Agenda item 7.1:


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Glossary

Acronyms

CC1 Control Cohort 1
CC2 Control Cohort 2
CI Confidence Intervals
CMN Calvary Mater Newcastle
DSP Deliberate self-poisoning
DSH Deliberate self-harm
ED Emergency Department
HATS Hunter Area Toxicology Service
HNE LHD Hunter New England Local Health District
HNE MHS Hunter New England Mental Health Service
HNECC PHN Hunter New England Central Coast Primary Health Network
HPC Hunter Primary Care
Int Intervention Cohort
IRR Incident Rate Ratios
K10 Kessler Psychological Distress Scale
WBSS Way Back Support Service

Terms used

Clients Consumers involved with the WBSS
Patients People admitted to a hospital service or a community health service
Participants People whose data was used in the effectiveness WBSS trial (control and intervention cohorts)
Referrals Refers to people who were referred to the WBSS; represents events (as individuals/clients could be referred multiple times over the trial period)
Executive Summary

“Through the tears and laughter of my recovery after the attempted suicide I can strongly recommend The Way Back service. Speaking to someone who was so supportive and understanding was truly amazing. The first step..... the second..... third and fourth steps came so much easier than they would have if I was alone. Thank you to all who were there for me.”

Hunter WBSS client

Background and context

A hospital-treated suicide attempt (also called self-harm) is the strongest independent risk factor for subsequent suicide, with the risk of non-fatal self-harm repetition and suicide mortality being highest in the first three months following discharge from hospital. Repetition of self-harm and suicide are key clinical outcomes for the hospital management of self-harm (Carroll, Metcalfe, & Gunnell, 2014) and while rates of hospital-treated self-harm from institutional record systems in Australia have reportedly increased over the past 15 years (AIHW, 2015), there are no national indicators for hospital-treated self-harm repetition.

On an individual level, people who have been treated in hospital for self-harm consistently report dissatisfaction with hospital Emergency Department care and the transition to community support, including experiences of a discontinuity of care, perceived absence of community-based aftercare and a sense that their needs have not been addressed well by the existing mental health services (CRESP, 2015).

Furthermore, these experiences occur in the context of a growing evidence-base for a range of effective aftercare interventions (brief contact interventions, psychological and psychosocial interventions and assertive aftercare and follow-up) that can reduce repetition of self-harm behaviour and suicide (Hetrick, Robinson, Spittal, & Carter, 2016; Hofstra et al., 2019; Milner, Carter, Pirkis, Robinson, & Spittal, 2015; While et al., 2012). While the degree to which these interventions are delivered as part of the routine aftercare provided by the public and private mental health system is not known, availability may be limited meaning consumers may find evidenced-based interventions difficult to access outside research settings.

These factors provide a clear case for action in improving aftercare for people who have attempted suicide, including as a way of reducing repetition of suicidal behaviours; with improved care being a recognised suicide prevention policy, clinical and sector priority.
Way Back Support Service

The Way Back Support Service (WBSS) is a suicide prevention aftercare service developed by Beyond Blue. It aims to prevent repeat suicidal behaviour among people presenting to hospital following a suicide attempt by delivering person-centred, non-clinical and practical support for three months after discharge from hospital. It is a community-based aftercare service that supports people to link into existing health, clinical and community-based services in order to address their needs and support their safety. An initial pilot of the Way Back Support Service was implemented in Darwin, Northern Territory (June, 2014).

Through a competitive tender process, Newcastle (New South Wales) was selected to conduct a large-scale service implementation trial. Hunter Primary Care (a well-established not-for-profit provider of primary care services, including mental health care) were the service delivery partner for the Hunter Way Back Support Service and members of a project governance group worked together to oversee the delivery of the service.

This project governance group included Hunter Primary Care, Calvary Mater Newcastle, Hunter New England Local Health District (specifically the Mental Health Service), Everymind, Relationships Australia and Beyond Blue; each having specific roles and areas of responsibility.

For this trial, the WBSS model of care was modified and expanded for integration into a busy established clinical service for deliberate self-poisoning patients, specifically for those assessed by the Hunter Area Toxicology Service based at the Calvary Mater Newcastle. Service delivery of WBSS commenced in April 2016 and continues to the current day (October 2019). To support patient engagement with the service and continuity of care, WBSS staff were seconded to and deployed within the Calvary Mater Newcastle hospital clinical services, to meet with potential service users and facilitate warm hand-overs between services. WBSS staff then continued contact with clients in the community after hospital discharge to support care coordination to meet the person’s identified needs. Clinical oversight and support for the WBSS staff was provided at the Calvary Mater Newcastle hospital via the Department of Consultation-Liaison Psychiatry and Clinical Toxicology and in the community phase through Hunter Primary Care.

A community-based family support component was also planned for this expanded WBSS service model, which was developed and delivered by Everymind in partnership with Relationships Australia.
Hunter Way Back Support Service Evaluation

The primary aim of the large-scale service development and effectiveness trial established in Newcastle was to demonstrate the effectiveness of the Way Back Support Service model of non-clinical support in reducing suicidal behaviour without duplicating existing clinical services. A number of evaluation activities were conducted for this trial.

The aims and objectives of this evaluation report are to:

1. Investigate the feasibility of scaling up and integration of the WBSS service within an existing complex clinical service system; and to identify the key factors underpinning effective scaling and integration.
2. Describe patient engagement and measures of service utilisation in order to understand the reach and fit of the service with the target population.
3. Conduct a comparative trial of the effectiveness of the WBSS in reducing rates of hospital-treated deliberate self-poisoning readmissions and psychiatric inpatient admissions in the 12 months following the index admission.

These activities have been led and conducted by staff from Calvary Mater Newcastle, Hunter New England Mental Health Services and Hunter Primary Care.

Other evaluation components (e.g. qualitative study and cost-effectiveness evaluation) were completed by other organisations (e.g. Everymind, Deakin University) and do not form part of the current report.
Synthesis of Findings

In summary, the Hunter trial of the Way Back Support Service demonstrated that:

1. It was feasible to integrate the WBSS into an existing service system (general hospital, psychiatric hospital, and various community services), including establishment of an integrated referral pathway, which enabled the service to be routinely offered to the target population. See Chapter 3; Section 3.3.3; Table 3.2.

2. It was possible to establish and sustain a ‘scaled up’ WBSS with high throughput of referrals and with continued high performance as measured by key performance indicators. See Chapter 3; Table 3.3.

3. 81% (1280/ 1578) of referrals accepted the initial service offer. See Chapter 4; Figure 4.1.

4. There was attrition after initial engagement, with approximately 61% (960/ 1578) of referrals who accepted the initial service offer going on to receive WBSS support in the community. See Chapter 4; Figure 4.1.

5. The service was able to effectively support the population that remained engaged in the service, with direct client activity accounting for the majority of service provision; and phone contact permitting a small staffing complement to support a large client base. See Chapter 4; Section 4.3.2.

6. The target population had significant needs, as demonstrated by the number of client-identified unmet needs, levels of significant psychological distress at service commencement, and number of hospitalisations that occurred during the follow-up period. See Chapter 4; Table 4.3; Figure 4.7; Chapter 5; Table 5.3.

7. Clients who remained engaged with the service were able to make meaningful progress towards identified goals, showing reduced unmet needs and psychological distress at program closure. See Chapter 4; Section 4.3.3.

8. Clients who responded to the satisfaction survey reported a high level of service satisfaction. See Chapter 4; Section 4.3.4; Table 4.7.

9. There was no reduction in hospital-treated deliberate self-poisoning readmissions, or related outcomes, in the twelve months following the index admission, associated with the intervention cohort or WBSS exposure. See Chapter 5; Table 5.3.

10. There was an unexpected increase in psychiatric admission event rates for the intervention cohort. See Chapter 5; Section 5.3.3.

Further details relevant to these findings, and specific to the three primary aims and objectives of the evaluation are described below.
Integration with Service System and Scaling Up Feasibility: Key Findings

Between the period April 2016 to April 2019, 1653 potential referrals were assessed by the service, 1578 referrals were deemed eligible and progressed. Of these, 1280 initial service offers were accepted (81% of eligible referrals) and 960 were provided support in the community (61% of eligible referrals; 75% of those who accepted the initial service offer).

Quality indicators (as monitored by key performance indicators defined by Beyond Blue) were met throughout the service delivery period. They demonstrated that the service maintained a high number of received and accepted referrals over time; that an initial engagement target of 80% for all genders was met; and that targets for timeframes for contact after discharge and safety planning completion were met or exceeded. The only key performance indicator that was not met was ‘referrals remaining engaged until a planned transition or exit point’, which occurred for 42% of clients (less than the target of 70%).

In short, these outcomes have demonstrated that it is possible to establish and sustain a ‘scaled up’ WBSS with high throughput of clients and with continued high performance as measured by key performance indicators. This trial also demonstrated that integration with the clinical service system, specifically the establishment of an integrated hospital pathway to community-based aftercare, was feasible, and we believe that it was this integration that provided capacity for the service to be offered routinely to the intended clinical target population (underpinning the capacity to scale up).

Process Measures and Service Utilisation Evaluation: Key Findings

The process evaluation confirmed that the service was feasible to establish and sustain at an organisational level; able to be delivered at the scale of a regional referral centre for deliberate self-poisoning patients; acceptable to and well received by the target population and clinical service providers; and consequently has established itself as a valuable and integral component of the local community’s approach to suicide prevention.

The findings from this evaluation component demonstrated that direct client activities were the principal focus of WBSS service delivery; phone contact was the primary form of contact allowing for a large client base to be serviced by a small staffing complement; and that service users reported positive impacts as a result of their contact with the WBSS.

For those for whom data was available, nearly all (527/ 542: 97%) reported progress towards goals, with fewer unmet needs at program conclusion (baseline mean= 3.8 (SD=1.5) closure mean= 2.6 (SD= 1.5), t(538)= 18.3, p=.001) and a significant reduction in psychological distress as measured by the available paired K10 data (baseline mean= 30.3 (SD=8.8) closure mean= 22.2 (SD=8.7), t(133)= 12.9, p=.001). Responses to the satisfaction survey (n= 131) also indicated high levels of service satisfaction (average scores all above 4 out of a possible 5 for every item).

It is important to note that even in this service where integration with the hospital system (the referring agents) was optimal, the intervention reach whilst substantial, was not universal and engagement attrition occurred with approximately one-third of those who accepted the service offer having WBSS contact for less than four weeks. This highlights that
there are opportunities to better understand the factors affecting engagement of patients with aftercare interventions and services.

**Effectiveness Study: Key Findings**

The aim of the effectiveness evaluation was to investigate whether the WBSS was associated with reduced hospitalisations (deliberate self-poisoning readmission, psychiatric hospital admission) in the 12 months following the index admission.

A non-randomised, historical controlled trial design was used. The intervention period was for the first eighteen months of WBSS delivery (April 2016- September 2017) and the historical control periods were drawn from two 18-month epochs prior to the introduction of the Hunter WBSS.

Effectiveness was evaluated with an intention-to-treat analysis for outcomes occurring in the 12 months following the index Calvary Mater Newcastle admission for deliberate self-poisoning in the intervention and control periods, with data drawn through the Hunter New England Local Health District hospital admission records.

**Primary outcomes**
- Proportion of participants with any deliberate self-poisoning readmission
- Number of deliberate self-poisoning readmissions.

**Secondary outcomes**
- Length of stay of deliberate self-poisoning readmissions
- Proportion of participants with any psychiatric admission
- Number of psychiatric inpatient admissions.
- Length of stay of psychiatric inpatient admissions.

In summary, 2770 participants were included in the effectiveness study across three study periods (historical control cohort 1 [CC1] n = 739; historical control cohort 2 [CC2] n = 710; intervention cohort [Int] n = 821).

**Primary Outcomes**
Overall, 13% of participants were readmitted to Calvary Mater Newcastle for deliberate self-poisoning. There were no significant differences for the intervention cohort vs control cohorts (CC1= 14%; CC2= 12%; Int= 13%).

A total of 445 deliberate self-poisoning readmissions were recorded. There were no significant differences between cohorts in deliberate self-poisoning readmission event rates, using the intervention cohort used as the referent group (CC1= 163/739; CC2=118/710; Int=164/821); best expressed as Incidence Rate Ratio [IRR], CC1 IRR= 1.10 [95% CI: 0.89-1.37]; CC2 IRR= 0.83 [0.66-1.05].

**Secondary Outcomes**
There were no significant differences in median length of stay (1 day) for Calvary Mater Newcastle deliberate self-poisoning readmissions.
There were no significant differences between cohorts in proportions with any psychiatric admission during the 12 month follow-up period (CC1= 18%; CC2= 18%; Int= 22%).

The intervention cohort had more psychiatric admissions (CC1= 238/739; CC2= 207/710; Int= 312/821), with control cohort 2 having significantly fewer admissions (IRR 0.77 [0.64-0.92]), and control cohort 1 having non-significantly fewer admission (IRR 0.85 [0.72-1.00]) compared to the intervention cohort.

There were no differences between cohorts in median length of stay (6 days) for psychiatric admissions.

Other Analyses

Intervention Cohort Sub-Group Analysis

Of the 821 participants in the intervention period, the sub-group receiving some level of WBSS exposure was substantial (n = 477, 58%): specifically, low exposure-less than 6 weeks, (n = 180); medium exposure-6-12 weeks, (n = 179); and high exposure-more than 12 weeks (n = 118).

The participants with no exposure to the WBSS intervention (n = 344, 42%) were classified into two sub-groups: not referred (ineligible or other) (n = 158); and no exposure after initial WBSS hospital contact (n = 186).

The no exposure and the high WBSS exposure sub-groups tended to have the highest rates of hospital-treated deliberate self-poisoning repetition and psychiatric inpatient admissions.

The low and medium WBSS exposure sub-groups tended to have lowest rates of hospital-treated deliberate self-poisoning repetition and psychiatric inpatient admissions.

Per-Protocol- Analysis

The per-protocol analysis (comparing the intervention sub-group (n=477) who were exposed to the WBSS intervention with the historical controls) showed no differences in repetition of hospital-treated deliberate self-poisoning or psychiatric admissions, for any event or number of events. It should be noted that this comparison was slightly underpowered. Appropriate caution should be used in interpreting this component of the analysis.
Proposed National Roll-Out of WBSS

Since the Hunter WBSS trial commenced, the Commonwealth government has committed to funding a national roll-out of the WBSS in partnership with State and Territory governments, recognising the need to better support people after a suicide attempt and the opportunity for support and prevention in the critical first few months after discharge from hospital for self-harm. The requirements for the current report involved a responsibility to make recommendations for the proposed national roll-out in the light of the Hunter WBSS trial experiences.

The national rollout of the WBSS should be carefully considered in the light of these results and a range of recommendations have been made. The main goal of the WBSS is to reduce suicidal behaviours and the recommendations are made in the context of that overall goal.

Implications and Recommendations

The recommendations fall into four main areas. Specifically:

- Modifying the service model to improve impact by increasing intervention reach and considering the potential need for specific clinical components to address the needs of different subgroups of the target population (Recommendations 1 and 2).
- Continuing to build the evidence base (Recommendation 3).
- Establishing a well-functioning non-clinical care coordination aftercare service within the Australian health care system (Recommendations 4, 5 and 6).
- Targeting quality assurance indicators and processes to increase capacity to track functional outcomes for service users (Recommendation 7).

Recommendation 1

For the WBSS service model to be improved, *intervention coverage needs to be addressed*. This could be addressed by:

1.1. Using qualitative methods to **consult with people who declined the initial invitation for intervention and those who initially agreed but later were not contactable** and so did not engage with the service after discharge from hospital. This could help to identify service modifications that could improve the WBSS coverage of those sub-groups.

1.2. However, it may prove to be difficult or impossible to increase the coverage beyond the substantial proportion of participants who engaged with the WBSS service to some degree. In light of this, consideration might be given to **broadening the non-clinical service model by incorporating universal brief contact interventions**, which have been demonstrated to have some beneficial effect on repeat hospital-treated self-harm.
Recommendation 2
Analyses showed no difference in repetition of hospital-treated deliberate self-poisoning, which was the key suicidal behaviour of interest. This suggests that despite substantial levels of engagement and high service satisfaction, a non-clinical care coordination model in addition to existing clinical service provision is not sufficient to reduce key suicidal behaviours at the clinical population level. Instead, it suggests that a multi-modal and stepped care approach to interventions for people who have presented to hospital for self-harm is required (Jobes & Chalker, 2019; Jobes, Gregorian & Colborn, 2018).

To better understand the key mechanisms of impact, it is recommended that this be explored further. Specifically:

2.1. Engage in further research to better understand the degree to which WBSS support resulted in increased connections with the service system and the degree to which evidence-based interventions are available/ provided within the existing service system in order to inform future service development.

2.2. Explore the characteristics of those who had high exposure to WBSS and who had multiple readmissions in order to better understand their needs. These people might have a high level of clinical complexity and require much more than a non-clinical intervention to modify suicidal behaviours. Both quantitative and qualitative methods would have merit in seeking to better understand the non-clinical and clinical requirements of this group.

2.3. Explore the characteristics of those who had exposure to the WBSS and had better outcomes in order to better understand the mechanisms of impact for this group. Both quantitative and qualitative methods would have merit in seeking to better understand the non-clinical and clinical requirements of this group.

2.4. Effectiveness analyses showed increased event rates for psychiatric hospitalisation for the intervention cohort and associated with WBSS exposure. This result was definitely unexpected and can be considered to be hypothesis generating, particularly with regard to exploring the potential role that increased activation of safety plans may play in driving hospital presentations and subsequent admissions.

Recommendation 3
Any changes or broadening of the model of care provided by WBSS should be accompanied by a testing of its effectiveness. Ultimately, this would best be done by a randomised controlled trial, although some developmental work would need to precede a full trial. Any regional or national rollout could be done using a stepped wedge design, which is a form of randomised controlled trial suitable for that situation.
Recommendation 4
For a non-clinical care coordination service to function well, integration with referring hospital services should be prioritised through:

4.1. Agreement with referring hospital services for referrals to WBSS to be considered routinely for all people admitted to hospital after self-harm.

4.2. The identification and development of processes, policies and procedures that support collaborative care across hospital and community service providers.

4.3. The establishment of low-demand referral processes for the referring hospital agents.

4.4. Agreements between the WBSS and referring hospital services about how WBSS can meet people while they are in hospital for their self-harm admission and/ or how “warm” hand-overs can be managed as part of routine care.

4.5. The identification of opportunities for close, professional relationships between the WBSS staff and relevant hospital services staff to be developed.

Recommendation 5
Strong clinical governance is essential as a ‘backbone’ to non-clinical care coordination. It is recommended that:

5.1. Lines of clinical responsibility and clinician support for WBSS support workers within the hospital setting are made clear.

5.2. A clear line of clinical responsibility and clinician support for WBSS Support Coordinators is established for community-based work, in order to ensure capacity for timely, coordinated acute clinical care when needed.

5.3. Local in-service and education opportunities be identified in order to enable clinical services to become familiar with the nature of non-clinical care coordination and its potential value.

Recommendation 6
To improve service delivery of the existing model it is recommended that:

6.1. Additional alternative contact details are collected at first contact (e.g. email address, alternative phone numbers) in order to reduce the proportion of people who are unable to be contacted after discharge from hospital.

6.2. Flexibility in service delivery is embedded within the model, including capacity for tailoring based on the needs of the local population (see recommendation 1 above).
Recommendation 7

Quality assurance processes can be improved by:

7.1. Identifying some **short standardised outcome measures** that can be integrated into routine service delivery and that are acceptable to clients and provide capacity for comparison of outcomes with other relevant participant groups and other studies.

7.2. Establishing an **online portal for data collection** for routine outcome measures that can host and store outcome measures data, manage automated invitations to service users to complete measures on their phone/ electronic device and has a feedback loop for tracking of outcomes back to the service user, WBSS and, potentially, other relevant service providers.
Conclusions

This evaluation of the WBSS in the Hunter has demonstrated the capacity for the service to be scaled up, integrated with existing clinical services and for high quality service delivery to be maintained over time.

The data presented in this report lends support to the model’s acceptability as an after hospital support service as demonstrated by the high throughput of clients; the service being well received by consumers who reported high levels of support; reported increases by clients of connection with services over time; and observation of clinically meaningful improvements in clients’ well-being.

However, from this study, there was no evidence that the WBSS intervention was associated with reduced repetition of suicidal behaviours or hospital admissions.

We would recommend further development of the WBSS model of care taking into consideration the recommendations outlined in this report, and subsequent evaluation of the revised model to determine its impact on repetition of suicidal behaviours.
1. Background and context

- Hospital-treated non-fatal self-harm (suicide attempt) is common and costly.

- Deliberate self-poisoning is overwhelmingly the most common type of hospital-treated self-harm.

- Hospital-treated self-harm is the strongest independent risk factor for later suicide.

- Reducing subsequent suicide and repetition of self-harm (suicidal behaviours) are key elements of and outcomes for suicide prevention.

- The first three months after discharge from hospital for deliberate self-harm is a critical time, with risk of suicide and non-fatal repetition being highest in the period immediately after discharge.

- Consumers report a discontinuity of support between hospital discharge and community-based aftercare.

- There is growing evidence that brief interventions, psychological and psychosocial therapies and assertive aftercare and follow-up can reduce repetition of self-harm and/or suicide deaths.

- The WBSS was developed by Beyond Blue. This initiative aims to prevent repeat suicidal behaviour for people presenting to hospital following a suicide attempt by delivering person-centred, non-clinical care and practical support for three months after discharge. It is a community-based aftercare service that supports people to link into existing health, clinical and community-based services to address their needs and support their safety.

- An initial pilot of the WBSS was implemented in Darwin, Northern Territory (June, 2014) with the goal of reducing future suicidal behaviours.

- A large-scale service development trial has been established in Newcastle, New South Wales (commencing January 2016).

- This report provides a snapshot of the evaluation of the Hunter WBSS.
1.1. Background

Hospital-treated attempted suicide is the strongest independent risk factor for later suicide making this clinical population a recognised priority group for suicide prevention. It is estimated that approximately half of all people who die by suicide have previously self-harmed and that one out of every 25 people who present to a health service after self-harm go on to die by suicide within 10 years, representing a 100-fold relative risk compared to the general population (Carrol, Metcalfe & Gunnell, 2014). The 12 month repetition rate for self-harm for people presenting to emergency departments after deliberate self-harm is 15% and it is estimated that 1.6% die by suicide in the year after presentation (Carroll et al., 2014; Owens, Horrocks & House, 2002).

Self-harm refers to behaviour that involves intentional harm or potential harm to the self. Self-harm includes self-injury behaviours such as cutting, scratching, burning and head-banging as well as behaviours more typically associated with suicidal intent, such as intentional self-poisoning (overdosing or gassing), hanging, jumping, strangulation, drowning and injury by fire-arms. While hospital-treated self-harm represents only a minority of all self-harm, it is thought to represent the more clinically serious cases because it is typically associated with suicidal ideation (Hjelmeland et al., 2002), mental health problems (Lilley et al, 2008; Hawton, Saunders, Topiwala & Haw, 2013), psychosocial vulnerabilities and various adverse outcomes (Walter et al., 2019).

Hospital-treated self-harm is common and costly and official reports indicate episodes have significantly increased over the past 15 years (AIHW, 2015). Overall, hospital-treated self-harm accounts for over 26,000 admissions and approximately 89,000 bed days per year in Australian hospitals (AIHW, 2012), although these are likely underestimates because of the limitations of hospital data collection systems. Self-poisoning is the most common type of hospital-treated self-harm. In 2012-13, self-poisoning accounted for 83% of all self-harm admissions in Australia (AIHW, 2015), similar to the rates reported in a systematic review, where self-poisoning accounted for a median (across studies) of 90% of self-harm hospital admissions (Carroll et al., 2014). These figures highlight that when discussing hospital-treated self-harm, we are usually referring to, and considering what works for, people who have intentionally self-poisoned.

The first three months after discharge from hospital for self-harm are a particularly critical period. Studies have generally focused on risk of suicide after psychiatric hospitalisation and these studies consistently identify that the immediate weeks and months following discharge are the riskiest times, with 40% of attempts and suicides occurring with the first three months after discharge and nearly three-quarters occurring within the first twelve months (Forte et al., 2019), while risk remain substantially higher than the general population across a person’s lifetime (Chung, Ryan & Hadzi-Pavlovic, 2017). A recent systematic review of suicide rates among people discharged from non-psychiatric settings after presentation for suicidal thoughts or behaviours similarly concluded that the immediate period post-discharge was the period of highest risk of suicide (Wang et al., 2019).

Many people who have been admitted to hospital for self-harm report being discharged with little information and few links to community care (Shand et al. 2015; Spittal et al. 2017). Many report good care being provided through ‘luck’ rather than enabled through...

health systems design (McKay & Shand, 2018). Thus, while hospitals offer a natural setting for engaging and linking people into community-based treatment for self-harm, there remain gaps in the degree to which this appears to occur as part of routine care.

1.1.1. Aftercare as a key suicide prevention strategy

Aftercare refers to the coordinated delivery of appropriate treatment after hospital discharge following a suicide attempt with the aim of increasing access to, and engagement in, care and support that will reduce suicide and related behaviours.

As summarised in Table 1.1, there are many different types of aftercare with evidence of benefit in reducing suicidal behaviors (Carter et al., 2016). This includes brief contact interventions (Milner et al., 2015), brief psychological therapy (Guthrie et al., 2001), longer-term psychological or psychosocial interventions such as cognitive behaviour therapy (Hetrick et al., 2016; Hawton et al., 2016), and long-term psychological interventions for those diagnosed with Borderline Personality Disorder (Cristea et al., 2017). For suicide, psychological or combination interventions (Hofstra et al., 2019) as well as changes to mental health service delivery systems, especially 24 hour crisis services and coordinated assertive aftercare (While et al., 2012) have been shown to be most promising. However, despite the evidence base, it is unclear as to the extent these evidence-based interventions are widely available as part of routine care within Australian clinical services.

Recommendations for aftercare for hospital-treated self-harm have also been made in recent Clinical Practice Guidelines in the United Kingdom (Kendall et al., 2011) and in Australia and New Zealand (Carter et al., 2016). These guidelines emphasise the importance of holistic, collaborative clinical assessment, active follow-up and engagement with aftercare supports, and engagement with psychological and psychosocial therapies aimed at reducing repetition of self-harm and for treatment of associated mental health conditions.

A recent Sax Institute-brokered rapid review (Shand et al., 2019) on the effectiveness of aftercare for hospital-treated self-harm identified that there have been six systematic reviews conducted since 2013 that have identified that dedicated care and follow-up after a suicide attempt is effective in reducing the number of people who will have a subsequent suicide attempt, including three studies that used meta-analysis.

