

# Increases in use of Medicare Benefits Schedule mental health items among women who gave birth in New South Wales, 2009–2015

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**M**ental health disorders are a leading cause of disease burden for women in Australia.<sup>1</sup> In a recent national survey, between 11% and 16% of Australian women aged between 25 and 44 years reported experiencing anxiety or depression,<sup>2</sup> with these conditions the first and third most common cause of healthy years lost.<sup>1</sup> Mental health morbidity during pregnancy and the first postnatal year (the perinatal period) is also highly prevalent. Up to one in seven women will experience perinatal depression<sup>3</sup> or anxiety,<sup>4</sup> while those with a history of lower prevalence conditions, such as bipolar disorder, are at particular risk of relapse during this time.<sup>5-7</sup> A recent record linkage study has also shown that the perinatal period is a time of increased risk for inpatient admission across the range of psychiatric disorders, compared to other times in a woman's childbearing years.<sup>8</sup> Left untreated, perinatal mental health conditions can have significant consequences for women, children, families and the economy.<sup>9-12</sup>

The New South Wales (NSW) Government has invested substantially in prevention, early intervention and treatment programs for perinatal mental health for more than twenty years. The Integrated Perinatal Care program was implemented at a number of NSW maternity hospitals beginning in the late 1990s<sup>13,14</sup> and was instrumental in informing the current NSW Health Supporting Families Early (SFE) Package,

## Abstract

**Objective:** To report rates of Medicare Benefits Schedule (MBS) mental health item use among a sample of women who gave birth in NSW (2009–2015) and examine if the SAFE START policy increased use of these items among perinatal women.

**Methods:** Data was drawn from women participating in the Australian Longitudinal Study on Women's Health 1973–1978 cohort, linked to data from the NSW Perinatal Data Collection and MBS.

**Results:** Use of Medicare-subsidised mental health items increased 2.7-fold among perinatal women ( $n=1,453$ ) between 2009 and 2015 (4.1% versus 11.0% respectively), compared to a 1.3-fold increase among non-perinatal women ( $n=1,800$ , 6.3% versus 8.4% respectively). However, the increased use of MBS mental health items among perinatal women was not observed to be impacted by the SAFE START policy, after accounting for time trends.

**Conclusion:** There was a substantial increase in the use of MBS mental health items among women in NSW between 2009 and 2015, with a more pronounced increase among women who had given birth compared to those who had not.

**Implications for public health:** This study provides important information about changes in mental health service use during a time of significant investment in perinatal mental health, and demonstrates the value of longitudinal survey data linked with administrative health data to evaluate the impact of health policy.

**Key words:** pregnancy, postnatal, mental health, service use, MBS

introduced in April 2010. Central to the SFE package are the SAFE START policy directive<sup>15</sup> and guideline,<sup>16</sup> which articulate a model of integrated perinatal depression screening using the Edinburgh Depression Scale<sup>17</sup> and broader psychosocial assessment as a core component of routine care in publicly-funded maternity and child and family health services. Completion of this routine screening and assessment is recommended at least once during pregnancy and twice after

birth, typically at a woman's first antenatal appointment, first postnatal home visit or scheduled 6–8 week check, and again at the 6–8 month appointment. Based on responses to the SAFE START assessment, women fall into one of three psychosocial risk levels: Level 1 (no specific vulnerabilities or risk); Level 2 (endorsing one or more of a broad range of vulnerabilities of variable severity and significance, such as a history of mild/moderate depression or anxiety,

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lack of social support, recent stressors) or Level 3 (endorsing one or more complex risk factors, such as severe mental illness, current or recent domestic violence, substance misuse or involvement with child protection services).

