



# 28-day readmission rates

Key performance indicator literature review, February 2023

Literature review (February 2023) by Te Pou for The Key Performance Indicator (KPI) Programme, Mental Health and Addiction Aotearoa New Zealand.

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# Executive summary

## Background

Readmission to inpatient mental health services is indicative of unmet need. Readmission is more likely to happen in the first 4 weeks after discharge. Understanding the factors that increase people's likelihood of readmission and identifying approaches to reduce readmission rates is key to addressing people's mental health challenges. This helps to ensure tāngata whai ora (people seeking wellness) are prepared to live well in the community and improve service outcomes. The Key Performance Indicator (KPI) Programme, Mental Health and Addiction, Aotearoa New Zealand includes the 'acute inpatient 28-day readmission indicator'. This measures the proportion of tāngata whai ora who return to inpatient mental health services within 28 days after discharge.

## Aim and objectives

This rapid literature review summarises the evidence base for the 28-day readmission indicator. It aims to develop a better understanding of the indicator and how it compares to those used internationally.

Specific objectives are to summarise evidence around:

- factors associated with readmission to inpatient mental health services within specific time periods
- readmission measures and rates in Aotearoa New Zealand and other International Initiative for Mental Health Leadership (IIMHL) countries
- strategies and modifiable service factors that can reduce readmission.

Findings are drawn from journal publications, national data websites, and grey literature identified via database searches.

## Key findings

A range of service- and person-level factors impact people's likelihood of readmission. Key service-level factors include:

- insufficient or lack of discharge planning
- low whānau involvement in the person's treatment and transition.

Key person-level factors predicting readmission include:

- certain mental health diagnoses such as psychotic conditions, personality disorders, a history of self-harm or suicidality, and co-existing conditions including problematic substance use
- higher number of previous admissions.

Readmission rates for Aotearoa New Zealand are presented using data from the KPI Programme's 28-day readmission data dashboard. Readmission rates have trended downwards from 16.8 percent in 2016 to 15.3 percent in 2021. Though readmission rates for Māori have also trended downwards during this period (from 17.5 to 16.4 percent), Māori are most likely to be readmitted within 28 days compared with other ethnic groups.

Compared to other IIMHL countries, Aotearoa New Zealand and Australia publish readmission rates most consistently over time. An NHS Benchmarking Network report (2019) provides the most recent snapshot of international readmission rates. This report shows the mean readmission rate across participating countries was 11 percent, with a median of around 13 percent.

Locally reported readmission rates tend to be more out of date, and readmission rates were found for most IIMHL countries except for Ireland and Sweden. It is not clear whether readmission rates are not routinely measured in other IIMHL countries or if this data is not publicly available.

The KPI Programme's readmission indicator is consistent with those used internationally in that readmission is measured as the percentage of people who return to inpatient mental health services within 28 to 30 days after discharge. Compared to other IIMHL countries, Aotearoa New Zealand appears to have slightly higher readmission rates.

Addressing service-level factors is key to reducing readmission. The main approaches to reducing readmissions are below.

- **Comprehensive discharge planning.** This aims to enhance continuity of support, ensure tāngata whai ora are prepared with resources to live well in the community, and improve outcomes for people. It involves multiple person-centred components including providing information, resources, and choice of support to tāngata whai ora; planning suitable accommodation; and support coordination. Delivering these components provides effective wrap-around support for people to ensure their health and broader social needs are met. Discharge plans are best done collaboratively, in partnership with tāngata whai ora.
- **Whānau involvement** relates to including the person's family, support network, and friends during their inpatient stay and after discharge. Involving whānau ensures tāngata whai ora are continuously supported by their loved ones across their service journey.
- **Enhancing relationships** between inpatient services, community services, and whānau is important in providing continuous support to tāngata whai ora. These relationships can be enhanced by appointing a transition manager, increasing communication and information sharing, and implementing community-based discharge teams and community links teams.

## Conclusion

Measuring readmission rates is important for monitoring who may still require support after being discharged from inpatient mental health services. As Aotearoa New Zealand's approach to measuring readmission rates is consistent with those used internationally, it is recommended the KPI Programme continue using the 28-day readmission indicator. Continued use supports comparability and benchmarking over time and allows services to examine whether equitable outcomes are being achieved for Māori.



## Background

People experiencing mental health challenges can experience various issues following their transition from an inpatient service to their community (Sather et al., 2018; Tyler et al., 2019). Around 16 percent of people leaving inpatient mental health services are readmitted within 1 month and 40 percent within 1 year (Kripalani et al., 2014; Madi et al., 2007; Mark et al., 2013; Wheeler et al., 2011). People may not have received adequate support, continue to experience high levels of distress, have issues with taking medication, be unprepared for community living, have limited community or whānau support, or experience challenges in accessing culturally responsive services (Adeponle et al., 2009; Donisi et al., 2016; Durbin et al., 2007; Gunnell et al., 2008; Haselden et al., 2019; The Key Performance Indicator Framework for New Zealand Mental Health and Addiction Services, 2021; Tulloch et al., 2016; Vigod et al., 2013; Zhang et al., 2011). Readmission may therefore indicate unmet needs for people discharged from an inpatient mental health unit. Addressing readmission is critical in ensuring tāngata whai ora (people seeking wellness) are supported to live well in the community following discharge, and to make efficient use of service and staff resources.

The KPI Programme for Mental Health and Addiction Services, Aotearoa New Zealand (the KPI Programme) framework includes the 28-day readmission indicator. The indicator describes the percentage of tāngata whai ora discharged from any inpatient mental health service after staying one or more nights, who are readmitted to any inpatient service within 28 days of discharge. The indicator measures readmission rates for all ethnic and age groups, and regions in Aotearoa New Zealand. Data is sourced from the Programme for the Integration of Mental Health Data (PRIMHD) database. See [Appendix A](#) for full details of the indicator.

## Aims and objectives

This rapid literature review aims to better understand the evidence base for the 28-day readmission indicator and measures used internationally. This will inform the KPI Programme in reviewing the indicator.

Specific objectives are to summarise evidence around:

- factors associated with readmission within specified time periods
- similar readmission indicators used in other International Initiative for Mental Health Leadership (IIMHL) countries and associated rates
- strategies and modifiable service factors shown to reduce readmission rates.

## Method

Literature searches were conducted using EBSCOHost (Academic Search Complete, CINAHL Complete, MEDLINE Complete, Psychology and Behavioural Science Complete), Google Scholar, and Google. Literature published until September 2022 were included. Searches included the following search terms.

- Readmission, inpatient readmission.
- Mental health, mental health services, psychiatric, behavioural health services.
- Risk factors, causes, outcomes.
- Reduce, strategies, approaches.
- Māori, Pasifika/Pacific, Indigenous.
- Performance indicators, key performance indicators, quality measures.

Information related to addiction services, readmissions to non-inpatient mental health services, and indicators and rates from non-IIMHL countries were excluded.

Meta-analyses, systematic reviews, single studies, and grey literature were included in the literature search. We identified several systematic reviews and meta-analyses related to strategies to reduce readmission rates. Meta-analyses and systematic reviews were prioritised. Individual studies were identified to supplement broader findings from meta-analyses and reviews. Studies looking at readmission rates and associated factors were primarily individual retrospective cohort studies. The latter likely analysed secondary data collected for other purposes. Individual studies may be limited in quality of findings and comparability (due to differences in measures and readmission time frames) but provide additional information that meta-analyses and reviews may not otherwise cover.

See Tables 3 and 4 ([Appendix A](#)) for a detailed summary of articles identified in the literature searches.<sup>1</sup>

Where possible, we report the odds ratios (OR), hazard ratios (HR), and relative risk (RR) for studies reviewed. A ratio greater than 1 indicates a higher likelihood compared to the comparison group; for example, OR = 1.5 indicates a 50 percent higher likelihood.

Information on readmission rates in Aotearoa New Zealand, including rates for Māori and Pasifika, were obtained from the KPI Programme data dashboard for the 28-day readmission indicator in September 2022.

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<sup>1</sup> The language used in the tables directly reflect the language used in the respective studies. This may not align with the language preferred by Te Pou and the KPI Programme to refer to tāngata whai ora, mental health challenges, and services.

## Language

This report uses person-centred and strengths-based language.

**Tāngata whai ora**, defined as “people seeking wellness” is used to refer to people accessing services and to people experiencing mental health challenges.

**Whānau** is primarily used to refer to people’s support networks, including family members, partners, friends, people who tāngata whai ora choose to be involved, and others who provide support.

**Family** is used where findings are specifically about people’s immediate families, particularly when referencing international research.

## Results

This section presents key findings from literature searches in order of the objectives. Factors associated with readmission are presented first, followed by readmission rates in Aotearoa New Zealand and other IIMHL countries, then approaches to reduce readmission.

It is important to note that while readmission is generally considered in the literature to be a negative outcome following discharge, this may not necessarily be the case for all tāngata whai ora. Recovery from mental health challenges is often not a linear process and can involve revisiting services and whānau to feel supported (Llewellyn-Beardsley et al., 2019). Readmissions may therefore be part of some people's recovery journeys and simply reflect people needing extra support.

### Factors associated with readmission

This section outlines service- and person-level factors associated with readmission into inpatient mental health services. Key service-level factors include insufficient or lack of discharge planning and low whānau involvement during treatment. Evidence of other service-level factors in the literature are more mixed; these include length of stay in the inpatient service, staffing rates, number of beds available within a given facility or region, and use of restrictive practices.

Key person-level factors associated with readmission include certain mental health diagnoses such as psychotic conditions, personality disorders, a history of self-harm and suicidality, and previous admissions into inpatient mental health services. There are mixed findings in the literature regarding other person-level factors such as co-existing mental health challenges and problematic substance use, ethnicity, and other demographic factors (such as unemployment, marital status, gender, and age).

These findings are discussed in more detail below. It is important to note that studies use a variety of different measures and readmission time frames. Findings in some studies may therefore not be directly comparable.

#### Service-level factors

##### *Insufficient discharge planning*

Lack of discharge planning is a key factor in readmissions. The main objective of discharge planning is to facilitate the transition from inpatient to outpatient support by coordinating services and providing the person with sufficient resources. Overall, discharge planning aims to enhance continuity of support, encourage self-management, prevent readmissions, and improve wellbeing outcomes (Steffen et al., 2009; Xiao et al., 2019).

In a systematic review which assessed the efficacy of discharge planning, people who received discharge plans were about 35 percent less likely than those who received no

planning to be readmitted to inpatient mental health services within 3 to 6 months (Steffen et al., 2009). Another study showed that people who had no record of a discharge plan being sent to their GP were almost 11 times more likely to be readmitted within 28 days, than those who did have a discharge plan (Callaly et al., 2011).

### *Low whānau involvement*

Overall, evidence suggests whānau involvement is associated with a lower likelihood of readmission (Donisi et al., 2016; Durbin et al., 2007; Sfetcu et al., 2017). Whānau involvement can include participating in discharge planning, communicating with tāngata whai ora or inpatient staff, visiting tāngata whai ora in the inpatient service, attending family therapy sessions, and providing supportive comments (Durbin et al., 2007; Government Inquiry into Mental Health and Addiction, 2018; Haselden et al., 2019; Sfetcu et al., 2017).

Further evidence from individual studies highlights how whānau involvement can reduce likelihood of readmission. Haselden and colleagues (2019) found people were two to three times more likely to attend follow-up mental health appointments within 30 days after discharge, if inpatient staff contacted a support person (OR = 2.71), or if there was any involvement between family and inpatient staff (OR = 3.65). Another study found people who were discharged to live with their family were about 39 percent less likely to be readmitted to an acute psychiatric unit within 28 days, compared to those discharged to living by themselves (Hariman et al., 2020).

In contrast, negative whānau involvement such as stigma from family members towards tāngata whai ora, criticism from family members, and maladaptive family functioning, has been associated with greater likelihood of readmission (Durbin et al., 2007; Government Inquiry into Mental Health and Addiction, 2018; Haselden et al., 2019; Sfetcu et al., 2017).

### *Length of stay*

The link between length of stay (LOS) and readmission appears to be unclear. Some studies show a shorter LOS is associated with a greater likelihood of readmission (Hariman et al., 2020; Osborn et al., 2021), while others indicate a longer stay is associated with a higher likelihood (Haselden et al., 2019; Mark et al., 2013; Tedeschi et al., 2020; Tulloch et al., 2016). Another study found no link between LOS and readmission (Zhang et al., 2011).

The association between LOS and readmission may be complex and depend on other factors. For example, Philips and colleagues (2020) found young people with a longer LOS (8 or more days) were more likely to be readmitted than those with a shorter LOS. The impact of LOS on readmission may depend in part on timely access to follow-up support. Young people with a longer LOS who received follow-up support within 7 days of discharge were less likely to be readmitted compared to those who did not receive follow-up support. Among young people with a shorter LOS, however, those who received follow-ups within 7 days were more likely to be readmitted than those who did not. The authors noted that readmission may depend on complex interactions between a range of different variables and

LOS may be a proxy for some of these. This may be the level of impact of mental health challenges on people's wellbeing, inadequate or insufficient inpatient support, poor discharge planning, and lack of continuity of support.

### *Other*

Other hospital- and service-level factors may predict readmission to inpatient mental health support, including staffing levels, number of beds, and use of restrictive practices.

**Low staffing rates** in hospitals or regions appear to increase the likelihood of readmission. Tedeschi and colleagues (2020) found higher numbers of staff per 100,000 people in the region decreased readmission by up to 9 percent.

**Low numbers of beds** may impact on readmission rates, although findings are mixed. A study among people who met diagnostic criteria for a mental health diagnosis and were discharged from a general hospital found regions with 1 bed per 100,000 people had lower readmission rates (by 7 to 11 percent) than regions with more beds per 100,000 people (Tedeschi et al., 2020). In contrast, a study with young people admitted to mental health services found facilities with more beds ( $\geq 400$ ) were less likely to have people readmitted multiple times than hospitals with fewer beds (OR = 0.37; Philips et al., 2020).

**Restrictive practices**, including the use of seclusion and restraint, may increase the likelihood of readmission (Donisi et al., 2016). A recent study of people who were admitted to an inpatient service for the first time, found those who experienced at least one seclusion or restraint event were almost twice as likely to be readmitted within 1 year (Akram et al., 2020). This highlights the need to encourage the use of recovery-focused approaches and eliminate the use of seclusion (Butterworth et al., 2022).

## **Person-level factors**

### *Mental health challenges*

It is difficult to assess the association between mental health diagnoses and likelihood of readmission, given studies use different measures and have inconsistent results (Donisi et al., 2016; Durbin et al., 2007; Hope et al., 2021). However, some specific mental health diagnoses may be associated with a greater likelihood of readmission. Those frequently identified across systematic reviews and individual studies include psychotic conditions, bipolar disorder, personality disorders, and problematic substance use. These are discussed further below.

Diagnosis of **psychotic conditions** has been identified as a key factor in readmission in several individual studies. Studies have found people meeting diagnostic criteria for psychotic conditions are more likely to be readmitted to mental health services (Evans et al., 2017; Hariman et al., 2020; Trask et al., 2016) and comprise the largest proportion of people readmitted within certain time frames (Chen et al., 2018; Wheeler et al., 2011). People who

experience psychotic conditions have been found to be 1.1 to 2.6 times more likely than those without to be readmitted into inpatient services in some studies (Osborn et al., 2021; Sveticic et al., 2020; Tedeschi et al., 2020). Similarly, Tulloch and colleagues (2016) found people meeting diagnostic criteria for psychotic conditions were 1.3 to 1.4 times more likely to be readmitted compared to people with other mental health diagnoses, including depression and anxiety.

**Personality disorders** are cited across the literature as a significant factor for readmission. For example, Sveticic and colleagues (2020) found people meeting diagnostic criteria for a personality disorder were about 2.6 times more likely to be readmitted within 28 days, than people with other conditions.

While **mood disorders** are not consistently linked with readmission, bipolar disorder specifically may increase a person's likelihood of readmission. For example, an inpatient mental health service found those meeting diagnostic criteria for any mood disorder comprised smaller proportions of people readmitted within 30 days compared to other diagnoses (Chen et al., 2018). Similarly, a study with young people found no association between primary diagnosis of a mood disorder and being readmitted at least once (Philips et al., 2020). In contrast, a study in Aotearoa New Zealand of people admitted to acute hospital services for mental health challenges found those meeting diagnostic criteria for bipolar disorder comprised the largest proportion of readmissions (68.5 percent) within 5 years (Wheeler et al., 2011).

A **history of self-harm or suicidality** may be associated with an increased likelihood of readmission, although results are not entirely consistent. Large and colleagues (2011) found people with a history of self-harm or suicide attempts were about 3 times more likely than those with no history to be readmitted to mental health services within a year. Gunnell and colleagues (2008) found 11.7 percent of people who were in inpatient mental health services had previously been admitted to hospital for self-harm in the past 12 months before their initial admission, and 6.5 percent were readmitted for self-harm within 12 months of their initial discharge. In line with this, Hariman and colleagues (2020) found people who were readmitted within 28 days were more likely to have a history of suicide attempts (32.2 percent of readmissions) compared to those who were not readmitted (22.2 percent). These studies indicate that among people who are readmitted into inpatient services, there are higher proportions of people with a history of self-harm or suicide attempts than those with no history.

Other studies show more mixed findings. Donisi et al.'s (2016) systematic review found conflicting evidence for own or family history of suicide attempt (Donisi et al., 2016).