Inagaki et al. (2015) identified that for people who had been admitted to hospital after self-harm “active contact and follow up type” interventions (n=9 trials) were effective in reducing repeat suicidal events at the 12 month follow-up time point (Relative Risk [RR]=0.83, 95% Confidence Interval [CI] 0.71-0.97). The studies included in this category included trials of: intensive outreach, brief interventions and contact, and brief contact. An updated review by the same investigators included additional studies (n=14) and similar findings emerged (Inagaki et al., 2019).
**Table 1.1: Interventions with evidence of effectiveness in reducing self-harm repetition**

<table>
<thead>
<tr>
<th>Type of intervention</th>
<th>Description of intervention; Example studies</th>
</tr>
</thead>
</table>
| Brief contact                         | Is an outreach method that utilises simple communication strategies (e.g. letters, text messages). Content is usually simple messages that offer care and support, not requiring two-way communication (unless participant-initiated), and may include a psycho-educational component with encouragement to participants to engage with clinical services. Includes supportive messages via postcard, text message or letter (no therapy).  
**Example studies**  
Carter et al. (2005)- Postcards from the EDge. 8 postcards over 12 months.  
Comtois et al. (2019)- Caring contacts (text messages) with the military. 11 text messages over 12 months. |
| Brief interventions with contact      | Include one or more sessions of limited duration (eg up to 30 mins), usually with a clinician, covering various content (e.g. safety planning, basic problem solving, service access). The content covered in sessions varies but includes a limited number of sessions within a set timeframe, frequently delivered by telephone and is not therapy-focused.  
**Example studies**  
Fleishmann et al., (2008)- Brief intervention (information session) & phone/ face to face contact with health worker over 12 mths.  
Cebria et al. (2013; 2015)- Nurse phone calls focused on follow-up of treatment plan over 12 mths.  
Naidoo et al. (2014)- Buddy delivered contact intervention. Buddy receives training and engaged in regular well-being and treatment engagement follow-up over 12 mths.  
Gysin-Maillart et al., (2016); Michel et al. (2017); Park et al. (2018)- ASSIP. 3 narrative sessions + tailored letters- 2 yrs.  
Messiah et al. (2019); Vaiva et al. (2018)- ALGOS. Crisis cards + psychiatrist phone contact at 1 or 3 mths- focused on treatment engagement & crisis response (if needed). |
<table>
<thead>
<tr>
<th>Type of intervention</th>
<th>Description of intervention; Example studies</th>
</tr>
</thead>
</table>
| Assertive aftercare and case management | Interventions where an identified person (usually a clinician) is responsible for maintaining contact with a person for the duration of care and encourages the person to adhere to/ engage with treatment, as well as takes a role in supporting and coordinating access to other clinical and non-clinical (psychosocial) services and provides psychoeducation (Kawanishi et al., 2014; Morthorst et al, 2013). A 24 hour crisis service may also be embedded in the support, and the intervention is usually provided as part of a coordinated community clinical service (While et al., 2012). Includes assertive and rapid follow-up after discharge from hospital, case management and provision of motivational support.  
*Example studies*
Hvid et al. (2011); Lahoz et al. (2016)- OPAC. Outreach, problem solving, adherence/ motivation, same nurse- 6 mths  
Johannessen et al. (2011)- Baerum model. Nurse follow-up focused on treatment engagement & advocacy- 12 mths.  
Morthorst et al. (2012)- Assertive intervention for deliberate self-harm (AID). 8-20 outreach consults by nurse- 6 mth  
Kawanishi et al. (2014)- ACTION-J. Regular health worker contact focused on trt adherence, care coordination-18 mth |
| Psychological interventions          | Psychological interventions refers to “talking therapies”. Most of these interventions are underpinned by a specific therapy framework that aims to address the underlying drivers of suicidal thinking or behaviour. Interventions include cognitive behavioural therapy, dialectical behaviour therapy, collaborative assessment and management of suicidality (CAMS), problem-solving based therapy, interpersonal therapy, etc. For those studies that have tracked impact on suicidal behaviour outcomes, benefit has been shown particularly for cognitive-behavioural therapy but not for problem-solving based therapies (Hawton et al., 2016; Hetrick et al., 2016), and effectiveness for long-term specialised therapies like dialectical behaviour therapy for the clinical sub-groups diagnosed with Borderline Personality Disorder (Cristea et al., 2017).  
*Example studies*
Brown et al. (2005)- Cognitive behaviour therapy- 10 sessions.  
Jobes (2012)- Collaborative assessment and management of suicidality- 3+ sessions addressing drivers of suicidality. |
Milner et al. (2015) investigated the effect of brief contact interventions on repetition of self-harm or suicide attempt and suicide. The meta-analysis estimated the effect of the interventions. In summary, it was identified that the pooled effect for the intervention group was a non-significant reduced risk (OR=0.87, CI 0.74-1.07, p=.01) for any repeat event after 12 months; a significant reduction of 33% for repeated number of events (IRR=0.66, 0.54-0.8, p=.001); and a non-significant significant risk reduction for suicide (OR=0.58, 0.24-1.38, p=.22). The authors concluded that brief contact interventions were promising but a large-scale trial in a clinical population was needed before they would recommend wide roll-out.

The three other identified systematic reviews provided narrative analysis only (Luxton, 2013; Falcone et al., 2017; Ghanbari, 2016). They identified that results of the studies were mixed, but all concluded that the evidence was suggestive that aftercare (particularly brief contact interventions) was effective in reducing further attempts or deaths.

The findings of the Sax Institute-brokered rapid review complements previous systematic reviews and focuses on recent evidence published since 2013. The range of models examined was broad but was categorised into the first three groups described in Table 1.1 and as summarised below.

Assertive aftercare is characterised by assertive and rapid follow-up after discharge from hospital, case management and provision of motivational support. Brief interventions are varied but included a limited number of sessions with a clinician within a set timeframe, are frequently delivered by telephone and do not involve case management or therapy; and brief contact interventions including supportive messages via postcard, text message or letter (and no therapy).

In short, the key findings of the rapid review were:

- two of the three brief contact studies found an effect on either the proportion of participants with any repeat self-harm event or reduced number of repetitions of self-harm in the intervention compared to the control groups;
- six of the ten brief intervention studies reported a significant reduction in repeated self-harm compared to the control conditions (usually treatment as usual); and
- two of the four assertive aftercare and case management studies found significantly reduced repeat self-harm compared to control conditions.

The authors concluded that the case for suicide attempt aftercare services was clear, and while promising, there were limits and nuances to the existing evidence-base regarding which models of aftercare have greatest impact. They also noted that there was a need for rigorous evaluation of the impact of aftercare services on suicidal behaviours within the Australian health care system.

The following intervention characteristics were suggested as being associated with positive outcomes:

- Rapid follow-up after discharge from hospital
- Longer follow-up duration
- A focus on continuity of care, therapeutic alliance and engagement
- First aftercare contact involving face-to-face contact
• Multiple methods used to follow-up/ engage with people (e.g. phone, email, letters)
• A broad focus of care based on a person’s needs
• Involvement of support people
• Engagement of people after their first attempt
• Integration with clinical care.

Taken together, the evidence suggests that aftercare can reduce self-harm repetition, with brief contact, brief interventions and assertive aftercare and case management all showing promise. Identification of which models of aftercare are most effective and feasible for integration into the existing Australian service system remains a priority.

While the WBSS model was developed well before the findings of the rapid review were known, it is clear that the WBSS incorporates many of the components of effective interventions within its model of care.
1.2. Way Back Support Service

Beyond Blue developed the WBSS and details of the initial development of this service model can be requested from Beyond Blue.

In summary, the WBSS is a Beyond Blue initiative that aims to prevent repeat suicidal behaviours among people treated in a hospital Emergency Department following a suicide attempt, with non-clinical support provided during the first three months after discharge. The service seeks to maintain contact with people after hospital discharge and to support and actively encourage and link people with existing clinical and other supports and services (e.g. social, financial, etc.) within the community.

The service model was specifically designed to support those discharged from hospital after a suicide attempt; aiming to moderate the discontinuity between hospital and community aftercare clinical services, recognising the importance for recovery of accessing services and supports in the community, and providing a specific contact person for supporting or resolving availability or access to appropriate services.

The establishment of this type of service model is also consistent with the whole-of-community ‘systems approach’ for suicide prevention that was proposed in the National Mental Health Commission’s Review of Mental Health Programmes and Services (NMHC, 2014) and the New South Wales Suicide Prevention Framework (MHC of NSW, 2018).

As outlined in the Original Request for Proposal and consequent Service Agreement for the Hunter WBSS, the WBSS aims to establish important infrastructure and processes as part of a stronger community-based approach to mental health and suicide prevention, including:

a) Development of a new, non-clinical workforce, that will enable more people to access treatment
b) Implementation of a stepped-care model, that delivers in the community, and ensures that people who need higher levels of care are ‘stepped up’ to specialised services as needed
c) Improvement of suicide prevention data collection and outcome measurement
d) Empowerment of people to control and make decisions about their health care
e) Recognition of the important role of family members and carers.

An initial pilot of the Way Back Support Service was implemented in Darwin, Northern Territory in June 2014. An independent evaluation indicated the service delivery model was appropriate and feasible to implement in other jurisdictions. A large-scale service development trial was established in Newcastle, New South Wales in January 2016 (the Hunter Way Back Support Service) and this trial is the focus of this report.

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1.3. Report Overview

This report provides a snapshot of the evaluation of the Hunter WBSS: specifically the evaluation of the feasibility of integrating the WBSS into an existing hospital service; patient engagement, service utilisation and satisfaction (process measures); and a service development effectiveness study (outcome measures).

The first and second part of the report provide a summary of the evidence-base relevant to aftercare and an overview of the Hunter WBSS project and the scope, objectives, aims and evaluation parameters.

The third, fourth and fifth sections provide an overview of the findings for the feasibility, process measures, and the service development effectiveness study.

The sixth part of the report presents conclusions drawn from the three evaluation components and recommendations for future developments.
2. Hunter Way Back Support Service Project - Overview

Through a competitive tender process, Beyond Blue selected Newcastle as the second trial site to undertake a service development project and comparative trial to:

   a) Scale up the WBSS to a higher throughput of consumers
   b) Integrate the WBSS in a metropolitan area with a complex service system
   c) Evaluate the feasibility, service engagement and effectiveness of the WBSS.

For the purposes of the WBSS project, eligibility for the service was restricted to a cohort of individuals admitted to the Calvary Mater Newcastle following deliberate self-poisoning.

A series of evaluations, each involving different lead investigators and partner organisations, were conducted to investigate multiple components of the WBSS project.

This report deals with the following WBSS evaluation components. Specifically, to:

1. Investigate the feasibility of scaling up and integration of the WBSS within an existing complex clinical service system; and to identify the key factors underpinning effective scaling and integration.

2. Describe patient engagement and measures of service utilisation in order to understand the reach and fit of the service with the target population.

3. Conduct a comparative trial of the effectiveness of the WBSS in reducing rates of hospital-treated deliberate self-poisoning readmissions and psychiatric inpatient admissions in the 12 months following the index admission.
2.1. Hunter Way Back Support Project - Service Delivery Objectives and Funding

The ultimate objective of the WBSS project was to demonstrate the effectiveness of the WBSS model of non-clinical support in reducing suicidal behaviour without duplicating existing clinical services.

As outlined in the Request for Proposal and the subsequent Service Agreement for the Hunter WBSS, the specific objectives of the Hunter service delivery trial were to modify, implement and evaluate the WBSS in NSW and ensure it:

a) Engaged participation in the WBSS with a particular focus on men (without excluding other population groups);
b) Supported individuals to stay safe and connect with essential services during a period of high risk and vulnerability;
c) Reduced the burden on supporting networks including family and carers;
d) Worked collaboratively with existing services/organisations and complemented current services by supporting attendance and by reducing the burden for follow-up care and support;
e) Provided direction or referral to service for a currently unmet need in the community;
f) Was cost-effective (in comparison to current systems and other health indicators), including providing economic benefits by preventing further attempts of suicide; and
g) Was a suitable model and could provide evidence to support further funding for rollout nationwide.

The WBSS is a Beyond Blue initiative funded by Beyond Blue directly, supported by seed funding from the Movember foundation. The service delivery of the Hunter WBSS was supported through these mechanisms.

Hunter Primary Care also acknowledges additional financial support received for service delivery including partial funding since May 2017 from the NSW Ministry of Health Suicide Prevention Fund (until June 2020) and contribution from Hunter New England Central Coast Primary Health Network.
2.2. Hunter Way Back Support Service Project - Evaluations

2.2.1. Evaluation Scope

As summarised in Table 2.1, the Hunter WBSS project has been subject to a series of evaluations, each involving different lead investigators and partner organisations.

The focus of this report is the feasibility, process and effectiveness evaluations, which were conducted by staff at the Calvary Mater Newcastle, Hunter New England Mental Health Service and Hunter Primary Care. This report specifically does not deal with: the development and evaluation of a family support group, the qualitative study of WBSS clients’ and service providers’ experiences, or the economic evaluation. The current report should be read in conjunction with the findings from the other reports.

Table 2.1: Hunter WBSS project evaluation series

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Focus</th>
<th>Lead investigators/ organisation &amp; partners</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Feasibility, service utilisation, and satisfaction. Process evaluation</em></td>
<td>Uses service and patient level data to identify service referral and uptake patterns, reach and engagement, patterns and types of service use, and individual outcomes for people who utilised the Hunter WBSS.</td>
<td>Hunter Primary Care Calvary Mater Newcastle Hunter New England Mental Health Service</td>
</tr>
<tr>
<td>Effectiveness evaluation*</td>
<td>Utilises a non-randomised controlled trial design to identify if a change occurs in the rates of re-presentation and admission for people who present to hospital after deliberate self-poisoning for a period of service delivery compared to historical controls.</td>
<td>Calvary Mater Newcastle Hunter New England Mental Health Service Hunter Primary Care</td>
</tr>
<tr>
<td>Family Support development and evaluation</td>
<td>Evaluation of the psychoeducational group for family and friends of WBSS clients</td>
<td>Evermind Relationships Australia</td>
</tr>
<tr>
<td>Qualitative evaluation</td>
<td>Service users and key stakeholders were interviewed to gain a deeper understanding of people’s experiences of the Support Service and their perceptions of its strengths, limitations and areas for improvement.</td>
<td>Evermind Hunter Primary Care</td>
</tr>
<tr>
<td>Economic evaluation</td>
<td>Will estimate the economic costs and benefits of the Support Service; and establish the cost-effectiveness of the Support Service.</td>
<td>Deakin University Calvary Mater Newcastle Hunter Primary Care</td>
</tr>
</tbody>
</table>

*Focus of this report
2.2.2. Hunter WBSS Evaluation Funding
Funding to support the evaluation of the Hunter WBSS trial was provided through Beyond Blue directly, supported by seed funding from the Movember foundation.

In-kind support for the evaluation activities that are the focus of this report were also provided by Calvary Mater Newcastle (Professor Greg Carter and Professor Ian Whyte’s time) and Hunter New England Local Health District, with Dr Katie McGill’s position supported through the Burdekin Suicide Prevention Initiative funding administered by Hunter New England Mental Health Service.

2.2.3. Evaluation Objectives
The objectives of this evaluation report were to:

1. Investigate the feasibility of scaling up and integration of the WBSS within an existing complex clinical service system; and to identify the key factors underpinning effective scaling and integration.
2. Describe patient engagement, service utilisation and satisfaction to understand the reach and fit of the service with the target population.
3. Conduct a comparative trial of the effectiveness of the WBSS in reducing rates of hospital-treated deliberate self-poisoning re-presentations in the 12 months following the index admission.

2.2.4. Study Period
The Hunter WBSS commenced in April 2016 and service provision has continued up to present day.

For the purposes of the feasibility and process evaluations, the study period of interest is a duration of three years 26 April 2016 to 30 April 2019 (i.e. three years after service commencement).

For the purposes of the service development effectiveness study, the study period draws on data from April 2011 to September 2018. This includes three 18-month epochs each with 12 month follow-up periods; specifically an intervention period (26 April 2016- 30 September 2017) and two historical control epochs from before the Support Service was introduced (26 April 2011- 30 September 2012; 26 April 2013- 30 September 2014).

2.2.5. Participants
For these evaluations, eligibility for the WBSS was restricted to a cohort of individuals admitted to the Calvary Mater Newcastle following deliberate self-poisoning. Calvary Mater Newcastle is a tertiary referral hospital for deliberate self-poisoning in the Hunter region and services almost all hospital-treated deliberate self-harm cases, who are admitted under the care of the Hunter Area Toxicology Service (HATS). Potential contingencies to broaden the referring hospitals were not implemented due to the WBSS reaching service capacity from the HATS referrals.
Participants for both the process and effectiveness study included adults (16+ years) who were admitted to Calvary Mater Newcastle after an episode of deliberate self-poisoning during the study period. Patients were eligible if they were a resident in the Hunter area before and after HATS admission. Patients discharged to a Hunter psychiatric hospital after the HATS admission were potentially eligible unless deemed otherwise by Hunter New England Mental Health Service staff. Patients considered to be potentially dangerous by Calvary Mater Newcastle clinical staff were not eligible for the WBSS.

For this study the first episode of hospital-treated deliberate self-poisoning in the study period was used as the inception rule. Repetition of any further event and the number of events that occurred during the twelve month period after the index event were used as the primary outcomes.

2.2.6. Ethics Approval

Both the effectiveness and process evaluation were approved by an ethics committee (HNE HREC Reference Number: 16/02/17/5.05).
3. Feasibility and Integration - Evaluation

Context

Newcastle is a metropolitan centre in New South Wales with a population of 400,000+ across the local government areas of Newcastle, Lake Macquarie and Port Stephens. It hosts a typical array of health and community services, including the Hunter New England Local Health District, Calvary Mater Newcastle Hospital and Hunter Primary Care. Hunter Primary Care is a well-established not-for-profit provider of primary care services, including mental health care.

Hunter Way Back Support Service

Integration with the Hospital and Community Services

Key service integration characteristics were established to support the trial. These included:

- An integrated referral pathway to ensure all eligible patients were referred to WBSS during or after HATS admission
- Minimisation of administrative referral load for referring HATS clinicians
- HATS staff introduction of WBSS staff to patients during admission
- Clear lines of clinical responsibility for WBSS staff during hospital admission (Department of Consultation-Liaison Psychiatry, Calvary Mater Newcastle) and after discharge (Hunter Primary Care)
- Weekly review meetings of all HATS cases with WBSS staff in attendance
- Hunter New England Mental Health Service social work staff liaison with WBSS staff
- Governance processes involving clinical and Executive representatives of all involved services.

Service Delivery

The WBSS was staffed by Support Coordinators (holding a minimum Cert IV Tafe Diploma) and supported by an Operations Manager, a Clinical Advisor, an Administration Officer, and a Data Coordinator (5-5.6 FTE).

HATS patients referred to the WBSS were met by WBSS Support Coordinators in person during admission or by phone after discharge. Eligible patients were offered post-discharge contact by the WBSS.

The focus of the first post-discharge meeting (conducted by phone or in person) included completion of a needs assessment, goal setting, development of a safety plan and the K10.

Non-clinical support coordination was provided for up to three months focusing on the issues and goals identified by the person.
Recruitment and initial engagement
Between the period April 2016 to April 2019,
- 1653 referrals were made to the service
- 1578 referrals were deemed eligible by WBSS and progressed
- 1280 acceptances of the initial offer of service occurred (81% of eligible referrals)
- 960 of those who accepted the initial service offer continued to accept WBSS support in the community (61% of eligible referrals; 75% of those who accepted initial service offer).

Quality indicators (as monitored by key performance indicators defined by Beyond Blue) were met throughout the service delivery period.

Key Findings
It was possible to establish and sustain a ‘scaled up’ WBSS with high throughput of referrals and with continued high performance as measured by key performance indicators. The service maintained a high number of received and accepted referrals over time; an initial engagement target of 80% for all genders; and met or exceeded targets for timeframes for contact after discharge and safety planning completion. The only key performance indicator that was not met was clients remaining engaged until a planned transition or exit point, which occurred for 42% of clients (less than the target of 70%).

Integration with the service system, specifically the establishment of an integrated hospital referral pathway and lines of clinical responsibility, was achieved. The feasibility of implementing the WBSS relied on establishment of service processes and agreements between multiple service providers. Collaborative care and opportunities for relationship building between clinical service providers and Executive sponsors were able to be established and maintained.

Helping stakeholders understand the specific role of a non-clinical care coordination service, especially how it differs from and complements clinical care was an important component of effective implementation. However, the WBSS still had exposure to acute clinical situations; so lines of clinical responsibility and access to clinical staff to help WBSS coordinators respond appropriately to these acute clinical situations was necessary.

Conclusions
The WBSS model of care is scalable and feasible to implement in a metropolitan hospital service.

Integration with the existing service system and the trust between the providers underpinned the capacity to scale up and enabled the service to be offered to the intended target population.
3.1. **Aims**
This chapter investigates the feasibility of taking the WBSS to scale and the integration of the service within a complex service system.

Specifically, within this chapter, we describe:

- The establishment of the Hunter project and the roles of partner organisations as required for scaling and service integration within the service system
- The key features of service integration
- The nature of service delivery established by Hunter WBSS
- The indicators of the success and feasibility of the scaling up of the service
- Some of the barriers and arising difficulties that emerged during the trial period.

The aim of this chapter is to provide a synthesis of factors relevant to the integration of the service into the service system and the feasibility of scaling up the service. This chapter also provides relevant context for understanding the findings of the process and effectiveness evaluations.

3.2. **Method**
The information presented in this chapter is drawn from a combination of sources, including the Hunter WBSS Operations Manual, governance meeting minutes, data tables (used for interim reports to Beyond Blue by Hunter Primary Care [HPC]), and reflections from key stakeholders within HPC and Calvary Mater Newcastle [CMN].

3.3. **Results**

3.3.1. **Hunter Trial Setting and Context**
Newcastle is the seventh largest city in Australia, located in the Hunter region, 160 kilometres north of Sydney on the eastern coast of New South Wales. The Greater Newcastle region (including Newcastle, Lake Macquarie and Port Stephens local government area) has an urban-suburban population of over 400,000, of whom 65% are 15-64 years of age, and an Indigenous population of approximately 4% (ABS, 2017).

The median total household income is $45,000 and the unemployment rate is 5.5% (ABS, 2017). Previously, industry and employment in the Hunter was heavily centred on the coal mining industry but over the past 20 years this has moved to the education (university) sector and health services being the major employers in the region (Wilkinson, 2011). The Hunter region has medium levels of socio-economic disadvantage with pockets of extreme disadvantage both within the Greater Newcastle area and in surrounding regions (City of Newcastle, 2016).

Estimates from the Australian Bureau of Statistics and the Public Health Information Development Unit indicate residents of the Hunter region experience slightly higher than average (compared to state and national) rates of mental health problems, with a similar pattern apparent for rates of suicide and hospital treated self-harm (HNECC PHN, 2017). Newcastle hosts most of the tertiary health services and teaching hospitals for the region.
and sits within the Hunter New England Local Health District (HNE LHD) and the Hunter New England Central Coast Primary Health Network (HNECC PHN).

Newcastle is unique in Australia with regard to the nature and way hospital services have been established to treat self-poisoning patients. The CMN hospital is a private hospital that provides free hospital services under a service level agreement with the Local Health District. This includes a 24-hr, 7 days a week Emergency Department, as well as an Intensive Care Unit, extensive Oncology, Haematology and Palliative Care services and a range of other medical, surgical and allied health services.

The Hunter Area Toxicology Service (HATS) was established in 1987 and is a regional toxicology unit based at the CMN hospital. Since the service commenced, the service has had a standard process for all poisoning presentations. Specifically, all people presenting to hospital within the Greater Newcastle region with poisoning are routinely admitted, with a toxicological assessment completed by medical staff (Whyte et al., 1997). Area-wide processes have been put in place to ensure that all poisoning presentations requiring hospital care are directed or transported to CMN, with the service accepting secondary and tertiary referrals from across the Hunter Valley. This means that all poisoning presentations to the CMN Emergency Department are routinely admitted to HATS (or notified to HATS) and all people receive a standard toxicological assessment. Those admitted for deliberate self-poisoning also receive a mental health assessment from Consultation-Liaison Psychiatry staff.

Newcastle also has a typical array of health services available to people experiencing mental health problems. For those experiencing acute mental health problems, including acute suicidality, the Hunter New England Mental Health Service (HNE MHS) provides community and inpatient treatment. Services are multi-disciplinary and available support includes case management, medication review, monitoring, and therapy. Support is usually provided on a short-term basis, until acuity has resolved or other service providers have been engaged. HNE MHS provide services across the lifespan and also provides specialist services for some priority populations, including people with Borderline Personality Disorder (through the Centre for Psychotherapy), Indigenous people (through the Aboriginal Mental Health Workforce) and those in the acute phase of mental illness (through the Acute Care Team which was established to provide an alternative to hospital admission). Community access to HNE MHS is managed through a telephone 1-800 triage service.

Within the Hunter area, there is one public psychiatric hospital, the Mater Mental Health Centre, and one public inpatient unit attached to a general hospital (Maitland). The Hunter New England Local Health District (HNE LHD) also includes public psychiatric inpatient facilities at Morisset, Taree, Tamworth and Armidale.

The Mater Mental Health Centre has been co-located on the CMN hospital site since 2009. The Mater Mental Health Centre has 100 adult psychiatric inpatient beds (including some specialist units e.g. for older people, for people with substance use and mental ill-health) and also runs the Psychiatric Emergency Centre, which provides front-of-house assessments for all people presenting for mental ill-health (conducting about 5 000 assessments each year). Average inpatient stays with the Mater Mental Health Centre are 12-14 days and
treatment is typically focused on stabilisation and commencement or modification of treatment (medication and therapy), with discharge to community-based supports.

The largest tertiary general hospital in the region is John Hunter Hospital. This hospital provides hospital treatment for people who have engaged in forms of self-harm or suicide attempt other than poisoning (e.g. hanging, jumping, etc.). It also has the public child and adolescent psychiatric inpatient unit (Nexus) located on-site.

Outside of the public mental health service, there are a range of other treatment options for people experiencing mental health difficulties. In the first instance, people are usually encouraged to engage with their general practitioner and thereafter Medicare-rebated specialist services, including private psychologists and private psychiatrists as appropriate. There are number of private hospitals providing inpatient mental health services under the care of private psychiatrists.

Hunter Primary Care (HPC) is a well-established not-for-profit provider of a range of primary care services, including mental health care. The objectives of the organisation are to support people to stay well, and have their physical and mental health needs supported in the community. Services provided by HPC include Care Coordination and Supports, Indigenous Health, Disability Support, After Hours General Practice Services and Mental Health Services. HPC has significant experience in providing mental health and care coordination services that are responsive to local demographic needs through the provision of Psychology and Mental Health Care-Coordination services across the region. These services are provided to a range of clients: adults, children, adolescents, Aboriginal and Torres Strait Islander clients, clients at risk of suicide and self-harm (national leader) and women with post-natal mental health issues. The mental health services provided by HPC are funded through a range of funding agreements with various funders and have no out-of-pocket costs for clients.

As a major urban centre, all other usual community services (e.g. Centrelink, Housing, Community Services, etc.) and businesses are available and located within the Greater Newcastle region.

It is also important to note that Newcastle is known for being a leader in suicide prevention research, evaluation, excellence and innovation. A variety of internationally renowned suicide prevention studies investigating hospital-treated self-harm have been conducted by Professor Carter and Professor Whyte. Everymind is also based in Newcastle. Everymind (formerly Hunter Institute of Mental Health) is an Institute dedicated to the prevention of mental ill-health and suicide. They have had continuous Commonwealth funding since 1997 to deliver a variety of suicide prevention programs, including Mindframe (the national media initiative aimed at supporting safe media reporting, portrayal and communication about suicide, mental ill-health and alcohol and other drugs) and, more recently, Life in Mind (a national gateway connecting Australian suicide prevention services to each other and the community).

In October, 2016, an alliance of health services (including HNE LHD, CMN, HPC and the HNECC PHN) received funding to implement the Black Dog Institute’s LifeSpan integrated approach to suicide prevention. This is particularly relevant to the Hunter WBSS trial as the
The aims of the LifeSpan trial were to reduce suicide deaths and attempts through implementation of a range of evidence-based interventions; including an objective of ‘improving emergency and follow-up care for suicidal crisis’, with a specific goal of establishing and supporting the maintenance of aftercare support for people who have made a suicide attempt. The parallel implementation of the LifeSpan trial (from October 2016) means that there were a range of other suicide prevention activity (e.g. clinical training, client-focused interventions, community education) occurring in the region while the intervention period of the Hunter WBSS effectiveness trial was underway.

In short, Newcastle provided a suitable setting to trial the feasibility of scaling and integration of the WBSS because of the urban setting, community need, and existing expertise and partnerships.

### 3.3.2. Governance and Partnerships

Following a tender process, HPC were contracted to establish and deliver the Hunter WBSS service; while a partnership between HPC, CMN and HNE MHS allowed an integrated hospital referral pathway to be established.

The members of the Project Governance group who worked together to oversee the delivery of the Hunter trial included HPC, CMN, HNE LHD (specifically, the Mental Health Service), Everymind (formerly Hunter Institute of Mental Health), Relationships Australia NSW and Beyond Blue. This group met regularly to oversee trial delivery throughout the trial period (January 2016 to April 2019) and roles are outlined in Table 3.1.

### 3.3.3. Integration with the Service System

Scaling of the service required integration with the service system, both to ensure that the service was available and accessible to the target population (i.e. that it would be offered routinely to those it was designed to support) as well as to enable the service to meet its aim of effective care coordination after hospital discharge (e.g. ensuring people could connect and engage with relevant community services).

Mechanisms to support integration with the service system were established within each phase of a person’s journey through care. These phases included: while the person was in hospital, immediately post-discharge, and within the community. The key integration features the Hunter WBSS established are outlined in Table 3.2.

### 3.3.4. Staffing

The Support Service employed Support Coordinators who were recruited from a range of backgrounds with a minimum Cert IV Tafe Diploma level qualification or equivalent. The Coordinators provided the day-to-day non-clinical care and individualised practical support to individuals referred to the service.

