregnancy based upon the sample in the study, and their patterns of alcohol consumption (as far as could be derived).

TABLE A8

Weighted relative risk of preterm birth by trimester and level of alcohol consumption

	Trimester 1		Trimester 2		Trimester 3		Average
	Relative risk	(%)	Relative risk	(%)	Relative risk	(%)	
<=2 drinks/week	3.55	33	1	55	1	43	
> 2 drinks/week	2.90	67	1	45	1	57	
Weighted relative risk	3.12		1		1		1.71

Note: Because the odds ratio can sometimes exaggerate the estimate of the relationship we have converted the odds ratio to a relative risk figure.[90]

Taking the increase in mothers that have abstained from alcohol (16,554), if these mothers had not abstained from alcohol, we estimate that there would have been 2,315 preterm births. But given they have abstained their risk of preterm birth has fallen back to the baseline, and it's anticipated there would have been 1,357 preterm births. The difference, 958, is the estimated number of preterm births avoided due to the Campaign.

88. Australia Institute for Health and Welfare (accessed 2024). *Australia's mothers and babies.*
89. Nykjaer, C. et al. (2014). *Maternal alcohol intake prior to and during pregnancy and risk of adverse birth outcomes: evidence from a British cohort.*
90. Ranganathan, P. (2015). *Common pitfalls in statistical analysis: Odds versus risk. Perspectives in Clinical Research.*

The next step is to estimate the associated avoided cost. To this end we draw upon an Australian study which has estimated the health and schooling costs associated with preterm birth through to 18 years.[91] The study took a hypothetical cohort of children and looked at health and educational costs and how these varied by extent of prematurity. Costs included birth, neonatal, and post-birth discharge hospitalisations; stillbirth government payments; emergency transportation for neonatal care; the Medicare Benefits Schedule (MBS) and Pharmaceutical Benefits Schedule (PBS); and government schooling for primary and secondary education. Costs were inflated to current prices using the CPI.

Costs were calculated in 3 groups based on gestational age: extremely preterm (20-27 weeks), moderately preterm (28-31 weeks) and late preterm (32-36 weeks). Similarly, our cohort of avoided preterm births was broken into the same groups using AIHW data on births by gestational age.[92]

TABLE A9 Avoided cost of preterm birth

	Extremely preterm	Moderately preterm	Late preterm	Total
Preterm births avoided	51	83	823	958
Cost per birth ($)	281,547	107,006	30,318	
Cost avoided ($ million)	14.5	8.9	25.0	48.3

In total, $48.3 million in health and schooling costs can be avoided, and attributed to the Campaign.

Low birth weight

Low birth weight is another common birth outcome as a consequence of maternal alcohol consumption.[93] A baby is typically considered to be of low birth weight when equal to or smaller than 2.5kg. However, low birth weight is often correlated with preterm birth. To avoid overlap we focus on babies that are small for their gestational age (SGA) but which are full term (>37 weeks gestation). Small for gestational age is typically defined as the 10th birthweight percentile by week of gestation.

We draw upon the same study used to measure the increased relative risk of preterm birth due to maternal alcohol consumption. Again, the elevated risk was statistically significant for the first trimester only. This time though, the risk of low birthweight was higher for higher levels of alcohol consumption.

91. Newnham, J. et al (2022). *The health and educational costs of preterm birth to 18 years of age in Australia.*
92. Australian Institute of Health and Welfare (2021). *Births by gestational age and birth status analysis of National Perinatal Data Collection.*
93. Nykjaer, C. et al. (2014). *Maternal alcohol intake prior to and during pregnancy and risk of adverse birth outcomes: evidence from a British cohort.*

TABLE A10 Avoided cost of preterm birth

	Trimester 1		Trimester 2		Trimester 3		Average
	Relative risk	(%)	Relative risk	(%)	Relative risk	(%)	
<=2 drinks/week	1.68	33	1	55	1	43	
> 2 drinks/week	1.96	67	1	45	1	57	
Weighted relative risk	1.87		1		1		1.29

Based upon the increase in mothers that have abstained, 1,490 babies are estimated to have been born small for gestational age (full term). However, if these mothers had not abstained, an estimated 1,859 babies would have been born small for gestational age. It follows then that there has been a reduction of 369 births of small for gestational age attributable to the Campaign.

Babies that are born small for their gestational age have greater hospital costs. A Canadian study found that full term babies that were small for their gestational age had costs that were 46 percent higher relative to those that weren't small.[94] This figure is then used to escalate Australian hospital costs associated with labour, birth and neonatal admissions for full term births.[95]

In total, an estimated $1.7 million can be saved through a reduction in babies born small for their gestational age.

Glossary

FASD	Fetal alcohol spectrum disorder
FAS	Fetal alcohol syndrome
Social Return on Investment	Reduction in social and economic costs associated with one dollar of expenditure
Statistical significance	The probability that an estimate is different from zero
Prenatal	Before birth
Low Birth Weight	Below 2,500 grams

94. Lim G, et al (2009). *CIHI survey: Hospital costs for preterm and small-for-gestational age babies in Canada.*
95. Newnham, J. (2022). *The health and educational costs of preterm birth to 18 years of age in Australia.*

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