### *Co-existing challenges, including problematic substance use*

The literature indicates that people who meet diagnostic criteria for **co-existing mental health conditions** have an increased likelihood of readmission (Donisi et al., 2016; Hariman et al., 2020; Hope et al., 2021; Madi et al., 2007; Philips et al., 2020). For example, Philip (2020) found that compared to people diagnosed with one mental health condition, people diagnosed with two conditions were 2.6 times more likely to be readmitted, and people diagnosed with three or more co-existing conditions were 12.6 times more likely to be readmitted within 6 months.

The likelihood of readmission appears to be higher for people diagnosed with co-existing mental health and problematic substance use specifically (Donisi et al., 2016; Mancuso, 2009). Across studies, people with co-existing mental health challenges and problematic substance use have been estimated to be 1.5 to 4 times more likely than those who experience mental health challenges to be readmitted into inpatient services (Gentil et al., 2021; Hariman et al., 2020; Philips et al., 2020). Higher rates of readmission among people experiencing co-existing challenges may reflect the greater level of support needed.

### *Previous inpatient admissions*

The chances of readmission appear to be higher for people with previous admissions into inpatient mental health services, particularly those with multiple previous admissions. While one study found having one previous admission to an inpatient mental health service had little impact on readmission (OR = 1.06; Hariman et al., 2020), others indicate the likelihood of readmission is about twice as high compared to those with no previous admissions (ORs ranged between 2.1 and 2.6; Callaly et al., 2011; Tulloch et al., 2016; Wheeler et al., 2011). Three systematic reviews further indicate that a greater number of previous admissions increases the likelihood for readmission within 28 days of discharge to mental health services (Donisi et al., 2016; Durbin et al., 2007; Zhou et al., 2016). These findings could suggest that services do not meet people's mental health needs, or that some people require multiple visits to services to feel supported.

### *Ethnicity*

Certain ethnic groups appear to have a higher likelihood of readmission. In Aotearoa, New Zealand, Māori have a 40 percent higher likelihood than Pākehā to be readmitted to secondary mental health services (Government Inquiry into Mental Health and Addiction, 2018; Wheeler et al., 2011). Wheeler and colleagues (2011) found Pasifika were 34 percent less likely to be readmitted than Pākehā.

### *Other characteristics*

Table 1 summarises other personal factors that may affect likelihood of readmission. Being employed and married or in a committed relationship appear to be linked with a lower



likelihood of readmission, while there are inconsistent findings for gender, age, and housing after discharge.

Table 1. Personal factors associated with readmission

| Personal factor     | Link with readmission  |
|---------------------|--|
| Unemployment        | Studies show unemployment is associated with a 1.2 to 2.0 times higher likelihood of readmission than being employed (Chen et al., 2018; Donisi et al., 2016; Evans et al., 2017).   |
| Relationship status | Research indicates being single or divorced is associated with a 1.1 to 1.8 times higher likelihood of readmission compared to being married or in a committed relationship (Chen et al., 2018; Osborn et al., 2021; Tulloch et al., 2016). <sup>2</sup>   |
| Gender              | The effect of gender has mixed findings. Some studies suggest women have a slightly higher likelihood of readmission within 28 days to 6 months (1.1 to 1.4 higher likelihood), while others indicate the likelihood of readmission within 30 days to 5 years is higher for men (1.1 to 1.3 higher likelihood; Callaly et al., 2011; Chen et al., 2018; Gunnell et al., 2008; Osborn et al., 2021).  |
| Age                 | Younger age has been associated with a slightly higher likelihood of readmission (Gunnell et al., 2008; Hariman et al., 2020), though results are not entirely consistent, with some studies showing no association between age and likelihood of readmission (Madi et al., 2007; Osborn et al., 2021; Tedeschi et al., 2020).   |
| Housing             | There is a relative paucity of research examining the effect of housing after discharge on readmission, with studies producing mixed findings. While some studies find no association between housing and readmission (Kennedy-Hendricks et al., 2021; Moore et al., 2019), others find that living close to the inpatient service (Lassemo et al., 2021), or being discharged to a group home or assisted support (Stewart et al., 2019), are associated with a higher likelihood of readmission. |

<sup>2</sup> Across studies, being “in a committed relationship” includes having a long-term partner, being in a civil partnership, and cohabiting.

## Aotearoa New Zealand and IIMHL country readmission rates

This section outlines readmission rates in Aotearoa New Zealand, Australia, and other IIMHL countries. It is important to note that this section reports national rates averaged across all people who access services and may not reflect sub-groups who may experience higher readmission rates.

### Aotearoa New Zealand

#### *KPI Programme*

Aotearoa New Zealand measures readmission rates as the percentage of people readmitted to a service within 28 days (Manatū Hauora Ministry of Health, 2017). The KPI Programme has provided national summary data on 28-day readmission rates for mental health inpatient services since 2016. This section presents data from the KPI Programme 28-day readmission indicator dashboard.<sup>3</sup>

Table 2 and Figure 1 show readmission rates by ethnicity and for all tāngata whai ora who accessed inpatient mental health services between 2016 and 2021. Annual rates appear to be trending down slightly, from 16.7 percent in 2016 to 15.3 percent in 2021. The total national average rate for this period was 16.4 percent.

In the same period, the average readmission rate for Māori was 17.4, decreasing slightly from 17.5 percent in 2016 to 16.4 percent in 2021. Each year, rates for Māori were higher compared to other ethnicities and compared to national rates for all tāngata whai ora. The average readmission rate for Pasifika during this period was 14.2 percent. Rates for Pasifika decreased from 15.2 in 2016 to 12.6 percent in 2019, then increased again to 15.5 percent in 2021. Readmission rates for Pasifika tended to be lower than rates for all tāngata whai ora, except in 2021 when rates were comparable. Asian peoples had the lowest average readmission rates (12.3 percent) during this period.

Table 2. Readmission rates (in percentages) in Aotearoa New Zealand by ethnicity, 2016 to 2021 (KPI Programme, 2022)

| Ethnicity | Year |      |      |      |      |      | Average |
|-----------|------|------|------|------|------|------|---------|
|           | 2021 | 2020 | 2019 | 2018 | 2017 | 2016 |         |
| Māori     | 16.4 | 18.0 | 16.9 | 17.8 | 17.8 | 17.5 | 17.4    |
| Pasifika  | 15.5 | 13.2 | 12.6 | 14.0 | 14.8 | 15.2 | 14.2    |
| Asian     | 10.0 | 13.4 | 10.6 | 13.7 | 13.7 | 12.5 | 12.3    |
| Pākehā    | 15.2 | 15.3 | 16.7 | 16.8 | 16.9 | 16.8 | 16.3    |
| Total     | 15.3 | 16.0 | 16.7 | 16.8 | 16.9 | 16.8 | 16.4    |

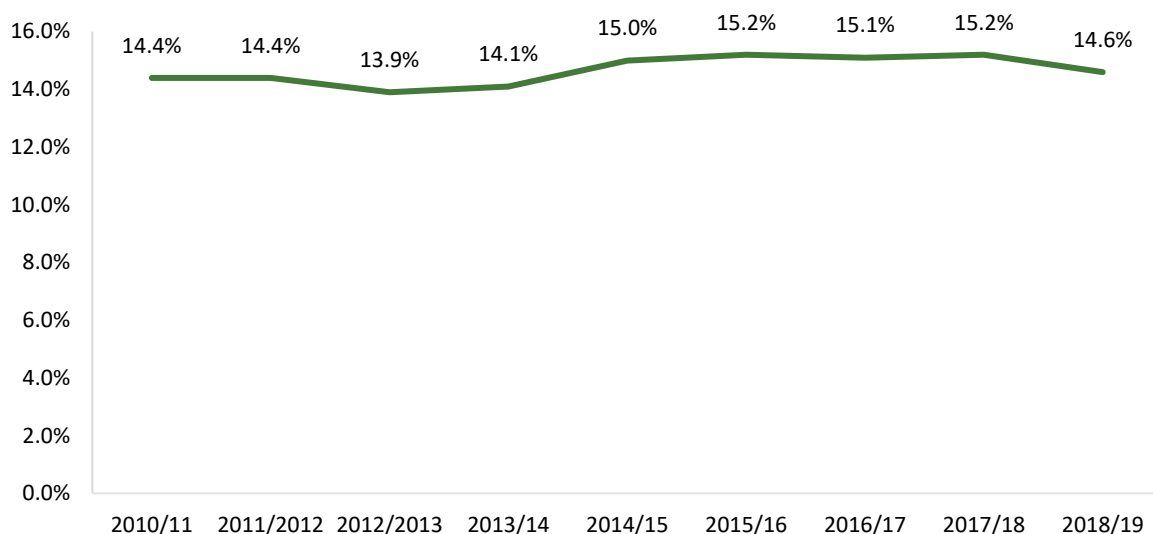
Source: KPI Programme 'Ask me anything' tool (KPI Programme, 2022). Accessed September 2022.

<sup>3</sup> The 28-day indicator data dashboard can be accessed at <https://www.mhakpi.health.nz>

## Australia

Australia uses 28-day readmission rates as a KPI measure for mental health services (Australian Commission Safety and Quality in Health Care, 2019). Figure 1 shows Australian readmission rates from 2010/2011 to 2018/19 reported by the Australian Institute of Health and Welfare (Australian Institute of Health and Welfare, 2021). Readmission rates in Australia appear to be stable over time, with national rates increasing by 0.2 percent between 2010/2011 and 2018/19.

Figure 1. Australian inpatient mental health readmission rates (Australian Institute of Health and Welfare, 2021)



## Other IIMHL countries

Table 2 presents readmission rates for IIMHL countries. Aotearoa New Zealand is similar to most other countries in measuring readmission rates within 28 to 30 days after discharge.

National readmission data appears to be scarcely reported, with Aotearoa New Zealand providing the most consistent data over time. The most recent snapshot of international readmission rates is reported by the NHS Benchmarking Network (2019). In 2019, the mean readmission rate across participating countries was around 11 percent, with a median of around 13 percent.<sup>4</sup> In this analysis, Aotearoa New Zealand and Australia had the highest readmission rates (approximately 15.5 and 15 percent, respectively), followed by Scotland (approximately 13.3 percent). The Netherlands had the lowest readmission rate of around 1 percent.

Apart from Aotearoa New Zealand and Australia, locally reported data on readmission rates tend to be out of date. The most recent data identified for other IIMHL countries were from

<sup>4</sup> Participating IIMHL countries for this analysis were Aotearoa New Zealand, Australia, Scotland, England, and Netherlands. Other countries include Wales and Northern Ireland.

2016 for Netherlands, 2015 for England, 2012 for Canada, and 2009 for Scotland. England, Canada, and the Netherlands reported 30-day readmission rates of 11 percent (2014/15), 11.6 percent (2011/12), and 7.9 percent (2015/16) respectively.

Table 3. Acute mental health service readmission rates in IIMHL countries.

| Country  | Time period                 | Readmission period | Readmission rate              |
|--|-----------------------------|--------------------|-------------------------------|
| Australia<br><br>(Australian Institute of Health and Welfare, 2021; Department of Health and Ageing, 2013) | 2018 to 2019                | 28 days            | 14.6%                         |
|  | 2010 to 2018 also available | 28 days            | Range 13.9% to 15.2%          |
| England<br><br>(Health & Social Care Information Centre, 2016; Osborn et al., 2021)                        | 2013 to 2014                | 30 days            | 10.7% <sup>5</sup>            |
|  | 2014 to 2015                | 30 days            | 11.0%                         |
|  | 2013 to 2015                | 6 months           | 21.4% (mean = 34 days)        |
| Scotland<br><br>(Forti, 2014)  | 2004 to 2009                | 28 days            | Reduced by 25.1% over 5 years |
| Canada<br><br>(Alberta Health Services, Addiction and Mental Health, 2015)                                 | 2011 to 2012                | 30 days            | 11.6%                         |
| Netherlands <sup>6</sup><br><br>(Hekkert et al., 2019)   | 2015 to 2016                | 30 days            | 7.9%                          |

Readmission data could not be found for Ireland and Sweden. It is unclear whether these countries do not routinely record readmission data or if this data is not publicly available.

Readmission rates from the US are not included in Table 3 as no national data was found. National rates are not recorded because states vary widely in methods and policies on mental health service data collection (Legal Action Network, 2020). Readmission rates

<sup>5</sup> Calculated from data provided by Health & Social Care Information Centre (2016).

<sup>6</sup> Averaged over five types of readmissions: without transfer, to other hospitals, to other general hospitals, to other leading clinical hospitals, and to other university hospitals.

reported in individual US studies range from 15 percent within 30 days across inpatient facilities to around one-third within 1.5 years in Washington State (Mancuso, 2009).

## Strategies to reduce readmission rates

This section summarises strategies to reduce readmission rates. Table 5 in [Appendix A](#) includes further study details.

### Discharge planning

As previously shown, insufficient discharge planning is a key factor for readmission. Comprehensive discharge planning involves multiple person-centred components. These include:

- providing information, resources, and choice of support to people
- structured assessment of the person and their support network's needs
- ensuring people are aware of support available in the community
- identifying the person's support preferences
- planning suitable accommodation
- planning finances and support for the person and their whānau
- presence of a discharge planner
- linking inpatient staff to those in community services
- educating the person on self-management
- ongoing assessment and adjustment of plans if needed
- support coordination after discharge
- setting a contingency plan in case arrangements break down (Durbin et al., 2007; Evans et al., 2017; Hegedüs et al., 2020; Kripalani et al., 2014; Vigod et al., 2013; Xiao et al., 2019).

Effective interdisciplinary communication between the person being discharged, their whānau, inpatient staff, and community services is key in ensuring tāngata whai ora are sufficiently and continuously supported in and outside of inpatient services. This provides effective wrap-around support for tāngata whai ora, and enables their health and broader social needs to be met (Office of the Auditor-General, 2017). Discharge plans are best done collaboratively and in partnership with tāngata whai ora (Xiao et al., 2019).

Manatū Hauora Ministry of Health expects discharge planning to start between 1 to 7 days after a person is admitted into inpatient services (Office of the Auditor-General, 2017). Beginning discharge planning early in the person's stay is important to allow enough time to achieve the above components and reduce the likelihood of discharging tāngata whai ora without a plan (Centers for Medicare & Medicaid Services Office of Minority Health, 2016; Durbin et al., 2007; Kripalani et al., 2014).

Comprehensive discharge planning reduces readmission rates. Kripalani and colleagues (2014) found comprehensive discharge planning reduced 6-week readmission rates from 23 percent to 10 percent. Another review of 15 studies found providing education to people (including self-management, medication information, and living skills), structured post-discharge planning, needs assessment, telephone follow-ups, home visits, and peer support were effective in reducing readmission rates (Vigod et al., 2013).

### *Factors affecting likelihood of developing a discharge plan*

Various factors affect people's likelihood of developing a discharge plan. Haselden and colleagues (2019) found any family involvement including communicating with the person in inpatient services, family visits, attending family therapy, and inpatient staff communicating with family about available services, increased the likelihood of developing a comprehensive discharge plan (OR = 2.39, 2.34, 2.74, and 2.25 respectively); whereas being diagnosed with a co-occurring substance use disorder was a factor for no family involvement (OR = 0.39) and not developing a sufficient discharge plan (OR = 0.46).

### **Whānau involvement**

Involving people's whānau can reduce the likelihood of readmission and improve outcomes. Five studies identified across two systematic reviews identified that family support is linked with lower rates of readmission (Durbin et al., 2007; Sfetcu et al., 2017).

Individual studies indicate whānau involvement is linked with positive treatment outcomes. Adeponle and colleagues (2009) found people whose family were involved in their treatment were significantly more likely to attend scheduled appointments (OR = 3.7). Another study found people were more likely to receive comprehensive discharge planning (which is linked with lower readmission rates) if they were contacted by their family (OR = 2.39), had family members visit (OR = 2.34), or attended family therapy sessions (OR = 2.74; Haselden et al., 2019). Communication between family and inpatient staff was also linked with a greater likelihood of people attending follow-up appointments within 7 days (OR = 2.81) and 30 days after discharge (OR = 3.65). Family involvement has also been identified as a key component in successful transitional approaches that reduce readmission rates (Hegedüs et al., 2020).

It is particularly important for services to involve whānau of Māori, Pasifika, and people of other Indigenous or collectivist cultures. Indigenous cultures are more likely to perceive themselves as an inseparable part of the family and wider community (Faleafa, 2020; Podsiadlowski & Fox, 2011). In a qualitative study with Samoan people in Aotearoa New Zealand, participants noted that addressing mental health challenges cannot be isolated without involving the family (Tiatia-Seath, 2014). It is therefore important for services to involve whānau during treatment, and particularly during discharge planning, to ensure tāngata whai ora are well-supported after discharge.

## External relationships

Enhancing external relationships with community services is essential to providing continuous wrap-around support for people accessing mental health services. Several studies identify the importance of fostering partnerships between inpatient and community services (Hegedüs et al., 2020; Sather et al., 2018; Tyler et al., 2019; Vigod et al., 2013). This can involve communication and involvement between inpatient and community mental health staff, as well as coordinating social services to ensure people are linked to their designated support after discharge. Increasing communication and cooperation are frequently cited components supporting development of relationships, with studies recognising that doing so can improve people's experiences, outcomes, and enhance information sharing (Hegedüs et al., 2020; Sather et al., 2018).