Whilst the WBSS Coordinators were in the hospital they were seconded to the CMN, within the Department of Consultation-Liaison Psychiatry. When in the community, they were supported by an Operations Manager, who oversaw the running of the service and clinical
governance, a Clinical Advisor, who provided clinical oversight, training and guidance for the Support Coordinators and liaised with clinical services including capacity for escalation for acute care, and an Administration Officer and a Data Coordinator who managed the administrative and data processing requirements. The number of full-time equivalent employees has ranged from 5.0-5.6. Notably, the Operations Manager, Clinical Advisor, Data Coordinator and one of the Support Coordinators have remained in the service since inception.
<table>
<thead>
<tr>
<th>Organisation or Department</th>
<th>Role in the Project</th>
</tr>
</thead>
</table>
| **Hunter Primary Care**    | • Co-ordinate development of the Proposal for the Project  
                              • Lead Agency  
                              • Service Provider for the Project  
                              • Engage Project/Management team |
| **Department of Clinical Toxicology, Calvary Mater Newcastle** | • Provide expert advice in area of clinical toxicology  
                              • Provide access to de-identified data on consumers presenting to Calvary Mater Newcastle  
                              • Referrers to the Project for consumers presenting to Calvary Mater Newcastle Emergency Department or admitted to Calvary Mater Newcastle  
                              • Provide liaison with Maitland, Belmont and John Hunter Hospitals to assist referral of consumers presenting to those hospitals (should the primary criteria be broadened) |
| **Department of Consultation–Liaison Psychiatry, Calvary Mater Newcastle** | • Provide expert advice from a Consultation-Liaison Psychiatry perspective  
                              • Provide expertise in area of suicide prevention & intervention  
                              • Provide input into writing up results of research projects  
                              • Referrers to the Project from Calvary Mater Newcastle |
| **Mental Health Services, Hunter New England Local Health District** | • Provide expert advice from acute mental health services perspective  
                              • Educate staff about the Project  
                              • Provide liaison with Community Mental Health Teams about the Project and shared clients  
                              • Facilitate connection between WBSS clients admitted to mental health facilities and Support Coordinators. |
| **Everymind (formerly Hunter Institute of Mental Health, HIMH)** | • Provide training as part of orientation to Project staff, including from perspective of people with experience of suicide and using current evidence base  
                              • Conduct consultations with people from high risk groups  
                              • Participate in advisory groups/sub-committees  
                              • Develop the family/carer support group concept in conjunction with Relationships Australia, using resources developed by Everymind for Beyond Blue and the successful Partners in Depression groups |
| **Relationship Australia NSW (Hunter)** | • Develop approaches to engaging men in this Project  
                              • Participate in consultations with family/carers  
                              • Run Partners in Support groups for family & carers who have experienced a suicide attempt by someone close to them  
                              • Provide family/couple interventions where relationship issues are a salient part of the suicide attempt |
### Table 3.2. Hunter WBSS Integration with the service system

<table>
<thead>
<tr>
<th>Type of integration</th>
<th>What was involved?</th>
<th>What was required?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hospital-based</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Aim was for all eligible people to be referred to WBSS after admission to CMN for deliberate self-poisoning | Calvary Mater Newcastle  
-  
- Integration mechanisms:  
  - Integrated hospital referral pathway  
  - Warm personal ‘hand-overs’ from hospital to WBSS staff  
  - Minimisation of additional administrative load for referring clinicians |  
- WBSS staff available to accompany HATS staff on hospital rounds each weekday (to meet people referred to the service)  
- HATS and Consultation-Liaison Psychiatry staff refer eligible patients to WBSS as part of routine practice  
- Establishment of information sharing/referral processes between CMN and WBSS  
- WBSS staff to complete referral documentation following verbal referral from medical team and agreed criteria met.  
- Attendance by Clinical Advisor at weekly CMN clinical review meetings for HATS patients |  
- Memorandum of Understanding between HPC WBSS and CMN  
- WBSS staff appointed on unpaid secondments whilst onsite at CMN, to enable a formal clinical governance arrangement  
- Clear identification of duty of care and clinical line management responsibilities (i.e. WBSS staff responsible to Consultation-Liaison Psychiatry Director while they were on CMN grounds)  
- WBSS Support Coordinators completed required CMN orientation activities  
- Education for CMN staff on the nature of the service; and opportunities established to allow for relationship building between Support Coordinators and HATS and C-L staff  
- Access to relevant hospital information and units provided to WBSS staff |
| **Post CMN hospital discharge; but before discharge back to community** | Hunter New England Mental Health Service  
- Establishment of communication pathways between HNE MHS hospital social workers and WBSS staff for referred patients  
- Capacity for WBSS staff to visit the ward to meet patients referred to the service while they were still in hospital |  
- Education for HNE MHS inpatient staff on the nature of the service; and opportunities established to allow for relationship building between WBSS and HNE MHS inpatient staff  
- Orientation and safety training for WBSS staff to attend mental health units  
- Identification of key staff in each unit for transfer of communication between services |
<table>
<thead>
<tr>
<th>Type of integration</th>
<th>What was involved</th>
<th>What was required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-discharge from hospital</td>
<td>- Aim was to ensure that the transition from hospital to community support by WBSS and information sharing was timely, seamless and secure</td>
<td>- Development of an agreed referral process and required documentation</td>
</tr>
<tr>
<td></td>
<td>- Integration mechanisms</td>
<td>- Establishment of a process to initiate contact in the community for those patients not met at hospital</td>
</tr>
<tr>
<td></td>
<td>- Integrated referral process that tracked hospital discharge dates and provided for sharing of discharge summaries for patients not met during admission</td>
<td>- Mechanism to identify when referrals were inappropriate/outside of eligibility criteria</td>
</tr>
<tr>
<td></td>
<td>- Feedback loops regarding referral outcome</td>
<td>- Referral feedback processes established regarding outcome of referral</td>
</tr>
<tr>
<td></td>
<td>- Referral process embedded into routine hospital practice</td>
<td>- Alignment of information sharing policies and consent processes with the hospital to allow for easy referral to WBSS</td>
</tr>
</tbody>
</table>

- Mon-Fri monitoring by WBSS staff to track discharge dates for referred patients
- WBSS contact of referrals to the service within 1 working day of discharge from hospital
- Routine notification to referrers of outcome of referral
- Clear processes for patient information and data-sharing, at the level of the hospital and the WBSS
- Attendance by Clinical Advisor at weekly CMN clinical review meetings for referred patients

<table>
<thead>
<tr>
<th>Type of integration</th>
<th>What was involved?</th>
<th>What was required?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community engagement</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| The intention of providing care coordination was to support people to put their discharge plan into action and encourage treatment engagement and adherence | - Discharge plan developed by hospital provided to WBSS via hospital discharge summary and at weekly clinical review meeting  
- Broad assessment of client’s needs by WBSS staff within first contact, in order to identify unmet needs and potential relevant services/supports  
- Safety planning introduced by WBSS staff within first 7 days of contact  
- Communication by WBSS staff with the client’s nominated GP occurred routinely at commencement and closure of care and more often as required  
- WBSS coordination of care included providing support to client, liaison with other providers, referral identification and generation, encouragement to engage with other services, information provision, safety planning, assistance to overcome barriers to accessing services and wellness plans  
- WBSS Support Coordinators tracked referral to, and engagement with, other treatment providers | - Maintenance of an up-to-date, comprehensive directory of local services and supports  
- Establishment of a suite of letter templates to facilitate communication  
- Development and maintenance of partnerships with key stakeholders  
- Ongoing professional development for Support Coordinators to maintain and increase skills for working with this population and broad range of presenting issues  
- Regular supervision and case review and promotion of self-care to support staff  
- Clinical Oversight and Governance Processes to oversee Support Coordination  
- Development of service policies and procedures including Incident and Reporting Procedures specific to this type of service provision |
3.3.5. Service Delivery

Like other Way Back Support Services, the Hunter WBSS was a non-clinical, assertive outreach service model focused on empowering people who have attempted suicide to connect with informal and formal supports by providing guidance, encouragement, motivation and follow-up. It was provided free of charge to service users, was time limited (for three months following a suicide attempt), and was designed to be collaborative with, and complementary to, existing services.

As seen in Figure 3.1, contact with, and support from, the service comprised three phases: in hospital, post-discharge, and community engagement.

In summary, referrals were made by HATS to the service. After confirming the eligibility of referrals, Support Coordinators commenced contact with the client as soon as possible, usually before the person had been discharged from hospital, or soon after discharge, to explain the scope and role of the support offered by the WBSS.

Post-discharge, people were contacted to confirm acceptance of the referral and to arrange an initial assessment appointment. The aim of the assessment appointment was to identify the goals and needs of the client and confirm what role the Support Coordinators could play. During the assessment, the client was asked to complete a K10, safety plan and a needs assessment.

The first assessment appointment was considered to be the start of the ‘community engagement’ phase. Support activities included assisting the client to: follow through with their hospital discharge plan, develop and implement a safety plan, identify any unmet needs and goal-setting, and assistance in connecting with formal and informal supports that strengthened their mental health and promoted recovery.

Relevant information was also provided in written form, including psychoeducation material and crisis numbers. Written information was also provided for family members and supporters, including suicide prevention information and resources to help to better understand the experiences of their loved one and advice on how to look after their own mental wellbeing. Addressing the needs of family members and supporters of people referred to the service was the specific focus of work led by Everymind and Relationships Australia who trialled the delivery of an education and support program as part of the Hunter Way Back Support Service Trial.

Support Coordinators then kept in touch with clients via a range of approaches tailored to suit the individual’s needs and preferences. This included phone, email, SMS, and face-to-face contact.

If suicidal behaviour behaviour escalated, the Support Coordinator, in conjunction with the Clinical Advisor, would facilitate access to specialist psychiatric care, Emergency Department contact or mental health inpatient units.
At the conclusion of a client’s contact with the WBSS, Support Coordinators would work with the client to develop a wellness plan that included identifying supports and steps to take in the event of a subsequent suicidal crisis. Support Coordinators provided a treatment summary via a letter to the nominated GP and other clinical services.

3.3.6. Clients
As noted, for the purposes of the trial evaluation, eligibility for the service was restricted to a cohort of individuals admitted to the CMN following deliberate self-poisoning. CMN is a tertiary referral hospital for adult (16+ years) deliberate self-poisoning in the region and therefore captures a significant proportion of all hospital-treated deliberate self-harm. Contingencies to broaden the referring hospitals were not implemented due to the service reaching capacity within this primary referral pathway.

**Inclusion Criteria**
- Admitted to CMN hospital following deliberate self-poisoning.
- Age: 16+ years.

**Exclusion Criteria**
- Resided outside of the Hunter Region.
- Safety concerns of potential dangerous to the WBSS Coordinator.
- Clinical staff deemed that a short-term service would not be beneficial to the client (e.g. because of clinical complexity).
Figure 3.1. Hunter WBSS Client Engagement Process Mapped to Key Performance Indicators
3.3.7. Clinical Governance and Support

The WBSS is a non-clinical coordination service provided by Support Coordinators. Within an already complex service system, it was particularly important to maintain clarity around what was within scope of the WBSS and to complement and support work by other clinical services (especially Community Mental Health Services). This required maintenance of clear role definition with Community Mental Health Services to ensure that the WBBS did not take on acute care activities, such as daily monitoring of safety. When WBBS staff felt that acute care was needed, they facilitated referral into such services.

It was also essential to have strong clinical governance processes underpinning the non-clinical service because of the needs of the target population and the likelihood of acute clinical situations occurring. The Clinical Advisor was able to assist with provision of support and guidance to the Support Coordinator team for: assessment and decision-making around escalation of referrals and liaison with other clinical services.

It was also recognised that the Support Coordinator role could be stressful and it was important to have access to supervision, professional development in addition to clinical support. The capacity to provide this internally was made possible through the role of Clinical Advisor. It is also noted that at no time was a Support Coordinator employed full-time, despite this being an option and it is suggested that this may be reflective of the intensity of the role.

3.3.8. Feasibility of Scaling Up

As discussed in more detail in the process evaluation chapter, over the first three years of the Hunter WBSS, a total of 1653 referrals to the service were made, of which 1578 were deemed eligible and people offered support. Of this group, 1280 acceptances of the initial service offer occurred and 960 proceeded to receiving support in the community. Note: numbers used within this chapter and the subsequent process evaluation chapter refer to events (i.e. individual referrals and the subsequent outcomes for that referral), meaning a person could be referred to the service more than once over the trial period.

Referral and engagement over three years can be seen in Figure 3.2. In short, the figure demonstrates a high rate of referral and initial engagement, which was sustained throughout the trial period.

A range of Key Performance Indicators were identified by Beyond Blue for the service to monitor throughout service delivery (see Appendix A for full list). These are summarised in Table 3.3.

In short, it demonstrates that the service was largely successful in being able to scale up and maintain WBSS high quality service delivery over time; that KPIs for WBBS contact post-hospital discharge and safety planning targets were met or exceeded; and while initial engagement met the KPI at 80% for all genders, clients remaining engaged in the WBSS until planned transition/exit was estimated at 42%, which was less than the KPI of 70%.
Figure 3.2: Referral and initial engagement patterns over time
### Table 3.3. Key performance indicator targets, and service achievements.

<table>
<thead>
<tr>
<th>KPI</th>
<th>Achieved</th>
<th>Target</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Engagement</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Referrals received</td>
<td>1653</td>
<td>1560</td>
<td>Target met</td>
</tr>
<tr>
<td>Referrals receive minimum contact attempt and engagement activities as appropriate</td>
<td>100%</td>
<td>100%</td>
<td>Target met</td>
</tr>
<tr>
<td>Referrals to WBSS initially accepted by clients (by gender)</td>
<td>Total = 81% Male = 82% Female = 81% Transgender = 80%</td>
<td>80%</td>
<td>Target met</td>
</tr>
<tr>
<td>Clients rate the Service as useful/meeting their needs</td>
<td>92%</td>
<td>75%</td>
<td>Target met</td>
</tr>
<tr>
<td>Clients remain engaged in the Service until planned transition/exit</td>
<td>42%</td>
<td>70%</td>
<td>Target not met</td>
</tr>
<tr>
<td><strong>Improved Safety</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wait time for first WBSS contact (post discharge) average</td>
<td>1 day</td>
<td>1 day</td>
<td>Target met</td>
</tr>
<tr>
<td>Clients engaged in safety planning within the first 7 days of hospital discharge</td>
<td>96%</td>
<td>90%</td>
<td>Target met</td>
</tr>
<tr>
<td>Safety plans are developed using appropriate structured formats</td>
<td>93%</td>
<td>90%</td>
<td>Target met</td>
</tr>
<tr>
<td><strong>Connections with Services/Community</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduction of participants’ unmet needs following participation in The Way Back Support Service</td>
<td>Yes</td>
<td>Reduction (see next chapter)</td>
<td>Target met</td>
</tr>
<tr>
<td>Number of referrals to other providers</td>
<td>See next chapter</td>
<td>Report activity</td>
<td>Target met</td>
</tr>
<tr>
<td>Record number of appointments attended where possible</td>
<td>See next chapter</td>
<td>Report activity</td>
<td>Target met</td>
</tr>
<tr>
<td>Client allocated to a Support Coordinator will have commenced action on their support plan or transition to longer-term supports</td>
<td>97%</td>
<td>95%</td>
<td>Target met</td>
</tr>
</tbody>
</table>
3.3.9. Other common issues and difficulties encountered

Other arising issues were drawn from a review of meeting records, staff meetings and by reflection of the Operations Manager regarding common issues and difficulties encountered in the operational delivery of the service. Arising issues included:

- A small staffing complement meant any disruptions to staffing (e.g. unexpected leave) potentially impacted service delivery capacity.

- It was recognised that a gender mix in the Support Coordinator role would be preferable for the trial. However there was a preponderance of female representation in applications and appointments.

- The needs of Indigenous patients for in-hospital and community care was recognised. The appointment of an Aboriginal WBSS Coordinator was very useful in better meeting the needs of this population.

- The WBSS sought to achieve a balance between the burden of data collection that would be manageable by staff and acceptable to clients, and yet would still be sufficient to inform the service evaluation and improve service delivery. The use of structured measures for data collection for all clients was not always aligned with a service model that promoted fostering engagement and connection with clients who often had a history of poor engagement with services. Many clients were reluctant to complete standardised measures. Client-centred service delivery was prioritised above data collection in those circumstances.

- There were a proportion of clients who, following referral to the WBSS had a further deliberate self-poisoning. The timing of this ranged from the deliberate self-poisoning occurring prior to initial community contact through to towards the end of the support period. For data consistency and evaluation, any new deliberate self-poisoning presentation through the existing referral pathway was treated as a new WBSS referral (pending eligibility). This meant that files were closed due to further suicide attempts and reopened as new episodes of care. For the client, the service aimed to maintain continuity of care and minimise change or disruption to support.

- For frequent re-presenters, referrals to WBSS were capped at a maximum of 3 referrals to WBSS in a 12-month period.
3.4. Discussion

3.4.1. Key findings

**Feasibility of Scaling Up**

**Key Finding:**
It was possible to establish and sustain a ‘scaled up’ WBSS, as tracked through key performance indicators of referral numbers and initial acceptance of the service offer.

Over 1500 referrals were made to the service during the trial period, and all except one key performance indicator (proportion of referrals who remained engaged until planned transition/ closure point) were met and maintained over time. This indicates that it is possible to scale the WBSS without a reduction in service/ support quality (as measured by these key performance indicators), and is promising with regard to the potential for the service to have a large footprint and complement the existing service system.

**Implication:**
The current model is scalable.

**Key Finding:**
It was difficult to maintain engagement for the entire planned duration of WBSS contact for all referrals resulting in reduced exposure.

Initial engagement (as indexed by initial acceptance of WBSS service offer) met the key performance indicator of 80% for all genders. However, referrals remaining engaged in the WBSS until planned transition/exit was estimated at 42%, which was less than the target of 70%. Further consideration should be given as to how this aspect of service coverage could be improved.

**Implication:**
Improvements in client retention in the WBSS needs consideration.
Feasibility of Integration with the Service System

Key Finding:
Integration with the service system, specifically the establishment of an integrated hospital referral pathway, was feasible, which enabled the service to be offered routinely to the intended target population.

A number of key aspects allowed for successful service integration. These included ensuring that service processes, policies and agreements supported collaborative care and that relationships and trust could be developed between frontline service providers.

As demonstrated in Table 3.2, integration with the service system was established through a number of different mechanisms.

We believe it was the successful integration of WBSS within the hospital service system and the establishment of an agreed referral pathway that allowed for the high referral and initial acceptance of the referral by the intended target population. Specifically, having Support Coordinators attend the hospital on weekdays to accompany the medical staff on daily ward rounds and to review eligible presentations; and having the Clinical Advisor or Manager attend the weekly clinical review meeting enabled good lines of communication and timely resolution of any issues.

The consistent referral volume to the service indicates that the integrated referral pathway successfully facilitated client access to the service, ensuring that referrals that were eligible were identified and all relevant people offered the service. The integrated model required a dedicated time commitment from WBSS staff in terms of daily attendance at the hospital, which the service considered to have been beneficial for client access and as a way of maintaining close partnerships with stakeholders. The pathway enabled the service to track patient flow through the hospital and ensure post-discharge contact occurred promptly.

Similarly, integration of WBSS with the Hunter New England psychiatric hospital staff ensured good communication for maintaining client contact during psychiatric inpatient care.

Implications:
Relevant policies, processes and infrastructure that support collaborative care between WBSS providers (across sectors) should be identified and used to set the parameters of service integration.

Effective service integration needs to be coupled with opportunities for education of stakeholders to allow for trust and relationships to be built between frontline service providers.

Referral pathways should maintain a model of close contact and integration between key referrers and service providers.
While ‘case management’ is a concept familiar to those working in acute mental health services, it is usually a clinical role delivered by trained clinicians. Familiarising the clinical sector with what non-clinical support or care coordination involved and the role that ‘non-clinicians’ can play, was an important educational step needed for the clinical sector to be able to work effectively with the WBSS.

Furthermore, the WBSS must have capacity to respond appropriately to the acute clinical situations that will inevitably arise when providing support to people who are or have been suicidal. The Hunter WBSS found that having a Clinical Advisor role was an effective way of providing a line of clinical responsibility to an experienced clinician, including providing capacity to advise and respond to acute situations in a timely fashion. Despite being non-clinical, a high degree of professionalism was required from WBSS Coordinators to operate alongside medical staff in a busy Emergency Department context and to support clients in the community. The Clinical Advisor played an important role in embedding and overseeing professional practices within the service. The Clinical Advisor also attended weekly clinical review meetings at CMN, ensuring ongoing lines of communication existed between the referring clinicians and the WBSS for acute clinical situations.

Key Finding:
Helping stakeholders understand the specific role of a non-clinical care coordination service and how it differs from, and complements, usual clinical care is an important component of implementation.

Having the capacity to appropriately respond to acute clinical situations and facilitate access to acute care is critical even for a non-clinical support service.

Implications:
Embedding an experienced clinician into the service, and/ or alternatively partnering with external clinicians, helps to ensure capacity for timely, coordinated acute care, trust of clinical services of the non-clinical coordination model, and offers a concrete accessible way of supporting WBSS staff wellbeing.
3.4.2. Limitations

The feasibility of scaling up the service model and the establishment of an integrated referral pathway was possible through a strong partnership between HPC, CMN and HNE MHS. These organisations, and specifically the key stakeholders within these services, had worked together before and had established trust with each other, as well as known capacity to be able to work together in a collaborative fashion.

The CMN hospital is also a private hospital delivering public services within the HNE LHD. While still having complex clinical governance processes and policy settings, it is likely that the stakeholders had greater capacity to influence and implement the referral pathway that was developed because of the long standing, high functioning relationships existing between the CMN Emergency Department, HATS and Department of Consultation-Liaison Psychiatry.

These units also specifically have experience, and are known as leaders, in suicide prevention, such that the culture of these units value research and have previously successfully conducted evaluations of suicide prevention innovations in large clinical trials, including large clinical trials delivered in partnership with other organisations and in other Local Health Districts.

Thus, while this trial demonstrates the feasibility of scaling up and integration of the WBSS, it may be more difficult to achieve these outcomes in other settings that do not have existing inter-sectoral working relationships, in-hospital clinical pathways, and clinical trial management and evaluation expertise.

3.5. Conclusions

The evaluation of the WBSS in the Hunter has demonstrated the capacity for the service to be scaled up, integrated with existing clinical services and maintain high levels of service delivery.

The following chapter provides a more detailed description of the nature of service provision and client engagement.
4. Process evaluation

Objective

The objective of the process evaluation was to characterise the nature of the services provided by the Hunter WBSS and examine the reach and impact of the service, using data collected as part of service delivery.

Specifically, the aims of process evaluation were to:

- Describe referral characteristics
- Provide an overview of service activity
- Investigate the impact of the service as indicated by person-level measures of need, psychological distress and client engagement with other health providers
- Synthesise themes from a client satisfaction survey.

Method

As part of routine practice, data was collected and entered by the Administration Officer or Support Coordinators on to the client management record system PENELOPE.

The data presented in this report represents a collation of routine service performance indicators, including number of referrals, client demographics, number and reason for file closures; service activity such as number and type of occasions of service and outcome measures used as part of quality assurance processes. This data also represents the data that was used for routine interim reporting to Beyond Blue.

It is important to note that the data reported refers to episodes of care (events), meaning that an individual may have had multiple referrals over the trial period.

Key Findings

During the first three years of WBSS (April 2016 - April 2019) there were a total of 1578 eligible referrals (from a total of 1653 total referrals made) to the service.

Of these, 1280 accepted the initial service offer representing a service engagement rate of 81%, with no major differences in initial acceptance of the service offer by gender.

There were 298 referrals where the initial offer of service was declined. Reasons for declining included reporting that they were already well supported (n= 120), because they were not interested in receiving support from WBSS (n=73) or because they did not identify any suicidal intent associated with the deliberate self-poisoning episode (n=23); whilst some were never able to be contacted (n= 82).
Following hospital discharge, 960 continued with WBSS support within the community setting (75% of those who accepted the initial service offer), with an attrition of 320 (25%) due to change of mind, being unable to be contacted, a further deliberate self-poisoning event, or change in circumstances (moved out of area; into care). This translates to 61% of all eligible referrals receiving WBSS support in the community.

Of those who accepted the service offer (n=1280), the majority were female (69%), between 20 and 50 years of age (77%), reported multiple unmet needs, with mood disorder identified as the most commonly presenting issue. Of these, there was closure information available for 1097 at the time of data analysis. The most common reason for closure was loss of contact (n=508, 46%); whilst 462 (42%) finished service contact in a planned way (program complete, entered care, well supported or moved out of area).

Throughout the three year period, an average of 101 clients were supported by the service each month. Direct client activity (including hospital based engagement, safety planning, informal support, facilitation and coordination and attempts to contact) comprised the majority (65%) of Support Coordinators’ time, with much of this contact occurring via phone support.

For those referrals for whom outcome measures were available, nearly all (527/ 542: 97%) reported progress towards goals, with significantly fewer unmet needs at program conclusion (baseline mean= 3.8 (SD=1.5) closure mean= 2.6 (SD= 1.5) n=538) and a significant reduction in psychological distress as measured by the available paired K10 data (baseline mean= 30.3 (SD=8.8) closure mean= 22.2 (SD=8.7), n=133).

Responses to the satisfaction survey (n= 131) also indicated high levels of satisfaction with the service (average scores all above 4 out of a possible 5 for every item).

Conclusions
These results demonstrated that direct client activity was the focus of Support Coordinators’ time, and that service users reported and experienced positive impacts during their contact with the service.

While a substantial proportion of the target population were engaged by the service, intervention reach was not universal, and planned closures were lower than anticipated.

Furthermore, there remain opportunities to better understand the impact of the service on service users by increasing client acceptance of the completion of standardised outcome measures in usual practice, and barriers to measurement completion should be investigated.
4.1. Objectives and Aims

The objective of the process evaluation was to characterise the nature of the services provided by the WBSS and to examine the reach and impact of the service, using data collected as part of service delivery routine practice.

Specifically, the aims of the process evaluation were to:

- Describe referral characteristics
- Provide an overview of service activity
- Investigate the impact of the service as indicated by person-level measures of need, psychological distress and client engagement with other health providers
- Synthesise themes from a client satisfaction survey.

4.2. Method

As described in the previous chapter, all people admitted to the CMN hospital for deliberate self-poisoning during the three year study period (April 2016 to April 2019) who met eligibility criteria were offered referral to the WBSS. Upon receiving the referral, Support Coordinators would confirm eligibility and then sought to contact the person, either speaking with them during the hospital stay or soon after discharge from hospital (e.g. if the hospital stay occurred over the weekend).

Post-discharge and after accepting the service, Support Coordinators would undertake an initial assessment with clients that included a needs assessment and a K10 (Kessler-10). Identification of unmet needs and a concern rating about the unmet needs was completed by Support Coordinators on the basis of the discussion with clients. The K10 was completed by clients. Coordinators also undertook safety planning with clients at the initial assessment.

During this contact, all clients were provided with an information sheet (see Appendix B) and verbal explanation regarding how routine data collected by the service would be used for evaluation purposes. Clients were free to withdraw their consent to use data for evaluation purposes at any stage by telling the Support Coordinator.

The needs assessment and K10 activities were repeated as the client approached the end of their 12 week support coordination period, or earlier, if possible, in the case of earlier disengagement.

All services provided by Support Coordinators were logged within the client management system. Support Coordinators also kept a separate record based on their contact with clients detailing what community services clients were engaging with and appointments attended. See Appendix C for all outcome measures.

At the point of discharge from the service, all clients were sent an invitation to complete a short service satisfaction survey, with the invitation via mail or text message with hyperlink.
All data was entered by the Administration Officer or Support Coordinators within the client management record system PENelope.

These data was used to populate the interim internal ‘Executive tables’ that summarised service activity and which was reviewed in internal service meetings as well as being used for routine reporting to Beyond Blue. This is also the dataset that was drawn upon for this process evaluation.

### 4.2.1. Data Notes and Measures

The data presented in this report represents a collation of routine service performance indicators, including number of referrals, demographics, number and reason for file closures. Service activity data included number and type of occasions of service (focus of content e.g. safety planning, assessment, informal support, etc.), mode of contact (e.g. phone, face to face, email, etc.) and whether the activity was conducted directly with the client. It is important to note that the data refer to episodes of care (referral events), meaning that an individual may have multiple referrals and episodes of care over the trial period.

The **K10** can be used as a measure of psychological distress (Andrews & Slade, 2001; Kessler et al., 2002). Clients indicate on a five-point scale how much each item has applied to them over the past 30 days. There are 10 self-report items, contributing to the overall measure of psychological distress. The score derived from this measure can also be indicative of the likelihood of experiencing a clinically significant mental health issue. This measure is used in Australian population health studies to identify mental disorder (ABS, 2001), and is used to assess outcomes across various mental health services (eg. Bassillos et al., 2016).

**Assessment of needs** is a critical aspect of providing person-centred care and determining the appropriate services needed to assist an individual (Pirkis, Burgess, Medows & Dunt, 2001). The Hunter WBSS developed a needs assessment and action plan template for clients to complete at the start of the community engagement phase and at the end of their engagement with the service (see Operations Manual for template). The areas to be considered were broadly consistent with those covered by Health of the Nation Outcome Scales (HoNOS; Wing, Beevor, Curtis, Park, Hadden & Burns, 1998). However, the HoNOS requires clinician administration and rating (James, Painter, Buckingham & Stewart, 2018), and does not allow for specific support needs to be listed in an action plan format. Scoring of the measure resulted in three indicators: number of unmet needs (total), concern rating for unmet needs (Likert scale 0-3) and progress toward goals at case closure (yes/no).