SAFE START recommends a spectrum of coordinated clinical responses to various configurations of risk factors and symptoms identified through the assessment and screening process. Ongoing support and follow-up through prevention and early intervention services are recommended for women with 'Level 2' vulnerabilities, while a coordinated team management approach is required for women with Level 3 vulnerabilities. For women with identified risk factors, one or more of a suite of active follow-up options may be appropriate, including (but not limited to) family care centres, specialist support groups, Sustained Nurse Home Visiting, or subsidised mental health services offered through the Better Outcomes in Mental Health Care and Better Access to Mental Health Care programs.<sup>15</sup>

Self-reported depression screening rates among pregnant women and new mothers in Australia has increased significantly since 2000.<sup>18</sup> In NSW specifically, the proportion of women who reported being screened both before and after birth, as is currently recommended, increased from 25% in 2000 to 61% in 2016. However, evaluating and isolating the impact of a single health policy like SAFE START is complex due to the potential influence of contemporaneous health policy and practice changes. For example, a perinatal depression stream was added as a Tier 2 initiative under the Access to Allied Psychological Services (ATAPS) program in 2009 as a core activity of the National Perinatal Depression Initiative (NPDI; 2008-2013),<sup>19</sup> and Australia's first clinical practice guidelines for perinatal mental health were released in 2011.<sup>20</sup> Previous reports have documented the substantial increase in numbers of referring professionals and sessions delivered through the ATAPS generally, and through the perinatal stream specifically, in the initial years following its introduction.<sup>21,22</sup> The proportion of perinatal women in NSW who accessed at least one Medicare Benefits Schedule (MBS) mental health item during pregnancy or in the year after birth increased from 93 to 145 per 1,000 between 2007 and 2010.<sup>23</sup> However, the impact that SAFE START has had on MBS mental health service use among

childbearing women in NSW beyond 2010, when SAFE START was introduced, remains largely unknown. In response, this study aimed to examine the uptake of MBS mental health items among a sample of women who gave birth in NSW between 2009 and 2015, and to determine if the introduction of the SAFE START policy and guideline in 2010 resulted in a significant increase in use of these items among perinatal women compared to a control group of non-perinatal women.

## Methods

This study used data from the Australian Longitudinal Study on Women's Health (ALSWH), linked to data from the NSW Perinatal Data Collection (PDC) and the Medicare Benefits Schedule (MBS).

The ALSWH is a national population-based study that began in 1996, with large representative samples of women in four age cohorts born in 1921-26, 1946-51, 1973-78, and 1989-95. Further details on the ALSWH cohort profiles have been published elsewhere.<sup>24</sup>

The NSW PDC, formerly known as the Midwives Data Collection, is a dataset containing details on all births of at least 20 weeks gestation or at least 400 grams birth weight in NSW public and private hospitals, as well as homebirths.

This study focused on women in the ALSWH 1973-78 cohort. Women were eligible for analysis at time points where they were living in NSW and had not withdrawn from data linkage. We defined a birth window and an observation window as two distinct time periods that were of interest for the analysis. The birth window was from 1 August 2009 to 30 June 2015 and included all births within these dates. The observation window was from 1 October 2008 to 30 June 2016, which is an extension of the birth window that was designed to capture the full breadth of the perinatal period by extending 10 months before the start of the birth window and 12 months after the end of the birth window. Self-reported ALSWH data and the NSW PDC were used to classify women as 'cases' if they had given birth during the birth window, and 'controls' if they had not.

The MBS is a program that provides subsidised health services (including mental health services) in Australia and is managed by the Australian Government Department

of Health. MBS data contains key information such as the types of services used and the dates of those services. The MBS mental health items included in the current analysis are provided in Table 1.

We calculated the proportion of cases and controls using MBS mental health items in each quarter from 1 October 2008 to 30 June 2016. For cases, mental health services in each quarter were counted if they occurred during the perinatal period. For controls, all mental health services in each quarter were counted. The denominator for the proportion of cases was the number of women who were alive and currently in the perinatal period at each quarter. The denominator for the proportion of controls was the number of women who were alive. The non-uniform distribution of the ages at which women give birth meant the denominators for the cases at each quarter varied substantially over time, peaking in 2009 when women were aged 31 to 36 years. Conversely, the denominators for the controls were relatively constant, due to low rates of mortality among women of this age. Additionally, some of the variation in the denominators can be attributed to women moving to and from NSW.

Ethical approval for the ALSWH has been granted from the University of Newcastle (H-076-0795) and the University of Queensland (2004000224). The Australian Institute of Health and Welfare and the Centre for Health Record Linkage acted as the integrating authorities for the MBS data and NSW PDC data, respectively.