Additional ways to enhance cross-service partnerships identified across the literature include:

- the presence of a transition coordinator or manager (that is, a staff member to ensure people have a sufficient discharge plan and are well supported during their transition into the community)
- timely communication between inpatient staff and outpatient support, or community service providers
- providing support from ward-based professionals in the community, or vice versa, by having community teams leading discharge planning in wards
- inpatient nurses working with people until they establish a therapeutic relationship with their community worker
- implementing and utilising community-based discharge teams and community links teams (Hegedüs et al., 2020; Tyler et al., 2019; Vigod et al., 2013).

## Other

Other modifiable service factors identified across the literature are listed below.

- **Cultural competence.** This includes understanding and demonstrating respect for cultural practices and beliefs to best facilitate people's transition and capacity to self-manage in the community. Cultural competence is particularly important for achieving positive service experiences and wellbeing outcomes for Indigenous peoples.
- **Effective use and collection of data** (including who is readmitted, for what condition, from what location, due to what factors, and at what cost) to better understand population groups, settings, and factors, and how these relate to readmissions.
- **Using a multidisciplinary team/approach.**
- **Ensuring timely post-discharge follow-up** (within 7 days).
- **Peer support** where people who have experienced mental health challenges and accessed services support people currently accessing services. Support includes

facilitating access to local communities, promoting connection, and using their own lived experience to support people in developing resilience and meaning.

- Implementing elements of **cognitive behavioural therapy** such as skills training.
- **Self-management training** (Centers for Medicare & Medicaid Services Office of Minority Health, 2016; Hegedüs et al., 2020; Kripalani et al., 2014; Mark et al., 2013; NSW Government, 2017; Sather et al., 2018; Vigod et al., 2013).



## Discussion

This review summarises evidence around factors associated with readmission, readmission measures and rates used in Aotearoa New Zealand and internationally, and strategies used to reduce readmission to inpatient mental health services. Several person- and service-level factors have been found to influence people's likelihood of readmission. This includes insufficient discharge planning, low whānau involvement, some specific mental health diagnoses, and a history of inpatient admissions.

Readmission may indicate unmet need and lack of appropriate support during transition back into the community. It is therefore important to address underlying factors to reduce readmission rates. Evidence suggests strategies such as comprehensive discharge planning, whānau involvement, enhancing and utilising the relationships between inpatient and community services, increasing cultural competency, and effective collection of quality improvement data can help to reduce readmission rates.

The KPI Programme's readmission indicator is in line with international measures in that readmission rate timeframes are generally set at 28 to 30 days (Fischer et al., 2014). Aotearoa New Zealand and Australia appear to report readmission rates most consistently compared to other IIMHL countries. Available and publicly reported data suggests that while readmission rates in Aotearoa New Zealand have trended downwards since 2016, they appear to be higher compared to other IIMHL countries.

Better support is required to reduce readmission rates for Māori. Rates for Māori indicate a need to better understand service experiences, such as whether services provide Māori with culturally appropriate treatment, equitable opportunities to form comprehensive discharge plans, or opportunities to involve whānau. Broader health literature highlights that Māori are more likely to experience racial discrimination, less positive experiences with services, unequal access to services, and differential management according to best practice guidelines compared to Pākehā (Ahuriri-Driscoll et al., 2022; Houkamau, 2016). It is important to understand factors which underlie differences in service experiences; doing so can help address inequities in outcomes for tāngata whai ora. This is in line with national strategies to transform Aotearoa New Zealand's mental health services and improve outcomes for tāngata whai ora (Government Inquiry into Mental Health and Addiction, 2018; Manatū Hauora Ministry of Health, 2021). Continuing to record and report local information is needed to inform service planning and delivery.

It is important to acknowledge that readmission rates do not, on their own, reflect the quality of mental health services. As outlined in this review, several factors, and the interaction between these, can affect people's likelihood of readmission. It is also important to acknowledge that readmission may not necessarily be a negative outcome for all tāngata whai ora. Recovery from mental health challenges may not be a linear process and can involve returning to whānau or services for extra support. Further examination is required to

better understand for whom readmission may be a positive and productive part of the recovery journey.

## Limitations

There is a paucity of research around the impact of cultural competence on readmission. It is essential to better understand this area given higher readmission rates among Māori in Aotearoa New Zealand. In Western countries including Aotearoa New Zealand, services are traditionally delivered based on Western, individualistic models of support rather than collectivist, whānau-focused approaches that are more aligned with Māori, Pasifika, and Indigenous concepts of wellbeing (O'Hagan et al., 2012). Further examination is therefore needed to identify factors that may contribute to higher readmission rates for Māori, such as cultural competency among staff, different service experiences, and alignment between service provision and cultural expectations.

Further research is needed regarding readmission indicators. We initially looked to examine social outcomes associated with readmission such as quality of life, employment, and housing. However, our search identified only supporting evidence, for example, the links between continuity of support or the effects of support management approaches on quality of life (Lim et al., 2021; Puntis et al., 2015). A better understanding of outcomes and social functioning for people who have experienced multiple readmissions is needed.

Though national reports tend to use a 28- to 30-day timeframe for measuring readmissions, some studies use a 1-year timeframe (such as Madi et al., 2007; Tedeschi et al., 2020; Zhang et al., 2011). Some people are also readmitted multiple times within a year of discharge (Gunnell et al., 2008; Hope et al., 2021). Further work may be required to explore the utility of a 1-year indicator within the KPI Programme.

## Conclusion

It is recommended that the KPI Programme continue using the current 28-day readmission indicator. Measuring the percentage of tāngata whai ora readmitted within 28 days of discharge is in line with international measures. Continued use also supports comparability and benchmarking over time.

In addition, continued use of the 28-day readmission indicator will help monitor disparities in readmission rates across ethnic groups, and reiterate the ongoing need for services to deliver culturally appropriate strategies to reduce readmission rates, particularly for Māori.

## Appendix A

Acute inpatient 28-day readmission rate indicator

The following information was retrieved from the KPI Programme website.<sup>7</sup>

### Description

Percentage of overnight discharges from the mental health and addiction service organisation's acute inpatient unit(s) that result in readmission within 28 days of discharge.

This KPI calculates an overall readmission rate, which is the percentage of all acute inpatient discharges that were readmitted, regardless of where that readmission occurred (same DHB or different DHB).

### Indicator rationale

Psychiatric inpatient services aim to provide treatment that enables individuals to return to the community as soon as possible. Unplanned admissions to a psychiatric facility following a recent discharge may indicate that inpatient treatment was either incomplete or ineffective, or that follow-up care was inadequate to maintain the person out of hospital.

### Denominator

Count of acute inpatient discharges

### Numerator

- Count of acute inpatient discharges where a readmission occurs within 28 days; that is where an activity exists (for the same person), where:
  - Referral team type is Inpatient — into an inpatient team
  - Activity type is T02 or T03 — acute inpatient bednight codes
  - Activity unit count > 0 — for more than 0 days
  - Activity start date is between 0 and 28 days after inpatient discharge date
    - ReadmissionActivityStartDate >= dateadd(0, day, InpatientDischargeDate)
    - ReadmissionActivityStartDate < dateadd(29, day, InpatientDischargeDate)

### Technical notes

This denominator is shared with the other members of the acute inpatient KPI suite: 7-day follow-up, length of stay, and pre-admission community contact.

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<sup>7</sup> <https://www.mhakpi.health.nz/kpi-streams/adult-stream/>

## **General terminology**

An acute inpatient discharge is any referral record where:

- 1) ReferralEndDate is not null — ended referral
- 2) TeamType is Inpatient — into an inpatient team
- 3) ReferralEndCode is DR, DW or DT — ended in a way where we expect follow-up
- 4) ReferralTo is not PI, AE or NP — was not moving on to another hospital setting
- 5) Exists at least one activity where — there was at least one acute inpatient bednight
  - a) ActivityTypeCode is T02 or T03 — acute inpatient bednight codes
  - b) ActivityUnitCount > 0 — for more than 0 days

## Appendix B

### Details of articles identified through the literature search

This section summarises articles identified through the literature searches. Table 3 presents summarised factors associated with readmission and outcomes, and Table 4 describes approaches to reducing readmission.

The searches included meta-analyses and systematic reviews published between 2007 to 2021. Individual studies, including grey literature, were published between 2008 and 2021 that may not have otherwise been identified in meta-analyses.

Table 4. Articles relevant to factors and outcomes associated with readmission

| Title and authors  | Aim  | Study type        | Sample details   | Main findings  |
|--|--|-------------------|--|--|
| <b>Meta-analyses and systematic reviews</b>  |  |                   |  |  |
| Pre-discharge factors predicting readmissions of psychiatric patients: A systematic review of the literature<br><br>Donisi et al., 2016<br><br>Italy | To identify the studied pre-discharge variables and describe their relevance to readmission among psychiatric patients | Systematic review | Papers were included based on the following characteristics: <ul style="list-style-type: none"> <li>Studied the quantitative association between pre-discharge variables and inpatient readmission after discharge for people with a main psychiatric diagnosis</li> <li>Outcome of interest: readmission to inpatient hospital care (psychiatric or non-psychiatric/general bed)</li> <li>Papers published in English, German,</li> </ul> | 58 articles were identified.<br><br>Pre-discharge variables were classified into six categories.<br><b>Patient-level factors</b> <ol style="list-style-type: none"> <li>Patient demographics and social and economic characteristics <ol style="list-style-type: none"> <li>Risk factors include higher number of previous admissions, longer duration of illness, previous use of non-psychiatric health services, unemployment, and disabilities.</li> <li>Protective factors include older age, being married, being employed, and higher education level.</li> </ol> </li> <li>Patient clinical characteristics <ol style="list-style-type: none"> <li>Risk factors include having a mood disorder, substance use disorder (primary or secondary diagnosis), personality disorder, history of suicide</li> </ol> </li> </ol> |

| Title and authors | Aim | Study type | Sample details   | Main findings   |
|-------------------|-----|------------|--|---|
|                   |     |            | <p>Spanish, Italian, and French</p> <p>Studied adult populations (at least 18 years old)</p> | <p>attempt (self or family), and lower Global Assessment of Functioning score.</p> <p>b. Protective factors include higher quality of life, higher number and frequency of contacts, and satisfaction (with living arrangements, family and social relations, leisure activities, personal safety, finances).</p> <p>3) Patient clinical history</p> <p>a. Risk factors include admission history, duration of illness, and number of hospital days (in a given period before index admission).</p> <p>4) Patient attitudes and perceptions</p> <p>a. Protective factors include higher satisfaction with hospital treatment and positive attitude towards medication.</p> <p><b>Contextual factors</b></p> <p>5) Environmental, social, and hospital characteristics</p> <p>a. Risk factors include being discharged from regional and public hospitals, lower median length of stay, higher annual mean number of stays, insufficient emotional and practical support from caregivers, and maladaptive family system functioning.</p> <p>b. Protective factors include being discharged from medical centres or not-for-profit hospitals.</p> <p>6) Admission and discharge characteristics</p> <p>a. Risk factors include being discharged to a relative, referral to social services, and complications during hospitalisation.</p> |

| Title and authors  | Aim  | Study type               | Sample details   | Main findings  |
|--|--|--------------------------|--|--|
| <p>Is readmission a valid indicator of the quality of inpatient psychiatric care?</p> <p>Durbin et al., 2007</p> <p>Canada</p> | <p>To review research on predictors of early readmission (within 30 to 90 days) to assess the association between this indicator and quality of inpatient psychiatric care</p> | <p>Systematic review</p> | <p>Articles identified from PsychInfo and Medline</p> <p>Included studies had the following characteristics:</p> <ul style="list-style-type: none"> <li>- Original quantitative analysis of predictors of readmission</li> <li>- Used early readmission (within 90 days of discharge) as a dependent variable</li> <li>- Assessed at least one predictor of patient status or treatment during hospitalisation</li> <li>- Written in English</li> </ul> <p>Published between 1995 and 2006</p> | <p>Protective factors include adequate discharge planning, being assigned to an outpatient commitment group, and intensive case management.</p> <p>Thirteen papers (based on 12 studies) were included for analysis – seven assessed predictors of readmission within 30 days, four within 60 to 90 days, and two compared earlier and later readmission groups. 30-day readmission rates ranged from 7 to 17%.</p> <p>Possible risk factors associated with readmission include:</p> <ul style="list-style-type: none"> <li>- previous hospitalisation (4 of 5 studies)</li> <li>- bipolar, depression, psychotic disorder diagnosis (4 of 10 studies)</li> <li>- acuity at discharge (eg active symptoms, were in restraint, isolation, exhibited active psychotic behaviour, had low overall ratings of functioning; 3 of 5)</li> <li>- being discharged earlier than recommended by clinicians (1 of 1)</li> <li>- being discharged without being prescribed the expected medications (2 of 2)</li> <li>- low staffing levels and patient turnover (1 of 1)</li> <li>- low family involvement (1 of 1)</li> <li>- problems with medication compliance (1 of 1)</li> <li>- behaviour issues (2 of 2).</li> </ul> <p>Studies identified that the period immediately after discharge is associated with high vulnerability to readmission, underscoring the importance of hospital-community transition and of examining service practices that may prepare people to better manage during this period.</p> |

| Title and authors   | Aim   | Study type                          | Sample details   | Main findings   |
|---|---|-------------------------------------|--|---|
|   |   |                                     |  | <p>Regarding acuity and behaviour issues, studies suggest the importance of greater (continuity in) discharge planning. Discharge planning should ideally begin at admission to allow time to educate people about the importance of continued support after discharge, explore clinical and social post-discharge needs, care preferences, stability of clinical condition, preparing people emotionally and practically to manage in the community, and connect people with community providers while they are receiving inpatient services.</p>  |
| <p>Risk factors for suicide within a year of discharge from psychiatric hospital: A systematic meta-analysis</p> <p>Large et al., 2011</p> <p>Australia</p> | <p>To establish risk factors for suicide in the year following discharge from psychiatric hospitals and their usefulness in categorising patients as high or low risk suicide</p> | <p>Systematic meta-analysis</p>     | <p>N = 13</p> <p>Studies reported a total of 1,544 suicides (mean = 127 per study)</p> <p>Study inclusion criteria:</p> <ul style="list-style-type: none"> <li>- Reported characteristics of people who committed suicide within one year after discharge from a psychiatric inpatient setting</li> <li>- Reported characteristics of a control group from the same settings who did not commit suicide in the same period</li> </ul> <p>Employed case control, nested case control, or cohort control designs</p> | <p><b>Risk factors</b></p> <ul style="list-style-type: none"> <li>- History of self-harm or suicide attempt (OR = 3.15)</li> <li>- Depressive symptoms irrespective of affective diagnosis (OR = 2.7)</li> <li>- Male sex (OR = 1.58)</li> <li>- Recent social difficulties (OR = 2.23)</li> <li>- Hopelessness (OR = 2.31)</li> <li>- Suicidal ideation (OR = 2.47)</li> <li>- Major depressive disorder (OR = 1.91)</li> <li>- Unplanned discharge (OR = 2.44)</li> </ul> <p>People who had less psychiatric follow-up because they were either discharged from care or had less frequent outpatient appointments were less likely to commit suicide in the year following discharge (OR = 0.69).</p> |
| <p>Overview of post-discharge</p>   | <p>To identify frequently reported</p>  | <p>Systematic literature review</p> | <p>N = 80 articles</p>   | <p>59 factors impacting readmission were identified. These were categorised into four types.</p>  |



| Title and authors  | Aim  | Study type | Sample details   | Main findings  |
|--|--|------------|--|--|
| <p>predictors for psychiatric re-hospitalisations: A systematic review of the literature</p> <p>Sfetcu et al., 2017</p> <p>Romania</p> | <p>post-discharge factors and their effects on readmission rates</p> |            | <p>Inclusion criteria:</p> <ul style="list-style-type: none"> <li>- Published between January 1990 and June 2014</li> <li>- Reported data on association between post-discharge variables and readmission of patients with a main psychiatric diagnosis at discharge</li> <li>- Bivariate or multivariate analyses</li> </ul> <p>Adult samples</p> | <ol style="list-style-type: none"> <li>1) Individual vulnerability – significant in 37 of the 58 studies which studied them</li> <li>2) Aftercare factors – significant in 30 of 45 studies</li> <li>3) Community care and service responsiveness – significant in 21 of 31 studies</li> <li>4) Contextual factors and social support – significant in all seven studies</li> </ol> <p><b>Individual vulnerability</b></p> <ul style="list-style-type: none"> <li>- Compliance/non-compliance to treatment/appointments – 12/16 protective factor</li> <li>- Housing and living arrangements – 7/12 mixed results</li> <li>- Related to symptoms – 6/10 risk factor</li> <li>- Post-discharge behaviour – 3/5 risk factor</li> <li>- Financial factors – 4/8 mixed results</li> <li>- General wellbeing in post-discharge period – 2/3 risk factor</li> </ul> <p><b>Aftercare factors</b></p> <ul style="list-style-type: none"> <li>- Follow-up in primary care – 7/8 mixed results</li> <li>- Referral to outpatient services – 4/7 mixed results</li> <li>- Post-discharge access to treatment (medication prescription) – 3/4 risk factor</li> <li>- Follow-up within seven days from discharge – 4/5 mixed results</li> <li>- Follow-up within 30 days from discharge – 6/6 mixed results</li> <li>- Long term follow-up – 4/10 protective factor</li> <li>- Day treatment – 2/4 mixed results</li> </ul> <p><b>Community care and service responsiveness factors</b></p> <ul style="list-style-type: none"> <li>- Case management programs – 7/12 mixed results</li> </ul> |