A **satisfaction survey** was developed by the service, which was available online from June 2017. The survey asked clients to report on their experience of the service across six items, rating each item from 1 (strongly disagree) to 5 (strongly agree) and also had a free text optional section. The WBSS satisfaction survey was similar to others that HPC has used for previous service evaluations.

It is noted that at different times, additional data points were added (as either requested from Beyond Blue or for the purposes of understanding service delivery more thoroughly) and these data points are only reported for the time periods they are available.
4.2.2. Data analysis

Descriptive analyses were conducted for all service-level and client-level characteristics data. Paired t-tests were used to estimate any statistically significant change on unmet needs and K10 scores.

The free text feedback from the survey was reviewed by the Project Officer and Operations Manager, and coded according to contents of the comments. Comments were coded as positive, negative, or neutral. In addition, comments that were considered to provide feedback on service modifications were also highlighted.

4.3. Results

4.3.1. Participant Characteristics and Engagement

As outlined in Figure 4.1, a total of 1653 referrals from HATS to the WBSS service were made over the trial period, of which 1578 were deemed eligible by WBSS and progressed. Of the 1578 referrals who were offered the WBSS, 1280 accepted the referral to the service and 960 progressed to ongoing support in the community. As seen in Table 4.1, females comprised over two-thirds the referrals and the highest proportion of referrals were for clients aged 20-29 years of age (range: 16-93 years; average age= 38 years, SD= 16 years). Indigenous people comprised approximately 9% of referrals. There were no demographic differences between those who were referred and those who declined WBSS.

Of the 1653 original referrals received, 75 (4.5%) were not progressed. As seen in Figure 4.1 this was mostly because the referrals met exclusion criteria. It is noted there were a number of additional clients who were excluded by HATS for not meeting eligibility criteria prior to a referral being made. The not progressed group outlined in Figure 4.1 refers only to those where the decision about ineligibility for service was made after the initial referral to the service.

Of the eligible referrals (n = 1578), 81% (n = 1280) initially engaged with the service. See Table 4.2. Acceptance of the referral was higher for clients who were met face-to-face than those not met face-to-face. No difference in engagement rates based on gender was evident. Approximately 74% of clients who identified as Indigenous and/or Torres Strait Islander initially engaged with the service (data from July 2017 -April 2019).

Of the 1578 eligible referrals, 298 people (19%) chose not to engage with the service for an episode of care. See Figure 4.2 for details. The main reasons for non-engagement with the Hunter WBSS were because patients felt well-supported, were not interested, or contact was not able to established post-discharge.

In recognition that clients could accept an initial offer of service, but subsequently withdraw shortly after hospital discharge, in the executive data summary, HPC began collecting data at exit regarding the proportion of referrals who on exit had more than a single occasion of service in the community. Using this measure, it was identified that 75% of referrals who initially agreed to service did progress to ongoing support with WBSS in the community.
Figure 4.1: Hunter WBSSS participant engagement

Clients initially referred to The Way Back Support Service = 1653

Met in Hospital = 983
Not Met in Hospital = 670

Not Progressed = 75
Not eligible = 72
Deceased prior to engagement = 3

Eligible referrals to The Way Back (Progressed referrals) = 1578

Accept Service Offer? No

Declined Service Offer = 298
- No initial contact established = 82
- Client reports no suicidal intent = 23
- Not interested = 73
- Well Supported = 120

Accept Service Offer = 1280/1578
- Male = 390/477
- Female = 886/886
- Transgender = 4/5

Post-DischARGE

Community Engagement

Support Coordination
- Client continues engagement in the community = 960/1280
- Average wait time for first attempted contact = 1.3 days
- Average length of engagement = 55 days
- Safety Planning commenced within first week = 96%
- Safety Planning using a structured format = 93%

Available Closure Data* n = 1097

Planned Closures* 462 (42%)
- Program Complete = 312 (28%)
- Entered Care/Facility = 24 (2%)
- Well Supported = 113 (10%)
- Moved out of area = 13 (1%)

Unplanned Closure* 635 (58%)
- No longer contactable = 508 (46%)
- No longer interested = 51 (5%)
- Further DSP = 72 (7%)
- Other = 2 (<1%)
- Deceased = 2 (<1%)

* Closure data is based on available data as of 30 April 2019 and therefore a portion of files remained opened and was not available for analysis.
Table 4.1. Key demographic characteristics of referrals to the service

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Total referrals to service n=1653</th>
</tr>
</thead>
<tbody>
<tr>
<td>Met in hospital</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>983 (60%)</td>
</tr>
<tr>
<td>No</td>
<td>670 (40%)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>1132 (69%)</td>
</tr>
<tr>
<td>Males</td>
<td>515 (31%)</td>
</tr>
<tr>
<td>Transgender</td>
<td>6 (0.4%)</td>
</tr>
<tr>
<td>Age group</td>
<td></td>
</tr>
<tr>
<td>16-19 years</td>
<td>221 (13%)</td>
</tr>
<tr>
<td>20-29 years</td>
<td>418 (25%)</td>
</tr>
<tr>
<td>30-39 years</td>
<td>292 (18%)</td>
</tr>
<tr>
<td>40-49 years</td>
<td>318 (19%)</td>
</tr>
<tr>
<td>50-59 years</td>
<td>245 (15%)</td>
</tr>
<tr>
<td>60-69 years</td>
<td>98 (6%)</td>
</tr>
<tr>
<td>70+ years</td>
<td>61 (4%)</td>
</tr>
<tr>
<td>Average Age</td>
<td>39.1</td>
</tr>
<tr>
<td>Age Range</td>
<td>16-93 years</td>
</tr>
<tr>
<td>Cultural identity</td>
<td></td>
</tr>
<tr>
<td>Aboriginal and/or Torres Strait Islander</td>
<td>149 (9%)</td>
</tr>
<tr>
<td>Culturally and Linguistically Diverse</td>
<td>9 (0.5%)</td>
</tr>
<tr>
<td>Area of Residence</td>
<td></td>
</tr>
<tr>
<td>Lake Macquarie</td>
<td>512 (31%)</td>
</tr>
<tr>
<td>Newcastle</td>
<td>532 (34%)</td>
</tr>
<tr>
<td>Port Stephens</td>
<td>165 (10%)</td>
</tr>
<tr>
<td>Maitland/ Dungog</td>
<td>182 (11%)</td>
</tr>
<tr>
<td>Cessnock</td>
<td>132 (8%)</td>
</tr>
<tr>
<td>Muswellbrook/ Singleton/ Upper Hunter</td>
<td>50 (3%)</td>
</tr>
<tr>
<td>Other</td>
<td>49 (3%)</td>
</tr>
</tbody>
</table>

Note: Based on total referrals to the service (includes not progressed group)

Table 4.2. Engagement rates according to selected characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Accepted service offer n=1280</th>
<th>Declined service offer n=298</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Meeting</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Met at Hospital</td>
<td>810 (86%)</td>
<td>133 (14%)</td>
<td>943</td>
</tr>
<tr>
<td>Not Met at Hospital</td>
<td>470 (74%)</td>
<td>165 (26%)</td>
<td>635</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>886 (81%)</td>
<td>210 (19%)</td>
<td>1096</td>
</tr>
<tr>
<td>Males</td>
<td>390 (82%)</td>
<td>87 (18%)</td>
<td>477</td>
</tr>
<tr>
<td>Transgender</td>
<td>4 (80%)</td>
<td>1 (20%)</td>
<td>5</td>
</tr>
<tr>
<td><strong>Cultural identity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aboriginal and/or Torres Strait Islander*</td>
<td>58(74%)</td>
<td>20 (26%)</td>
<td>78</td>
</tr>
</tbody>
</table>

Note: Engagement rates are based on referrals progressed
*Engagement data for Aboriginal and Torres Strait Islander clients refers to July 2017-2019 period
As seen in Table 4.3, upon entry to the service, the most common presenting problem (other than deliberate self-poisoning) reported by clients was mood disorder, followed by relationship issues, substance use, anxiety and health concerns.

Most identified either 1-3, or 4-6, unmet needs, and had a total concern ratings a score below 17.

The average K10 score at entry to the service was 30.6, indicating that on average referrals were experiencing psychological distress at a level indicative of a severe mental health condition. The majority (58%) were classified as experiencing a severe condition at the time of engagement with the service.

The majority of referrals were supported for 1-3 months.

As seen in Table 4.4, the proportion of clinical mental health services being accessed by referrals increased during the period in which clients were involved with the WBSS. It is noted that new referrals captured all services the client reported being referred to and were not limited just to referrals made by WBSS staff.

Discharge from the service could be characterised as planned or unplanned. As seen in Table 4.5, 42% of cases were closed in a planned way (primarily because program support had been completed or because the person was well supported), and 58% were closed for an unplanned reason (primarily because a person was no longer contactable).
Table 4.3. *Key presenting characteristics of referrals who engaged with the service*

<table>
<thead>
<tr>
<th>Participant Characteristics</th>
<th>Presenting issues (5 most frequently reported presenting issue)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mood disorder</td>
<td>772 (32%)</td>
</tr>
<tr>
<td></td>
<td>Interpersonal/relationship issues</td>
<td>362 (15%)</td>
</tr>
<tr>
<td></td>
<td>Substance use disorder/issue</td>
<td>301 (12%)</td>
</tr>
<tr>
<td></td>
<td>Anxiety disorder</td>
<td>266 (11%)</td>
</tr>
<tr>
<td></td>
<td>Health concerns (incl. pain)</td>
<td>157 (6%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of unmet needs (at assessment)</th>
<th>n=593</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 to 3</td>
<td>290 (49%)</td>
</tr>
<tr>
<td></td>
<td>4 to 6</td>
<td>279 (47%)</td>
</tr>
<tr>
<td></td>
<td>7 to 9</td>
<td>24 (4%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level of concern for unmet needs (at assessment)</th>
<th>n=593</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 to 8</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td>9 to 16</td>
<td>53%</td>
</tr>
<tr>
<td></td>
<td>17 to 24</td>
<td>7%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>K10 (at assessment)</th>
<th>n=235</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Average (SD)</td>
<td>31 (9)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>K10 classification</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Well</td>
<td>12%</td>
<td></td>
</tr>
<tr>
<td>Mild condition</td>
<td>11%</td>
<td></td>
</tr>
<tr>
<td>Moderate condition</td>
<td>17%</td>
<td></td>
</tr>
<tr>
<td>Severe condition</td>
<td>59%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration of service contact (based on file closures as at April 2019)</th>
<th>n= 1097</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0 days</td>
<td>11 (1%)</td>
<td></td>
</tr>
<tr>
<td>1 day-2 weeks</td>
<td>121 (11%)</td>
<td></td>
</tr>
<tr>
<td>3-4 weeks</td>
<td>241 (22%)</td>
<td></td>
</tr>
<tr>
<td>1-3 mths</td>
<td>516 (47%)</td>
<td></td>
</tr>
<tr>
<td>3+ mths</td>
<td>208 (19%)</td>
<td></td>
</tr>
</tbody>
</table>
Table 4.4. External service connection during WBSS involvement (based on client recall)

<table>
<thead>
<tr>
<th>External Service Engagement</th>
<th>Engaged referrals n = 740</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confirmed attendance with GP</td>
<td>587 (79%)</td>
</tr>
<tr>
<td>Confirmed attendance with a clinician (GP or Mental Health Clinician)</td>
<td>634 (86%)</td>
</tr>
<tr>
<td>Confirmed involvement with Community Mental Health Team</td>
<td>278 (38%)</td>
</tr>
<tr>
<td>Number of external services client used (average)</td>
<td>2.3</td>
</tr>
<tr>
<td>Number of attendances with external services (average)</td>
<td>5</td>
</tr>
</tbody>
</table>

Figure 4.3 External service involvement prior to WBSS and following WBSS support period

Table 4.5. File closures types – Planned and unplanned

<table>
<thead>
<tr>
<th>File closures</th>
<th>n= 1097 n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planned</td>
<td></td>
</tr>
<tr>
<td>Program Complete</td>
<td>312 (28%)</td>
</tr>
<tr>
<td>Entered Care/Facility</td>
<td>24 (2%)</td>
</tr>
<tr>
<td>Well Supported</td>
<td>113 (10%)</td>
</tr>
<tr>
<td>Moved out of Area</td>
<td>13 (1%)</td>
</tr>
<tr>
<td>Unplanned</td>
<td></td>
</tr>
<tr>
<td>No longer contactable</td>
<td>508 (46%)</td>
</tr>
<tr>
<td>No longer interested</td>
<td>51 (5%)</td>
</tr>
<tr>
<td>Further deliberate self-poisoning</td>
<td>72 (7%)</td>
</tr>
<tr>
<td>Other</td>
<td>2 (&lt;1%)</td>
</tr>
<tr>
<td>Deceased</td>
<td>2 (&lt;1%)</td>
</tr>
</tbody>
</table>
4.3.2. Service Activity

On average, the WBSS provided services to 101 clients per month.

At the end of each month the number of open referrals was recorded as a measure of service utilisation. On average, the number of open intake files at the end of each month was 64, and the average number of open intensity files was 51 (i.e. those who had been allocated to a Support Coordinator).

Upon discharge from hospital, referrals were allocated to an intensity file based on an assessment of likely care coordination need: low, moderate and high. Of those assigned an intensity file, over three-quarters (77%) were allocated to receive moderate intensity support (see Operations Manual for detailed explanation of intensity levels), with 11% and 12% allocated to low and high support respectively. However, due to the setup of the intensity files within the client management system, moving referrals between intensity files resulted in discontinuity with regard to viewing client file information and therefore referrals were rarely shifted from their initial allocation despite changing care coordination needs. Consequently, the validity of this result pertaining to caseload mix should be considered with caution.

Overall, 26,895 individual activities were logged by Hunter WBSS since inception; 46% of this activity was conducted when the client was not present (indirect client activity e.g. liaising with other service providers on behalf of the client). As seen in Figure 4.4, all other activity involved direct contact with the client and the vast majority of this activity was phone based. This was reflective of the large geographical area that the Hunter WBSS covered.

The type of work conducted by Hunter WBSS staff was classified into the following broad categories: client-related administrative activities, attempted contact, hospital-based engagement, safety planning and assessment, informal support, facilitation and information and clinical consultation/review (see Operations Manual for more detail regarding these activity descriptors).

As seen in Figure 4.5, the largest proportion of activity was related to direct client service provision. Client-related administration was a significant component of the indirect activity. For the purposes of the trial, all staff (including Administrative Officers) recorded any activity relating to the Hunter WBSS (e.g. setting up files in client management system) and this accounts for the relatively high levels of this activity type.
Figure 4.4. Breakdown of WBSS service contacts (all staff)

Figure 4.5. Proportion of work across activity type
4.3.3. Patient Outcome Process Measures

Only a subset (n=134) of referrals completed a K10 at baseline and again prior to program closure. The average K10 score at baseline was 30.3 (SD = 8.8), before program closure the average post-test K10 score reduced to 22.2 (SD = 8.7; see Table 4.6). This difference was statistically significant \( t(133) = 12.9, p < .001 \), and reflected clinically significant change with average reduction from likely to have ‘severe’ mental disorder to likely experiencing a ‘mild’ mental disorder.

Table 4.6. Change in client outcome measures

<table>
<thead>
<tr>
<th></th>
<th>Average (SD) Pre-test</th>
<th>Average (SD) Post-test</th>
<th>Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>K10 (n=134)</td>
<td>30.3 (8.8)</td>
<td>22.2 (8.7)</td>
<td>( p &lt; .001 )</td>
</tr>
<tr>
<td>Unmet Needs (n=539)</td>
<td>3.8 (1.5)</td>
<td>2.9 (1.5)</td>
<td>( p &lt; .001 )</td>
</tr>
<tr>
<td>Concern Rating (n=535)</td>
<td>10.1 (4.4)</td>
<td>4.64 (3.0)</td>
<td>( p &lt; .001 )</td>
</tr>
</tbody>
</table>

Figure 4.6 outlines the change in unmet needs and the associated concern ratings which were also completed at the start of service provision (baseline) and at program closure. There were 539 paired samples available. The average number of unmet needs reduced from 3.8 (SD = 1.5) to 2.6 (SD = 1.5); \( t(538) = 18.3, p < .001 \).

535 paired samples had a change in concern ratings available for analysis. Concern ratings reduced from an average score of 10.1 (SD = 4.4) to 4.6 (SD = 3.0); \( t(534) = 32.42, p < .001 \).

There were 542 data points available to examine whether progress towards goals had been achieved by clients exiting the service. 527 (97.2%) of referrals were reported to have made progress on their goals in their action plan.

The type of unmet needs were recorded and coded according to the categories in Figure 4.7. Examining this data revealed that the largest number of unmet needs were identified as related to mental health and well-being, followed by unmet needs related to interpersonal relationships, finances/employment/study and physical health issues.
Figure 4.6. *Number of unmet needs and level of concern ratings at pre and post-test.*

![Bar chart showing number of unmet needs and level of concern ratings at pre and post-test.](image)

Figure 4.7. *Type and number of unmet needs reported in the client group initially and post service involvement.*

![Bar chart showing type and number of unmet needs reported.](image)
4.3.4. Client Experience

A total of 131 responses were received from the 683 satisfaction surveys sent, reflecting a response rate of 19%. A summary of the responses are presented in Table 4.7. The high average scores and the high proportion of responses to each item that were positively endorsed indicates that clients who responded were very satisfied with the service. Of note is the item with the highest average score indicating that the Way Back staff experienced as supportive and understanding.

Table 4.7. Feedback survey results (n=131)

<table>
<thead>
<tr>
<th>Question</th>
<th>Average score (max score 5)</th>
<th>Neutral or positively endorsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>I was satisfied with The Way Back Support Service</td>
<td>4.6</td>
<td>96%</td>
</tr>
<tr>
<td>After my hospital admission, it was easy to connect to The Way Back</td>
<td>4.4</td>
<td>96%</td>
</tr>
<tr>
<td>Back Support Service</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Way Back staff were supportive and understanding</td>
<td>4.8</td>
<td>99%</td>
</tr>
<tr>
<td>I felt encouraged to take steps towards my recovery</td>
<td>4.6</td>
<td>98%</td>
</tr>
<tr>
<td>The service helped me connect to the supports I needed</td>
<td>4.4</td>
<td>94%</td>
</tr>
<tr>
<td>I believe this service is useful in my community</td>
<td>4.7</td>
<td>99%</td>
</tr>
</tbody>
</table>

Additionally, 73 comments were received in the free text field on the returned surveys. Of these 65 comments were considered positive (90.3%), 5 were considered neutral (6.9%) and 2 were considered negative (2.8%). See Table 4.8 for a selection of responses.

In some of the comments provided, recommendations for change were offered by clients. These are presented below for consideration.

- It’s sad that I had to make an attempt to end my life to find the services I needed. I would encourage you to investigate capturing carers before they get to the stage I did. Perhaps treating Drs should be giving the carers your packages … great service! In much need.
- It would be helpful to be able to send reply text messages to your texts. My job makes it difficult to answer phone calls, but having the option to text would allow users of the service to get back to you when they can, rather than trying to call back inside office hours. Plus it’s easier to send a text when you’re finding it hard to deal with other people. Thank you for your help. [Support Coordinator] was lovely.
- I felt like I could have used the service for longer if it was available.
- Need to coordinate with ACUTE team as often double-up calls can be distressing. The books sent out very helpful and managed with support of psychologist. We have a plan so extra support not required but phone calls appreciated. Thank you.
Table 4.8. Participant feedback survey (n= 131)

<table>
<thead>
<tr>
<th>Examples of client feedback from survey responses</th>
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<tbody>
<tr>
<td><strong>The encouragement I received was supportive, I definitely benefited from this Service, thank you.</strong></td>
</tr>
<tr>
<td><strong>Through the tears and laughter of my recovery after the attempted suicide I can strongly recommend The Way Back service. Speaking to someone who was so supportive and understanding was truly amazing. The first step..... the second.... third and fourth steps came so much easier than they would have if I was alone. Thank you to all who were there for me.</strong></td>
</tr>
<tr>
<td><strong>The staff and service really helped guide, support and show me that it’s okay to talk. Made me feel comfortable to reach out especially when never having engaged in seeking support. The scary became less so and for once didn't feel judged for anything i said or did. Thank You.</strong></td>
</tr>
<tr>
<td><strong>This service greatly helped me. I feel the Way Back continued support helped me stay strong and helped me ask for support amongst my friends. I owe many thanks to everyone involved.</strong></td>
</tr>
<tr>
<td><strong>{Support Coordinator] helped me through some of my worst depression I've experienced. Without her I think I would done it again and succeeded.</strong></td>
</tr>
<tr>
<td><strong>It really helped having someone check in and encourage me to get the supports in place that I needed. Especially in the early days when I was more unstable. Thank you!</strong></td>
</tr>
<tr>
<td><strong>I'd go as far to say the Way Back service has saved my life. From those days with the Way Back service. I am now 6mths clean off all drugs &amp; alcohol. Which was the reason I gave up living. That was after a 29 year habit on drugs. I am now studying cert IV in Mental Health &amp; halfway through my 12 month rehab.</strong></td>
</tr>
<tr>
<td><strong>I would like to thank all your staff for the help in my recovery much appreciated and I could not think of any way that you could change your system it seems to be a good system.</strong></td>
</tr>
<tr>
<td><strong>I loved how I could talk for as long as I needed and wasn’t hurried off the phone. I felt that the lady I talked to really cared about what I was talking about and gave great advice. A huge thank you for getting me through some rough times.</strong></td>
</tr>
<tr>
<td><strong>The service provided has been very helpful with my recovery. It was good to have a separate point of contact. [Support Coordinator] was very supportive and has done an outstanding job. Thank you very much.</strong></td>
</tr>
</tbody>
</table>
4.4. Discussion

4.4.1. Key Findings and Recommendations

Client Need

**Key Finding:**
The client group reported multiple unmet needs, significant psychological distress, and less than 10% identified they did not need the service because they were already well supported.

This client group reported high levels of distress (59% of K10s completed at the initial contact point were in severe range for psychological distress) and the predominant type of client-identified unmet needs were related to mental health. Furthermore, of the 1578 offered the WBSS, only 8% (n=120) declined it because they already had sufficient supports in place. This highlights and confirms that this population group are managing significant issues for which support and treatment can be of benefit and, on a clinical population level, indicative of a client group with significant needs.

**Implication:**
People who have engaged in deliberate self-poisoning present with significant needs. Addressing these needs is a priority.
Client Engagement

Key Finding:
The service was successful in connecting with a group of people who had taken a deliberate overdose and presented to hospital, across the lifespan, regardless of gender or cultural identity.

Service engagement levels were similar, across gender, age group and cultural identity. Within this context, the small differences (<10%), reported for both Indigenous people and those who were not met in hospital, are worthy of further consideration.

It would appear likely that meeting Support Coordinators whilst in hospital boosted engagement upon discharge, however a more nuanced investigation of this (e.g. the degree to which initial acceptance of referral was associated with ongoing engagement into the community) is needed to be able to draw a clear conclusion about the specific value of meeting people in hospital.

Similarly, after discussion with local Indigenous stakeholders about the difference in engagement levels between Indigenous and non-Indigenous people, with external funding from the local Primary Health Network and as an action outside the scope of the Beyond Blue trial, HPC introduced an additional referral pathway with an identified Aboriginal Support Coordinator which brought engagement levels to parity. Thus, reviewing engagement of the service with different sub-groups of clients helps to highlight tailoring that may be indicated.

It should also be noted that there was attrition throughout the support period. While 81% of clients accepted the initial service offer, 25% of these did not progress to ongoing support in the community. Reasons for this included not being contactable following hospital discharge, change of mind, a further deliberate self-poisoning event, and change of circumstances (moved out of area or into care). This translated to 61% of the original referrals (960/1578) receiving ongoing community support from the WBSS.

A potential consideration is that higher levels of attrition may be expected in a model with such a broad access point. That is, due to the integrated referral pathway, all eligible individuals were offered the Way Back service. A strength of this approach is that it is likely to reach individuals who did not plan to seek support. However, this may also inflate the attrition rate as this group may also be less likely to maintain contact with a support service over time. In contrast, an alternate model, where express consent and acceptance of the service referral is obtained prior to referral, may feasibly lead to higher retention with the service over time and fewer unplanned service closures.

However, this latter model is likely to significantly reduce initial access and result in a much smaller referral base. This premise is supported by the Hunter trial being the largest in terms of referral rate when compared to other aftercare models that do not have an integrated pathway. Regardless, it highlights that even with an integrated hospital pathway and assertive outreach approach, while substantial proportion of the target population were able to be engaged, intervention coverage was not universal and levels of exposure varied.
**Implications:**
The Hunter WBSS service model was able to initially engage a representative group of people who had engaged in deliberate self-poisoning and presented to hospital. The integrated nature of the referral pathway facilitated access but may have led to increased attrition compared to models where explicit interest in accessing the service is assessed prior to referral.

Further work is needed to understand engagement of different sub-groups of clients with the service and how to increase the proportion of people who decide to utilise WBSS support after hospital discharge.
Service Provision

Key Finding:
A primarily phone-based model demonstrated economies of scale that enabled a small staffing complement to service a high volume of referrals across a large geographical area.

The service covered a large geographical area with only three full-time equivalent Support Coordinators. With an average of 46 referrals per month, it was evident early in the trial that phone contact would play a significant role in support provision. Data indicated that while most clients received at least one face-to-face contact, phone contact was the most frequently utilised mode. Client outcome data suggested that the model was well received by consumers and service connection data indicated that over time clients connected with a broader array of services to address unmet needs.

Closure data indicated that planned closures were lower than original targets and the main reason for closure was due to premature loss of contact. The service adopted an assertive approach to contact and this was escalated where risk concerns indicated action was required. However, this was also balanced with recognition that the service was voluntary and the need to respect individual choice. It was anecdotally observed that some clients who did resume contact did not regard themselves as ‘disengaging’ but instead just not getting around to calling back. This may indicate that a shorter period of support was required for some people and it would be appropriate to further investigate why people discontinued contact as it may be that three months of support was too long for some people, with a natural earlier closure point (e.g. six weeks) indicated for those that are doing well.

Taken together with the engagement data it would be appropriate to seek to better understand which sub-groups of people did not feel that the service was relevant to their needs and consider whether alternative strategies of engagement/ intervention may be appropriate.

Implications:
It is important to ensure flexibility in the service delivery model is possible to allow for tailoring according to client needs and within available resources.

There is a need to identify ways to reduce loss of contact – e.g. identification of alternative contact details (email and additional numbers).

Further investigation is required to better understand the reasons for client disengagement with the service and closure timing.
Client Outcome Data

**Key Finding:**
Clients were able to reduce levels of distress and make meaningful progress in reducing psychological distress and unmet needs.

The strength of this finding could be improved by having a higher proportion of people complete the outcome measures prior to program closure and use of standardised outcome measures.

Client data demonstrated significant decreases in psychological distress and the number of unmet needs during the course of the support period.

The measure used to track unmet needs was not an existing measure with established psychometric properties. At the start of the trial it was identified that there was a paucity of measures that were suitable for this population; many were instead designed for use with mental illness and were not appropriate to capture the broad range of presentations to the WBSS. Hence the decision to use a service-developed one.

Only 29% of planned closures and 12% of all closures also had a record for psychological distress at the program closure point. The high number of unplanned closures inhibited the ability to capture paired data points for client-reported measures. Feedback from the Support Coordinators highlighted that completing the outcome measures over the phone was a barrier to engagement and completion. This points to the need to consider alternative means of data capture for outcome measures. Furthermore, it is acknowledged that these findings may reflect sample bias as they rely on the responses from those who engaged with the service, had planned exits and agreed to complete the measures.

**Implications:**
It would be useful to establish an electronic data capture platform for outcome measures that can be filled in by clients on their mobile and sent out automatically as required.

Identification of an alternative needs assessment outcome measure that is fit for purpose and has established psychometric properties would be useful.
Client Feedback

**Key Finding:**
The Hunter WBSS model was endorsed by its consumers as a useful support service following hospital discharge.

For those who responded to the satisfaction survey, client feedback was overwhelmingly positive with particular emphasis placed on the connection between the client and their Support Coordinator. This client feedback also provided strong endorsement of the role of the WBSS model in the local community.

Free text comments highlighted the value placed on empathic support and time taken to listen. Some constructive comments were provided for service improvement and development including broadening the model to include support for people in suicidal crisis and improved coordination between services, such as the Mental Health Service. Some clients reported that it could also be confusing to receive calls from both the Acute Care Team and the WBSS in the days following hospital discharge.