## Statistical analysis

Descriptive statistics were used to examine the baseline characteristics of the sample and to summarise the annual proportion of case and control women who claimed MBS mental health items. We then analysed use of MBS mental health services by cases and controls at each of the 31 quarters between 1 October 2008 and 30 June 2016. The SAFE START strategic policy and guideline, for analysis purposes, was considered to have come into effect on 1 April 2010.<sup>15,16</sup> This created six pre-intervention quarters, and 25 post-intervention quarters. Quarterly MBS mental health item use across a year was calculated by taking the mean of the service use in each quarter, in order to be reflective of the full year of service use.

A difference-in-difference (DID) analysis approach was used to estimate the effect

of the SAFE START policy on the use of MBS mental health services. DID analysis is a quasi-experimental technique that can be used to estimate the effect of an intervention by comparing the average change over time in a case group, which was exposed to an intervention, to the average change over time in a control group, which was not exposed to the intervention. In the current study, the key assumption was that only case women, and not the controls, would have been affected by the implementation of SAFE START, which was targeted at perinatal women. Consequently, the change in MBS mental health service use among the case group before and after the introduction of SAFE START, minus the corresponding change in the control group, provided an estimate of the effect of SAFE START on mental health service use. We used graphical evidence to assess the validity of the DID common trends assumption<sup>25</sup>.

The linear DID model was comprised of the proportion of women who used a mental health service in each quarter as the outcome, a dichotomous group indicator (case or control), a dichotomous time indicator (before or after 1 April 2010), and a two-way interaction term between the group and time indicators (the DID estimator).

### Results

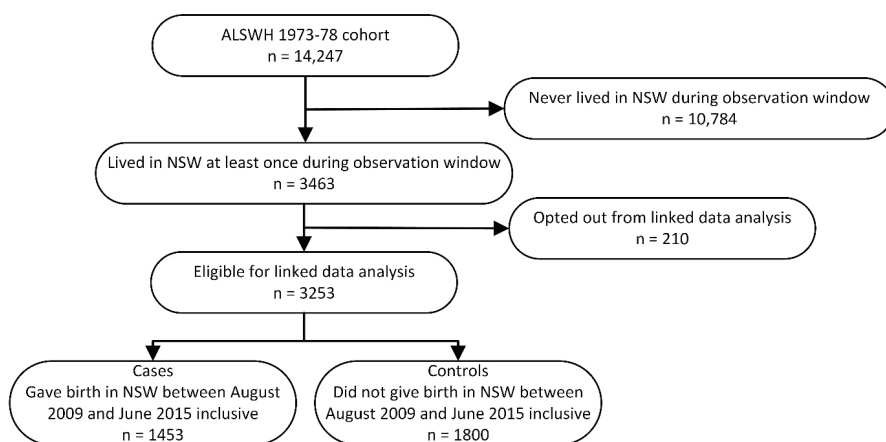
The pathway to sample selection is summarised in Figure 1. Our final sample for analysis included 1,453 cases (44.7%) and 1,800 controls (55.3%). Supplementary File 1 presents the baseline sociodemographic and health behaviour characteristics of the cases and controls in the sample using their most recent survey data up to 2009, when participants were aged 31-36 years. Overall, our study group consisted of women who were predominantly born in Australia (91.2%), and who, at baseline, were partnered (69.1%), had tertiary-level qualifications (46.0%) and resided in major cities (59.3%). Cases and controls had similar characteristics at baseline for country of birth, relationship status, smoking status, and physical activity. However, there were some minor differences in area of residence, highest qualification, ability to manage on available income and alcohol consumption.