| Title and authors  | Aim  | Study type                                    | Sample details   | Main findings   |
|--|--|---|--|---|
|  |  |   |  | <ul style="list-style-type: none"> <li>- Compulsory outpatient treatment – 5/5 mixed results</li> <li>- Continuity of care practices and programs – 9/14 mixed results</li> </ul> <p><b>Contextual factors and social support</b></p> <ul style="list-style-type: none"> <li>- Geographical variables – 2/2 risk factor</li> <li>- Support/lack of support of the family – 4/4 protective factor</li> </ul> <p>Peer support – 1/1 protective factor</p> |
| <b>Individual studies</b>  |  |   |  |   |
| <p>Family participation in treatment, post-discharge appointment and medication adherence at a Nigerian psychiatric hospital</p> <p>Adeponle et al., 2009</p> <p>Nigeria</p> | <p>To investigate the relationship of family engagement in treatment during hospitalisation with post-discharge appointment and medication adherence</p> | <p>Prospective observational cohort study</p> | <p>81 patients from a Nigerian psychiatric hospital (68 were effectively assessed due to uncontactable people)</p> <p>54.3% (n = 47) male, 45.7% (n = 44) female</p> <p>Most were 21 to 40 years old (67.9%; n = 55)</p> <p>Diagnoses included non-affective psychosis (59.3%), affective disorders (24.7%), and substance-related disorders (16.0%)</p> <ul style="list-style-type: none"> <li>- Most had their diagnosis for at least one year (69.1%) and had received previous treatment (71.6%).</li> </ul> | <p>People whose families were involved in treatment were significantly more likely to adhere to scheduled appointments (odds ratio OR = 3.66, <math>p = 0.047</math>). Family involvement slightly improved medication adherence (OR = 1.51) but this effect was not significant (<math>p = 0.59</math>). Results sustained with or without people who were unable to be contacted.</p>   |

| Title and authors  | Aim  | Study type                        | Sample details  | Main findings  |
|--|--|-----------------------------------|---|--|
| <p>An examination of risk factors for readmission to acute adult mental health services within 28 days of discharge in the Australian setting</p> <p>Callaly et al., 2016</p> <p>Australia</p> | <p>To identify risk factors associated with readmission within 28 days of discharge from eight Australian acute adult mental health inpatient services</p> | <p>Retrospective cohort study</p> | <p>N = 480 (222 people readmitted within 28 days, compared with 258 controls not readmitted in same period)</p>   | <p>Risk factors for being readmitted include:</p> <ul style="list-style-type: none"> <li>- being female (OR = 1.46)</li> <li>- being an existing client at the service (OR = 3.62)</li> <li>- admitted at least once within the last 12 months (OR = 3.30)</li> <li>- emotionally unstable personality disorder diagnosis (OR = 3.70)</li> <li>- follow-up care planned to be with local adult mental health service (OR = 1.89)</li> <li>- no discharge plan (OR = 5.30)</li> <li>- no record of discharge plan sent to GP (OR = 6.91)</li> <li>- higher mean HoNOS score at admission (<math>t_{(366)} = 2.33</math>).</li> </ul> <p>Risk factors that remained significant in multivariate analyses include:</p> <ul style="list-style-type: none"> <li>- being female (OR = 1.41)</li> <li>- being an existing client at the service (OR = 2.27)</li> <li>- admitted at least once in the last 12 months (OR = 2.23)</li> <li>- emotionally unstable personality disorder diagnosis (OR = 2.62)</li> <li>- follow-up care planned to be with local adult mental health service (OR = 1.87)</li> <li>- no record of discharge plan sent to GP (OR = 10.94)</li> </ul> |
| <p>Quality of Follow-Up after Hospitalization for Mental Illness among Patients from Racial-Ethnic Minority Groups</p>   | <p>To assess the quality of outpatient treatment episodes following inpatient psychiatric treatment among</p>  | <p>Retrospective cohort study</p> | <p>N = 339 adults (18+) with any inpatient psychiatric treatment (from Medical Expenditure Panel Survey, 2004 to 2010)</p> <p>Total of 432 treatment episodes</p> | <p>Rates of follow-up ranged from 16% to 22% for any outpatient service within seven days, 11% to 14% for adequate treatment beginning with seven days, 29% to 51% for any outpatient visit within 30 days, and 17% to 26% for adequate treatment within 30 days.</p> <p><b>Comparisons</b></p>  |

| Title and authors   | Aim  | Study type                 | Sample details   | Main findings   |
|---|--|----------------------------|--|---|
| Carson et al., 2014<br><br>USA  | blacks, whites, and Latinos in the United States   |                            |  | <p>Black people were more likely to be diagnosed with a psychotic disorder while hospitalised, have low family income, and have public insurance compared to white people.</p> <p>Black people were half as likely as white people to receive follow-ups within 30 days of inpatient discharge (OR = 0.45) and were one-third as likely to receive adequate care within 30 days of discharge (OR = 0.36). In proportions, this translated to 23% of black people receiving follow-ups within 30 days compared to 40% of white people. Latinos and white people received follow-up care at similar rates.</p> <p>Having two or more co-existing medical illnesses was significantly predictive of follow-up within seven days (OR = 2.96), adequate treatment within seven days (OR = 3.19), and follow-up within 30 days (OR = 1.90). Being aged 35 to 64 years old was significantly predictive of receiving adequate treatment within seven days (OR = 3.38).</p> |
| Thirty-Day and 5-Year Readmissions following First Psychiatric Hospitalization: A System-Level Study of Ontario's Psychiatric Care<br><br>Chen et al., 2018 | To examine key trends and variables with implications for inpatient care as indicated by 30-day readmission and outpatient care as reflected by readmission within 5 years | Retrospective cohort study | <p>N = 42,280 people who had their first inpatient admission were followed for 5 years to examine their subsequent 30-day and overall admission rates</p> <p>Diagnoses:</p> <ul style="list-style-type: none"> <li>- 44.6% mood disorders</li> <li>- 18.0% schizophrenia</li> <li>- 17.4% substance-related</li> <li>- 6.9% delirium/dementia</li> <li>- 13.0% other.</li> </ul> | <p>The 30-day and 5-year readmission rates for the entire sample were 7.2% and 35.1% respectively.</p> <p>30-day readmission rates by diagnosis:</p> <ul style="list-style-type: none"> <li>- 6.8% mood disorders</li> <li>- 10.2% schizophrenia/other psychosis disorder</li> <li>- 4.3% substance-related</li> <li>- 10% delirium/dementia</li> <li>- 6.9% other.</li> </ul> <p>30-day readmission rates steadily declined between 2005 and 2010. Compared with the 2009/10 group, rates were significantly</p>   |

| Title and authors | Aim | Study type | Sample details | Main findings   |
|-------------------|-----|------------|----------------|---|
| Canada            |     |            |                | <p>higher in 2005/6, 2006/7, and 2007/8. This decline was not evident for substance-related and delirium/dementia.</p> <p>5-year readmission rates by diagnosis:</p> <ul style="list-style-type: none"> <li>- 34% mood disorders</li> <li>- 51.5% schizophrenia/other psychosis disorder</li> <li>- 29.1% substance-related</li> <li>- 25.7% delirium/dementia</li> <li>- 29.5% other.</li> </ul> <p>5-year readmission rates also declined from 2005 to 2010, with rates in 2005/6, 2006/7, and 2008/9 being higher than the 2009/10 rate. This pattern was not evident for those with delirium/dementia.</p> <p>For 5-year readmission, authors also analysed the time interval between the discharge of the first inpatient stay and the second admission. The medians were 229 days for the full cohort, with 227 days for mood disorders, 265 days for schizophrenia/other psychotic disorders, 252 days for substance-related disorders, and 85 days for delirium/dementia.</p> <p><b>Sociodemographic factors</b></p> <ul style="list-style-type: none"> <li>- Being female was associated with lower risk of 5-year readmission in schizophrenia/other psychosis disorders and both 30-day and 5-year readmission for delirium/dementia.</li> <li>- Middle age (35 to 50 years) was protective for 30-day readmission in mood disorders, and both 30-day and 5-year readmission in schizophrenia/other psychosis disorders but was a risk factor for 5-year readmission for substance-related disorders.</li> </ul> |

| Title and authors   | Aim   | Study type                        | Sample details   | Main findings   |
|---|---|-----------------------------------|--|---|
|   |   |                                   |  | <ul style="list-style-type: none"> <li>- Being single/divorced/separated/widowed was a significant risk factor for 5-year readmission in mood, schizophrenia/other, and substance-related disorders.</li> <li>- Speaking languages other than English was a protective factor for 5-year readmission in mood, schizophrenia, and substance-related disorders.</li> <li>- Higher education was protective for 30-day and 5-year readmission in schizophrenia/other but a risk factor for delirium/dementia.</li> <li>- Unemployment was a significant risk factor for readmission in almost all diagnoses.</li> <li>- Aboriginal origin was a risk factor for 5-year readmission in schizophrenia/other disorders.</li> <li>- Treatment in a psychiatric hospital was a significant risk factor for readmission in all major diagnoses.</li> <li>- Longer LOS (&gt;14 days) was a risk factor for 5-year readmission in mood disorders but protective for readmission in substance-related disorders and delirium/dementia.</li> </ul> |
| <p>Rapid and frequent psychiatric readmissions:<br/>Associated factors</p> <p>Evans et al., 2017</p> <p>England</p> | <p>To examine the impact of clinical and demographic factors on both rapid readmission (within 30 days) and frequent readmission (three or more admissions) in a London mental health trust</p> | <p>Retrospective cohort study</p> | <p>N = 7,648 adults admitted to inpatient units</p> <ul style="list-style-type: none"> <li>- 5,083 had single admissions</li> <li>- 2,565 had multiple admissions</li> <li>- Total of 13,015 admissions</li> </ul> | <p>43.7% of the sample had at least three admissions.</p> <p>Between frequent and non-frequent admitters, all sociodemographic factors except for gender and age were significantly different. Frequent admitters were more likely to:</p> <ul style="list-style-type: none"> <li>- be unemployed</li> <li>- have more care coordinators</li> <li>- be living in accommodation with support</li> <li>- be of black ethnicity</li> <li>- diagnosed with schizophrenia/schizotypal/delusional disorder or personality disorder</li> <li>- have a mental health act (MHA) section 2/3/5/136</li> </ul>   |

| Title and authors  | Aim  | Study type                 | Sample details  | Main findings   |
|--|--|----------------------------|---|---|
|  |  |                            |   | <ul style="list-style-type: none"> <li>- be single.</li> </ul> <p>Additional multivariate analyses showed that ethnicity, diagnosis, number of care coordinators, and MHA section remained significant in predicting differences in admission frequency (fewer than three vs at least three). This model explained between 36.1% and 60.9% of variance, and correctly classified 86.3% of cases.</p> <p>Comparing those who were rapidly readmitted (within 30 days) to those who were not, the following factors significantly predicted differences:</p> <ul style="list-style-type: none"> <li>- younger age</li> <li>- fewer care coordinators</li> <li>- not have a MHA section</li> <li>- white ethnicity</li> <li>- personality disorder.</li> </ul> <p>Additional multivariate analyses showed only age and number of care coordinators were significant. This model explained only a small amount of variance (between 3.7% and 4.2%) and correctly classified 77.7% of cases.</p> |
| Factors Related to 30-day Readmission following Hospitalization for Any Medical Reasons among Patients with Mental Disorders | To evaluate the contributions of clinical, sociodemographic, and service use variables to the risk of early readmission among people with mental disorders | Retrospective cohort study | <p>N = 2,954 people diagnosed with a mental disorder, hospitalised for any medical reason, who visited one of six Quebec emergency departments in 2014 to 2015</p> <p>Age 12+</p> | <p>Multivariate regression resulted in the following risk factors:</p> <ul style="list-style-type: none"> <li>- adjustment disorder (OR = 1.52)</li> <li>- serious mental disorder (OR = 1.64)</li> <li>- co-occurring substance-related disorder/chronic physical illness (OR = 3.92)</li> <li>- consulted the same outpatient psychiatrist 4+ times (OR = 1.85)</li> <li>- hospitalised for any reason in the 12 months prior to index hospitalisation (OR = 1.83).</li> </ul>  |

| Title and authors   | Aim   | Study type   | Sample details   | Main findings  |
|---|---|--|--|--|
| Gentil et al., 2020   | in Quebec, Canada   |  |  | <p>Consulting a physician for any medical reason within a 30-day period after discharge or prior to readmission was a protective factor for 30-day readmission (OR = 0.33).</p> <p>Clinical variables accounted for 52% of the total variance in the model, service use variables contributed 42%, sociodemographic variables contributed 6%.</p>  |
| <p>Hospital admissions for self harm after discharge from psychiatric inpatient care: Cohort study</p> <p>Gunnell et al., 2008</p> <p>England</p> | To determine the risk of non-fatal self-harm in the 12 months after discharge from psychiatric inpatient care | Cohort study based on national hospital episode statistics | <p>N = 75,401</p> <p>People aged 16 to 64 years discharged from psychiatric inpatient care between 1 April 2004 and 31 March 2005 and followed up for one year</p> | <p>11.7% were hospitalised for self-harm in the 12 months before their index psychiatric admission.</p> <p>24.7% of those discharged from psychiatric care were readmitted to a psychiatric bed in the 12 months after discharge and 6.5% were readmitted to a general hospital or psychiatric bed for self-harm. 0.3% of people who were readmitted after self-harm died.</p> <p>The risk of readmission for self-harm among people discharged from psychiatric inpatient care was higher in females (8.0%) than males (5.3%). More than one third of those who self-harmed after discharge (38.5%) had been admitted to hospital for self-harm in the 12 months before their index admission to psychiatric care.</p> <p><b>Timing of self-harm episodes</b></p> <p>Admissions for self-harm within 12 months post-discharge comprised about 7% of all admissions for self-harm.</p> <p>Risk of self-harm diminished rapidly in the weeks after discharge: around one third (32.0%) of admissions for self-harm occurred within 4 weeks after discharge, 11.9% occurred within 7 days, and 57.3% occurred within 12 weeks.</p> |



| Title and authors   | Aim  | Study type                 | Sample details   | Main findings   |        |              |                 |                     |  |  |     |       |       |    |       |       |
|---|--|----------------------------|--|---|--------|--------------|-----------------|---------------------|--|--|-----|-------|-------|----|-------|-------|
|   |  |                            |  | <p><b>Risk factors</b><br/>           At least 6% of people discharged from psychiatric inpatient care in England engaged in self-harm within 12 months. One third of these episodes occurred in the month after discharge. The actual figure is likely to be higher than this as less than half of all episodes of self-harm in England result in hospital admission.</p> <p>The strongest risk factor was an admission for self-harm in the previous 12 months (hazard ratio HR = 4.85).</p> <p>Additional risk factors for self-harm within 12 months include:</p> <ul style="list-style-type: none"> <li>- 40% higher in females</li> <li>- risk was 32% lower in those aged 45 to 64 years than for those aged 16 to 24 years (decreased with age)</li> <li>- risk was higher for those diagnosed with personality disorders (HR = 3.71), depression and anxiety (2.69), and substance misuse (2.64)</li> <li>- people who self-harmed tended to have shorter lengths of hospital stay than those who did not self-harm across all diagnostic groups.</li> </ul> |        |              |                 |                     |  |  |     |       |       |    |       |       |
| Clinical risk model to predict 28-day unplanned readmission via the accident and emergency department after discharge from acute psychiatric units for patients | To establish a clinical risk prediction model to predict 28-day unplanned readmission via the accident and emergency department after discharge from | Retrospective cohort study | N = 18,514 people (aged 18 to 65) discharged from psychiatric units between 1 January 2013 to 31 December 2017, comprising 30,717 discharge episodes | <p>The readmission rate was 7.09% with 1,496 people having more than one admission.</p> <p>Factors that differed significantly between people who had readmissions and those who did not:</p> <table border="1" data-bbox="1339 1187 2190 1332"> <thead> <tr> <th data-bbox="1339 1187 1630 1227">Factor</th> <th data-bbox="1637 1187 1912 1227">Readmissions</th> <th data-bbox="1919 1187 2190 1227">No readmissions</th> </tr> </thead> <tbody> <tr> <td data-bbox="1339 1232 1630 1272">History of violence</td> <td data-bbox="1637 1232 1912 1272"></td> <td data-bbox="1919 1232 2190 1272"></td> </tr> <tr> <td data-bbox="1339 1272 1630 1295">Yes</td> <td data-bbox="1637 1272 1912 1295">37.0%</td> <td data-bbox="1919 1272 2190 1295">24.2%</td> </tr> <tr> <td data-bbox="1339 1295 1630 1332">No</td> <td data-bbox="1637 1295 1912 1332">63.0%</td> <td data-bbox="1919 1295 2190 1332">75.8%</td> </tr> </tbody> </table>  | Factor | Readmissions | No readmissions | History of violence |  |  | Yes | 37.0% | 24.2% | No | 63.0% | 75.8% |
| Factor  | Readmissions   | No readmissions            |  |   |        |              |                 |                     |  |  |     |       |       |    |       |       |
| History of violence   |  |                            |  |   |        |              |                 |                     |  |  |     |       |       |    |       |       |
| Yes   | 37.0%  | 24.2%                      |  |   |        |              |                 |                     |  |  |     |       |       |    |       |       |
| No  | 63.0%  | 75.8%                      |  |   |        |              |                 |                     |  |  |     |       |       |    |       |       |