**Implications:**
The Hunter WBSS model met the needs of at least a subset of people who have engaged in deliberate self-poisoning.

Opportunities exist for improved collaboration with community Mental Health Services.
4.4.3. Limitations and Context

It is important to remain cognisant of the limitations of the process evaluation of the Hunter WBSS and the features that may limit the generalisability of the findings.

First, the conclusions that can be drawn from quality assurance data and process measures are limited. Only a small proportion of service users completed both baseline and post program outcome measures; or responded to the client feedback survey. Thus the positive findings reported may be a result of sample or response bias, with only those people most engaged (or who benefited most) responding.

There were no measures of suicidality used within routine care and this may have been an outcome of interest, particularly with reference to understanding the impact of the service in supporting people to manage the intensity, frequency or self-management of suicidal crises. Furthermore, as noted, only one measure was standardised and this limits the capacity to compare the impact of service use on participants with other studies. Based on the available data it is not possible to establish whether particular sub-groups of clients benefitted most from the service or what the mechanisms of benefit may be.

Second, the use of a behavioural indicator of suicide attempt (specifically, deliberate self-poisoning) provided a concrete means of identifying eligibility for the service, while also being the most common type of self-harm to present to hospital settings and required within the context of the effectiveness evaluation. However, from this trial, the value of the service to people with other types of suicidal behaviour is unknown.

4.5. Conclusion

The process evaluation confirmed that the service was feasible to establish and sustain at an organisational level; able to be delivered at the scale of a regional referral centre for deliberate self-poisoning patients; acceptable to and well received by the target population and clinical service providers; and has consequently established itself as a valuable and integral component of the local community’s approach to suicide prevention.

Continued engagement by a substantial proportion of clients in the WBSS was encouraging, although coverage of all eligible clients was incomplete and some that engaged did not utilise the full 12 weeks of support available.

The data outlined in this chapter lends support to the model’s acceptability as an aftercare support service based on the high throughput of clients; the service being well received by consumers who reported high levels of support; demonstration of increased client connection with services over time; and observation of clinically meaningful improvements in well-being.
5. Effectiveness evaluation

Aim
The aim of the effectiveness evaluation was to investigate whether the WBSS was associated with reduced hospitalisations (deliberate self-poisoning readmission, psychiatric hospital admission, any other admission) in the 12 months following the index admission.

Research Design
A non-randomised, historical controlled trial design was used. Outcome data was sourced from Local Health District-wide hospital records. The intervention period was for the first eighteen months of WBSS delivery (April 2016- September 2017) and the historical control periods were from two 18-month epochs prior to the introduction of the WBSS.

Analyses
Effectiveness was evaluated by intention-to-treat analyses.

Outcomes
The primary outcomes were:
- Proportion of participants with any deliberate self-poisoning readmission
- Number of deliberate self-poisoning readmissions.

Secondary outcomes were:
- Length of stay of deliberate self-poisoning readmissions
- Proportion of participants with any psychiatric admission
- Number of psychiatric inpatient admissions.
- Length of stay of psychiatric inpatient admissions.

Participants
There were a total of 2770 participants across the three study periods (control cohort 1 [CC1]= 739; control cohort 2 [CC2]= 710; intervention cohort [Int]= 821). Females accounted for three-fifths of participants, the average age at index admission was 39 years, and 9% of participants identified as Aboriginal or Torres Strait Islander. Demographic and clinical characteristics were similar across the historical control and intervention cohorts.

Key Findings - Intention to Treat Analysis

Primary Outcomes
Overall, 13% of participants were readmitted to Calvary Mater Newcastle for deliberate self-poisoning. There were no significant differences between the intervention cohort vs control cohorts (CC1= 14%; CC2= 12%; Int= 13%).

A total of 445 deliberate self-poisoning readmissions were recorded. There were no significant differences between cohorts in number of deliberate self-poisoning readmissions, using the intervention cohort as the referent group (CC1= 163/739; CC2=118/710; Int=164/821).
Secondary Outcomes

There were no significant differences in median length of stay (1 day) for Calvary Mater Newcastle deliberate self-poisoning readmissions.

There were no significant differences between cohorts for proportions with any psychiatric inpatient admission (CC1= 18%; CC2= 18%; Int= 22%).

The intervention cohort had more psychiatric inpatient admissions (CC1= 238; CC2= 207; Int= 312), with control cohort 2 having significantly fewer admissions IRR 0.77 (0.64-0.92), and control cohort 1 having non-significantly fewer admission IRR 0.85 (0.72-1.00), compared to intervention cohort.

There were no cohort differences in median length of stay (6 days) for psychiatric admissions.

Other Key Findings: Intervention Cohort Sub-Group

Of the 821 people who comprised the potential referral pool for the WBSS, 58% (n=477) received some WBSS support; 36% (n= 297) with six weeks or more WBSS exposure.

The no exposure and the high WBSS exposure sub-groups tended to have the highest rates of hospital-treated deliberate self-poisoning repetition and psychiatric inpatient admissions.

The not referred and the high WBSS exposure sub-groups tended to have the highest rates of general hospital admissions.

The low and medium WBSS exposure sub-groups tended to have lowest rates of hospital-treated deliberate self-poisoning repetition and psychiatric inpatient admissions.

Other Key Findings: Per-Protocol Analysis

There were no significant differences for any per-protocol analyses, which compared outcomes for only those who engaged with the intervention with historical controls.

Conclusions

The intention-to-treat analysis and the per-protocol analysis did not show that the WBSS was effective in reducing repetition of hospital-treated deliberate self-poisoning readmissions over a 12 month follow-up period.

The WBSS cohort had a higher rate of psychiatric inpatient admissions over the 12 month follow-up, which was an unexpected result warranting further consideration.

There was variability in outcomes based on level of exposure to the WBSS, for which we offer a speculative explanation. We suggest that these variations were probably best explained by participant characteristics and participant self-selection in relation to WBSS exposure. Specifically, it is likely that some clients with the highest need for clinical and support services accepted the WBSS service offer and maintained engagement for 12 weeks or more; whilst other participants with high clinical and support needs decided not to accept WBSS support.
5.1. Aims

The aim of the effectiveness evaluation was to investigate whether the WBSS was associated with a reduced need for hospitalisation in the 12 months following the index admission, for the intervention cohort compared to two historical control cohorts.

Specifically, the study investigated whether in the twelve-month follow-up period there was a difference (reduction) in:
- Readmissions to CMN for deliberate self-poisoning
- Psychiatric inpatient admissions
- General hospital admissions.

Primary outcomes were:
- Proportion of participants with any (one or more) CMN deliberate self-poisoning readmission.
- Number of CMN deliberate self-poisoning readmissions.

Secondary outcomes were:
- Length of stay for CMN deliberate self-poisoning readmissions.
- Proportion of participants with any (one or more) psychiatric inpatient admission (not including transfers from the index admission).
- Number of psychiatric inpatient admissions (not including transfers from the index admission).
- Length of stay for psychiatric inpatient admissions.

Other outcomes were:
- Proportion of participants with any (one or more) general hospital admission.
- Number of general hospital admissions.
- Length of stay for general hospital admissions.

It is not within the scope of this evaluation to assess differences in suicide deaths between the groups, due to the low prevalence of this outcome and lack of access to mortality data.

5.2. Method

5.2.1. Study design

This effectiveness evaluation utilised a non-randomised controlled trial design, using outcome data sourced from Local Health District-wide hospital records.

5.2.2. Study Period

As seen in Figure 5.1, the intervention period was from April 2016 to September 2017. Controls were drawn from two 18 month epochs prior to WBSS being introduced (April 2011 – September 2012; April 2013– September 2014). The first admission for each participant within each study period was treated as the index admission; with 12 month follow-up periods calculated from the day of the index admission for each participant.
**Figure 5.1: Effectiveness study - cohort periods**

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</thead>
<tbody>
<tr>
<td><strong>April 2011 - September 2012</strong></td>
<td>Control cohort 1</td>
<td></td>
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<tr>
<td><strong>April 2012 - September 2013</strong></td>
<td>Control cohort 1 follow-up: 12 mths from index admission</td>
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<tr>
<td><strong>April 2013 - September 2014</strong></td>
<td>Control cohort 2</td>
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<tr>
<td><strong>April 2014 - September 2015</strong></td>
<td>Control cohort 2 follow-up: 12 mths from index admission</td>
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<tr>
<td><strong>April 2016 - September 2017</strong></td>
<td>Intervention cohort</td>
<td></td>
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<tr>
<td><strong>April 2017 - September 2018</strong></td>
<td>Intervention cohort follow-up: 12 mths from index admission</td>
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5.2.3. Participants
The participant cohort comprised adults (16+ years) who presented to CMN for an episode of hospital-treated deliberate self-poisoning during the study period.

NOTE
The participant group for the intervention cohort in the effectiveness evaluation is a subset of the WBSS client group reported on in the process evaluation. It differs in three key ways.

1. Time period: The intervention cohort for the effectiveness study is drawn from the first 18 months of WBSS service delivery. The process chapter reflects referrals that occurred across the first 3 years of service delivery.
2. Unit of analysis: The effectiveness evaluation reports outcomes for: individual participants, admission events, and length of stay as the units of analysis. The data reported in the process evaluation reflects either total number of WBSS episodes of care (referrals) or individual client-level data from respondents.
3. Intervention cohort: The comparative analyses used in the effectiveness evaluation uses an intention-to-treat approach. This means the intervention cohort includes participants who were eligible for WBSS, regardless of whether they accepted or were exposed to the intervention.

5.2.4. Setting
The Hunter Area Toxicology Service (HATS) is based at the CMN hospital. It has provided hospital-based treatment for poisoning patients, including deliberate self-poisoning patients, since 1987. HATS services a primary referral area with an urban-suburban population of over 400 000 and is a tertiary referral centre for an additional rural population of around 250 000. All poisoning presentations to Emergency Departments are admitted (or notified) to HATS under the clinical care of the attending clinical toxicologist and all people who engage in deliberate self-poisoning receive a mental health assessment by Department of Liaison-Psychiatry before they are discharged (Whyte et al., 1997). The service does not comprehensively cover childhood (<14 years) poisonings. The standard admissions and assessment process used by HATS is unique in Australia.

5.2.5. Procedure
Data were drawn from hospital district-wide records held by HNE LHD for the study periods described above. Ethics approval was provided for a consent waiver for this component of the study due to the historical nature of the control groups, the use of routine administrative data which would be de-identified for analysis, and the low risk posed to participants. Data access was restricted to Dr Katie McGill and Professor Greg Carter and unique identifiers replaced identifying information as soon as was practical.
As described in the previous chapter, people admitted to CMN for deliberate self-poisoning during the intervention period were routinely referred to the WBSS by HATS and Department of Consultation-Liaison Psychiatry staff.

WBSS staff accompanied HATS staff on hospital rounds Monday to Friday, meaning WBSS staff were able to meet people who were discharged on a weekday face-to-face before discharge. Patients who had an admission and were discharged on the weekend were also referred to WBSS and were aware that the service would contact them to offer support.

People who accepted the referral to WBSS were contacted via phone within one day of discharge from hospital. They were provided more information about the service and agreement was reached about what sort of support the service could provide. For people who accepted the referral, a needs assessment was completed (including completion of the K10) and support was provided for up to 12 weeks for an initial contact.

As part of the first contact with the WBSS, patients were provided with an information and consent form (Appendix B) and given a verbal explanation about how their information would be used for evaluation purposes. Participants were free to withdraw their consent to use data for evaluation purposes at any stage by telling the Support Coordinator.

5.2.6. Power Calculation and Sample Size

The effectiveness evaluation sample size (power) calculation was based on the following assumptions: a binary 12 month repetition rate of 15% was estimated from previous studies for hospital-treated deliberate self-harm populations (Carroll, Metcalfe & Gunnell, 2014), and a clinically meaningful absolute risk reduction of 5% for an expected repetition rate of 10% in the intervention cohort, with Alpha of 0.05 and 80% power. This calculation indicated that a minimum of 686 participants were required per arm of the trial.

5.2.7. Data

Data extraction for the three epochs was completed based on a data request to Hunter New England Data Analytics Unit for all presentations and admissions to CMN hospital for X codes 40-49 and 60-84 for the three study periods described above. The first admission for each person within the study periods was used as the index admission; and this index admission was the inception rule for each cohort.

For each of the three cohorts, data relevant to all admissions to all hospitals within the HNE LHD that occurred within 12 months of the index admission were included.

The data extracted from the hospital records for each admission included demographic details (date of birth, gender, cultural identity) and hospital presentation details (admitting facility, hospital presentation/admission/discharge date and time; first five diagnoses; service referred to on separation; nature of discharge).
As seen in Figure 5.2, admissions within 12 months following the index admission were classified by type. Specifically, as:

- **Calvary Mater Newcastle- deliberate self-poisoning** (CMN-DSP), as indicated by an X code of 60 to 69 being recorded in their presenting diagnoses;
- **Psychiatric inpatient**, as identified by any admission to the Mater Mental Health Unit; and any admission to hospitals with a psychiatric inpatient ward (including Maitland, Tamworth, Taree, Morisset) where mental health diagnostic codes (F codes) were dominant or X codes (as above) were present in the first five diagnostic codes; and
- **Any other general hospital admission**, including any admissions to a general hospital for any reason, admissions to CMN- not deliberate self-harm (poisoning or injury), and admissions to hospitals with a psychiatric inpatient unit where physical diagnostic codes were dominant and X codes (as above) were not present in the first five diagnostic codes. These admissions were also coded as being mental health/ drug and alcohol or physical in nature based on the type of diagnoses recorded in the first five diagnostic codes.
- **Deliberate self-harm admissions** as indicated by an X code of 60 to 84 (that is, self-poisoning and self-injury) were also coded as a subset of the above categories, representing admissions for deliberate self-harm within any facility (CMN, psychiatric inpatient wards, or general hospital).

Psychiatric inpatient admissions that had an admission date of less than 24 hours from the index admission discharge date and where the mode of separation for the index admission was ‘transferred to public psychiatric hospital’ were classified as index admission transfers and were not counted in the calculation of psychiatric inpatient admissions during follow-up.

Length of stay was calculated in hours and days, as the time between admission date/ time and discharge date/time for each admission. For the index admission, length of stay in hours are reported. For the outcome analyses, length of stay is reported in days and a total length of stay was calculated by summing length of stays (bed days) across each admission type providing a total number of bed days for each recorded admission type per participant.

**Intervention Cohort Within-Subjects Sub-group Analysis**

The intervention cohort dataset was linked with the HPC WBSS process dataset, with data linked via name, date of birth and CMN discharge/ WBSS service registration date. The WBSS linked data included the WBSS registration date, discharge date, number and type of service activities recorded within episode of care, K10 scores, and reason for program closure.

Patterns of service engagement (based on length of stay/ episode of care with the service), number and type of activity, and reason for program closure were reviewed to identify exposure to the intervention. Service engagement was defined as the number of days between WBSS service registration/ admission date and WBSS discharge date. Where a
person had more than one referral, the total length of time across referrals were summed to get a score that reflected total exposure to the intervention within the 12 months period following the index episode.

We classified five sub-groups of participants based on level of WBSS exposure:

- **Not referred (ineligible or other):** Included participants who were within the WBSS intervention cohort but were not registered on the WBSS client management system, meaning no referral to the WBSS was made. This included people where hospital staff identified safety concerns, clinical complexity indicators, clients who were based outside the catchment area or where intent to self-poison was questionable, meaning service provision was not appropriate. This group also included some people who were referred to WBSS but who after WBSS review did not meet eligibility criteria so the referral was not progressed.

- **Not exposed to WBSS:** This sub-group included participants who declined the service offer and participants with whom no WBSS contact was able to be established after discharge from hospital. There were also a small subset of clients who were initially referred and then later deemed ineligible for the service (as per reasons listed above).

- **Low exposure** to WBSS: Included participants who received less than 6 weeks of WBSS in total.

- **Medium exposure** to WBSS: Included participants who received 6 to 12 weeks of WBSS in total.

- **High exposure** to WBSS: Included participants who received 12+ weeks of WBSS in total.

### 5.2.8. Data analysis

Analyses were conducted on an intention-to-treat basis (comparing outcomes for all participants in the study period and all participants in the historical control periods) using chi-square tests for difference in proportions for any event, incidence risk ratios for number of events (Poisson regression), and differences in medians (Kruskal-Wallis median test) for length of stay data. Difference in proportions were tested sequentially for intervention versus control cohort 1 and for intervention versus control cohort 2. Incidence rate ratios reflect the number of events relative to population size, so for this analysis they reflect a comparison of the number of admissions per cohort; using the intervention cohort as the referent category. Length of stay was not normally distributed and was also tested sequentially for intervention versus control cohort 1 and for intervention versus control cohort 2.

The analyses were conducted for the primary, secondary and other outcomes as outlined earlier in this chapter. As requested by Beyond Blue, the analyses were repeated for any admissions associated with a deliberate self-harm diagnosis.

Within-subjects sub-group analyses were conducted for the intervention cohort using similar statistical techniques, specifically investigating whether there was any overall
difference in outcomes based on level of exposure to the WBSS intervention. Incidence rate ratios used the high exposure sub-group as the referent category.

Per-protocol analyses were conducted comparing the three sub-groups of the intervention cohort who were exposed to the intervention (low, medium and high WBSS) with the historical control cohorts, using the same statistical analyses described in the intention-to-treat analyses.

5.2.9. Data extraction and cohort definition
A total of 3 174 participants were initially identified across the three study periods.

As seen in Table 5.1, the cohort definition was refined to reflect the exact study period and eligibility criteria.

Table 5.1. Data extraction and cohort definition

<table>
<thead>
<tr>
<th>Category</th>
<th>Control cohort 1</th>
<th>Control cohort 2</th>
<th>Intervention cohort</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original data extraction</td>
<td>1057</td>
<td>997</td>
<td>1120</td>
<td>3174</td>
</tr>
<tr>
<td>Age criteria: 16+ years</td>
<td>1056</td>
<td>996</td>
<td>1120</td>
<td>3172</td>
</tr>
<tr>
<td>Time period: CMN admissions/ discharges from April 26 within each study period (original data request included episodes from April 1)</td>
<td>1007</td>
<td>945</td>
<td>1064</td>
<td>3016</td>
</tr>
<tr>
<td>Diagnosis: Deliberate self-harm diagnosis only (X60- X84)</td>
<td>827</td>
<td>769</td>
<td>863</td>
<td>2459</td>
</tr>
<tr>
<td>Postcode: WBSS catchment only</td>
<td>783</td>
<td>731</td>
<td>838</td>
<td>2352</td>
</tr>
<tr>
<td>Final cohort</td>
<td>739</td>
<td>710</td>
<td>821</td>
<td>2270</td>
</tr>
</tbody>
</table>
Figure 5.2: Classification of admissions (yellow highlight= primary admission types)

- CMN
- MHTMH Unit
- Hosp w psychiatric ward (eg. Maitland, Tamworth, Taree, Morisset)
- General hosp- no psych ward (eg. JHH, Cessnock, Scone, Tomaree, etc)

- DSH
  - CMN- DSH, not DSP
  - CMN- Other

- Psychiatric inpatient
  - MH diagnoses (incl DSP)
  - Other diagnoses

- Any other admission
  - Physical
  - MH diagnoses (incl DSP)
5.3. Results

5.3.1. Participant characteristics

There were 2270 participants across the three study periods (Control cohort 1 [CC1]= 739; Control cohort 2 [CC2]= 710; Intervention cohort [Int]= 821).

As seen in Table 5.2, females accounted for three-fifths of participants, the average age at the point of the index admission was 38.6 years (SD= 17.15) and the majority of participants did not identify as Aboriginal or Torres Strait Islander (91%).

The referral source for the index admission was the Emergency Department (93%) with internal hospital transfers and other sources accounting for 6% and 1% respectively.

The median length of stay for the initial admission was 17 hours (IQR= 16), which significantly increased across the three cohort periods. However the median length of stay was less than one day for all cohorts.

Over two-thirds of participants were discharged home from the index admission, usually with a referral to see their general practitioner (70%). Over one-fifth (29%) of participants were discharged for further assessment at the psychiatric hospital and 75% of these were admitted to the psychiatric hospital.

Participant characteristics were consistent over the three study epochs with the only significant difference being for the proportion of people who were recorded as identifying as Aboriginal or Torres Strait Islander, which increased over time ($\chi^2(2)=9.80$, p=.01).
Table 5.2. Participant characteristics

<table>
<thead>
<tr>
<th></th>
<th>Control cohort 1 n=739</th>
<th>Control cohort 2 n=710</th>
<th>Intervention cohort n=821</th>
<th>Overall</th>
<th>Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Males</td>
<td>274 (37%)</td>
<td>277 (39%)</td>
<td>306 (37%)</td>
<td>857 (38%)</td>
<td>$\chi^2(2)=0.71,$ p=.70</td>
</tr>
<tr>
<td>Females</td>
<td>465 (63%)</td>
<td>433 (61%)</td>
<td>515 (63%)</td>
<td>143 (62%)</td>
<td></td>
</tr>
<tr>
<td><strong>Age Group</strong></td>
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<tr>
<td>&lt;18 years</td>
<td>37 (5%)</td>
<td>56 (8%)</td>
<td>58 (7%)</td>
<td>151 (7%)</td>
<td>$\chi^2(8)=15.81,$ p=.05</td>
</tr>
<tr>
<td>18-25 years</td>
<td>181 (25%)</td>
<td>187 (26%)</td>
<td>208 (25%)</td>
<td>576 (25%)</td>
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</tr>
<tr>
<td>26-45 years</td>
<td>324 (44%)</td>
<td>271 (38%)</td>
<td>311 (38%)</td>
<td>906 (40%)</td>
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</tr>
<tr>
<td>46-65 years</td>
<td>172 (23%)</td>
<td>157 (22%)</td>
<td>195 (23%)</td>
<td>524 (23%)</td>
<td></td>
</tr>
<tr>
<td>66+ years</td>
<td>25 (3%)</td>
<td>39 (6%)</td>
<td>49 (6%)</td>
<td>113 (5%)</td>
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</tr>
<tr>
<td>Average age (SD)</td>
<td>36.38 (14.41)</td>
<td>36.26 (16.25)</td>
<td>37.06 (16.04)</td>
<td>36.59 (15.59)</td>
<td>F(2,2266)=0.57, p=.55</td>
</tr>
<tr>
<td>Range</td>
<td>16-88</td>
<td>16-94</td>
<td>16-93</td>
<td>16-94</td>
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<tr>
<td><strong>Cultural Identity</strong></td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Non Indigenous</td>
<td>677 (92%)</td>
<td>655 (92%)</td>
<td>724 (88%)</td>
<td>2056 (91%)</td>
<td>$\chi^2(2)=8.76,$ p=.01</td>
</tr>
<tr>
<td>Indigenous</td>
<td>62 (8%)</td>
<td>55 (8%)</td>
<td>97 (12%)</td>
<td>214 (9%)</td>
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<tr>
<td><strong>Length of stay- in hours</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Kruskal-Wallis</td>
</tr>
<tr>
<td>Median</td>
<td>16.91</td>
<td>17.34</td>
<td>19.68</td>
<td>17.98</td>
<td>$\chi^2(2)=47.03,$ p=.001</td>
</tr>
<tr>
<td>Interquartile range</td>
<td>13.00</td>
<td>13.44</td>
<td>20.72</td>
<td>13.94</td>
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<tr>
<td><strong>Mode of separation</strong></td>
<td></td>
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<tr>
<td>Discharge home</td>
<td>475 (64%)</td>
<td>475 (67%)</td>
<td>549 (67%)</td>
<td>1499 (66%)</td>
<td>$\chi^2(4)=10.47,$ p=.03</td>
</tr>
<tr>
<td>Discharge own risk</td>
<td>8 (1%)</td>
<td>2 (0.3%)</td>
<td>1 (0.1%)</td>
<td>11 (0.5%)</td>
<td></td>
</tr>
<tr>
<td>Transfer- other hospital$^1$</td>
<td>25 (3%)</td>
<td>28 (4%)</td>
<td>50 (6%)</td>
<td>98 (4%)</td>
<td></td>
</tr>
<tr>
<td>Transfer for assessment to public psych hospital</td>
<td>229 (31%)</td>
<td>202 (29%)</td>
<td>217 (26%)</td>
<td>648 (29%)</td>
<td></td>
</tr>
<tr>
<td>Admitted to public psych hospital$^2$</td>
<td>168 (60%)</td>
<td>153 (76%)</td>
<td>164 (76%)</td>
<td>485 (75%)</td>
<td></td>
</tr>
<tr>
<td>Death</td>
<td>2 (0.3%)</td>
<td>3 (0.4%)</td>
<td>4 (0.5%)</td>
<td>9 (0.4%)</td>
<td></td>
</tr>
</tbody>
</table>
*1- Included transfers from private psychiatric hospital, general hospital, and other wards.

*2- Is a subset of transferred for assessment to public psychiatric hospital. Identified by time to first admission <1 day and mode of separation for index admission being ‘transferred to public psychiatric hospital’. The percentages reflect the proportion of people admitted out of those who were transferred for assessment.

*3- Comparison of collapsed categories: Discharged home (including discharged at own risk), other (including transfer- other hospital, death) and transferred for assessment to public psychiatric hospital’.
5.3.2. Readmission to Calvary Mater Newcastle for Deliberate Self-Poisoning

Across the three cohorts, the proportion of the sample who were readmitted for any deliberate self-poisoning was 13%, with no significant differences between cohorts (CC1= 14%; CC2= 12%; Int= 13%). See Table 5.3 for details.

Across the study period, there were a total of 445 deliberate self-poisoning readmissions within the 12 month follow-up period (CC1= 163/739; CC2= 118/710; Int= 164/821). Incidence rate ratios for deliberate self-poisoning readmissions did not significantly differ across cohorts. See Figure 5.3.

Deliberate self-poisoning readmissions accounted for a total of 657 CMN bed days in the 12 months following the index admission (CC1= 180; CC2= 127; Int= 259). The median length of stay for these readmissions was 1 day (IQR=1) and was not significantly different across cohorts. See Figure 5.4.

5.3.3. Admission to Psychiatric Inpatient Care for Mental Health Diagnoses

Overall, 19% of participants across the three cohorts were admitted to a psychiatric inpatient unit within 12 months of their index admission, with a greater (but not significant) proportion of intervention cohort participants admitted compared to control participants (CC1= 18%; CC2= 18%; Int=22%). See Table 5.3.

The intervention cohort had the most psychiatric inpatient admissions followed by control cohort 1, while control cohort 2 had the fewest (CC1= 238/739; CC2= 207/710; Int= 312/821). Control cohort 2 had significantly lower psychiatric inpatient event rates (IRR 0.77 95% CI [0.64-0.92]) and control cohort 1 had non-significantly lower psychiatric inpatient event rates (IRR 0.85 95% CI [0.72-1.00]) compared to the intervention referent cohort.

Overall, psychiatric inpatient admissions were longer than deliberate self-poisoning readmissions, with an overall total of 8703 bed days required in the follow-up period across the three cohorts. The greater number of psychiatric inpatient admissions for the intervention cohort also translated into this group also having the highest number of psychiatric inpatient bed days (CC1= 3359; CC2= 1888; Int=3456). However, the median length of stay for the admissions did not differ between cohorts (median=6; IQR- 0-27). See Figure 5.4.

5.3.4. Any Other General Hospital Admissions

Overall, about one-fifth (21%) of participants were admitted to a general hospital in the 12 month follow-up period; with the intervention group having a significantly greater proportion with a general hospital admission than control cohort 1 and a non-significantly greater proportion than control cohort 2 (CC1= 19%; CC2= 20%; Int=24%). See Table 5.2.
Both control cohorts had significantly lower event rates for other hospital admissions compared to the intervention cohort; control cohort 1 IRR 0.79 [0.68-0.93] and control cohort 2 IRR 0.80 [0.69-0.94]. See Figure 5.3.

There was a significant difference in the length of stay for other hospital admissions, dropping from a median of 4 days [IQR= 7] to 2 days [IQR=5], with a total number of 3757 bed days required across the cohorts (CC1= 1101, CC2= 1095, Int= 1561).

### 5.3.5. Any Deliberate Self-Harm Admissions in 12 months from Index Admission

Expanding the analyses to include admissions within 12 months of the index admission for other types of self-harm (not just self-poisoning) did not substantially change the pattern of results. The vast majority of deliberate self-harm admissions occurred at CMN and thus patterns have been captured in the analyses described earlier. See Appendix D for details (analyses conducted as per request).

In summary, overall, 16% of participants had an admission for deliberate self-harm (including self-poisoning) across any facility (CC1= 18%, CC2= 14%, Int = 17%), with no significant differences in the proportion who had a deliberate self-harm admission at any facility across cohorts.