Figure 2 summarises the proportion of case and control women using mental health services at each quarter from Q4 2008 to Q2 2016. The median number of eligible

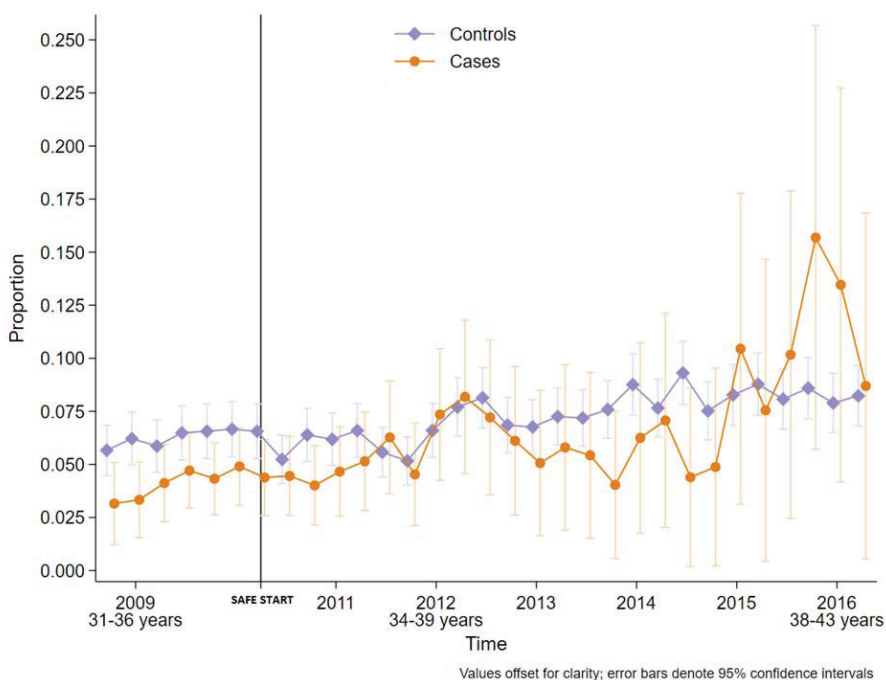
**Table 1: MBS mental health service item codes used in the analysis.**

| Provider type   | Item code   |
|---|---|
| Psychiatrists   | 00291 00293 00296 00297 00299 00300 00302 00304 00306 00308 00310 00312 00314 00316 00318 00319 00320 00322 00324 00326 00328 00330 00332 00334 00336 00338 00342 00344 00346 00348 00350 00352 00353 00355 00356 00357 00358 00359 00361 00364 00366 00367 00369 00370 00855 00857 00858 00861 00864 00866 00288 |
| General practitioners   | 02702 02710 02712 02713 02721 02723 02725 02727 00170 00171 00172 02705 02707 02708 04001 00281 00282 00283 00285 00286 00287 00371 00372 02715 02717 00272 00276 02700 02701 00277 00279 02719 02729 02731 00221 00222 00223 02574 02575 02577 02578 02704   |
| Allied health providers (including clinical psychologists, psychologists and other allied health providers) | 10968 80100 80105 80110 80115 80120 80000 80005 80010 80015 80020 81355 10956 80125 80130 80135 80140 80145 80150 80155 80160 80165 80170 81325 81000 81005 81010 80001 80011 80021 80101 80111 80121 80126 80136 80146 80151 80161 80171   |

**Figure 1: Selection of eligible women for study analysis.**



**Figure 2: Proportion of case (perinatal) and control (non-perinatal) women who used at least one MBS mental health item, October 2008 to June 2016.**



controls and cases per quarter was 1,448 and 194, respectively. The average quarterly percentage of control women who accessed at least one MBS mental health item increased from 6.28% in 2009 (95%CI=5.78, 6.79) to 8.43% in 2015 (95%CI=7.93, 8.93). Over the same period, the average quarterly percentage of case women who accessed these services at least once increased from 4.12% (95%CI=3.20, 5.05) to 10.96% (95%CI=5.54, 16.39).

MBS mental health item use in the pre-intervention period, prior to the implementation of SAFE START, was higher among controls compared to cases. Importantly, visual inspection suggested that the common trends assumption in the pre-intervention period held true, evidenced by the approximately parallel lines for cases and controls<sup>25</sup>. After SAFE START was introduced, we observed a gradual increase in the proportion of controls using mental health services. However, the plot shows that the perinatal cases, who were targeted by the SAFE START program, had a more pronounced increase in the use of mental health services over time, particularly from 2014 onwards. Note that the additional variability for cases after 2014 Q2, illustrated by the inconsistent trend and wider confidence intervals, can be attributed to there being fewer women in their perinatal period at each quarter after 2014 Q2 when women were aged 36 to 41 years.