| Title and authors  | Aim  | Study type | Sample details | Main findings                         |       |       |
|--|--|------------|----------------|---------------------------------------|-------|-------|
| with psychotic spectrum disorders<br><br>Hariman et al., 2020<br><br>Hong Kong | acute psychiatric units for patients with psychotic spectrum disorders |            |                | History of suicide                    |       |       |
|  |  |            |                | Yes                                   | 32.2% | 22.2% |
|  |  |            |                | No                                    | 67.8% | 77.8% |
|  |  |            |                | Number of previous admissions, median | 5     | 2     |
|  |  |            |                | Duration of illness, mean             | 15.8  | 14.01 |
|  |  |            |                | Schizophrenia                         | 92.6% | 90.6% |
|  |  |            |                | Affective disorder                    | 7.4%  | 9.4%  |
|  |  |            |                | Co-existing diagnoses                 | 11.7% | 5.8%  |
|  |  |            |                | Substance use                         | 3.3%  | 1.3%  |
|  |  |            |                | Personality disorder                  | 6.6%  | 3.3%  |
| Intellectual disability  |  |            |                |                                       |       |       |
| Follow-up by:  |  |            |                |                                       |       |       |
| Clinical psychologists   | 32.6%  | 35.0%      |                |                                       |       |       |
| Occupational therapists  | 6.6%   | 3.3%       |                |                                       |       |       |
| Legal status upon discharge  |  |            |                |                                       |       |       |
| Involuntary  | 7.7%   | 11.2%      |                |                                       |       |       |
| Voluntary/informal   | 92.3%  | 88.7%      |                |                                       |       |       |
| Special care system status   |  |            |                |                                       |       |       |
| Conventional care  | 71.2%  | 80.5%      |                |                                       |       |       |
| Special care   | 26.9%  | 17.6%      |                |                                       |       |       |
| Intensive care   | 1.9%   | 1.6%       |                |                                       |       |       |
| Length of stay, mean   | 58.5   | 69.3       |                |                                       |       |       |

| Title and authors   | Aim  | Study type                        | Sample details   | Main findings   |
|---|--|-----------------------------------|--|---|
|   |  |                                   |  | <p>Final set of predictors of 28-day unplanned readmission.</p> <ul style="list-style-type: none"> <li>- Number of previous admissions OR = 1.06</li> <li>- Co-existing substance misuse OR = 1.49</li> <li>- History of violence OR = 1.30</li> <li>- HoNOS item 1: overactive, aggressive, disruptive, or aggravated OR = 1.50</li> <li>- Conditional discharge OR = 0.29</li> <li>- Clozapine prescribed OR = 0.70</li> <li>- Age (older) OR = 0.98</li> <li>- Abode after discharge (compared to alone) <ul style="list-style-type: none"> <li>o Family/relatives OR = 0.61</li> </ul> </li> </ul>  |
| <p>Family Involvement in Psychiatric Hospitalizations: Associations with Discharge Planning and Prompt Follow-Up Care</p> <p>Haselden et al., 2019</p> <p>USA</p> | <p>To examine frequencies of involvement by family in the care and discharge planning for psychiatric inpatients</p> | <p>Retrospective cohort study</p> | <p>N = 179</p> <p>People who received Medicaid and had a psychiatric hospitalisation at two urban hospitals in New York State in 2012 to 2013</p> <p>Length of stay:</p> <ul style="list-style-type: none"> <li>- 22% stayed 1 to 6 days</li> <li>- 39% stayed 7 to 13 days</li> <li>- 39% stayed 14 or more days</li> </ul> <p>Primary discharge diagnosis:</p> <ul style="list-style-type: none"> <li>- 42% psychotic disorder</li> <li>- 49% mood disorder</li> <li>- 9% other</li> </ul> | <p>Inpatient staff contacted a family member for 75% of patients, staff were unable to contact a family member for 1% of patients, and there were no documented attempts to contact a family member for the remaining 24%.</p> <p>Factors associated with receiving comprehensive discharge planning include:</p> <ul style="list-style-type: none"> <li>- family member contact with the patient (OR = 2.39)</li> <li>- family member visits to the patient (OR = 2.34)</li> <li>- attendance at a family therapy sessions (OR = 2.74)</li> <li>- communication with inpatient staff about services available to families (OR = 2.25)</li> <li>- longer length of stay (7 to 13 days) than people who stayed 0 to 6 days (OR = 2.65)</li> </ul> <p>Co-occurring substance use disorder was significantly associated with no family involvement (OR = 0.39) and lower likelihood of receiving comprehensive discharge planning (OR = 0.46).</p> |

| Title and authors   | Aim   | Study type                 | Sample details  | Main findings   |
|---|---|----------------------------|---|---|
|   |   |                            | 45% had a co-occurring substance use disorder   | <p>Factors associated with people attending follow-up appointments within 7 and 30 days after discharge:</p> <ul style="list-style-type: none"> <li>- inpatient staff contacting a support person (OR = 2.32)</li> <li>- communicating about the person's health or mental health (OR = 2.42)</li> <li>- discussing discharge-related topics before or after discharge (OR = 2.20).</li> </ul> <p>Factors associated with attending mental health appointment within 30 days after discharge:</p> <ul style="list-style-type: none"> <li>- inpatient staff contacting a support person (OR = 2.71)</li> <li>- communicating about the person's health or mental health (OR = 2.80)</li> <li>- discussing date of discharge (OR = 2.29)</li> <li>- discussing person's residence following discharge (OR = 2.30)</li> <li>- any involvement between family and inpatient staff (OR = 3.65).</li> </ul> |
| Comparison of inpatients who were readmitted within 28 days of discharge with those not readmitted: An audit at an Australian private psychiatric hospital<br><br>Hope et al., 2021 | To compare inpatients who had been readmitted within 28 days of discharge with patients not readmitted within the same period in a private psychiatric hospital | Retrospective cohort study | N = 100 (50 readmissions within 28 days of discharge in 2017 and 50 age- and sex-matched controls who were not readmitted within the same time period)<br><br>Ages ranged from 19 to 89 | <p>Overall, people who were readmitted were more likely to have co-existing mental health diagnoses, have longer length of stay at index admission, and have previous admissions in the preceding 12 months.</p> <p>People who were readmitted were more likely to be diagnosed with major depressive disorder (80% vs 60% no readmissions) and schizophrenia or schizoaffective disorder (28% vs 12%).</p> <p>People who were readmitted were more likely to have co-existing mental health diagnoses than controls:</p>   |

| Title and authors  | Aim   | Study type                                 | Sample details   | Main findings   |                     |              |                 |     |     |     |     |     |     |        |     |     |  |  |
|--|---|--|--|---|---------------------|--------------|-----------------|-----|-----|-----|-----|-----|-----|--------|-----|-----|--|--|
|  |   |  |  | <table border="1"> <thead> <tr> <th>Number of diagnoses</th> <th>Readmissions</th> <th>No readmissions</th> </tr> </thead> <tbody> <tr> <td>One</td> <td>22%</td> <td>60%</td> </tr> <tr> <td>Two</td> <td>50%</td> <td>28%</td> </tr> <tr> <td>Three+</td> <td>28%</td> <td>12%</td> </tr> </tbody> </table>   | Number of diagnoses | Readmissions | No readmissions | One | 22% | 60% | Two | 50% | 28% | Three+ | 28% | 12% |  |  |
| Number of diagnoses  | Readmissions  | No readmissions                            |  |   |                     |              |                 |     |     |     |     |     |     |        |     |     |  |  |
| One  | 22%   | 60%  |  |   |                     |              |                 |     |     |     |     |     |     |        |     |     |  |  |
| Two  | 50%   | 28%  |  |   |                     |              |                 |     |     |     |     |     |     |        |     |     |  |  |
| Three+   | 28%   | 12%  |  |   |                     |              |                 |     |     |     |     |     |     |        |     |     |  |  |
| <p>Suicide in recently discharged psychiatric patients: A case-control study</p> <p>Hunt et al., 2009</p> <p>England</p> | <p>To identify risk factors, including variation in healthcare received, for suicide within three months of discharge</p> | <p>Population-based case-control study</p> | <p>N = 238 psychiatric patients dying by suicide within three months of hospital discharge, matched on date of discharge to 238 case controls</p> <p>People aged between 16 to 65 who died between 1 April 2000 and 31 December 2001 within three months of hospital discharge</p> | <p>43% of suicides occurred within a month of discharge, 47% of whom died before their first follow-up appointment. 65% of suicides were male.</p> <p>Among suicide cases the most common primary diagnoses were major affective disorder (40%), schizophrenia (18%), alcohol dependence (12%), and personality disorder (10%). The majority of cases had a secondary diagnosis (61%), usually a depressive disorder (24%).</p> <p>12% of suicides occurred within one week of discharge, 43% within a month, and 72% within two months. Among those that occurred within one week, the highest number of deaths was on the day after discharge (24%).</p> <p><b>Risk factors (univariate models)</b><br/> <i>Demographic characteristics</i></p> |                     |              |                 |     |     |     |     |     |     |        |     |     |  |  |

| Title and authors | Aim | Study type | Sample details | Main findings  |
|-------------------|-----|------------|----------------|--|
|                   |     |            |                | <ul style="list-style-type: none"> <li>- Male gender (OR = 1.8)</li> <li><i>Behavioural and clinical characteristics</i></li> <li>- Lifetime history of self-harm (OR = 3.4)</li> <li>- Diagnosis of affective disorder (OR = 1.6)</li> <li>- Short (&lt; 12 months) illness duration (OR = 1.6)</li> <li>- Any secondary diagnosis (OR = 1.9)</li> <li>- Recent (within 3 months prior to index admission) adverse life event (OR = 1.9)</li> <li><i>Contact with psychiatric services</i></li> <li>- Being in contact with mental health team within one week prior to index admission (OR = 1.6)</li> <li>- Psychiatric symptoms at last contact <ul style="list-style-type: none"> <li>o Depressive symptoms (OR = 2.2)</li> <li>o Hopelessness (OR = 2.2)</li> <li>o Suicidal ideation (OR = 2.9)</li> </ul> </li> <li>- Initiate own discharge (OR = 2.0)</li> <li>- Missed last appointment (OR = 2.3)</li> <li><b>Risk factors (multivariate)</b></li> <li>- Male gender (OR = 2.2)</li> <li>- History of self-harm (OR = 3.2)</li> <li>- Diagnosis of affective disorder (OR = 2.3)</li> <li>- Any secondary diagnosis (OR = 1.8; marginally significant, <math>p = .048</math>)</li> <li>- Last contact within one week before index date (OR = 2.2)</li> <li>- Suicidal ideation (OR = 2.5; marginally significant, <math>p = .045</math>)</li> <li>- Initiated own discharge (OR = 2.5)</li> <li>- Missed last appointment (OR = 2.1)</li> </ul> |

| Title and authors   | Aim   | Study type                      | Sample details   | Main findings  |
|---|---|---------------------------------|--|--|
| <p>Prospective study of risk factors for increased suicide ideation and behavior following recent discharge</p> <p>Links et al., 2012</p> <p>Canada</p> | <p>To prospectively examine the association between predictors from three thematic areas – suicidality, personal risk factors, and patient care factors – and the occurrence of post-discharge suicide ideation and behaviour in recently discharged patients</p> | <p>Prospective cohort study</p> | <p>N = 120 adults (baseline sample who consented to participating; by the end of the study 10 withdrew and eight were lost to follow-up)</p> <p>22.5% were admitted for a first suicide attempt, 59.2% were admitted for a non-first-time suicide attempt, 18.3% had current suicide ideation and previously attempted suicide</p> | <p>Significantly more of the suicide cases had at least four of the above seven risk factors than controls (36% vs 13%).</p> <p>Scale for suicide ideation (SSI) scores decreased from baseline (mean = 23.6) to 1-month (7.9), 3-month (6.6), and 6-month (5.7) follow-ups. A high proportion of people reported no suicidal ideation at all three follow-ups (1-month = 40%, 3-month = 44.8%, 6-month = 48.0%). Overall, SSI scores decreased with a mean change of -15.7.</p> <p>3.3% of the sample committed suicide within the study period – one person (0.8%) while hospitalised and three (2.5%) within one month after hospital discharge. Of those who survived, 39.4% reported self-injury or suicide attempts within 6 months of hospital discharge.</p> <p><b>Univariate analysis risk factors</b> (outcome: higher SSI score)</p> <ul style="list-style-type: none"> <li>- More than one past suicide attempt before current admission (OR = 2.11)</li> <li>- Suicide attempt as reason for admission (compared to suicidal ideation) (OR = 3.25)</li> <li>- Female gender (OR = 2.22)</li> <li>- Depression (OR = 1.04)</li> <li>- Hopelessness (OR = 1.07)</li> <li>- Impulsivity (OR = 1.04)</li> </ul> <p><b>Multivariate analysis risk factors</b> (outcome: higher SSI score)</p> <ul style="list-style-type: none"> <li>- Suicide attempt as reason for admission (compared to suicidal ideation) (OR = 3.60)</li> <li>- Female gender (OR = 2.46)</li> <li>- Depression (OR = 1.04)</li> </ul> |

| Title and authors  | Aim  | Study type                        | Sample details  | Main findings  |     |                |                    |         |       |       |          |       |       |          |       |       |          |       |       |     |       |       |
|--|--|-----------------------------------|---|--|-----|----------------|--------------------|---------|-------|-------|----------|-------|-------|----------|-------|-------|----------|-------|-------|-----|-------|-------|
| <p>Hospital Readmissions for Patients with Mental Illness in Canada</p> <p>Madi et al., 2007</p> <p>Canada</p> | <p>To provide information on the patterns of one-year readmissions (for any reason) to acute hospitals in Canada among people with mental illness at index admission during 2002 to 2003</p> | <p>Retrospective cohort study</p> | <p>Based on data from the Hospital Morbidity Database and Hospital Mental Health Database of the Canadian Institute for Health Information</p> <p>Readmissions were counted if the person had more than one hospital episode during 2002 to 2003 and 2003 to 2004</p> | <p>In 2003 to 2004, 37% of people with mental illness discharged from acute care hospitals were readmitted within one year, compared with 27.3% of people discharged with a non-mental illness. People with a mental illness were more likely to be readmitted more than once within one year of index discharge (15%) than those with a non-mental illness (9.9%).</p> <p>Older age was also generally associated with higher rates of readmission:</p> <table border="1"> <thead> <tr> <th>Age</th> <th>Mental illness</th> <th>Non-mental illness</th> </tr> </thead> <tbody> <tr> <td>0 to 14</td> <td>26.5%</td> <td>18.0%</td> </tr> <tr> <td>15 to 24</td> <td>33.5%</td> <td>18.1%</td> </tr> <tr> <td>25 to 44</td> <td>37.5%</td> <td>16.5%</td> </tr> <tr> <td>45 to 64</td> <td>38.8%</td> <td>28.5%</td> </tr> <tr> <td>65+</td> <td>38.7%</td> <td>40.7%</td> </tr> </tbody> </table> <p>Across all mental health diagnoses (organic disorders, schizophrenia, affective disorders, anxiety disorders, personality disorders, other disorders), readmission rates were highest among those with co-occurring substance use disorders. The association between dual diagnosis and readmission was strongest for those with schizophrenia (53.3% compared to 39.1% for those with schizophrenia only).</p> | Age | Mental illness | Non-mental illness | 0 to 14 | 26.5% | 18.0% | 15 to 24 | 33.5% | 18.1% | 25 to 44 | 37.5% | 16.5% | 45 to 64 | 38.8% | 28.5% | 65+ | 38.7% | 40.7% |
| Age  | Mental illness   | Non-mental illness                |   |  |     |                |                    |         |       |       |          |       |       |          |       |       |          |       |       |     |       |       |
| 0 to 14  | 26.5%  | 18.0%                             |   |  |     |                |                    |         |       |       |          |       |       |          |       |       |          |       |       |     |       |       |
| 15 to 24   | 33.5%  | 18.1%                             |   |  |     |                |                    |         |       |       |          |       |       |          |       |       |          |       |       |     |       |       |
| 25 to 44   | 37.5%  | 16.5%                             |   |  |     |                |                    |         |       |       |          |       |       |          |       |       |          |       |       |     |       |       |
| 45 to 64   | 38.8%  | 28.5%                             |   |  |     |                |                    |         |       |       |          |       |       |          |       |       |          |       |       |     |       |       |
| 65+  | 38.7%  | 40.7%                             |   |  |     |                |                    |         |       |       |          |       |       |          |       |       |          |       |       |     |       |       |
| <p>Hospital Readmission Among Medicaid Patients with an Index</p>  | <p>To assess whether hospital readmission rates are a valid, reliable, and</p>   | <p>Retrospective cohort study</p> | <p>N = 121,271 index admission across 171 hospitals</p> <p>Inclusion criteria</p>   | <p><b>Person-level factors</b></p> <p>The strongest person-level factor associated with readmission was a prior admission for mental health or substance use; being admitted in the 6 months prior to the index admission increases</p>  |     |                |                    |         |       |       |          |       |       |          |       |       |          |       |       |     |       |       |