There were a total of 609 admissions for deliberate self-harm (CC1= 230/739, CC2= 147/710, Int= 232/821) accounting for 1502 bed days across the three cohorts (CC1= 516, CC2= 286, Int= 700). Control cohort 2 had significantly fewer deliberate self-harm admissions compared to the intervention cohort (IRR [95% CI]= 0.73 [0.60-0.90], p=.003) while there was no significant difference for control cohort 1 compared to the intervention group (IRR [95% CI]= 1.01 [0.92-1.32], p=.30).

There were no significant differences in the median length of stay for deliberate self-harm admissions across the three cohorts (median= 2 days, p>.05).
Table 5.3. Admissions within 12 months of index deliberate self-poisoning admission

<table>
<thead>
<tr>
<th>Type of admission</th>
<th>Control cohort 1 n=739</th>
<th>Control cohort 2 n=710</th>
<th>Intervention cohort n=821</th>
<th>Overall</th>
<th>Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repetition proportion: Number (%) with any admission of that type in 12 mth follow-up period</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Chi square</td>
</tr>
<tr>
<td>Any CMN DSP readmission(^1)</td>
<td>102 (14%)</td>
<td>86 (12%)</td>
<td>108 (13%)</td>
<td>296 (13%)</td>
<td>(\chi^2(1)=0.14, p=.71) (\chi^2(1)=0.37, p=.71)</td>
</tr>
<tr>
<td>Any psychiatric inpatient admission(^1)(^2)</td>
<td>133 (18%)</td>
<td>126 (18%)</td>
<td>177 (22%)</td>
<td>436 (19%)</td>
<td>(\chi^2(1)=3.10, p=.08) (\chi^2(1)=3.49, p=.06)</td>
</tr>
<tr>
<td>Any other hospital admission(^1)</td>
<td>142 (19%)</td>
<td>141 (20%)</td>
<td>194 (24%)</td>
<td>477 (21%)</td>
<td>(\chi^2(1)=4.49, p=.03) (\chi^2(1)=3.17, p=.08)</td>
</tr>
<tr>
<td>Total number of admissions in 12 mth follow-up period</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Incident Rate Ratio [95% CI]</td>
</tr>
<tr>
<td>CMN DSP readmission(^1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ref cat= Int cohort 3</td>
</tr>
<tr>
<td>Psychiatric inpatient admission(^1)(^2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CC1 vs Int</td>
</tr>
<tr>
<td>Other hospital admissions(^1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CC2 vs Int</td>
</tr>
<tr>
<td>Median LoS [IQR] for those with any admission of that type; Total number of bed days in 12 mth follow-up period</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Kruskal-Wallis H</td>
</tr>
<tr>
<td>CMN DSP readmission(^1)</td>
<td>1.05 [1.57]</td>
<td>1.12 [1.57]</td>
<td>1.16 [2.06]</td>
<td>1.13 [1.79]</td>
<td>(\chi^2(1)=0.14, p=.71) (\chi^2(1)=0.37, p=.54)</td>
</tr>
<tr>
<td>Psychiatric inpatient admission(^1)(^2)</td>
<td>5.92 [22.32]</td>
<td>6.22 [14.06]</td>
<td>5.57 [20.10]</td>
<td>5.82 [18.99]</td>
<td>(\chi^2(1)=3.09, p=.08) (\chi^2(1)=3.49, p=.06)</td>
</tr>
<tr>
<td>Other hospital admissions(^1)</td>
<td>4.38 [7.45]</td>
<td>3.98 [8.89]</td>
<td>2.27 [5.31]</td>
<td>3.22 [7.03]</td>
<td>(\chi^2(1)=4.02, p=.05) (\chi^2(1)=4.34, p=.04)</td>
</tr>
</tbody>
</table>
*p<.05

^ primary outcomes \^secondary outcomes

1- Includes Mater MH Unit, and all mental health/ DSP/ DSH admissions to hospitals with a psychiatric unit (including Maitland, Tamworth, Taree, Morisset)

2- Includes any admissions to a general hospital (e.g. John Hunter Hospital, Belmont, Scone, Cessnock, Tomaree, etc) for any reason (including physical, mental health and DSP and DSH), admissions to CMN- other (not DSP), and admissions to hospital with psychiatric units (including Maitland, Tamworth, Taree, Morisset, etc) for physical diagnoses.

3- (Ref cat= Int cohort)= (Reference category= Intervention cohort).
Figure 5.3: Total number of admissions by admission type and cohort group

Figure 5.4: Total number of bed days by admission type
5.3.6. Intervention cohort within-subjects sub-group analyses

**Intervention cohort - participant flow and exposure to intervention**

As can be seen in Figure 5.5, there were a total of 863 index CMN admissions during the intervention cohort period, of which 821 admissions met eligibility criteria for the WBSS evaluation study.

Of those 821, 158 potential referrals were not progressed to WBSS by the hospital referrer (safety concerns for WBSS staff was the most frequent reason recorded), resulting in a total of 663 eligible referrals during the study period (i.e. 81% of eligible CMN admissions).

Of those 663 people who were referred to the service, 477 received some level of support from WBSS; representing 72% of those referred to the service and 58% of the available cohort.

However, 186 people (28% of eligible referrals) did not receive community WBSS support. Half of these people declined the WBSS (because they were well supported or not interested), a third (31%) initially agreed to WBSS whilst in hospital but were not contactable after discharge and a fifth (19%) felt the WBSS was not suitable for their needs.

Of those who received support from the WBSS (n=477), 38%, 38% and 25% people were engaged with the service for 6 weeks, 6-12 weeks, and 12+ weeks respectively (n=180, 179 and 118).

**Intervention cohort participant characteristics by WBSS exposure**

There were some differences in demographic and clinical characteristic across WBSS exposure sub-groups. See Table 5.4 for details.

Men represented 37% of the intervention cohort overall. However, they comprised 56% of the group whose referrals to WBSS were not progressed (i.e. deemed ineligible for service by referrer) and 40% of those with no exposure to WBSS (i.e. largely representing those who self-selected out of receiving support).

Although there was a significant difference in average age across the WBSS exposure sub-groups, with those exposed to more than 12 weeks having the highest average age of 41.63 years ($F(4, 815)= 3.08, p=.02$), the greatest absolute difference between oldest and youngest sub-groups was not large (6 years).

There were no significant differences in the proportion of people who identified as Aboriginal or Torres Strait Islander across the intervention exposure groups ($\chi^2(4)=4.88, p=0.33$).
Figure 5.5: Intervention cohort flow diagram

CMN DSH admissions\(^1\) in study period
(April 2016-September 2017)
\(n=863\)

- **DSH admissions**
  - \(n=17\)

DSP admissions
\(n=846\)

Out-of-area admissions
\(n=25\)

WBSS Intervention Cohort
\(n=821\)

WBSS referrals
\(n=663\)

Not referred (ineligible or other)
\(n=158\)
- 64 x unknown
- 41 x safety concerns
- 17 x not suicidal intent (consumer)
- 15 x out-of-area
- 15 x not suitable (clinical complexity indicators)
- 6 x not DSP (clinician)

No WBSS support provided
\(n=186\)
- 93 x declined\(^2\)
- 57 x unable to be contacted
- 36 x service not suitable\(^3\)

WBSS support provided
\(n=477\)

Low: <6 wks support
\(n=180\)

Medium: 6-12 wks support
\(n=179\)

High: 3+mths support\(^4\)
\(n=118\)

Any CMN DSP readmission
\(n=18\) (11%)

Any Psych inpatient adm
\(n=35\) (22%)

Any CMN DSP readmission
\(n=29\) (16%)

Any Psych inpatient adm
\(n=49\) (26%)

Any CMN DSP readmission
\(n=15\) (8%)

Any Psych inpatient adm
\(n=29\) (16%)

Any CMN DSP readmission
\(n=23\) (13%)

Any Psych inpatient adm
\(n=32\) (18%)

Any CMN DSP readmission
\(n=23\) (20%)

Any Psych inpatient adm
\(n=32\) (27%)
Figure 5.5: Notes

*1= All numbers refer to persons (not episodes), first episode treated as index admission.

*2= Includes declined because well supported & declined because not interested

*3= Includes person denies suicidal intent, not deliberate self-poisoning, complexity indicators, safety concerns

*4= Possible when people were referred more than once
Table 5.4. *Intervention cohort participant characteristics – Within-group sub-analyses*

<table>
<thead>
<tr>
<th></th>
<th>No WBSS exposure</th>
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<td>Low- &lt;6 wks</td>
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<td>Med- 6-12 wks</td>
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<td>n=179</td>
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<td>High- 12+ wks</td>
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<td>n=118</td>
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<td>Overall</td>
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<tr>
<td>Gender</td>
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</tr>
<tr>
<td>Males</td>
<td>89 (56%)</td>
<td>120 (67%)</td>
<td>54 (36%)</td>
<td>28 (24%)</td>
<td></td>
<td>306 (37%)</td>
</tr>
<tr>
<td>Females</td>
<td>69 (44%)</td>
<td>111 (60%)</td>
<td>60 (33%)</td>
<td>90 (76%)</td>
<td></td>
<td>515 (63%)</td>
</tr>
<tr>
<td>Age Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;18 years</td>
<td>5 (3%)</td>
<td>19 (11%)</td>
<td>15 (8%)</td>
<td>5 (4%)</td>
<td></td>
<td>58 (7%)</td>
</tr>
<tr>
<td>18-25 years</td>
<td>41 (26%)</td>
<td>53 (29%)</td>
<td>43 (24%)</td>
<td>23 (20%)</td>
<td></td>
<td>208 (25%)</td>
</tr>
<tr>
<td>26-45 years</td>
<td>70 (44%)</td>
<td>58 (32%)</td>
<td>70 (39%)</td>
<td>39 (33%)</td>
<td></td>
<td>311 (38%)</td>
</tr>
<tr>
<td>46-65 years</td>
<td>30 (19%)</td>
<td>39 (22%)</td>
<td>46 (26%)</td>
<td>41 (35%)</td>
<td></td>
<td>195 (24%)</td>
</tr>
<tr>
<td>66+ years</td>
<td>12 (8%)</td>
<td>11 (6%)</td>
<td>11 (6%)</td>
<td>10 (9%)</td>
<td></td>
<td>49 (6%)</td>
</tr>
<tr>
<td></td>
<td>Average age (SD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>37.09 (15.71)</td>
<td>35.45 (16.73)</td>
<td>36.07 (14.76)</td>
<td>41.63 (16.52)</td>
<td></td>
<td>37.06 (16.04)</td>
</tr>
<tr>
<td></td>
<td>Range</td>
<td>16-89</td>
<td>16-93</td>
<td>16-92</td>
<td>16-87</td>
<td>16-93</td>
</tr>
<tr>
<td>Cultural Identity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non Indigenous</td>
<td>133 (84%)</td>
<td>163 (91%)</td>
<td>158 (88%)</td>
<td>108 (91%)</td>
<td></td>
<td>724 (88%)</td>
</tr>
<tr>
<td>Indigenous</td>
<td>25 (16%)</td>
<td>17 (9%)</td>
<td>21 (12%)</td>
<td>10 (9%)</td>
<td></td>
<td>97 (12%)</td>
</tr>
<tr>
<td>Length of stay - in hours</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>19</td>
<td>22</td>
<td>19</td>
<td>19</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>Interquartile range</td>
<td>21</td>
<td>20</td>
<td>26</td>
<td>20</td>
<td></td>
<td>21</td>
</tr>
<tr>
<td>Mode of separation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discharge home</td>
<td>95 (60%)</td>
<td>132 (73%)</td>
<td>136 (76%)</td>
<td>77 (65%)</td>
<td></td>
<td>549 (67%)</td>
</tr>
<tr>
<td>Discharge own risk</td>
<td>1 (0.6%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td></td>
<td>1 (0.5%)</td>
</tr>
<tr>
<td>Transfer- other hospital(^1)</td>
<td>10 (6%)</td>
<td>11 (6%)</td>
<td>7 (4%)</td>
<td>9 (8%)</td>
<td></td>
<td>50 (5%)</td>
</tr>
<tr>
<td>Transfer for assessment to public psych hospital</td>
<td>50 (32%)</td>
<td>27 (20%)</td>
<td>36 (20%)</td>
<td>32 (27%)</td>
<td>217 (26%)</td>
<td></td>
</tr>
<tr>
<td>Admitted to public psych hospital(^2)</td>
<td>34 (68%)</td>
<td>28 (76%)</td>
<td>28 (78%)</td>
<td>25 (78%)</td>
<td>104 (76%)</td>
<td></td>
</tr>
<tr>
<td>Death</td>
<td>2 (1%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td></td>
<td>4 (0.5%)</td>
</tr>
</tbody>
</table>
*1- Included transfers from private psychiatric hospital, general hospital, and other wards.

*2- Is a subset of transferred for assessment to public psychiatric hospital. Identified by time to first admission <1 and mode of separation for index admission being 'transferred to public psychiatric hospital'. The percentages reflect the proportion of people admitted out of those who were transferred for assessment.

*3- Comparison of collapsed categories: Discharged home (including discharged at own risk), other (including transfer- other hospital, death) and transferred for assessment to public psychiatric hospital'.
There were significant differences across the WBSS exposure sub-groups for discharge destination following the index admission ($\chi^2(8) = 19.28$, p 0.01). Those within the **not referred** (32%), **no exposure** (33%) and **high** WBSS exposure (27%) were most commonly transferred to the psychiatric hospital for assessment on discharge from CMN. Those within the **not referred** (60%), **no exposure** (59%) and **high** WBSS exposure (65%) were the least commonly discharged home from CMN.

**Outcomes by level of exposure to WBSS**

Overall, 13% of the intervention cohort were readmitted to Calvary Mater Newcastle for deliberate self-poisoning in the 12 months follow-up period. There was some variability in deliberate self-poisoning repetition by level of exposure; the greatest proportion of people who had any deliberate self-poisoning readmission were those in the **high** WBSS exposure (20%) and the **no exposure** sub-groups (16%). See Table 5.5 and Figure 5.6.

The **high** WBSS exposure sub-group also had significantly higher deliberate self-poisoning repetition event rates compared to all other sub-groups.

However, there was no overall significant difference in the median length of stay for deliberate self-poisoning readmissions across intervention exposure sub-groups. See Table 5.5 and Figure 5.7 and 5.8.

A similar pattern was apparent for psychiatric inpatient admissions. The highest proportion of participants with any psychiatric inpatient admission were seen for the **high** WBSS exposure (27%) and **no exposure** sub-groups (26%). The highest psychiatric inpatient admission event rates were also for the **high** WBSS exposure and both the **not referred** and **no exposure** sub-groups. There were no overall differences in median length of stay by WBSS exposure for psychiatric inpatient admissions. See Table 5.5 for details.

Nearly one-quarter (24%) of the intervention cohort had other general hospital admissions in the 12 months follow-up period, with no overall significant differences in the proportion by WBSS exposure sub-group. The highest general hospital admission event rates were for the **high** WBSS exposure and **not referred** sub-groups. There was no difference in overall median length of stay by WBSS exposure sub-group.

Overall, 17% of the intervention cohort had an admission for deliberate self-harm within any facility during the 12 months follow-up; the **high** WBSS exposure (22%) and **no exposure** (22%) sub-groups had the highest proportions. The **high** WBSS exposure, **not referred** and **no exposure** sub-groups had the highest deliberate self-harm repetition event rates. There were significant overall differences across sub-groups for median length of stay for deliberate self-harm admissions; with the **not referred** and **no exposure** sub-groups having the longest admissions (median= 1.6 days [IQR-3.15] ). See Table A2 in Appendix D for details.
### Table 5.5. Intervention cohort within subjects sub-group analyses- Admissions within 12 months of index admission

<table>
<thead>
<tr>
<th>Type of admission</th>
<th>No WBSS exposure</th>
<th>WBSS exposure</th>
<th>Overall</th>
<th>Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not referred</td>
<td>No exposure</td>
<td>Low- &lt;6 wks</td>
<td>Med- 6-12 wks</td>
</tr>
<tr>
<td></td>
<td>n=158</td>
<td>n=186</td>
<td>n=180</td>
<td>n=179</td>
</tr>
<tr>
<td>Repetition proportion: % with any admission of that type in 12 mth follow-up period</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any CMN DSP readmission*</td>
<td>18 (11%)</td>
<td>29 (16%)</td>
<td>15 (8%)</td>
<td>23 (13%)</td>
</tr>
<tr>
<td>Any psychiatric inpatient admission$^1$</td>
<td>35 (22%)</td>
<td>49 (26%)</td>
<td>29 (16%)</td>
<td>32 (18%)</td>
</tr>
<tr>
<td>Any other hospital admission$^2$</td>
<td>43 (27%)</td>
<td>43 (23%)</td>
<td>37 (21%)</td>
<td>38 (21%)</td>
</tr>
<tr>
<td>Total number of admissions in 12 mth follow-up period; Incident Rate Ratio [95% Confidence Interval], Ref category= High exposure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CMN DSP readmissions*</td>
<td>23 [0.36 [0.22-0.59]*</td>
<td>45 [0.60 [0.40-0.80]*</td>
<td>19 [0.26 [0.15-0.44]*</td>
<td>29 [0.40 [0.25-0.63]*</td>
</tr>
<tr>
<td>Psychiatric inpatient admissions$^1$</td>
<td>64 [0.73 [0.52-1.04]</td>
<td>99 [0.97 [0.71-1.30]</td>
<td>42 [0.42 [0.29-0.62]*</td>
<td>42 [0.43 [0.29-0.63]*</td>
</tr>
<tr>
<td>Other hospital admissions$^2$</td>
<td>94 [0.95 [0.70-1.29]</td>
<td>81 [0.69 [0.51-0.95]*</td>
<td>54 [0.48 [0.34-0.68]*</td>
<td>74 [0.66 [0.48-0.91]*</td>
</tr>
<tr>
<td>Total number of bed days in 12 mth follow-up period; Median LoS [IQR] for those with any admission of that type</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*CMN DSP readmissions

$^1$Psychiatric inpatient admissions

$^2$Other hospital admissions

LoS: Length of Stay

IQR: Interquartile Range

**Note:** A chi-square test was used to determine if there were significant differences in the repetition proportion of admissions between the groups. The significance level for all tests was set at p<.05.
*p<.05

^ primary outcomes ˅secondary outcomes

1- Includes Mater MH Unit, and all mental health/ DSP/ DSH admissions to hospitals with a psychiatric unit (including Maitland, Tamworth, Taree, Morisset)

2- Includes any admissions to a general hospital (e.g. John Hunter Hospital, Belmont, Scone, Cessnock, Tomaree, etc) for any reason (including physical, mental health and DSP and DSH), admissions to CMN- other (not DSP), and admissions to hospital with psychiatric units (including Maitland, Tamworth, Taree, Morisset, etc) for physical diagnoses.
Figure 5.6: Proportion of participants with any admission in the follow-up period by admission type and WBSS exposure
Figure 5.7: Number of admissions in follow-up period by admission type and WBSS exposure sub-group

Figure 5.8: Number of bed days recorded in follow up period by admission type and WBSS exposure sub-group
5.3.7. Per protocol analyses

Per protocol analyses comparing outcomes for those exposed to the WBSS (n=477) with the control cohorts are displayed in Table 5.6.

In summary, there were no significant differences in the proportion of participants with any deliberate self-poisoning readmission (CC1= 14%, CC2= 13%; WBSS exposed= 13%), or deliberate self-poisoning repetition event rates (CC1= 163/739, CC2=118/710, WBSS exposed=96/477), or in the length of stay associated with these admissions (median= 1 day, IQR= 1.39).

There were also no significant differences in the proportion of participants with any psychiatric inpatient admission (CC1= 18%, CC2= 18%; WBSS exposed= 20%), psychiatric admission event rates (CC1= 238/739, CC2=207/710, WBSS exposed=149/477), or length of stay associated with these admissions (median= 6 days, IQR= 17.90).

There were also no significant differences in the proportion of participants with other general hospital admissions (CC1= 19%, CC2= 20%; WBSS exposed= 23%), general hospital other admission event rates (CC1= 269/739, CC2=262/710, WBSS exposed=202/477), or length of stay associated with these admissions (median= 3 days, IQR= 7.34).
### Table 5.6. Per protocol analysis - Admissions within 12 months of index admission

<table>
<thead>
<tr>
<th>Type of admission</th>
<th>Control cohort 1 (n=739)</th>
<th>Control cohort 2 (n=710)</th>
<th>WBSS exposed cohort (n=477)</th>
<th>Overall</th>
<th>Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repetition proportion: Number (%) with any admission of that type in 12 mth follow-up period</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any CMN DSP readmission^</td>
<td>102 (14%)</td>
<td>86 (12%)</td>
<td>61 (13%)</td>
<td>249 (13%)</td>
<td>χ²(1)=0.26, p=.62  χ²(1)=0.12, p=.73</td>
</tr>
<tr>
<td>Any psychiatric inpatient admission^</td>
<td>133 (18%)</td>
<td>126 (18%)</td>
<td>93 (20%)</td>
<td>352 (18%)</td>
<td>χ²(1)=0.43, p=.51  χ²(1)=0.58, p=.45</td>
</tr>
<tr>
<td>Any other hospital admission^</td>
<td>142 (19%)</td>
<td>141 (20%)</td>
<td>108 (23%)</td>
<td>391 (20%)</td>
<td>χ²(1)=2.08, p=.15  χ²(1)=1.33, p=.25</td>
</tr>
<tr>
<td>Total number of admissions in 12 mth follow-up period</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CMN DSP readmission^</td>
<td>163</td>
<td>118</td>
<td>96</td>
<td>377</td>
<td>1.10 [0.85-1.41]  0.82 [0.63-1.08]</td>
</tr>
<tr>
<td>Psychiatric inpatient admission^</td>
<td>238</td>
<td>207</td>
<td>149</td>
<td>594</td>
<td>1.03 [0.84-1.27]  0.93 [0.76-1.15]</td>
</tr>
<tr>
<td>Other hospital admissions^</td>
<td>269</td>
<td>262</td>
<td>202</td>
<td>733</td>
<td>0.86 [0.72-1.03]  0.87 [0.73-1.05]</td>
</tr>
<tr>
<td>Median LoS [IQR] for those with any admission of that type; Total number of bed days in 12 mth follow-up period</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CMN DSP readmission^</td>
<td>1.05 [1.57, 217]</td>
<td>1.12 [1.57, 180]</td>
<td>1.07 [0.81, 122]</td>
<td>1.07 [1.39, 519]</td>
<td>χ²(1)=0.25, p=.62  χ²(1)=0.11, p=.73</td>
</tr>
<tr>
<td>Psychiatric inpatient admission^</td>
<td>5.92 [22.32, 3359]</td>
<td>6.22 [14.06, 1888]</td>
<td>4.76 [17.07, 1506]</td>
<td>5.88 [17.90, 6753]</td>
<td>χ²(1)=0.41, p=.52  χ²(1)=0.52, p=.45</td>
</tr>
<tr>
<td>Other hospital admissions^</td>
<td>4.38 [7.45, 1101]</td>
<td>3.98 [8.89, 1095]</td>
<td>2.27 [4.66, 648]</td>
<td>3.45 [7.34, 2844]</td>
<td>χ²(1)=0.77, p=.38  χ²(1)=1.02, p=.31</td>
</tr>
</tbody>
</table>
*p < .05

^ primary outcomes ˅ secondary outcomes

1. Includes Mater MH Unit, and all mental health/ DSP/ DSH admissions to hospitals with a psychiatric unit (including Maitland, Tamworth, Taree, Morisset).

2. Includes any admissions to a general hospital (e.g. John Hunter Hospital, Belmont, Scone, Cessnock, Tomaree, etc) for any reason (including physical, mental health and DSP and DSH), admissions to CMN- other (not DSP), and admissions to hospital with psychiatric units (including Maitland, Tamworth, Taree, Morisset, etc) for physical diagnoses.
5.4. Discussion

5.4.1. Intention-to-Treat Analysis Key Findings

Cohort Comparisons

**Key Findings:**
There were no substantial differences in participant characteristics across cohorts.

The similarity of the two historical and one intervention cohort(s) on key demographic and clinical variables (e.g. gender, age group, referral source, discharge destination) suggests that comparison of outcomes for these cohorts was appropriate for testing of effectiveness.

The modest increase in proportion of people identified as Aboriginal or Torres Strait Islander in the intervention cohort may be “real”, but is more likely due to improved administrative processes; where Indigeneity is specifically enquired about and training has occurred to ensure organisational and individual responses are culturally inclusive and welcoming.

While the length of stay (in hours) at CMN hospital for the index admission significantly increased across the cohorts, the absolute increase in median length of stay was only by two hours. The proportion of people discharged home and transferred to the public psychiatric hospital for assessment was also similar across cohorts, however the proportion of people who were discharged to the public psychiatric hospital for assessment and subsequently admitted was higher for the intervention and second control cohorts compared to the first control cohort (60% vs 76% vs 76%).

**Implication:**
The historical control cohorts and the intervention cohort showed no substantial imbalances at baseline and so comparisons are appropriate to evaluate effectiveness.
Primary Outcomes - Intention to treat analysis

Key Findings:
The analysis showed no significant differences between cohorts in the proportion of people who had any deliberate self-poisoning readmission in the twelve months following the index admission.

There was also no significant reduction in the number of deliberate self-poisoning readmissions for the intervention cohort compared to the historical control cohorts.

The intention-to-treat analysis showed no significant differences between cohorts in the proportion of participants with a deliberate self-poisoning readmission in the twelve months following the index admission, or in the number of deliberate self-poisoning readmissions recorded for each cohort.

It is also worth noting that the rate of repetition across control cohorts was 13%. This was slightly less than the estimated rate of 15% used in the sample size calculation. However, maintaining the principle that a 5% absolute reduction (from 13% to 8% repetition) would be clinically meaningful, then the sample size required would be 589 participants per group. This sample size was exceeded across cohorts.

Based on this analysis, the intervention was not associated with reduced repetition of deliberate self-poisoning or fewer episodes of hospital-treated deliberate self-poisoning, and so showed no benefit with regard to reducing these key suicidal behaviour outcomes.

Implication
The intervention showed no significant reduction in suicidal behaviour outcomes in the 12 month follow-up period.
Secondary Outcomes- Intention to treat analysis

**Key Findings:**
The median length of stay for deliberate self-poisoning readmission did not differ across cohorts.

There was no reduction in length of stay for readmissions for deliberate self-poisoning. This is unsurprising given the very short length of stay that is characteristic of CMN HATS admissions of less than 20 hours (median).

**Key Findings:**
Within the intervention cohort, there was a higher proportion of people with any psychiatric inpatient admission compared to the control cohorts, however this difference was not significant.

The intervention cohort also had significantly more psychiatric inpatient admissions than control cohort 2; and, non-significantly, more psychiatric inpatient admissions than control cohort 1.

There was no difference in median length of stay for psychiatric admissions.

There was no reduction in psychiatric admissions for the intervention cohort, and contrary to expectations, there was a suggestion of increased utilisation of psychiatric admissions. There was no significant difference in duration of psychiatric admissions.

These results were for secondary outcomes of the study and should be considered as essentially hypothesis-raising. If this apparent increase in psychiatric inpatient utilisation is associated with the WBSS intervention, then speculation on possible mechanisms for this effect is warranted.

There may have been an effect of the safety planning component of the WBSS intervention, which usually encourages client presentation at hospital for assistance when suicidal and after other avenues of support have been exhausted. There were also other programs which came online during the intervention period within the service’s catchment area (e.g. Hunter New England Mental Health Service- Acute Care Team and Lifespan interventions in the Newcastle local government area), which also endorsed safety planning. However, safety planning also discourages suicidal behaviours like deliberate self-poisoning, which did not show any reduction. How exposure to safety planning and/ or exposure to WBSS might increase some clients’ help-seeking behaviours without decreasing suicidal behaviours is a question for future investigation.

Further exploration of these results would be useful in order to explore possible mechanisms. In the first instance, qualitative studies of consumers, family members and
service providers could be conducted to better understand what might be behind the increased psychiatric admissions; as well as exploration as to whether this pattern has been noted in other WBSS or aftercare services.

If this finding does appear to be related to the WBSS intervention or increased activation of safety plans, future development, deployment and evaluations of interventions similar to WBSS need to consider the implications of cost, service availability and staff training, required for possible increased psychiatric hospital inpatient utilisation.

**Implication**

The WBSS intervention was not associated with reduced psychiatric inpatient admissions in the 12 months following the index admission.

The possibility of increased psychiatric admissions associated with the intervention cohort was unexpected and needs further consideration in any future development of the WBSS.
Other Outcomes (General Hospital) - Intention to treat analysis

**Key Findings:**
The intervention cohort had a significant increase in the proportion of participants who had a general hospital admission in the 12 month follow-up period compared to control cohort 1, and a non-significant increased proportion compared to control cohort 2.