Table 2 presents the DID model estimates. The DID estimator suggested the implementation of SAFE START in 2010 was associated with an absolute 1.69% increase in the proportion of cases using mental health services (95%CI: -0.95, 4.32,  $p=0.206$ ). The wide confidence interval indicated that we cannot conclude that SAFE START was associated with a change in the use of MBS mental health services in this sample during the study period. It is important to note that in a DID analysis, the coefficients for the treatment

and SAFE START variables should not be individually interpreted.

## Discussion

This study showed a substantial increase in the use of MBS mental health items among women in NSW over an almost eight-year period. This was not unexpected given the widely reported rises in rates of people accessing these services nationally, particularly in the years since the introduction of the Better Access to Mental Health Care scheme in 2006.<sup>26-29</sup> The increase in uptake among control women in this study, from 6.28% in 2009 to 8.43% in 2015, also aligns closely with the overall increase in use of the services observed in the general NSW population (5.9% in 2008-09 to 9.4% in 2015-16).<sup>30</sup> The overall increase among both case and control women is in keeping with reports showing that the highest proportion of people receiving Medicare-subsidised mental health-specific services are those aged 35-44 years.<sup>28</sup>

While the 2.7-fold annual increase in use of Medicare-subsidised mental health services among perinatal women in this study from 2009 (4.12%) to 2015 (10.96%) was double the 1.3-fold increase observed for non-perinatal women in the same time frame, we observed no impact of SAFE START on the use of MBS mental health items among perinatal women after accounting for time trends in the DID model. However, this finding needs to be interpreted with caution for a number of reasons. First, several important state-based and national perinatal mental health initiatives either preceded or overlapped with the observation period in this study. These included the Integrated Perinatal Care program<sup>13</sup> and the beyondblue Postnatal Depression Screening program,<sup>31</sup> which were implemented at select sites across NSW in the early 2000s. These were followed by the National Perinatal Depression Initiative

(NPDI; 2008-2013),<sup>19</sup> which was associated with increased MBS mental health item use among younger and older mothers living in major cities.<sup>32</sup> The NPDI also supported the introduction of an ATAPS perinatal depression stream in 2009. Although ATAPS sessions are not subsidised by Medicare, referral to this program requires the completion of a mental health plan using an appropriate MBS mental health item by a referring professional, such as a general practitioner or maternal health nurse. Previous research using ALSWH data has shown that self-reported perinatal depression screening rates increased earlier in NSW than in other states<sup>18</sup> and while we have assumed for the purposes of this study that SAFE START came into complete effect on 1 April 2010, in reality some sites and health districts in NSW were well established prior to this time. This was further demonstrated in the final report of the beyondblue Postnatal Depression Screening Program: of the more than 40,000 women who participated in this landmark initiative between 2002 and 2005, over half (52.8%) were recruited from NSW, reflecting that procedures, policies and service networks had been well-defined in NSW prior to the introduction of SAFE START.<sup>31</sup>

Second, the SAFE START policy and guideline provides a framework for integrated perinatal mental health care for pregnant and new mothers attending *public* maternity services. In NSW, approximately one-quarter of women give birth in the private hospital sector<sup>33</sup> and so are unlikely to be reached through the SAFE START initiative until they engage with universal child and family health services following birth. Although we could not control for maternity care sector in this study, previous reports have shown that approximately 65% of women in the ALSWH 1973-78 cohort in 2009 had some level of private health insurance and that uptake of insurance increases with age.<sup>34</sup> Although a number of studies have shown that women who give birth in the private sector are less likely to be asked about their mental health psychosocial circumstances during pregnancy than women in the public sector,<sup>35-37</sup> conversely, women with health insurance are, overall, more likely to make MBS claims than those without.<sup>38</sup>

Third, there are obvious challenges associated with evaluating a comprehensive program like SAFE START, which spans the hospital maternity care system and the post-birth community-based primary care system, and