| Title and authors   | Aim   | Study type  | Sample details   | Main findings   |
|---|---|---|--|---|
| <p>Hospitalization for Mental and/or Substance Use Disorder</p> <p>Mark et al., 2013</p> <p>USA</p>   | <p>actionable measure for behavioural health</p>  |   | <ul style="list-style-type: none"> <li>- Inpatient claim with a principal mental health or substance use diagnosis</li> <li>- Discharge date between February 2004 and November 2009</li> <li>- Discharged to the community</li> <li>- Admission dates were not within 30 days of a previous hospital discharge (to ensure they were index admissions not readmissions)</li> </ul> | <p>the probability of readmission by 5.7%. The next largest effects include:</p> <ul style="list-style-type: none"> <li>- schizophrenia or another psychosis diagnosis (increase likelihood by 2.7%)</li> <li>- medication prescription for substance use disorder in the prior 6 months (2.1% increase)</li> <li>- having a mental health or substance use outpatient visit or visit to a community mental health centre (1% increase)</li> <li>- living in an urban setting (1% increase)</li> <li>- having a substance use diagnosis prior to index admission (0.9%).</li> </ul> <p><b>Hospital-level factors</b></p> <p>Receiving post-discharge follow-up within 7 days at a community mental health centre was associated with a 5% reduction in readmission likelihood. Other hospital-level factors include:</p> <ul style="list-style-type: none"> <li>- hospital median length of stay – a 1 day increase in LOS reduced likelihood of readmission by 0.04%.</li> </ul> |
| <p>Predictors of 30-day Postdischarge Readmission to a Multistate National Sample of State Psychiatric Hospitals</p> <p>Ortiz et al., 2019</p> <p>USA</p> | <p>To study identified demographic, clinical, and the continuing of care characteristics associated with rapid readmission into a sample of psychiatric inpatient hospitals</p> | <p>Cross-sectional analysis of secondary data</p> | <p>N = 60,254 discharges from state psychiatric hospitals</p> <p>Adults aged 18 to 64 discharged in 2014</p> <p>Sample was drawn from 127 state psychiatric hospitals in 39 states</p>   | <p>8% of discharges were readmitted within 30 days.</p> <p>The following were identified as risk factors</p> <ul style="list-style-type: none"> <li>- White ethnicity (OR = 1.23)</li> <li>- Non-Hispanic (OR = 1.48)</li> <li>- Not married (OR = 1.53)</li> <li>- Voluntarily admitted (OR = 1.18)</li> <li>- LOS &lt;7 days (OR = 3.52)</li> <li>- LOS 8 to 31 days (OR = 3.20)</li> <li>- LOS 32 to 92 days (OR = 1.91)</li> <li>- Schizophrenia or other psychotic disorder (OR = 1.69)</li> <li>- Personality disorder (OR = 1.76)</li> </ul>   |

| Title and authors  | Aim  | Study type                        | Sample details   | Main findings  |
|--|--|-----------------------------------|--|--|
| <p>Readmission after discharge from acute mental healthcare among 231 988 people in England: cohort study exploring predictors of readmission including availability of acute day units in local areas</p> <p>Osborn et al., 2021</p> <p>England</p> | <p>To assess predictors of readmission to acute mental healthcare following discharge in England, including availability of acute day units (ADUs)</p> | <p>Retrospective cohort study</p> | <p>N = 231,988 people discharged from NHS acute mental healthcare between 1 April 2013 and 30 May 2015</p> | <ul style="list-style-type: none"> <li>- Referred to a setting different from the outpatient (OR = 1.27)</li> <li>- Living arrangement different from private residence (OR = 1.54)</li> </ul> <p>21.4% of the sample were readmitted to acute care within 6 months following discharge with a median time of 34 days.</p> <p>The overall odds of readmission across all provider trusts was 0.25. Only 2% of variance in readmissions was attributable to provider trust-level factors and 98% was attributable to individual-level factors.</p> <p>Significant individual-level risk (and protective where OR &lt; 1) factors for readmission include:</p> <ul style="list-style-type: none"> <li>- older age (compared to 16 to 24) <ul style="list-style-type: none"> <li>o 25 to 34 – adjusted OR = 1.09</li> <li>o 35 to 44 – OR = 1.14</li> <li>o 45 to 54 – OR = 1.20</li> <li>o 55 to 64 – OR = 1.23</li> <li>o &gt;64 years – OR = 1.05</li> </ul> </li> <li>- being female (compared to male: OR = 1.14)</li> <li>- single relationship status (compared to non-single: married/civil partnership OR = 0.88, other = 0.96)</li> <li>- ethnicity (compared to white) <ul style="list-style-type: none"> <li>o Mixed – OR = 1.10</li> <li>o Black – OR = 0.91</li> <li>o Other – OR = 0.87</li> </ul> </li> <li>- assigned to clinical care cluster for psychosis (compared to non-psychosis) <ul style="list-style-type: none"> <li>o Psychosis – OR = 1.21</li> <li>o Severe psychosis – OR = 1.76</li> </ul> </li> </ul> |

| Title and authors | Aim | Study type | Sample details | Main findings  |
|-------------------|-----|------------|----------------|--|
|                   |     |            |                | <p>living in more deprived areas (compared to 1<sup>st</sup> quintile as measured by index of multiple deprivation [IMD])</p> <ul style="list-style-type: none"> <li>○ 4<sup>th</sup> quintile – OR = 1.07</li> <li>○ 5<sup>th</sup> quintile – OR = 1.08</li> </ul> <p>- admitted to inpatient care at index admission (compared to crisis resolution team: OR = 1.35)</p> <p>- shorter stay at index admission (compared to longer stay)</p> <ul style="list-style-type: none"> <li>○ 13 to 31 days – OR = 0.89</li> <li>○ &gt; 31 days – OR = 0.74.</li> </ul> <p>Of the people who were readmitted to acute mental healthcare, 47% were readmitted to an inpatient psychiatric ward. Significant risk (and protective) factors include:</p> <ul style="list-style-type: none"> <li>- older age <ul style="list-style-type: none"> <li>○ 25 to 34 – OR = 1.22</li> <li>○ 35 to 44 – OR = 1.26</li> <li>○ 45 to 54 – OR = 1.34</li> <li>○ 55 to 64 – OR = 1.48</li> <li>○ &gt; 65 – OR = 1.63</li> </ul> </li> <li>- being female (OR = 1.13)</li> <li>- being single <ul style="list-style-type: none"> <li>○ Married – OR = 0.85</li> <li>○ Other – OR = 0.94</li> </ul> </li> <li>- ethnicity <ul style="list-style-type: none"> <li>○ Mixed – OR = 1.20</li> <li>○ Black – OR = 1.11</li> <li>○ Other – OR = 0.79</li> </ul> </li> <li>- assigned to clinical care cluster for psychosis <ul style="list-style-type: none"> <li>○ Psychosis – OR = 1.72</li> <li>○ Severe psychosis – OR = 2.62</li> </ul> </li> </ul> |

| Title and authors   | Aim   | Study type                        | Sample details  | Main findings   |
|---|---|-----------------------------------|---|---|
|   |   |                                   |   | <ul style="list-style-type: none"> <li>- inpatient index admission – OR = 2.28</li> <li>- LOS at index admission               <ul style="list-style-type: none"> <li>o 3 to 12 days – OR = 1.05</li> <li>o 13 to 31 days – OR = 0.88</li> <li>o &gt; 32 days – OR = 0.68.</li> </ul> </li> </ul>   |
| <p>Factors associated with multiple psychiatric readmissions for youth with mood disorders</p> <p>Philips et al., 2020</p> <p>USA</p> | <p>To examine patient-, hospital-, and community-level factors associated with single and multiple readmissions for youth</p> | <p>Retrospective cohort study</p> | <p>N = 6,797 youth (aged six to 17) with a primary diagnosis of a mood disorder</p> <p>Specific diagnoses were:</p> <ul style="list-style-type: none"> <li>- 56.1% major depressive</li> <li>- 23.5% bipolar</li> <li>- 20.4% other</li> </ul> <p>53% of the sample had two or more co-existing psychiatric diagnoses. The three most common co-existing diagnoses were:</p> <ul style="list-style-type: none"> <li>- 33.5% disruptive behaviour</li> <li>- 27.0% attention-deficit/hyperactivity disorder (ADHD)</li> <li>- 23.5% anxiety</li> </ul> | <p>20.8% were readmitted at least once within 6 months of discharge – 13.8% had a single readmission and 6.9% had multiple readmissions. The mean number of readmissions was 1.6.</p> <p><b>Bivariate analyses</b></p> <p><b>Patient-level</b></p> <p>Single and multiple readmissions were more likely among youth:</p> <ul style="list-style-type: none"> <li>- with disabilities or in foster care</li> <li>- diagnosed with bipolar disorder</li> <li>- with co-existing diagnoses</li> <li>- with history of inpatient or outpatient psychiatric treatment before index admission</li> <li>- outpatient psychiatric follow-up within 7 days</li> <li>- hospitalised in general hospitals rather than teaching hospitals</li> <li>- in smaller hospitals with fewer beds.</li> </ul> <p><b>Community-level</b></p> <p>Single and multiple readmissions were more likely among youth living in regions with higher availability of mental health providers, health clinics, outpatient mental health care, and psychiatric hospitals.</p> <p><b>Multivariate analyses</b></p> <p>Factors significantly associated with higher (or lower) likelihood single or multiple readmissions:</p> |

| Title and authors  | Aim   | Study type                 | Sample details   | Main findings   |  |             |  |  |        |          |                      |  |  |                                 |  |  |   |      |      |    |      |       |                               |      |      |                                   |      |      |                                     |      |      |  |      |      |                       |  |  |                       |      |      |  |  |  |        |      |   |      |      |   |
|--|---|----------------------------|--|---|--|-------------|--|--|--------|----------|----------------------|--|--|---------------------------------|--|--|---|------|------|----|------|-------|-------------------------------|------|------|-----------------------------------|------|------|-------------------------------------|------|------|--|------|------|-----------------------|--|--|-----------------------|------|------|--|--|--|--------|------|---|------|------|---|
|  |   |                            |  | <table border="1"> <thead> <tr> <th></th> <th colspan="2">Adjusted OR</th> </tr> <tr> <th></th> <th>Single</th> <th>Multiple</th> </tr> </thead> <tbody> <tr> <td><b>Patient-level</b></td> <td></td> <td></td> </tr> <tr> <td>Co-existing mental health issue</td> <td></td> <td></td> </tr> <tr> <td>1</td> <td>2.45</td> <td>2.60</td> </tr> <tr> <td>≥2</td> <td>4.50</td> <td>12.59</td> </tr> <tr> <td>Any chronic medical condition</td> <td>1.42</td> <td>1.05</td> </tr> <tr> <td>Prior psychiatric hospitalisation</td> <td>1.60</td> <td>1.58</td> </tr> <tr> <td>Prior psychiatric outpatient visits</td> <td>0.67</td> <td>0.30</td> </tr> <tr> <td>Follow-up appointment vs no follow-up with short LOS</td> <td>1.60</td> <td>1.44</td> </tr> <tr> <td><b>Hospital-level</b></td> <td></td> <td></td> </tr> <tr> <td>Higher number of beds</td> <td>0.54</td> <td>0.37</td> </tr> <tr> <td>Medicaid enrollees among annual discharges</td> <td></td> <td></td> </tr> <tr> <td>Medium</td> <td>0.80</td> <td>-</td> </tr> <tr> <td>High</td> <td>0.62</td> <td>-</td> </tr> </tbody> </table> |  | Adjusted OR |  |  | Single | Multiple | <b>Patient-level</b> |  |  | Co-existing mental health issue |  |  | 1 | 2.45 | 2.60 | ≥2 | 4.50 | 12.59 | Any chronic medical condition | 1.42 | 1.05 | Prior psychiatric hospitalisation | 1.60 | 1.58 | Prior psychiatric outpatient visits | 0.67 | 0.30 | Follow-up appointment vs no follow-up with short LOS | 1.60 | 1.44 | <b>Hospital-level</b> |  |  | Higher number of beds | 0.54 | 0.37 | Medicaid enrollees among annual discharges |  |  | Medium | 0.80 | - | High | 0.62 | - |
|  | Adjusted OR   |                            |  |   |  |             |  |  |        |          |                      |  |  |                                 |  |  |   |      |      |    |      |       |                               |      |      |                                   |      |      |                                     |      |      |  |      |      |                       |  |  |                       |      |      |  |  |  |        |      |   |      |      |   |
|  | Single  | Multiple                   |  |   |  |             |  |  |        |          |                      |  |  |                                 |  |  |   |      |      |    |      |       |                               |      |      |                                   |      |      |                                     |      |      |  |      |      |                       |  |  |                       |      |      |  |  |  |        |      |   |      |      |   |
| <b>Patient-level</b>   |   |                            |  |   |  |             |  |  |        |          |                      |  |  |                                 |  |  |   |      |      |    |      |       |                               |      |      |                                   |      |      |                                     |      |      |  |      |      |                       |  |  |                       |      |      |  |  |  |        |      |   |      |      |   |
| Co-existing mental health issue                                    |   |                            |  |   |  |             |  |  |        |          |                      |  |  |                                 |  |  |   |      |      |    |      |       |                               |      |      |                                   |      |      |                                     |      |      |  |      |      |                       |  |  |                       |      |      |  |  |  |        |      |   |      |      |   |
| 1  | 2.45  | 2.60                       |  |   |  |             |  |  |        |          |                      |  |  |                                 |  |  |   |      |      |    |      |       |                               |      |      |                                   |      |      |                                     |      |      |  |      |      |                       |  |  |                       |      |      |  |  |  |        |      |   |      |      |   |
| ≥2   | 4.50  | 12.59                      |  |   |  |             |  |  |        |          |                      |  |  |                                 |  |  |   |      |      |    |      |       |                               |      |      |                                   |      |      |                                     |      |      |  |      |      |                       |  |  |                       |      |      |  |  |  |        |      |   |      |      |   |
| Any chronic medical condition                                      | 1.42  | 1.05                       |  |   |  |             |  |  |        |          |                      |  |  |                                 |  |  |   |      |      |    |      |       |                               |      |      |                                   |      |      |                                     |      |      |  |      |      |                       |  |  |                       |      |      |  |  |  |        |      |   |      |      |   |
| Prior psychiatric hospitalisation                                  | 1.60  | 1.58                       |  |   |  |             |  |  |        |          |                      |  |  |                                 |  |  |   |      |      |    |      |       |                               |      |      |                                   |      |      |                                     |      |      |  |      |      |                       |  |  |                       |      |      |  |  |  |        |      |   |      |      |   |
| Prior psychiatric outpatient visits                                | 0.67  | 0.30                       |  |   |  |             |  |  |        |          |                      |  |  |                                 |  |  |   |      |      |    |      |       |                               |      |      |                                   |      |      |                                     |      |      |  |      |      |                       |  |  |                       |      |      |  |  |  |        |      |   |      |      |   |
| Follow-up appointment vs no follow-up with short LOS               | 1.60  | 1.44                       |  |   |  |             |  |  |        |          |                      |  |  |                                 |  |  |   |      |      |    |      |       |                               |      |      |                                   |      |      |                                     |      |      |  |      |      |                       |  |  |                       |      |      |  |  |  |        |      |   |      |      |   |
| <b>Hospital-level</b>  |   |                            |  |   |  |             |  |  |        |          |                      |  |  |                                 |  |  |   |      |      |    |      |       |                               |      |      |                                   |      |      |                                     |      |      |  |      |      |                       |  |  |                       |      |      |  |  |  |        |      |   |      |      |   |
| Higher number of beds  | 0.54  | 0.37                       |  |   |  |             |  |  |        |          |                      |  |  |                                 |  |  |   |      |      |    |      |       |                               |      |      |                                   |      |      |                                     |      |      |  |      |      |                       |  |  |                       |      |      |  |  |  |        |      |   |      |      |   |
| Medicaid enrollees among annual discharges                         |   |                            |  |   |  |             |  |  |        |          |                      |  |  |                                 |  |  |   |      |      |    |      |       |                               |      |      |                                   |      |      |                                     |      |      |  |      |      |                       |  |  |                       |      |      |  |  |  |        |      |   |      |      |   |
| Medium   | 0.80  | -                          |  |   |  |             |  |  |        |          |                      |  |  |                                 |  |  |   |      |      |    |      |       |                               |      |      |                                   |      |      |                                     |      |      |  |      |      |                       |  |  |                       |      |      |  |  |  |        |      |   |      |      |   |
| High   | 0.62  | -                          |  |   |  |             |  |  |        |          |                      |  |  |                                 |  |  |   |      |      |    |      |       |                               |      |      |                                   |      |      |                                     |      |      |  |      |      |                       |  |  |                       |      |      |  |  |  |        |      |   |      |      |   |
| Short stay unit for patients in acute mental health crisis: A case | To evaluate the introduction of a short stay pathway (SSP) for patients | Retrospective cohort study | N = 678 people admitted to the SSP between 1 March 2016 and 30 June 2018 | After matching by mental health diagnosis, the SSP group had a significantly lower readmission rate of 10.4% within 28 days compared to 18.4% for the control group.  |  |             |  |  |        |          |                      |  |  |                                 |  |  |   |      |      |    |      |       |                               |      |      |                                   |      |      |                                     |      |      |  |      |      |                       |  |  |                       |      |      |  |  |  |        |      |   |      |      |   |