There was also a significantly increased event rate of general hospital admissions for the intervention cohort; while the median length of stay for general hospital admissions was shorter for the intervention cohort.

The other outcomes based on general hospital admissions were *post hoc* analyses and should be treated with appropriate caution. These results should only be considered as hypothesis-raising.

The intervention cohort had an apparent increased general hospital admission utilisation, with an apparent shorter length of stay. The rates of general hospital utilisation by these cohorts was previously not known and so producing these estimates of the substantial use of this clinical resource by this clinical population is an important finding. It is possible that WBSS exposure may have been underlying these factors (e.g. through increased recognition of clients’ health issues and validation of help-seeking); however, it is also possible that other factors (e.g. changes in hospital admission patterns) underlie this finding.

Further exploration of these results would be useful in order to explore possible mechanisms including the degree to which the finding is associated with WBSS exposure.

If an association is found, as above, future development, deployment and evaluations of interventions similar to WBSS need to consider the implications of cost, service availability and staff training, required for possible increased general hospital utilisation by this population.

**Implication**

General hospital utilisation by this clinical population was substantial.

The intervention cohort had increased utilisation of general hospital admissions in the 12 months follow-up, with an apparent shorter length of stay.

These implications warrant further consideration and investigation.
Other Findings: Admissions for Deliberate Self-Harm

Key Findings:
The pattern of results were similar when a broader outcome of ‘admissions for deliberate self-harm at any facility’ was applied.

The findings that used any hospital admissions for deliberate self-harm as an outcome were post hoc analyses and should be treated with the appropriate caution. These results should only be considered as hypothesis-raising.

The results were consistent with the primary analyses. Deliberate self-poisoning is by far the most common form of hospital-treated self-harm. The evaluation estimates for deliberate self-harm were only incrementally different compared to those for deliberate self-poisoning, representing the addition of a small number of deliberate self-injury admissions to the deliberate self-poisoning estimates reported in the primary outcomes. The result helps to confirm the validity of using CMN deliberate self-poisoning readmissions as a reliable indicator of deliberate self-harm repetition.

Implication
The intervention showed no benefit in reducing this 12-month follow-up of a broader index for self-harm hospital admissions.
Other Findings: Admissions in 12 Months after a DSP Hospital Admission

**Key Findings:**
Across all cohorts, a total of 12,717 hospital bed days were utilised during the 12 month follow-up period.

The majority of days were accounted for by psychiatric inpatient admissions.

A total of 2,101 admissions requiring 12,717 hospital bed days for 878 individuals were recorded in the 12 month follow-up period. This represents an average of 5 hospital bed days per participant (whole sample) or 14 hospital bed days for the proportion of the sample who had any admission; with the majority of bed days associated with psychiatric inpatient care. These numbers highlight the extent and cost of hospital inpatient utilisation by this clinical population.

Interventions need to be developed and evaluated with the aim of reducing the need for and utilisation of these hospital services.

**Implication**
Reducing the need for all types of admissions in the 12 months following hospital-treated deliberate self-poisoning remains a high priority.
5.4.2. Intervention Cohort Within-Subjects Analysis by WBSS exposure Sub-groups: Key Findings

Primary, Secondary and Other Outcomes by Exposure to the Intervention

Key Finding:
Those who had high WBSS exposure (12+ weeks of WBSS support) had the most admissions of any type.

The intervention cohort within-subjects sub-group analyses provided an opportunity to explore whether outcomes differed by level of exposure to the intervention. These analyses and the reported associations should be considered as exploratory and hypothesis generating.

It is also important to understand that high WBSS exposure and hospital-treated deliberate self-poisoning outcomes (and possibly other outcomes) are not independent of each other. The maximum WBSS exposure for a single episode of hospital-treated deliberate self-poisoning was 12 weeks, so in order to be classified as high WBSS exposure (12+ weeks of WBSS support) a WBSS client would need to have more than one episode of hospital-treated deliberate self-poisoning and accepted subsequent WBSS re-referrals.

In short, the no exposure sub-group and the high WBSS exposure sub-group tended to have the highest rates of hospital-treated deliberate self-poisoning repetition and psychiatric inpatient admissions.

The not referred sub-group and the high WBSS exposure sub-group tended to have the highest rates of general hospital admissions.

The low and medium WBSS exposure sub-groups tended to have lowest rates of hospital-treated deliberate self-poisoning repetition, psychiatric inpatient admissions and general hospital admissions.

We suggest these associations are probably best explained by participant characteristics and participant self-selection in relation to WBSS exposure, rather than being a direct effect of the level of WBSS exposure. Specifically, it is likely that some clients with the highest need for clinical and support services accepted the referral to WBSS and maintained engagement for the full available period; whilst other participants with high clinical and support needs decided not to accept the engage with the WBSS or were not eligible for WBSS support. The low and medium exposure sub-groups might have also been influenced by these factors, such that the most optimistic interpretation of a beneficial effect of the WBSS exposure might be made for these two-sub-groups.

The lack of independence of the high WBSS exposure classification and hospital-treated deliberate self-poisoning repetition is also relevant to consider in interpreting these associations. Understanding more about the characteristics of the different sub-groups will be important to understanding who WBSS services are most beneficial for.
Implication

It is unknown whether exposure to the intervention is driving the differences in outcomes within the intervention cohort, although it is likely that the difference in outcomes is an artefact of participant characteristics and self-selection of WBSS exposure levels.

The high WBSS exposure sub-group clearly had high service utilisation and were able to be retained in the WBSS service.

A better understanding of the characteristics of the sub-groups of the target population will help inform who benefits most from the service model.
5.4.3. Per Protocol Analysis

Primary & Secondary Outcomes by Intervention Group (Exposed Only) and Historical Controls

Key Finding:
There were no significant differences for any outcomes between those exposed to the WBSS (low, medium and high sub-groups) compared to the historical control cohorts. It is important to note that this comparison may have been slightly underpowered as the WBSS exposed sub-group included only 477 participants. Thus appropriate caution should be used in interpreting these results.

There were no significant differences between the cohorts for any of the primary or secondary outcomes, including proportion of people with a deliberate self-poisoning readmission, number of deliberate self-poisoning readmissions, length of stay of deliberate self-poisoning readmissions, proportion of people with any psychiatric inpatient admission, number of psychiatric inpatient admissions and length of stay of psychiatric inpatient admissions.

Implication
The per protocol analyses did not show any significant differences in the primary or secondary outcomes.
5.4.5. Understanding the Findings

Understanding the Intention-to-Treat Analysis Findings: Intervention Exposure and Reach

**Key Findings:**
The intention-to-treat analysis did not demonstrate significant reductions in hospital admissions for deliberate self-poisoning, psychiatric inpatient stays or any other hospital admission types for the intervention cohort compared to the control cohorts.

However, intervention coverage within the intervention cohort was an issue.

Only 36% of the total intervention cohort received 6+ weeks of support from WBSS.

Intention-to-treat analysis compares outcomes across whole cohorts (i.e. all participants within a treatment arm), not just outcomes for the participants who received/engaged with the treatment. It is an approach that reduces bias in results and is an appropriate analysis to use in real world settings because it provides an indication of the degree to which allocating an intervention in practice is associated with benefits on a population level. In contrast, per protocol analyses provide an indication of effects for participants who engaged with the intervention.

Thus the capacity for an intervention to be associated with benefits in intention-to-treat analyses will be influenced by the degree to which all participants in the intervention arm were exposed to the treatment; and it is possible that intention-to-treat analyses will provide an underestimate of effect because it assumes that all people in the intervention arm received the intervention.

If it is accepted that six weeks represents a minimum ‘dose’ of the intervention likely to have an impact, then only 36% (n=295) of the intervention cohort received this level of exposure. Furthermore, of the 344 people who did not receive the WBSS intervention, the referral was not progressed (unsuitable for WBSS) for 158, or the participant declined the referral or accepted the initial referral but was non-contactable after discharge for 186 others.

This highlights that intervention reach was an issue, and may be a factor that contributed to the null findings. It highlights that those for whom service provision is deemed unsuitable and those who do not engage with the intervention may be critical sub-groups for whom there is capacity to reduce the need for hospitalisations.

Specific to the WBSS, a better understanding about why people declined the service, and what services/supports this group believe would be of value, would be useful to inform the design of future initiatives. For example, there may be alternate ways to frame the service invitation or shape the intervention that would result in greater participant acceptability and engagement.
Thus, the intention-to-treat analysis is valuable in understanding the impact of an intervention on a population level and from a pragmatic perspective (e.g. will introduction of this service reduce repetition rates?) but is useful to pair with per protocol analyses to understand whether intervention exposure is associated with benefits for those who engaged with the service.

**Implication**

- Intention-to-treat analysis compares outcomes across whole cohorts and can produce underestimates of effect if intervention coverage is not universal.
- Increasing intervention coverage or finding effective alternative interventions for the sub-groups who declined the WBSS service is a priority.
Understanding the Intervention Cohort Within-Subjects Sub-group Analyses: Intervention Exposure and Outcomes

**Key Findings:**
The intervention cohort within-subjects sub-group analyses showed that those with *no exposure* and those with *high WBSS exposure* had the most admissions.
This pattern of results is difficult to interpret and all explanations are speculative.

There are various interpretations that could be made of the intervention cohort within-subjects sub-group analyses. Our primary suggestion is that the findings suggest that there are people that have poorer outcomes (and higher needs) with regard to hospital admissions; and that some of these people will engage with the service and some will not.

It is possible that this pattern is a consequence of broader use of safety plans across the service system in the Hunter or that for some people engaged with the WBSS it resulted in increased use of hospital services for mental health (or other) crises.

It could alternatively be argued that intervention exposure was driving the better outcomes for those who received low and medium (up to 12 weeks WBSS support) levels of WBSS support (compared to the historical controls).

However, within this scenario, it is also important to note that exposure to the intervention may not be driving the outcomes but instead may reflect a person’s capacity and willingness to engage more broadly with services, which is associated with better recovery. That is, within each cohort there will be a sub-group of people who would ‘do better’ anyway, regardless of exposure to the intervention- and engagement with the intervention may be a reflection of this propensity rather than the causal factor underlying the better outcomes.

Thus, it is not possible to make conclusive statements about the relationship between intervention exposure and outcomes based on this study. Notwithstanding, the above findings raise the question about what the critical elements of aftercare are that drive better outcomes, as it may be that the group who received low and medium amounts of intervention exposure (up to 12 weeks WBSS support) are the subgroups who are best serviced by the WBSS service model.

**Implication**
It is not clear what is driving the pattern of more admissions for those with *no exposure* and *high WBSS exposure*.

A better understanding is needed regarding which critical components of aftercare drive reduction of suicidal behaviours.

A better understanding is also needed of the characteristics of people who engage (or not) with the service and the degree to which participant characteristics drive engagement with the service and/ or key outcomes, in order to identify which groups of people are most likely to benefit from a short-term non-clinical support service.
Understanding the Findings in Context

**Key Finding:**
For the intervention cohort, the study did not show a significant reduction in deliberate self-poisoning repetition or any other hospital admissions.

There was an unexpected increase in psychiatric inpatient admissions.

At a cohort level, there were no clear benefits for the intervention group with regard to fewer deliberate self-poisoning readmissions, psychiatric inpatient admissions or other hospital admissions and this warrants further consideration.

The rates of deliberate self-poisoning repetition for this study are within the range of repetition rates that have been previously reported in meta-analyses of international studies (Carroll et al., 2014) and are consistent with the level of variation reported across different time periods for the HATS deliberate self-poisoning population (Carter et al., 1999; Cater et al., 2002; Carter et al., 2005). Previous interventions demonstrating effectiveness for reducing repetition of hospital-treated deliberate self-harm have been evaluated in clinical populations with similar repetition rates (Hetrick et al., 2016; Milner et al., 2015), which suggests there was unlikely to be a floor effect, whereby any further reduction in rates would have been limited.

A variety of aftercare intervention models exist, with some shared and some unique characteristics. Duration of interventions range from a single contact point (green cards) (Evans, Evans, Morgan, Hayward, & Gunnell, 2005) to brief intervention close to hospital discharge and then 18 months telephone contact (Bertolote et al., 2010), or three psychological therapy sessions followed by regular letter contact over 24 months (Gysin-Maillart, Schwab, Soravia, Megert, & Michel, 2016). Some require no obligation on the participant to respond or interact with the intervention service (e.g. letters, postcards, green cards from a clinician) (Milner et al., 2015) or only very little two-way interaction (single telephone call from a clinician) (Vaiva et al., 2006). Others combine a single brief face-to-face psychological intervention followed by telephone contact on a regular schedule (Bertolote et al., 2010). Brief psychological interventions (as few as four sessions) delivered by a clinician, or longer periods of psychological or psychosocial therapies using multiple sessions, a variety of theoretical orientations, outreach and multilevel components (Hetrick et al., 2016) have also been used.

The WBSS was a novel intervention, which was designed as a non-clinical psychosocial support service delivered for up to three-month after hospital discharge for a suicide attempt. The service aims to address several recognised shortfalls in usual aftercare service delivery including; discontinuity from hospital to community care; a single contact point for support; and information or advice on a range of client needs beyond clinical services.

The WBSS model has some characteristics of other aftercare interventions, but was not specifically derived from any of them. We do not know what components of various
aftercare interventions contribute to effectiveness, however the WBSS uses both novel and familiar components.

The WBSS is delivered by non-clinical Support Coordinators under clinical supervision. Support Coordinators usually have multiple contacts with clients in a flexible but non-scheduled pattern that requires active participation by clients; a focus on safety planning and support planning; information and access to social, legal and educational resources; and encouragement to engage with planned clinical aftercare contacts from general practitioners, private psychologists, community mental health services, drug and alcohol services. We can speculate on possible effects of these components.

Most interventions that have identified a positive effect on repetition of suicidal behaviours through brief contact, psychological therapy, or assertive aftercare have utilised clinical staff. It is possible that benefits identified in other studies are a consequence of time spent with a clinician and that time spent with non-clinicians does not render the same benefits with regard to repetition of suicidal behaviours of hospital admissions.

Brief contact interventions have been shown to be effective (e.g. postcards, single telephone contact), and the proposed mechanisms of action are social support and improved suicide prevention literacy (Milner et al., 2016). These brief contact interventions impose little or no obligation on the client to respond or interact. While the WBSS intervention sought to improve social support and improve suicide prevention literacy, it required participants to be an active/engaged participant (e.g. keep appointments, answer the phone). Perhaps the obligatory interaction required might produce different effects, with some clients finding this level of interaction difficult and hence opting out of service early, or through re-traumatising effects of repeated support contacts, or by client dependence on the WBSS Support Coordinators leading to avoidance of other clinical aftercare services, or even continued suicidal behaviours to maintain contact with coordinators. Perhaps the most similar intervention model to WBSS would be the WHO Multisite Intervention Study on Suicidal Behaviors (SUPRE-MISS), which also showed no benefit for repetition of hospital-treated suicide attempts (Bertolote et al., 2010).

Understanding the services people were linked into is also important. The WBSS sought to encourage clients to maintain their hospital discharge plan for follow-up care with various clinical services, most commonly general practitioners, private psychologists, community mental health services, and drug and alcohol services. We have limited data on the level of services actually used by the intervention or control cohorts, so we cannot say whether any variation in follow-through with aftercare discharge planning was apparent across cohorts. While the process evaluation suggests that people were linked into more services over the period of time they were engaged with the WBSS, we do not know whether the type or number of services people they were linked into were different for those in the intervention cohort compared to the control cohorts, or whether there was a difference in service connections between those supported by the WBSS and those who were not (the within-subjects sub-group comparisons).
We also cannot say whether the clinical aftercare services that WBSS clients engaged with delivered or used any evidence-based interventions, as would be needed to maximise the likelihood of reducing future suicidal behaviours.

General practitioner aftercare was frequently recommended across cohorts, however the evidence for general practice interventions to reduce suicidal behaviours overall is equivocal; and for repetition of hospital-treated suicide attempt, the limited evidence suggests there is probably no benefit (Milner et al., 2017). Clients diagnosed with Borderline Personality Disorder benefit in terms of repeated suicidal behaviours and psychological outcomes from various long-term interventions (Cristea et al., 2017). The Hunter New England Mental Health Service has provided a clinical service offering dialectical behaviour therapy since 2000 (Carter, Willcox, Lewin, Conrad, & Bendit, 2010). This service has been available across all three study cohorts, albeit with access limited by demand, resulting in a 12 month waiting list. Other effective interventions were likely to have had limited availability in usual clinical services across all three study cohorts (Hetrick et al., 2016; Milner et al., 2015). At the national population level, the availability of increased clinical care has also not been associated with a reduction in suicide mortality (Jorm, 2019). Thus, it might be more effective to increase the exposure to evidenced-based interventions for clinical aftercare rather than encouraging access to services that do not offer these interventions.

Furthermore, the effectiveness study also demonstrated an unexpected increase in psychiatric admissions in both the intention-to-treat analysis and for those with high WBSS exposure in the per protocol analysis. We can offer limited speculations on why this occurred, however this is a finding that requires further investigation in future studies. Improved help-seeking behaviour and suicide prevention literacy was hoped to be components of WBSS intervention model. One specific focus of the WBSS intervention model was safety planning, which was delivered to a high proportion of WBSS clients. The ultimate step in a safety plan usually involves presentation to hospital for assessment when suicidal ideation and planning cannot be reduced or modified by other techniques. Perhaps the WBSS clients were influenced to present to hospital more frequently and hence be admitted more frequently with suicidal ideation and planning. However, there was no effect on repeat hospital-treated self-poisoning or self-harm (which would have also been addressed in safety planning) and this does not account for why those with no exposure to the WBSS within the intervention cohort also had higher rates of admission.

Finally, the findings from this study need to be considered with regard to the other things that may have impacted on clinical service delivery at a cohort level. Two clear examples come to mind. The first is that the Acute Care Team within the Mental Health Service was introduced in December 2016 within the context of media coverage about suicides of people that had occurred while in the care of the Mental Health Service. The Acute Care Team provided coverage across the Hunter region, corresponding to the effectiveness study inception rule for residence and was established as a way of providing an alternative to psychiatric hospitalisation for those in need of acute care. It is possible that the introduction of this team or the context for the introduction of the team (local focus on the nature of care provided by the Mental Health Service) changed the way the Mental Health Service managed acute presentations and/ or bed availability- both of which may have influenced
the rate and number of psychiatric inpatient admissions. However, the intention in the introduction of this service was to reduce the number of (unwarranted) psychiatric inpatient admissions.

The other service change at the cohort level was that the LifeSpan integrated suicide prevention trial commenced in October 2016, across the Newcastle local government area, with implementation commencing in April 2017.

Relevant activities conducted up to October 2018 included:

- Working with CMN Emergency Department to complete a self-audit of current practice against best practice guidelines for support of a person who are suicidal in the emergency and acute care setting;
- Delivery of various clinical professional development activities (e.g. Advanced Training in Suicide Prevention, Collaborative Assessment and Management of Suicidality) to over 250 clinicians across various education events and initiatives;
- Approximately 1000 people completed community suicide prevention education training (Question, Persuade Refer or ASIST), that had a key message of “if a person is at acute risk of suicide, encourage and support them to go to hospital or link in with emergency services”.

Again, while the intention of these activities was to improve the care provided to people who are suicidal, including reducing the need for hospitalisations during suicidal crises, it is possible that these activities increased help-seeking by clients in unanticipated ways, resulting in impact at the cohort level.

**Implication**

The study did not demonstrate a significant reduction in hospital admissions for deliberate self-poisoning or other hospital admissions, indicating that further development and evaluation of the model is required to establish its effectiveness in achieving these outcomes.

The WBSS intervention model is a novel non-clinical intervention, which does not specifically include access to evidenced-based clinical interventions. Inclusion of evidenced-based interventions into the WBSS intervention model should be considered.

The WBSS was associated with increased psychiatric admissions. This might be mediated by the impact of safety planning on psychiatric admissions, which needs further evaluation in future studies.
5.4.6. Limitations

The use of a historical control cohort design rather than a randomised control design can result in potential biases. In particular, any changes in participant characteristics or service delivery characteristics, changes in suicidal behaviour rates at the underlying population level, or changes in hospital discharge data systems over the time period of the study might affect results. We used routine clinical data from the Local Health District to determine cohort inception rules and hospital admission outcomes, which could produce measurement errors resulting in misclassification of participants or outcomes.

Furthermore, the study was conducted for a given population of hospital-treated deliberate self-poisoning in the Hunter and the results may not be generalisable to other areas of Australia or other suicidal behaviour populations.

Within this study, we did not have the capacity to investigate potential mechanisms of action of the WBSS intervention model (e.g. whether intervention clients were linked into aftercare clinical services or other non-clinical services at a greater rate than controls) and so our interpretations of what may have accounted for any outcomes is entirely speculative.

As outlined in the Australian Healthcare Associates (2014) report for the Department of Health on the Development and implementation of an evaluation framework for suicide prevention activities, there are a number of challenges associated with evaluation of suicide prevention programs; and many are pertinent to this study. For example, large sample sizes are required to ensure adequate power to detect effects (relevant to the per protocol analysis), limited data availability regarding participant risk and protective factors or clinical and personal characteristics mean only broad population group differences can be investigated (we have noted the value of better understanding how participant characteristics may influence engagement with the service and suicidal behaviour outcomes), difficulties exist in attribution of effects because programs are delivered in a service system and community context (where changes external to the intervention may impact primary outcomes) (as per our commentary regarding other factors that may have influenced the cohort findings) and there is a need for methodologies that do not rely on traditional randomisation because of the ethical or pragmatic implications of this (noting the cohort study design).

However, it is important to note that even within this context, the findings from this study are valuable. The scientific rigour underpinning the effectiveness study provides clear next steps, and the approach taken to test the effectiveness of this ‘real-world’ intervention is of peer review quality. We believe the approach taken to evaluating this intervention demonstrates the importance of embedding good research and evaluation into suicide prevention initiatives and this should be the norm rather than the exception.
5.5. Conclusions

From this study, there was no evidence that the WBSS intervention was associated with a significant reduction in repetition of suicidal behaviours or hospital admissions for the intervention cohort compared to two historical cohorts.

It is also important to note that while (re)admissions for repeated suicide behaviour within 12 months of an index admission is an important clinical outcome, which allows for comparison with international studies; it may not reflect other symptomatic, quality of life and functional outcomes considered to be important by consumers.

Considering these findings, we recommend further development of the WBSS service delivery model taking into consideration the recommendations outlined in this report, and subsequent evaluation of the effectiveness of any revised model.
6. Key Findings, Conclusions and Recommendations

The Hunter trial of the Way Back Support Service demonstrated that:

1. It was feasible to integrate the WBSS into an existing service system (general hospital, psychiatric hospital, and various community services), including establishment of an integrated referral pathway which enabled the service to be routinely offered to the target population.

2. It was possible to establish and sustain a ‘scaled up’ WBSS with high throughput of clients and with continued high performance as measured by key performance indicators.

3. 80% (1280/1578) of referrals accepted the initial service offer.

4. There was attrition after initial engagement, with approximately 60% (960/1578) of referrals going on to receive WBSS support in the community.

5. The service was able to effectively support the population that remained engaged in the service, with direct client activity accounting for the majority of service activity; and phone contact allowed for a small staffing complement to support a large client base.

6. The target population had significant needs, as demonstrated through the number of client-identified unmet needs, levels of significant psychological distress at service commencement, and number of hospitalisations that occurred during the follow-up period.

7. Clients who remained engaged with the service were able to make meaningful progress towards identified goals, showing reduced unmet needs and psychological distress.

8. Clients who responded to the satisfaction survey reported a high level of service satisfaction.

9. There was no reduction in hospital-treated deliberate self-poisoning readmissions or related outcomes in the twelve months following the index admission were associated with the intervention.

10. There was an unexpected increase in psychiatric admission event rates for the intervention cohort.

Since the Hunter WBSS trial commenced, the Commonwealth government has committed to funding a national roll-out of the WBSS in partnership with State and Territory governments, recognising the need to better support people after a suicide attempt and the opportunity for support and prevention in the critical first few months after discharge from hospital for self-harm.

The results and recommendations of this evaluation should be carefully considered in the current national rollout of the WBSS.
Recommendations

Recommendation 1
For the WBSS service model to be improved, intervention coverage needs to be addressed by:

1.1. Using qualitative methods to consult with people who declined the initial invitation for intervention and those who initially agreed but later were not contactable and so did not engage with the service after discharge from hospital. This could help to identify service modifications that could improve the WBSS coverage of those sub-groups.

1.2. Consideration be given to broadening the non-clinical service model by incorporating universal brief contact interventions, which have been demonstrated to have some beneficial effect on repeat hospital-treated self-harm.

Recommendation 2
Effectiveness analyses showed no difference in repetition of hospital-treated deliberate self-poisoning, which was the key suicidal behaviour of interest. This suggests that despite substantial levels of engagement and high service satisfaction, a non-clinical care coordination model in addition to existing clinical service provision is not sufficient to reduce key suicidal behaviours at the clinical population level.

To better understand why, it is recommended that this be explored further. Specifically:

2.1. Engage in further research to better understand the degree to which WBSS support resulted in increased connections with the service system and the degree to which evidence-based interventions are available/provided within the existing service system in order to inform future service development.

2.2. Explore the characteristics of those who had high exposure to WBSS and who had multiple readmissions in order to better understand their needs. These people might have a high level of clinical complexity and require much more than a non-clinical intervention to modify suicidal behaviours. Both quantitative and qualitative methods would have merit in seeking to better understand the non-clinical and clinical requirements of this group.

2.3. Explore the characteristics of those who had exposure to the WBSS and had better outcomes in order to better understand the mechanisms of impact for this group. Both quantitative and qualitative methods would have merit in seeking to better understand the non-clinical and clinical requirements of this group.
2.4. Effectiveness analyses showed increased event rates for psychiatric hospitalisation associated with WBSS exposure. This result was unexpected and can be considered to be hypothesis generating, particularly with regard to *exploring the potential role that increased activation of safety plans may play in driving hospital presentations and subsequent admissions.*

**Recommendation 3**
Any changes or broadening of the model of care provided by WBSS should be accompanied by a testing of its effectiveness. Ultimately, this would best be done by a randomised controlled trial, although some developmental work would need to precede a full trial. Any regional or national rollout could be done using a stepped wedge design, which is a form of randomised controlled trial suitable for that situation.

**Recommendation 4**
For a non-clinical care coordination service to function well, integration with referring hospital services should be prioritised through:

4.1. Agreement with referring hospital services for **referrals to WBSS to be considered routinely** for all people admitted to hospital after self-harm.

4.2. The identification and development of processes, policies and procedures that support collaborative care across hospital and community service providers.

4.3. The establishment of **low-demand referral processes** for the referring hospital agents.

4.4. Agreements between the WBSS and referring hospital services about how WBSS can meet people while they are in hospital for their self-harm admission and/ or how “warm” hand-overs can be managed as part of routine care.

4.5. The identification of opportunities for close, professional relationships between the WBSS staff and relevant hospital services staff to be developed.

**Recommendation 5**
**Strong clinical governance is essential** as a ‘backbone’ to non-clinical care coordination. It is recommended that:

5.1. Lines of clinical responsibility and clinician support for WBSS support workers within the hospital setting are made clear.

5.2. A clear line of clinical responsibility and clinician support for WBSS Support Coordinators is established for community-based work, in order to ensure capacity for timely, coordinated acute clinical care when needed.

5.3. Local in-service and education opportunities be identified in order to enable clinical services to become familiar with the nature of non-clinical care coordination and its potential value.
Recommendation 6
To **improve service delivery of the existing model** it is recommended that:

6.1. **Additional alternative contact details** are collected at first contact (e.g. email address, alternative phone numbers) in order to reduce the proportion of people who are unable to be contacted after discharge from hospital.

6.2. **Flexibility in service delivery** is embedded within the model, including capacity for tailoring based on the needs of the local population.

Recommendation 7
**Quality assurance processes** can be improved by:

7.1. Identifying some **short standardised outcome measures** that can be integrated into routine service delivery that are acceptable to clients and provide capacity for comparison of outcomes with other relevant participant groups and other studies.

7.2. Establishing an **online portal for data collection** of routine outcome measures that can host and store outcome measures data, manage automated invitations to service users to complete measures on their phone/ electronic device and has a feedback loop for tracking of outcomes back to the service user, WBSS and, potentially, other relevant service providers.

Conclusions
This evaluation of the WBSS in the Hunter has demonstrated the capacity for the service to be scaled up, integrated with existing clinical services and for high quality service delivery to be maintained over time.