**Table 2: Difference-in-difference model to estimate the impact of SAFE START on the proportion of women using at least one MBS mental health item during the perinatal period.**

| Factor                             | Coefficient | 95%CI         | p     |
|------------------------------------|-------------|---------------|-------|
| Treatment                          |             |               |       |
| Controls                           | Ref.        |               |       |
| Cases                              | -0.022      | -0.045, 0.002 | 0.074 |
| SAFESTART                          |             |               |       |
| Before 1 April 2010                | Ref.        |               |       |
| After 1 April 2010                 | 0.011       | -0.008, 0.029 | 0.254 |
| Difference-in-difference estimator | 0.017       | -0.010, 0.043 | 0.206 |

with follow-up care and support provided across primary care, mental health and social care systems and public, private and not-for-profit health care sectors. This study did not aim to capture service engagement across all possible pathways. Rather, we focused on Medicare-subsidised mental health services as one component of the service pathway recommended in the SAFE START policy and guideline. As a result, findings of this study should be considered alongside evidence from other related care pathways. An evaluation of the targeted nurse-led Sustaining NSW Families Program, for example, demonstrated that referrals to this sustained home visiting program increased from 419 in 2010-11 to in 2010-11 to 558 in 2013-14.<sup>39</sup> Previous studies have also shown that up to 78% of women who experienced emotional distress received support from their midwife or child health nurse,<sup>40</sup> however, provision of such active care is not currently quantifiable using administrative health datasets. Support provided by other care pathways, including early parenting services<sup>41</sup> and national phone helplines,<sup>42</sup> was also outside the scope of this paper.

Several limitations of our study should be noted. Our analyses were restricted to a sample of women in the ALSWH 1973-78 cohort and there was an over-representation of Australian-born and tertiary-level educated women compared to mothers of the same age in the general population in NSW,<sup>43,44</sup> which limits the generalisability of our results. Due to age restrictions of this cohort of women when recruited in to ALSWH, we were also unable to examine whether there were differences in the uptake of MBS mental health items between younger and older women, however, a number of systematic reviews have noted that maternal age is not a consistent risk factor for perinatal depressive or anxiety disorders.<sup>45,46</sup> We included only women who gave birth in NSW so could not examine or compare the cumulative impact of national and various state-based initiatives on MBS mental health item use across jurisdictions. Low quarterly birth frequencies in NSW in our cohort prior to 2009 and beyond 2015 resulted in substantial noise and inflated variation and consequently we analysed births from August 2009 to June 2015 only. Furthermore, we were unable to adjust for any potentially confounding covariates in the DID model. This was because some of the women were determined to be cases from PDC data but had not completed

ALSWH surveys proximal to the birth of their index child, resulting in substantial amounts of missing covariate data for these women. Finally, approximating perinatal periods by quarters rather than months may have introduced some measurement error.

However, our study also has several important strengths. Our results were based on a random sample of women rather than a clinical sample and were not limited to a single geographic location or clinical context. Importantly, we were able to draw on structures for linkage of the ALSWH data to NSW PDC data to robustly identify a control group of women who had not given birth during the study period and demonstrated how longitudinal community-based survey data, linked with administrative health data, can contribute to health policy evaluation in this context.

## Conclusion

This study provides important information about changes in MBS mental health item use during a time of significant investment in perinatal mental health in NSW. We report a 2.7-fold increase in use of Medicare-subsidised mental health services among perinatal women between 2009 and 2015, however, observed no specific impact of SAFE START on the use of these aggregated services among women in our sample. However, isolating the impact of a single health policy like SAFE START is complex. Future large-scale studies are needed to further examine the impact of perinatal mental health policy and practice changes on specific MBS mental health items, using samples that are more representative of the general population of women in NSW. Further cross-sector collaborative research, monitoring and evaluation is also needed to fully ascertain whether contemporaneous perinatal mental health and social policies have led to increases in timely and appropriate engagement with a broad range of government and non-government support services and, in turn, improved social and emotional outcomes for women and their families at a population level.

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## Supporting Information

Additional supporting information may be found in the online version of this article:

**Supplementary File 1:** Characteristics of sample at study baseline.