| Title and authors  | Aim   | Study type                 | Sample details  | Main findings  |        |             |               |                       |      |      |                                       |      |      |                     |      |      |                          |  |  |          |      |      |          |      |      |
|--|---|----------------------------|---|--|--------|-------------|---------------|-----------------------|------|------|---------------------------------------|------|------|---------------------|------|------|--------------------------|--|--|----------|------|------|----------|------|------|
| control study of readmission rates<br><br>Sveticic et al., 2020<br><br>Australia   | in acute mental health crisis with admissions of up to 3 days   |                            | Matched against case controls (n = 1,356) admitted to acute mental health beds in the same period | Binary regressions identified independent predictors of readmission rates. For both groups, receiving follow-up within 7 days from discharge significantly reduced likelihood of readmitting within 28 days:<br>- SSP OR = 2.29<br>- Controls OR = 1.98<br>Indigenous people in SSP had 2.88 higher odds of readmission than non-Indigenous people; being Indigenous had no effect for the control group.<br>Personality disorder diagnoses were associated with 2.61 higher odds of readmission than no personality diagnosis for the control group; this effect was not significant for the SSP group.   |        |             |               |                       |      |      |                                       |      |      |                     |      |      |                          |  |  |          |      |      |          |      |      |
| Clinical and organizational factors predicting readmission for mental health patients across Italy<br><br>Tedeschi et al., 2019<br><br>Italy | To explore rehospitalization in mental health services across Italian regions, Local Health Districts (LHDs), and hospitals; and to examine the predictive power of different clinical and organizational factors | Retrospective cohort study | N = 63,419 people comprising 126,838 admissions   | Overall 1-year readmission rate was 43.0%. The highest regional readmission rate was 46.8% in Sicily and the lowest was 37.6% in Trento.<br><br>Significant risk and protective factors analysed through simple and multiple regression: <table border="1" data-bbox="1339 928 2190 1335"> <thead> <tr> <th data-bbox="1339 928 1624 965">Factor</th> <th data-bbox="1630 928 1906 965">Simple (OR)</th> <th data-bbox="1912 928 2190 965">Multiple (OR)</th> </tr> </thead> <tbody> <tr> <td data-bbox="1339 970 1624 1038">Involuntary admission</td> <td data-bbox="1630 970 1906 1038">0.74</td> <td data-bbox="1912 970 2190 1038">0.72</td> </tr> <tr> <td data-bbox="1339 1043 1624 1150">Admitted in the same LHD of residence</td> <td data-bbox="1630 1043 1906 1150">1.16</td> <td data-bbox="1912 1043 2190 1150">1.14</td> </tr> <tr> <td data-bbox="1339 1155 1624 1192">Psychotic diagnosis</td> <td data-bbox="1630 1155 1906 1192">1.09</td> <td data-bbox="1912 1155 2190 1192">1.10</td> </tr> <tr> <td data-bbox="1339 1197 1624 1265">Age (18 to 24 reference)</td> <td data-bbox="1630 1197 1906 1265"></td> <td data-bbox="1912 1197 2190 1265"></td> </tr> <tr> <td data-bbox="1339 1270 1624 1307">25 to 44</td> <td data-bbox="1630 1270 1906 1307">1.16</td> <td data-bbox="1912 1270 2190 1307">1.15</td> </tr> <tr> <td data-bbox="1339 1311 1624 1335">45 to 64</td> <td data-bbox="1630 1311 1906 1335">1.22</td> <td data-bbox="1912 1311 2190 1335">1.20</td> </tr> </tbody> </table> | Factor | Simple (OR) | Multiple (OR) | Involuntary admission | 0.74 | 0.72 | Admitted in the same LHD of residence | 1.16 | 1.14 | Psychotic diagnosis | 1.09 | 1.10 | Age (18 to 24 reference) |  |  | 25 to 44 | 1.16 | 1.15 | 45 to 64 | 1.22 | 1.20 |
| Factor   | Simple (OR)   | Multiple (OR)              |   |  |        |             |               |                       |      |      |                                       |      |      |                     |      |      |                          |  |  |          |      |      |          |      |      |
| Involuntary admission  | 0.74  | 0.72                       |   |  |        |             |               |                       |      |      |                                       |      |      |                     |      |      |                          |  |  |          |      |      |          |      |      |
| Admitted in the same LHD of residence  | 1.16  | 1.14                       |   |  |        |             |               |                       |      |      |                                       |      |      |                     |      |      |                          |  |  |          |      |      |          |      |      |
| Psychotic diagnosis  | 1.09  | 1.10                       |   |  |        |             |               |                       |      |      |                                       |      |      |                     |      |      |                          |  |  |          |      |      |          |      |      |
| Age (18 to 24 reference)   |   |                            |   |  |        |             |               |                       |      |      |                                       |      |      |                     |      |      |                          |  |  |          |      |      |          |      |      |
| 25 to 44   | 1.16  | 1.15                       |   |  |        |             |               |                       |      |      |                                       |      |      |                     |      |      |                          |  |  |          |      |      |          |      |      |
| 45 to 64   | 1.22  | 1.20                       |   |  |        |             |               |                       |      |      |                                       |      |      |                     |      |      |                          |  |  |          |      |      |          |      |      |

| Title and authors   | Aim  | Study type                 | Sample details   | Main findings  |     |      |      |                                    |  |  |              |      |      |          |      |      |   |  |  |         |      |      |     |      |      |   |  |  |        |      |   |    |      |   |  |  |  |          |      |      |     |      |      |
|---|--|----------------------------|--|--|-----|------|------|------------------------------------|--|--|--------------|------|------|----------|------|------|---|--|--|---------|------|------|-----|------|------|---|--|--|--------|------|---|----|------|---|--|--|--|----------|------|------|-----|------|------|
|   |  |                            |  | <table border="1"> <tr> <td data-bbox="1339 234 1621 271">65+</td> <td data-bbox="1628 234 1906 271">1.20</td> <td data-bbox="1912 234 2181 271">1.18</td> </tr> <tr> <td data-bbox="1339 276 1621 344">Length of stay (&lt;7 days reference)</td> <td data-bbox="1628 276 1906 344"></td> <td data-bbox="1912 276 2181 344"></td> </tr> <tr> <td data-bbox="1339 349 1621 386">8 to 14 days</td> <td data-bbox="1628 349 1906 386">1.00</td> <td data-bbox="1912 349 2181 386">1.00</td> </tr> <tr> <td data-bbox="1339 391 1621 427">15+ days</td> <td data-bbox="1628 391 1906 427">1.07</td> <td data-bbox="1912 391 2181 427">1.07</td> </tr> <tr> <td data-bbox="1339 432 1621 501">Rate (per 100,000) of public psychiatric beds in LHD (&lt;5 reference)</td> <td data-bbox="1628 432 1906 501"></td> <td data-bbox="1912 432 2181 501"></td> </tr> <tr> <td data-bbox="1339 505 1621 542">5 to 10</td> <td data-bbox="1628 505 1906 542">1.07</td> <td data-bbox="1912 505 2181 542">1.07</td> </tr> <tr> <td data-bbox="1339 547 1621 584">10+</td> <td data-bbox="1628 547 1906 584">1.10</td> <td data-bbox="1912 547 2181 584">1.11</td> </tr> <tr> <td data-bbox="1339 588 1621 657">Rate (per 100,000) of private psychiatric beds in region (&lt;1 reference)</td> <td data-bbox="1628 588 1906 657"></td> <td data-bbox="1912 588 2181 657"></td> </tr> <tr> <td data-bbox="1339 662 1621 699">1 to 5</td> <td data-bbox="1628 662 1906 699">1.16</td> <td data-bbox="1912 662 2181 699">-</td> </tr> <tr> <td data-bbox="1339 703 1621 740">5+</td> <td data-bbox="1628 703 1906 740">1.02</td> <td data-bbox="1912 703 2181 740">-</td> </tr> <tr> <td data-bbox="1339 745 1621 813">Rate (per 100,000) of public health staff in LHD (&lt;10 reference)</td> <td data-bbox="1628 745 1906 813"></td> <td data-bbox="1912 745 2181 813"></td> </tr> <tr> <td data-bbox="1339 818 1621 855">10 to 15</td> <td data-bbox="1628 818 1906 855">0.92</td> <td data-bbox="1912 818 2181 855">0.91</td> </tr> <tr> <td data-bbox="1339 860 1621 896">15+</td> <td data-bbox="1628 860 1906 896">0.98</td> <td data-bbox="1912 860 2181 896">0.98</td> </tr> </table> | 65+ | 1.20 | 1.18 | Length of stay (<7 days reference) |  |  | 8 to 14 days | 1.00 | 1.00 | 15+ days | 1.07 | 1.07 | Rate (per 100,000) of public psychiatric beds in LHD (<5 reference) |  |  | 5 to 10 | 1.07 | 1.07 | 10+ | 1.10 | 1.11 | Rate (per 100,000) of private psychiatric beds in region (<1 reference) |  |  | 1 to 5 | 1.16 | - | 5+ | 1.02 | - | Rate (per 100,000) of public health staff in LHD (<10 reference) |  |  | 10 to 15 | 0.92 | 0.91 | 15+ | 0.98 | 0.98 |
| 65+   | 1.20   | 1.18                       |  |  |     |      |      |                                    |  |  |              |      |      |          |      |      |   |  |  |         |      |      |     |      |      |   |  |  |        |      |   |    |      |   |  |  |  |          |      |      |     |      |      |
| Length of stay (<7 days reference)  |  |                            |  |  |     |      |      |                                    |  |  |              |      |      |          |      |      |   |  |  |         |      |      |     |      |      |   |  |  |        |      |   |    |      |   |  |  |  |          |      |      |     |      |      |
| 8 to 14 days  | 1.00   | 1.00                       |  |  |     |      |      |                                    |  |  |              |      |      |          |      |      |   |  |  |         |      |      |     |      |      |   |  |  |        |      |   |    |      |   |  |  |  |          |      |      |     |      |      |
| 15+ days  | 1.07   | 1.07                       |  |  |     |      |      |                                    |  |  |              |      |      |          |      |      |   |  |  |         |      |      |     |      |      |   |  |  |        |      |   |    |      |   |  |  |  |          |      |      |     |      |      |
| Rate (per 100,000) of public psychiatric beds in LHD (<5 reference)                               |  |                            |  |  |     |      |      |                                    |  |  |              |      |      |          |      |      |   |  |  |         |      |      |     |      |      |   |  |  |        |      |   |    |      |   |  |  |  |          |      |      |     |      |      |
| 5 to 10   | 1.07   | 1.07                       |  |  |     |      |      |                                    |  |  |              |      |      |          |      |      |   |  |  |         |      |      |     |      |      |   |  |  |        |      |   |    |      |   |  |  |  |          |      |      |     |      |      |
| 10+   | 1.10   | 1.11                       |  |  |     |      |      |                                    |  |  |              |      |      |          |      |      |   |  |  |         |      |      |     |      |      |   |  |  |        |      |   |    |      |   |  |  |  |          |      |      |     |      |      |
| Rate (per 100,000) of private psychiatric beds in region (<1 reference)                           |  |                            |  |  |     |      |      |                                    |  |  |              |      |      |          |      |      |   |  |  |         |      |      |     |      |      |   |  |  |        |      |   |    |      |   |  |  |  |          |      |      |     |      |      |
| 1 to 5  | 1.16   | -                          |  |  |     |      |      |                                    |  |  |              |      |      |          |      |      |   |  |  |         |      |      |     |      |      |   |  |  |        |      |   |    |      |   |  |  |  |          |      |      |     |      |      |
| 5+  | 1.02   | -                          |  |  |     |      |      |                                    |  |  |              |      |      |          |      |      |   |  |  |         |      |      |     |      |      |   |  |  |        |      |   |    |      |   |  |  |  |          |      |      |     |      |      |
| Rate (per 100,000) of public health staff in LHD (<10 reference)                                  |  |                            |  |  |     |      |      |                                    |  |  |              |      |      |          |      |      |   |  |  |         |      |      |     |      |      |   |  |  |        |      |   |    |      |   |  |  |  |          |      |      |     |      |      |
| 10 to 15  | 0.92   | 0.91                       |  |  |     |      |      |                                    |  |  |              |      |      |          |      |      |   |  |  |         |      |      |     |      |      |   |  |  |        |      |   |    |      |   |  |  |  |          |      |      |     |      |      |
| 15+   | 0.98   | 0.98                       |  |  |     |      |      |                                    |  |  |              |      |      |          |      |      |   |  |  |         |      |      |     |      |      |   |  |  |        |      |   |    |      |   |  |  |  |          |      |      |     |      |      |
| Exploring the predictors of early readmission to psychiatric hospital<br><br>Tulloch et al., 2016 | To explore the associations of readmission to psychiatric hospital over time | Retrospective cohort study | N = 7,891 hospital discharges<br><br>Primary diagnosis:<br>- 26% schizophrenia<br>- 16% other psychotic disorder | 15% of people discharged were readmitted within 90 days.<br><br>Risk factors for readmission include:<br>- any Black ethnic group at one year follow-up (compared to White British) (HR = 1.12)  |     |      |      |                                    |  |  |              |      |      |          |      |      |   |  |  |         |      |      |     |      |      |   |  |  |        |      |   |    |      |   |  |  |  |          |      |      |     |      |      |

| Title and authors   | Aim  | Study type                 | Sample details  | Main findings   |
|---|--|----------------------------|---|---|
| England   | <p>To develop a statistical model for early readmission to psychiatric hospital</p> <p>To assess the feasibility of predicting early readmission</p> |                            | <ul style="list-style-type: none"> <li>- 12% hypomania/mania/bipolar disorder</li> <li>- 16% depression</li> <li>- 9% neurotic and anxiety disorders</li> <li>- 6% personality disorders</li> <li>- 11% drug and alcohol disorders</li> <li>- 5% other</li> </ul> | <ul style="list-style-type: none"> <li>- greater number of psychiatric hospital discharges in the two years before admission (compared to none) <ul style="list-style-type: none"> <li>o One (HR = 1.49)</li> <li>o Two (HR = 1.69)</li> <li>o Three or more (HR = 2.63)</li> </ul> </li> <li>- being managed by 'Other community mental health team' at one year follow-up (HR = 1.13)</li> <li>- personality disorder diagnosis (compared to schizophrenia) (HR = 1.50)</li> <li>- length of index hospital admission (compared to 0 days) <ul style="list-style-type: none"> <li>o 1 to 5 days (HR = 1.38)</li> <li>o 6 to 18 days (HR = 1.49)</li> <li>o 19 to 47 days (HR = 1.52)</li> <li>o 48 days or more (HR = 1.54).</li> </ul> </li> </ul> <p>Protective factors include:</p> <ul style="list-style-type: none"> <li>- being married (HR = 0.76)</li> <li>- primary diagnosis compared to schizophrenia <ul style="list-style-type: none"> <li>o depression at one day follow-up (HR = 0.79) and one year follow-up (HR = .67)</li> <li>o neurotic and anxiety disorder at one year follow-up (HR = 0.68)</li> <li>o other primary diagnosis at one year follow-up (HR = 0.72).</li> </ul> </li> </ul> |
| Five-year follow-up of an acute psychiatric admission cohort in Auckland, New Zealand | To look at engagement with hospital and community-based mental health services in the 5  | Retrospective cohort study | <p>N = 924 (had at least one psychiatric admission in 2000)</p> <p>Adults aged 18 to 65 living in north, west, and south Auckland between 2000 and 2006.</p>  | Over a third (38.5%) of the original cohort had no further acute psychiatric hospital contact in the 5 years following their index admission, meaning just under two thirds were readmitted. People who had no previous psychiatric admissions were less likely to be readmitted than people who did (32.3% vs 47.7% respectively).   |



| Title and authors                                       | Aim                           | Study type | Sample details   | Main findings   |
|---|-------------------------------|------------|--|---|
| <p>Wheeler et al., 2011</p> <p>Aotearoa New Zealand</p> | <p>years after discharge.</p> |            | <p>Primary diagnosis:</p> <ul style="list-style-type: none"> <li>- 38.1% schizophrenia/schizoaffective</li> <li>- 24.0% bipolar</li> <li>- 12.6% depression</li> <li>- 25.3% other</li> </ul> <p>59.6% had a previous psychiatric admission, 40.4% did not</p> | <p>In the 5-year follow-up period, 16.7% had one readmission, 10.7% had two, and 34.1% had three or more (range of 3 to 43 readmissions).</p> <p>41% were readmitted within one year of index admission, 11.1% were readmitted sometime within the second year, 4.1% within the third year, and 2.6% within the fourth and fifth year after index discharge. 5.6% experienced at least one admission in every 12-month period following their index admission.</p> <p>There were significant differences in the proportion of people having readmissions between diagnostic groups: 68.5% of people with bipolar were readmitted, followed by 67.3% with schizophrenia/schizoaffective, then 52.1 % with other disorders, and 49.1% with depression (<math>p &lt; .001</math>).</p> <p><b>Negative binomial regression</b></p> <p>Ethnicity (<math>p = .001</math>) and previous admissions (<math>p &lt; .0001</math>) were associated with the total number of readmissions, adjusting for other factors in the model. Māori and people with previous admissions were more likely to have greater number of readmissions, and Pasifika peoples were more likely to have fewer readmissions.</p> <p>Of those who were readmitted at least once, the median length of stay over the 5 year study period was 67 days, ranging from brief day admissions with no overnight stays to a total of 1,743 days over the 5 years.</p> |

| Title and authors  | Aim  | Study type   | Sample details  | Main findings  |
|--|--|--|---|--|
|  |  |  |   | <p>Diagnosis (<math>p &lt; .0001</math>) and previous admissions (<math>p &lt; .0001</math>) were significantly associated with length of stay. People with bipolar or 'other' diagnoses had shorter stays than those with schizophrenia, and those with previous admissions stayed longer. Age was also associated with length of stay (<math>p = .017</math>), with incidence decreasing with age.</p>   |
| <p>Factors associated with length of stay and the risk of readmission in an acute psychiatric inpatient facility: A retrospective study</p> <p>Zhang et al., 2011</p> <p>Australia</p> | <p>To investigate factors influencing the length of stay and predictors for the risk of readmission at an acute psychiatric inpatient unit</p> | <p>Retrospective cross-sectional clinical file audit</p> | <p>N = 226 admission episodes (178 patients) during a 12-month period</p> <ul style="list-style-type: none"> <li>- 46% of the sample had a psychiatric history of more than 10 years duration</li> <li>- 71% had previous psychiatric admission</li> <li>- 22% had a forensic history</li> <li>- Nearly 52% had history of self-harm or suicide attempts</li> <li>- 44% had history of aggression towards others</li> <li>- 57% were admitted involuntarily</li> <li>- 32% were discharged on a community treatment order</li> <li>- 61% were discharged to case management</li> <li>- 30% of admissions were directly related to either drug intoxication or withdrawal</li> </ul> | <p>46% were readmitted during the follow-up period, including 40% within 12 months. 13% had at least two readmissions within 12 months and 8% had three or more.</p> <p>Risk factors for readmission include:</p> <ul style="list-style-type: none"> <li>- greater number of previous admissions</li> <li>- recorded deterioration of mental health state prior to index admission</li> <li>- risk to others at time of index admission</li> <li>- contact with emergency department post-discharge</li> <li>- alcohol intoxication on index admission</li> <li>- electro-convulsive therapy on index admission.</li> </ul> <p>Protective factors include:</p> <ul style="list-style-type: none"> <li>- involuntary treatment in the community</li> <li>- reviewing individual service plans</li> <li>- transferring care to a new treating team</li> </ul> <p>Factors that did not affect readmission rates include:</p> <ul style="list-style-type: none"> <li>- sociodemographic characteristics</li> <li>- diagnosis of a major psychiatric illness</li> <li>- length of stay</li> <li>- clinical care and practice provided at the inpatient unit during index admission</li> </ul> |

| Title and authors | Aim | Study type | Sample details  | Main findings      |
|-------------------|-----|------------|---|--------------------|
|                   |     |            | Primary diagnosis: <ul style="list-style-type: none"> <li>- 60% psychosis</li> <li>- 36% schizophrenia</li> <li>- 29% personality disorder</li> <li>- 16% schizoaffective</li> </ul> 59% had at least one drug or alcohol-related diagnosis | - quality of care. |