The data presented in this report lends support to the model’s acceptability as an after-hospital support service as demonstrated by the high throughput of clients, the service being well received by consumers who reported high levels of support, reported increases in connection with services over time, and observation of clinically meaningful improvements in clients’ well-being.

However, from this study, there was no evidence that the WBSS intervention was associated with significant reductions in repetition of suicidal behaviours or reduced hospital admissions.

We would recommend further development of the WBSS model of care, based on the recommendations outlined in this report, and subsequent evaluation of the revised model to determine the impact on repetition of suicidal behaviours.
6.1. Synthesis of Key Findings

In summary, the Hunter trial of the Way Back Support Service demonstrated that:

1. It was feasible to integrate the WBSS into an existing service system (general hospital, psychiatric hospital, and various community services), including establishment of an integrated referral pathway, which enabled the service to be routinely offered to the target population. See Chapter 3; Section 3.3.3; Table 3.2.

2. It was possible to establish and sustain a ‘scaled up’ WBSS with high throughput of clients and with continued high performance as measured by key performance indicators. See Chapter 3; Table 3.3.

3. 80% (1280/1578) of all referrals accepted the initial service offer. See Chapter 4; Figure 4.1.

4. There was attrition after initial engagement, with approximately 60% (960/1578) of referrals going on to receive WBSS support in the community. See Chapter 4; Figure 4.1.

5. The service was able to effectively support the population that remained engaged in the service, with direct client activity accounting for the majority of service activity; while phone contact permitted a small staffing complement to support a large client base. See Chapter 4; Section 4.3.2.

6. The target population had significant needs, as demonstrated by the number of client-identified unmet needs, levels of significant psychological distress at service commencement, and number of hospitalisations that occurred during the follow-up period. See Chapter 4; Table 4.3; Figure 4.7; Chapter 5; Table 5.3.

7. Clients who remained engaged with the service were able to make meaningful progress towards identified goals, showing reduced unmet needs and psychological distress. See Chapter 4; Section 4.3.3.

8. Clients who responded to the satisfaction survey reported a high level of service satisfaction. See Chapter 4; Section 4.3.4; Table 4.7.

9. There was no significant reduction in hospital-treated deliberate self-poisoning readmissions or related outcomes in the twelve months following the index admission were associated with the intervention. See Chapter 5; Table 5.3.

10. There was an unexpected increase in psychiatric admission event rates for the intervention cohort. See Chapter 5; Section 5.3.3.
6.2. Meeting the WBSS Service Delivery and Objectives

As outlined Section 2.1, the specific objectives of the Hunter WBSS service delivery trial were to modify, implement and evaluate the WBSS in NSW and ensure it:

a) Engaged participation in the WBSS with a particular focus on men (without excluding other population groups);

b) Supported individuals to stay safe and connect with essential services during a period of high risk and vulnerability;

c) Reduced the burden on supporting networks including family and carers;

d) Worked collaboratively with existing services/organisations and complemented current services by supporting attendance and by reducing the burden for follow-up care and support;

e) Provided direction or referral to service for a currently unmet need in the community;

f) Was cost-effective (in comparison to current systems and other health indicators), including providing economic benefits by preventing further attempts of suicide; and

g) Was a suitable model and could provide evidence to support further funding for rollout nationwide.

Overall, we believe that the trial met the aims and objectives of the service as outlined below.

a) Engaged participation in the service with a particular focus on men.

Service Activity data showed engagement targets were met. Whilst more women were referred to the service, this was proportionate to presentations to the hospital. Initial engagement rates were comparable across all genders suggesting the model was initially acceptable to both men and women.

b) Support an individual to stay safe and connect with essential services during a period of high risk and vulnerability.

Safety planning was implemented using a structured format in a timely manner. Support and oversight from the Clinical Advisor was integral to service delivery. Any client with a repeat self-harm event was discussed at case review and a clinical file review was undertaken by the Clinical Advisor noting potential risk considerations, potential referral services, and warning signs to monitor. Staff were also supported throughout their time with the service to attend workshops and engage in ongoing professional development particularly in suicide prevention.

c) Reduce the burden on supporting networks including family and carers.

Specific psychoeducation support groups were developed for family and carers by an external body via the Guiding Their Way Back Support Groups and this was investigated via a separate evaluation conducted by Everymind. The WBSS provided written information for carers as part of the Information Pack provided to all people who engaged with the service.
d) Worked collaboratively with existing services/organisations and complements current service offering by supporting attendance and by reducing the burden for follow-up care and support.

Connections with external services were tracked by the Support Coordinators throughout the trial period. This included logging the services the client was involved with at the time of their suicide attempt and the services they connected with in the 3 months after their attempt. Attendances were tracked based on client recall. The data showed a broadening of service domains that individuals were connecting with following their deliberate self-poisoning and during their time with WBSS. Targets were also met with regard to confirming a connection with a clinician following discharge from hospital (GP or mental health clinician).

e) Provided a service for a currently unmet need in the community.

Service connection data indicated that an estimated 38% of people engaged with WBSS (n=1280) reported being involved with the Community Mental Health Services. This highlights that a large proportion of people who presented with deliberate self-poisoning were discharged into the community with links to primary care services only (rather than tertiary mental health care services). The WBSS was able to establish high rates of connection with general practitioners as well as psychosocial support services. It offered a model of support and empathy during a time of increased risk whilst ensuring the appropriate connections were occurring within the community. Client feedback was supportive of the usefulness of such a service in the community.

f) Was cost-effective (in comparison to current systems and other health indicators) and will provide economic benefits by preventing further attempts of suicide.

This was not part of this study and will need to be examined through an economic evaluation.

g) Is a suitable model and can provide evidence to support further funding for roll-out nationwide.

The WBSS model is feasible to deliver at scale, acceptable to those clients who remain engaged, and able to work alongside established hospital services, community mental health services, general practitioners and integrate with other support services.

Engagement with WBSS showed a marked decline immediately after hospital discharge due to many people being uncontactable after discharge and a smaller proportion declining ongoing support because they were already engaged with other services (GP, Community mental health, psychologist etc.).

The effectiveness study did not demonstrate any benefit to participants with regard to the proportions who presented to hospital for a further deliberate self-poisoning event or the number of readmissions for deliberate self-poisoning in the twelve months following the index admission.
Thus, while the WBSS appeared to be able to engage a substantial proportion of the target population, filled a gap in the service system, and met the needs of, and was appreciated by, clients who had a level of ongoing engagement, it was not associated with a reduction in admissions for deliberate self-poisoning or mental health reasons.
6.3. Implementation Requirements for a National Roll-Out

Since the Hunter WBSS trial commenced, the Commonwealth government has committed to funding a national roll-out of the WBSS in partnership with State and Territory governments, recognising the need to better support people after a suicide attempt and the opportunity for support and prevention in the critical first few months after discharge from hospital for self-harm (Commonwealth Dept of Health, 2018). This national roll-out will be supported by Beyond Blue and Primary Health Networks across Australia and will include up to 25 services being established over a 3 year period.

The following points capture the perspective of the authors (including HPC, CMN and HNE MHS staff) regarding factors that we believe are important to consider in a national roll-out. They have been identified based on our experience with the Hunter trial and our understanding of the suicide prevention and health sectors. These points are not an exhaustive list of factors to consider, but provide some key priority issues worthy of consideration.
6.3.1. Barriers and enablers required to support large scale adoption of the Support Service nationwide

There are a number of barriers and enablers that we speculate may impact the adoption of the WBSS within specific settings. Where possible, we would recommend assessing the likelihood of these barriers within each proposed site and identifying mitigating strategies; as well as strengthening and leveraging off any enabling factors.

Potential Barriers

- Disjointed or poorly coordinated general hospital services for deliberate self-poisoning or self-harm.
- Little trust or existing relationship between service providers.
- Long-standing problems in the communication of information between service providers will not provide a strong foundation for convenient and integrated referral processes or feedback loops.
- Health workers/ administrators having a lack of understanding about the nature of non-clinical support and how it supports the existing service system and complements routine care for a priority population.
- Low perceived credibility of WBSS as a model, in light of the limited evidence base for this specific model of aftercare.
- Patient perceptions of the relevance/ value of non-clinical support coordination and the potential impact that needing active consumer participation may have on consumers’ interest in the engaging with the intervention.
- Extensive data capture and assessment procedures to evaluate service use and effectiveness may be impractical for many centres to embed within routine quality assurance practices.

Enablers

- Funding for WBSS service delivery.
- Emerging evidence-base about the effectiveness of aftercare for reducing self-harm repetition and suicide, including brief interventions, psychological therapies and assertive aftercare.
- Existing good partnerships between service providers.
- Low demand referral processes for the referring agent (e.g. hospital staff).
- Integration of patient engagement with WBSS without burden on hospital services.
- Processes & policies that support collaborative and team-based care across service providers.
- A model that incorporates strong, clinical governance, including WBSS capacity to respond to acute clinical situations.
- Executive sponsorship/ support from hospital and community services for a non-clinical support coordination service/ role.
- Flexible delivery model for WBSS e.g. face to face, phone, online, service or community-based.
- Funding for additional components of WBSS service delivery that may increase effectiveness or allow for tailoring.
6.3.2. Resourcing required to deliver the Support Service in other jurisdictions and locations

There are three critical areas that should be considered with regard to resourcing a wider dissemination of the model: site-level resourcing, central-level resourcing, and research and evaluation resourcing. It is our understanding that these factors will already have been scoped, but we provide some minimum suggestions for consideration.

Resourcing at a site level should include funding for:

- **WBSS workforce**: Support Coordinators (TAFE Diploma level), Operations Manager, Clinical Advisor, Administration Support, and Data Support.
- **Infrastructure**: a client management software, which is fit for purpose and has capacity to produce minimum data set compliant data as required for Primary Health Network (and other Commonwealth government funded) mental health programs.
- **Professional development activities**: to ensure the workforce has relevant specific expertise and understanding of issues relevant to supporting people who have attempted suicide.
- **Stakeholder engagement activities**: in-services, interagency meetings, written promotional material.
- **Communications material**: e.g. brochures, business cards, etc. to promote the service and ensure service information is accessible.

It may also be useful to consider making available some client support funds, particularly to assist with addressing practical barriers that can influence engagement with services (e.g. taxi fares to attend clinical appointments, funds for one-off child care arrangements, capacity to cover gap payments for private psychology providers).

We do not have the expertise to comprehensively scope what resourcing at the central (Beyond Blue or Primary Health Network) level may entail, but would suggest that the following be considered:

- **Workforce**: for liaison with state health, primary health networks, Commonwealth departments and with sites.
- **Infrastructure**: an online portal that all sites can access that stores core materials and provides an easy way for sites and central staff to communicate. Ideally, this online portal would also have the capacity to be used for data submission and feedback.
- **Professional development**: Beyond Blue staff are likely to be called upon to answer many and varied questions from site staff. It will be important to ensure that Central staff have the expertise and specific knowledge relevant to the types of queries for which they will be expected to show leadership on.
- **Communications**: there will be a range of materials that will/should be common across sites for which templates could be developed allowing sites to adapt as needed, and activities that could increase brand recognition that may assist engagement.
It may also be useful to consider ways to facilitate cross-site knowledge exchange and connection that goes beyond an online portal. This may include hosting professional development webinars, facilitating cross-site communities of practice, or presenting workshops specific to aftercare services at relevant events that WBSS staff might be attending (e.g. national suicide prevention conference).

Research and evaluation is a fundamental aspect of service delivery that is often not adequately planned and resourced. We would recommend that funds are set aside to ensure a strong evaluation of the national roll-out of the service, including monitoring of ‘hard’ clinical outcomes (e.g. repetition of self-harm), ideally using a rigorous clinical trial design. Other study types including qualitative studies with service providers and service users would also be useful. We also anticipate that there will be emerging questions that arise for which evidence should be reviewed to identify how to respond, and we would recommend that some funds are held aside to allow for capacity to do this.
6.3.3. Scale to which this model can be replicated

Overall, we believe that the service model (including an integrated referral pathway, WBSS staff embedded with hospital clinical services, and non-clinical Support Coordinators with supervision and support from Clinical Advisor) is able to be replicated elsewhere, when:

- Strong relationships with hospital and community services can be established;
- Processes and policies that support collaborative and team-based care (across providers/services) exist or can be established;
- There is good clinical governance and/or embedding of clinical access to support non-clinical staff to respond to acute situations;
- There is flexibility to tailor service delivery according to individual need and service demand.

When these characteristics are not in place, the capacity to which the model or scaling of the model can be replicated may be limited.

We would recommend that flexibility in service delivery needs to be incorporated into the model e.g. phone format was most often preferred by clients and provided capacity to support larger number of clients. However, in services with reduced throughout, increased face-to-face contact may be more possible or preferred by some service user groups.

Uptake for the family program managed and delivered by Everymind and Relationships Australia was low (not covered in this report). However, we believe that public health and other educational interventions focussed on mental health literacy and suicidal behaviours is potentially an important component of the program and a component that has a developing evidence base (Jorm et al., 2019; Nicholas et al., 2019; Nicholas, Rossetto, Jorm, Pirkis, & Reavley, 2018). Having a Family Worker sitting within the WBSS itself, rather than relying on external agencies might be considered as a way to increase utilisation of this component.
6.3.4. Settings that the model is transferable to

The service delivery trialled within Newcastle was specific to supporting people who had been admitted to CMN hospital after self-poisoning. However, we believe that the model could be relevant more broadly.

Specifically, we believe that the model would have capacity to be deployed where the primary referring agents were public hospitals, as well as psychiatric emergency centres and psychiatric inpatient units involved in the treatment of any patients with deliberate self-poisoning, deliberate self-harm or suicide attempt.

However, we also note that there are many issues that may impact on integration effectiveness in other hospitals. This would include the size and activity level of the Emergency Department in question, existing attitudes of health service staff towards people who engage in self-harm or other suicidal behaviour, the nature of standard care provided to people who attend the hospital and existing follow-up processes for people who have made a suicide attempt. Smaller rural and remote hospitals and health centres might not be well positioned to implement WBSS.

We also believe the model would have capacity to function with a broader range of referring agents. That is, eligibility may not need to be specific to presentation to hospital after self-harm or suicide attempt. Community self-harm is also very common; people who self-harm, general practitioners and family members could refer into the community component of the WBSS program. This approach is being used by Hunter WBSS for Indigenous service users.

Similarly, eligibility for service for this trial was specific to people who had engaged in hospital-treated deliberate self-poisoning. However, we believe the model might be relevant to people engaging in other types of self-harm or suicidal behaviour.

Finally, we believe that the model has capacity to be tailored to specific population groups. For example, young people, Indigenous people, LGBTIQ+ people. We would recommend that consultation occurs with members of the relevant populations and the service providers who support them, to establish the differences required in how the service would function, including referral mechanisms and key clinical and community service partners. An obvious partner at this point in time, in light of recent Commonwealth commitment to youth suicide prevention, would be headspace.

However, we would caution that because the WBSS can be delivered, does not mean it should be delivered on a wider scale without consideration of how the model could be strengthened based on the recommendations outlined in this report. In this trial, the WBSS model of care did not demonstrate significant reductions in suicidal behaviours and hospital admission outcomes associated with deliberate self-poisoning.

The WBSS intervention model is a novel non-clinical intervention, which does not specifically include access to evidenced-based clinical interventions. Inclusion of evidenced-based interventions into the WBSS intervention model should be considered. In short, the WBSS intervention model should undergo further development and subsequent evaluation in order to test effectiveness before widespread rollout.
6.3.5. How the model can be improved

A key element that needs to be explored further is what the components of aftercare are that drive reduced deliberate self-harm repetition and broader positive outcomes for service users. There are two key elements, based on existing evidence, that we believe could be included to potentially improve the effectiveness of the existing model.

1. Improve intervention reach of the model by broadening the model to include brief ‘caring contact’ interventions (e.g. postcards, letters or text messages) (as described by Milner et al., 2015).

2. Include a clinical component (or strengthened linkage to clinical services) providing evidence-based interventions such as specific cognitive behaviour therapy (CBT) for suicidal behaviours, Collaborative Assessment and Management of Suicidality (CAMS) for suicidal ideation, or Dialectical Behaviour Therapy (DBT) for people meeting diagnostic Borderline Personality Disorder for self-harm and suicidal behaviours. Other brief clinical aftercare interventions with a more limited evidence base might also be suitable for inclusion, including Psychodynamic Interpersonal Therapy or the Attempted Suicide Short Intervention Program (ASSIP). Hofstra et al. (2019) and Hetrick et al. (2016) provide useful summaries of the evidence base for these interventions.

It may also be possible to improve or leverage further from integration with the existing service system. For example, there are potential opportunities for stronger team-care with existing community mental health teams if systems to identify shared clients can be established. Within NSW, there may also be opportunities for WBSS to connect with the to-be-established “Safe Spaces” that will be funded through the Towards Zero Suicides initiatives, both as a referral source and as a crisis support service provider.

Any modifications and developments of the WBSS model should be evaluated with appropriate study designs and effectiveness would best be evaluated in a randomised controlled trial design. If a major rollout of a modified WBSS model occurs in the future, a stepped wedge design would probably be most suitable randomised design available (Hemming, Haines, Chilton, Girling, & Lilford, 2015).

Furthermore, as mentioned above, we believe the model would be transferable for delivery for specific population or priority groups. However, even within mainstream delivery of the service, we believe service delivery can be improved by considering the needs of particular population groups and modifying or tailoring referral pathways or service delivery formats to better suit specific target groups. A specific example would be as Dialectical Behaviour Therapy is known to be effective in reducing self-harm for people with Borderline Personality Disorder, it would be sensible to establish clear referral pathways and local service agreements with clinical services about provision of clinical services for this population who may also be supported by the WBSS.

Finally, in light of the need for ongoing evaluation, we believe the service model would be improved by establishing an electronic data capture platform that could be used to host short standardised outcome measures, manage automated invitations to clients to complete the measures on their phone and integrate a feedback loop/tracking of outcomes for WBSS staff (and/or other service providers).
6.4. Recommendations

The current national rollout of the WBSS should be carefully considered in the light of these results.

The intervention did not significantly reduce subsequent hospital-treated suicidal behaviours or other hospital admissions for mental health concerns. However, those who engaged with the service progressed towards person-centred goals, and reported reductions on unmet needs and psychological distress.

Intervention coverage was an issue; and it is unclear from the current evaluation if the intervention was beneficial or not for specific sub-groups.

The model could be modified by incorporating interventions that have been shown to reduce self-harm repetition, suicide attempt and suicide.

In light of the national roll-out that is already underway and the above issues, recommendations have been made relevant to:

- Modifying the service model to improve impact by increasing intervention reach and considering the potential need for specific clinical components to address the needs of some of the target population.
- Continuing to build the evidence base.
- Establishing a well-functioning non-clinical care coordination aftercare service within the Australian health care system.
- Targeting quality assurance indicators and processes to increase capacity to track functional outcomes for service users.

These recommendations draw from and build on the key findings and implications identified within each chapter.
6.4.1. Recommendations for how to modify the service model to improve impact

Recommendation 1
For the WBSS service model to be improved, **intervention coverage needs to be addressed**.

To address this, we would recommend that the following steps be taken.

1.1. Using qualitative methods to **consult with people who declined the initial invitation for intervention and those who initially agreed but later were not contactable** and so did not engage with the service after discharge from hospital. This could help to identify service modifications that could improve the WBSS coverage of those sub-groups.

1.2. However, it may prove to be difficult or impossible to increase the coverage beyond the substantial proportion of participants who engaged with the WBSS service to some degree. In light of this, consideration might be given to **broadening the non-clinical service model by incorporating universal brief contact interventions**, which have been demonstrated to have some beneficial effect on repeat hospital-treated self-harm and which have broader eligibility criteria (e.g. safety concerns is not a reason for exclusion).

Recommendation 2
Effectiveness analyses showed no difference in repetition of hospital-treated deliberate self-poisoning, which was the key suicidal behaviour of interest.

This suggests that despite substantial levels of engagement and high service satisfaction, a non-clinical care coordination model in addition to existing clinical service provision is not sufficient to reduce key suicidal behaviours at the clinical population level.

Instead, it suggests that a multi-modal and stepped care approach to interventions for people who have presented to hospital for self-harm is required (Jobes & Chalker, 2019; Jobes, Gregorian & Colborn, 2018).

To better understand the key mechanisms of impact, it is recommended that this be explored further.

Specifically:

2.1. Engage in further research to better understand the **degree to which WBSS support resulted in increased connections with the service system and the degree to which evidence-based interventions are available/provided within the existing service system** in order to better understand what may be limiting effectiveness and to inform future service development.

The WBSS generally encouraged the clients to engage and continue in follow-up clinical care in the community, which was usually supplied by mental health services, drug and alcohol services, private sector psychologists and general...
practitioners. However, we have no data on whether there was any increased use of these community services associated with WBSS exposure. We also have no data on the types of interventions offered by these community services. Although there are evidenced-based aftercare interventions demonstrating beneficial effects on suicidal behaviour endpoints, we do not know the extent to which these interventions were deployed by community services, and WBSS effectiveness will be limited if it is not associated with increased aftercare service utilisation or if aftercare services do not use evidence-based interventions. Further research work could address these questions. This would require input from clinical community service providers to measure any increased service utilisation and in order to increase the availability of evidenced-based interventions within community clinical services.

2.2. **Explore the characteristics of those who had high exposure to WBSS and who had multiple readmissions** in order to better understand their needs. This group of people might have a high level of clinical complexity and require much more than a non-clinical intervention to modify suicidal behaviours. Both quantitative and qualitative methods would have merit in seeking to better understand the non-clinical and clinical requirements of this group.

2.3. **Explore the characteristics of those who had exposure to the WBSS and had better outcomes** in order to better understand the mechanisms of impact for this group. Both quantitative and qualitative methods would have merit in seeking to better understand the non-clinical and clinical requirements of this group.

2.4. Effectiveness analyses showed increased event rates for psychiatric hospitalisation associated with the intervention cohort and high WBSS exposure. This result was definitely unexpected and can be considered to be hypothesis generating, particularly with regard to **exploring the potential role that increased activation of safety plans may play in driving hospital presentations and subsequent admissions**.

These speculative explanations can be the basis for further exploration.

The WBSS encouraged clients to use safety planning in order to better manage future episodes of suicidal thinking, planning or associated behaviours. Safety planning is a technique increasingly used by mental health services when providing service to previously suicidal patients. The ultimate step in most safety plans requires presentation to hospital for assessment. We have no data on the possible association of increased exposure to safety planning and increased psychiatric hospital admissions but such an association is plausible and could be tested.

Although unexpected and not in keeping with the aims of the effectiveness trial, it could be that increased psychiatric hospitalisation, perhaps associated with increased exposure to safety planning and times of escalating suicidal ideation might have some benefit for patients. Further exploration of the reasons and
outcomes of the increased psychiatric hospitalisation events might be instructive.

If safety planning does result in increased psychiatric hospitalisation, this would have implications for service providers in terms of costs, staffing, bed requirements and it would be appropriate to investigate this.

Safety planning may be associated with increased psychiatric hospital presentations, or admissions or some combination of these. This could be explored further.

If safety planning is associated with increased psychiatric hospitalisation, alternative management strategies could be developed and tested in order to reduce the harms of psychiatric hospitalisation without increased suicidal behaviours.

Any changes or broadening of the model of care provided by WBSS should be accompanied by a testing of its effectiveness. Additional recommendations regarding building the evidence base for the WBSS are provided in the next section.
6.3.2. Recommendations for continuing to build the evidence base

Recommendation 3

Any changes or broadening of the model of care provided by WBSS should be accompanied by a testing of its effectiveness. Ultimately, this would best be done by a randomised controlled trial, although some developmental work would need to precede a full trial. Any regional or national rollout could be done using a stepped wedge design, which is a form of randomised controlled trial suitable for that situation.

Additional detail

For service delivery to justify the level of investment that has been committed, it is important that the evidence-base for its impact is strong and that clinically significant benefit has been demonstrated to support the positive feedback, outcomes, and value identified by users of the service.

The current trial would not be a sufficient basis to justify a national rollout. Modifications to the WBSS should first be tested in more limited settings (like the current evaluation trial) and progress to a more widespread rollout and evaluation only if there was a substantial signal suggesting benefit in those limited settings.

Should that occur, then to conclusively establish the effectiveness of the model, it is recommended that a randomised controlled trial be conducted. A stepped wedge design would be the most suitable.

Ideally, these model development research trials would have the capacity to:

- Investigate a broader range of outcomes (other than just hospital admission)
- Have a reliable and valid means of tracking uptake and use of other relevant services.
- Analyse outcomes by whether the index admission was the first or later episode of self-harm.
- Test variations of additional evidence-based interventions with fewer participant demands (e.g. caring contacts) and/or links to clinical treatments.
- Compare different staffing models of WBSS delivery (non-clinical, clinical and/or peer workers) in order to identify if staffing characteristics affects outcomes.
6.3.3. Recommendations for how to establish a well-functioning non-clinical care coordination aftercare service within the Australian health care system

Recommendation 4
To establish a well-functioning non-clinical care coordination aftercare service within the Australian health care system, it is recommended that integration with referring hospital services be prioritised through:

4.1. Agreement with referring hospital services for referrals to WBSS to be considered routinely for all people admitted to hospital after self-harm.

4.2. The identification and development of processes, policies and procedures that support collaborative care across hospital and community service providers.

4.3. The establishment of low-demand referral processes for the referring hospital agents.

4.4. Agreements between the WBSS and referring hospital services about how WBSS can meet people while they are in hospital for their self-harm admission and/or how “warm” hand-overs can be managed as part of routine care.

4.5. The identification of opportunities for close, professional relationships between the WBSS staff and relevant hospital service staff to be developed.

Recommendation 5
Strong clinical governance is essential as a foundational component of non-clinical care coordination. It is recommended that:

5.1. Lines of clinical responsibility and clinician support for WBSS support workers within the hospital setting are made clear.

5.2. A clear line of clinical responsibility and clinician support for WBSS Support Coordinators is established for community-based work, in order to ensure capacity for timely, coordinated acute clinical care when needed.

5.3. Local in-service and education opportunities be identified in order to enable clinical services to become familiar with the nature of non-clinical care coordination and its potential value.

It may also be helpful for some short fact sheets to be developed that outline the nature of non-clinical care coordination and the evidence-base underpinning the service model to assist with explanations and understanding of how the service may contribute to better outcomes for people who have attempted suicide.
Recommendation 6
To **improve service delivery of the existing model** it is recommended that:

6.1. *Additional alternative contact details* are collected at first contact (e.g. email address, alternative phone numbers) in order to reduce the proportion of people who are unable to be contacted after discharge from hospital.

6.2. *Flexibility in service delivery is embedded within the model*, including capacity for tailoring based on the needs of the local population.
6.3.4. Recommendations for how to increase the capacity of the initiative to track functional outcomes for service users through improved quality assurance indicators and processes

**Recommendation 7**

**Quality assurance processes** have the potential to track important functional outcomes for service users.

Quality assurance processes can be improved by:

1. Identifying some *short standardised measures* that are acceptable to clients and provide capacity for comparison of outcomes with other relevant participant groups and other studies.

2. Establishing an *online portal for data collection* that can host and store outcome measures data, manage automated invitations to service users to complete measures on their phone/ electronic device and has a feedback loop for tracking of outcomes back to the service user, WBSS and, potentially, other relevant service providers.
6.5. Final Conclusion

In summary, this evaluation of the WBSS in the Hunter has demonstrated the capacity for the service to be scaled up, integrated with existing clinical services and high quality service delivery to be maintained over time. The Hunter WBSS established itself as a valuable and integral component to the local community’s approach to suicide prevention and the service endeavoured to put the client at the forefront of its activities and provide a supportive and encouraging space whereby the individual was supported as they took their first steps in their recovery.

Continued engagement by a substantial proportion of clients in the WBSS was encouraging. However, coverage of all those in the target population was incomplete and some people who engaged with the service did not remain engaged for the full 12 weeks of support available. The data presented in this report lends support to the model’s acceptability as an after hospital support service as demonstrated by the high throughput of clients, the service being well received by consumers who reported high levels of support, the facilitation of client connection with services over time, and observation of clinically meaningful improvements in some clients’ well-being.

However, from this study, there was no evidence that the WBSS intervention was associated with a significant reduction in the repetition of suicidal behaviours or reduced hospital admissions for the intervention cohort compared to two historical cohorts. While these are important outcomes and reflect the outcomes traditionally used by the field to test effectiveness, future evaluation should also more thoroughly investigate the impact of the intervention on other symptomatic, quality of life and functional outcomes considered important by consumers.

Thus, we recommend further development of the WBSS model of care, taking into consideration the recommendations outlined in this report, and subsequent evaluation of the effectiveness of any revised models of care on reduction repetition of suicidal behaviour, in addition to other relevant outcomes.
7. References


CRESP. (2015). *Care After a Suicide Attempt*. Retrieved from