Table 5. Articles relevant to reducing readmission rates and improving outcomes

| Title and authors  | Aim   | Study type                          | Sample details  | Main findings  |
|--|---|-------------------------------------|---|--|
| <b>Meta-analyses and systematic reviews</b>  |   |                                     |   |  |
| Compulsory community treatment to reduce readmission to hospital and increase engagement with community care in people with mental illness: A systematic review and meta-analysis<br><br>Barnett et al., 2018<br><br>England | To assess the effectiveness of compulsory community treatment (CCT) in reducing readmission and length of stay in hospital and increasing community service use and treatment adherence | Systematic review and meta-analysis | N = 41 peer-reviewed pre-post studies<br><br>Inclusion criteria: <ul style="list-style-type: none"> <li>- Sample had &gt;50% with a severe mental illness</li> <li>- Included CCT intervention (defined as a legal compulsion on patients to remain in contact with mental health services or accept treatment in the community, or both)</li> <li>- Primary outcome measure: readmission to hospital</li> <li>- Secondary outcomes: length of hospital stay (inpatient bed-</li> </ul> | Seventeen studies had before and after CCT comparisons and four studies had both before and after and control group comparisons, including 9,455 people from six countries. There was a medium effect for reduction in inpatient bed-days (standardised mean difference [SMD] = 0.66), a large effect for reduction in hospital readmission (SMD = 0.8), increase in use of community services (SMD = 0.83, and increase in treatment adherence (SMD = 2.12).<br><br>Twenty studies compared people on CCT with controls; 16 were non-randomised and four were randomised. These did not significantly reduce hospital readmissions, inpatient bed days, or affect treatment adherence; but did moderately increase use of community services (SMD = 0.38). Reduction in hospital readmissions remained non-significant when separately analysing RCTs and non-randomised studies. |

| Title and authors   | Aim  | Study type                                 | Sample details   | Main findings   |
|---|--|--|--|---|
|   |  |  | days), use of community services, treatment adherence  | Overall, CCT does not have a clear positive effect on readmission and use of inpatient beds. Evidence suggests a potentially positive effect on treatment adherence but this finding should be interpreted with caution as only a few studies measuring this. CCT may also result in increased community service use but evidence was inconsistent.   |
| <p>Effectiveness of Transitional Interventions in Improving Patient Outcomes and Service Use After Discharge from Psychiatric Inpatient Care: A Systematic Review and Meta-Analysis</p> <p>Hegedüs et al., 2020</p> | <p>To assess the effectiveness of transitional interventions with pre-discharge and post discharge components in reducing readmissions and improving health-related or social outcomes of patients discharged from psychiatric hospitals</p> | <p>Systematic review and meta-analysis</p> | <p>N = 16 studies (including 10 RCTs, three quasi-experimental, three cohort studies)</p> <p>Inclusion criteria:</p> <ul style="list-style-type: none"> <li>- Sampled people aged 18 to 65</li> <li>- Participants had a psychiatric diagnosis and were discharged from a psychiatric inpatient unit</li> <li>- Included interventions that aimed to improve discharge from inpatient care to home with a combination of pre- and post-discharge components</li> </ul> | <p>Nine of the included RCTs (total n = 1,258) reported readmission rates. Readmission rates were higher in control groups in all but two studies. Overall, the OR was 0.76 for readmission due to transitional interventions.</p> <p>The included studies tested 15 different interventions. All interventions included multiple components and were conducted by mental health workers, nurses, case or care managers, social workers, or peer support workers.</p> <p>Pre-discharge interventions included:</p> <ul style="list-style-type: none"> <li>- case management <ul style="list-style-type: none"> <li>o needs assessment</li> <li>o discharge or care planning</li> <li>o scheduling or preparing follow-up appointments</li> <li>o family or carer involvement</li> </ul> </li> <li>- psychoeducational components <ul style="list-style-type: none"> <li>o individualised psychoeducation</li> <li>o medication reconciliation elements</li> <li>o CBT elements (including skills training, peer support).</li> </ul> </li> </ul> <p>Post-discharge components aimed to support people during a transition period and were most frequently delivered through phone calls, home visits, or letters. Components included:</p> <ul style="list-style-type: none"> <li>- ensuring timely follow-up with outpatient care providers</li> </ul> |

| Title and authors | Aim | Study type | Sample details | Main findings   |
|-------------------|-----|------------|----------------|---|
|                   |     |            |                | <ul style="list-style-type: none"> <li>- treatment coordination</li> <li>- timely communication between inpatient staff and outpatient care or community service provider after discharge</li> <li>- monitoring health status</li> <li>- implementing discharge plan</li> <li>- activating resources in the social network</li> <li>- CBT elements               <ul style="list-style-type: none"> <li>o therapeutic meetings with staff</li> <li>o skills training</li> </ul> </li> <li>- psychoeducation and counselling</li> <li>- peer support               <ul style="list-style-type: none"> <li>o facilitating access to local communities</li> <li>o promoting friendship</li> <li>o providing basic necessities, understanding, encouragement.</li> </ul> </li> </ul> <p>Interventions lasted between one week and two years, or until a therapeutic relationship was established between the patient and outpatient care provider; but most interventions ended three months after discharge.</p> <p>Studies reported significant improvements favouring interventions in:</p> <ul style="list-style-type: none"> <li>- compulsory readmission</li> <li>- length of compulsory hospital episodes</li> <li>- outpatient service use</li> <li>- continuity of care</li> <li>- functioning</li> <li>- symptom severity</li> <li>- quality of life</li> <li>- social support</li> </ul> |

| Title and authors  | Aim  | Study type                                 | Sample details  | Main findings   |
|--|--|--|---|---|
|  |  |  |   | <ul style="list-style-type: none"> <li>- engagement in community.</li> </ul> <p>All studies with significant effects in at least one of these outcomes included elements of case management, most frequently in combination with CBT and psychoeducation, or exclusively CBT, or peer support.</p>  |
| <p>Discharge management strategies and post-discharge care interventions for depression – Systematic review and meta-analysis</p> <p>Holzinger et al., 2017</p> <p>Germany</p> | <p>To evaluate the effectiveness of care transition interventions for people with depression after psychiatric hospitalisation</p> | <p>Systematic review and meta-analysis</p> | <p>N = 16 publications of controlled trials</p> <p>Inclusion criteria:</p> <ul style="list-style-type: none"> <li>- People of all ages treated for depression (unipolar; first or recurrent) in inpatient settings and discharged into outpatient care</li> <li>- Interventions aimed at facilitating transition into ambulatory care or improving post-discharge care</li> <li>- Controlled trials</li> <li>- Primary outcomes: readmissions into inpatient treatment due to a mental health condition, depression symptoms</li> <li>- Secondary outcomes: recurrence, relapse, remission rates, treatment adherence, disease-specific (eg suicide rate), all-cause mortality during follow-up, time of post-</li> </ul> | <p>Studies evaluated the following approaches:</p> <ul style="list-style-type: none"> <li>- psychoeducation (pre-discharge counselling, post-discharge support groups)</li> <li>- psychotherapeutic based on cognitive-behavioural methods (social skills training, motivational therapy)</li> <li>- case management interventions</li> <li>- internet- or smartphone-based support systems</li> <li>- multi-faceted interventions (mixed cognitive-behavioural approaches and psychoeducation)</li> <li>- antidepressant medication regime.</li> </ul> <p>Interventions differed in time of onset – some began at time of discharge, others at pre-discharge. Control condition in all studies was treatment as usual.</p> <p><b>Readmission rates</b></p> <p>Readmission rates ranged between 0% to 40% in intervention groups, and 21% to 67% in control groups. Risk ratios for group differences were non-significant in all but one study. The overall risk ratio for readmission was 0.65 (<math>p = .06</math>). None of the intervention types showed statistically significant results for psychiatric readmission.</p> <p><b>Depression symptoms</b></p> |

| Title and authors   | Aim  | Study type    | Sample details   | Main findings  |
|---|--|---------------|--|--|
|   |  |               | discharge absence from work, quality of life, and patient satisfaction | Meta-analyses showed significant overall intervention effects, and subgroup evaluation showed no significant differences in interventional approach.   |
| <p>Reducing Hospital Readmission Rates: Current Strategies and Future Directions</p> <p>Kripalani et al., 2014</p> <p>USA</p> | <p>To summarise the prevalence of hospital readmission approaches to reduce readmission for patients discharged to home or to post-acute care (PAC) facilities, and methods to identify people at high risk of readmission</p> | <p>Review</p> | <p>N/A</p>   | <p><b>Comprehensive discharge planning</b><br/> Reduced 6-week readmission rate for medical patients (10% vs 23%)<br/> Intervention components:</p> <ul style="list-style-type: none"> <li>- structured assessment of patient and caregiver needs</li> <li>- patient and caregiver education</li> <li>- ongoing assessment and adjustment of plan if needed</li> <li>- care coordination for up to two weeks after discharge</li> <li>- interdisciplinary communication.</li> </ul> <p><b>Care transitions intervention</b><br/> Reduced 30-day readmission rate from 11.9% to 8.3%, and 90-day readmission rate from 22.5% to 16.7%.</p> <ul style="list-style-type: none"> <li>- Medication self-management</li> <li>- Patient-owned health record</li> <li>- Timely outpatient follow-up</li> <li>- Awareness of red flags and appropriate actions to take</li> </ul> <p><b>Project reengineering discharge (RED)</b><br/> Reduced 30-day readmission rate – incidence ratio = 0.695</p> <ul style="list-style-type: none"> <li>- Patient education (including after-hospital care plan)</li> <li>- Scheduled follow-up appointments</li> <li>- Review of test results and outstanding tests</li> <li>- Organised post-discharge services</li> <li>- Medication reconciliation</li> <li>- Discharge plan reconciled with care pathways and guidelines</li> <li>- Action plan in case or problems is discussed with patient</li> </ul> |

| Title and authors  | Aim   | Study type                                 | Sample details  | Main findings   |
|--|---|--|---|---|
|  |   |  |   | <ul style="list-style-type: none"> <li>- Discharge summary to following provider</li> <li>- Assessment of patient understanding</li> <li>- Telephone reinforcement</li> </ul> <p>Evidence suggests single-facet interventions are unlikely to effectively reduce readmission rates. Multifaceted interventions (like those above) are likely necessary to substantially improve readmission rates by bridging the hospital and post-discharge periods. Authors acknowledge these interventions require substantial resources for planning, implementation, monitoring, and evaluation.</p> <p>Overall, interventions require addressing patient, facility, and policy factors; and can involve factors like dedicated transitional care personnel, enhancing inter/intra-facility communication, patient-centred discharge plans, and telephone follow-ups.</p> <p>Other points</p> <ul style="list-style-type: none"> <li>• Preventive steps should be initiated early in the acute hospital stay</li> <li>• Important to identify who may be at high risk of readmission</li> </ul> |
| <p>Care Management for Serious Mental Illness: A Systematic Review and Meta-Analysis</p> <p>Lim et al., 2021</p> | <p>To determine the impact of care management on clinical outcomes, acute care utilisation, cost, and satisfaction among adults</p> | <p>Systematic review and meta-analysis</p> | <p>N = 34 studies (31 included in the meta-analysis)</p> <p>Inclusion criteria:</p> <ul style="list-style-type: none"> <li>- RCTs, quasi- and non-RCTs, prospective cohort studies, retrospective cohort studies, and time series analyses</li> </ul> | <p>Care management approaches across studies included:</p> <ul style="list-style-type: none"> <li>- social service coordination</li> <li>- providing services beyond care planning and coordination</li> <li>- psychoeducation</li> <li>- counselling on treatment adherence, medication, general medical health</li> <li>- crisis intervention</li> <li>- other clinical skills and self-management training.</li> </ul>   |



| Title and authors                              | Aim  | Study type    | Sample details   | Main findings  |
|--|--|---------------|--|--|
|  | with serious mental illness                          |               | <ul style="list-style-type: none"> <li>- At least half of participants have a serious mental illness (namely schizophrenia spectrum disorders or bipolar disorder)</li> <li>- Intervention cohort received standard outpatient care plus the care management intervention and a control cohort with standard care only</li> <li>- Interventions involve individual performing assessment, care planning, and care coordination (including service referrals)</li> <li>- At least one of these outcomes: psychiatric symptoms, general medical health symptoms, mental quality of life, physical QOL, global QOL, patient satisfaction, total healthcare costs, number of inpatient psychiatric hospitalisations, number of inpatient psychiatric hospital days, and number of emergency department visits</li> </ul> | <p>The meta-analysis indicates a small, significant effect of care management for psychiatric symptoms (Hedges' <math>g = 0.15</math>), mental QOL (<math>g = 0.26</math>), global QOL (<math>g = 0.13</math>).</p> <p>There was a small, significant reduction in inpatient psychiatric hospital days for those who received care management (<math>g = 0.16</math>). No significant effect was found for the total number of inpatient psychiatric hospitalisations.</p> <p>A large effect was found favouring care management for patient satisfaction (<math>g = 0.92</math>) and healthcare costs (<math>g = -1.07</math>).</p> |
| Psychological therapy for inpatients receiving | To synthesise evidence from all controlled trials of | Meta-analysis | N = 20 articles (including individual studies, meta-analyses, reviews)   | Eleven trials examined CBT, three examined meta-cognitive training, two acceptance and commitment therapy, one dialectical behaviour   |

| Title and authors  | Aim   | Study type        | Sample details  | Main findings   |
|--|---|-------------------|---|---|
| acute mental health care: A systematic review and meta-analysis of controlled trials<br><br>Paterson et al., 2018                  | psychological therapy carried out with this group, to estimate its effects on a number of important outcomes and examine whether the presence of randomisation and rater blinding moderated these estimates |                   | Inclusion criteria:<br><ul style="list-style-type: none"> <li>- Randomised and non-randomised trials of psychological therapies for adults receiving acute mental health inpatient care</li> <li>- Comparison group was usual care, usual care plus waiting list, or usual care plus 'inactive' psychological interventions</li> </ul>  | therapy, one eye-movement desensitisation and reprocessing, one interpersonal psychotherapy, and one social skills training.<br><br>Six studies measured readmission data. These suggest active psychological therapy is associated with a reduction in odds of readmission by over a third (OR = 0.62).  |
| Associations Between Continuity of Care and Patient Outcomes in Mental Health Care: A Systematic Review<br><br>Puntis et al., 2015 | To provide an update on the association between continuity of care (CoC) and patient outcomes in mental health care   | Systematic review | N = 18 studies<br><br>Inclusion criteria:<br><ul style="list-style-type: none"> <li>- Use at least one quantitative measure of CoC (including time from inpatient discharge to first outpatient contact with mental health services, number of outpatient service contacts over a specified period, number of changes in care coordinator)</li> <li>- Outcomes: <ul style="list-style-type: none"> <li>o Clinical (hospitalisation, symptom reduction)</li> </ul> </li> </ul> | There was little consistency in outcome measures across studies. For example, the six studies that measured duration of hospitalisation did so using three different measures (total number of days in hospital, average number of nights in hospital per month, and hospitalisation measured by the Strauss Carpenter Outcome Scale).<br><br><b>Hospitalisation outcomes</b><br><ul style="list-style-type: none"> <li>- Duration of hospitalisation: only one study (out of six) found a significant association. Duration of hospitalisation was longer in the cohort with low CoC but there was no significant relative risk of readmission between the cohorts.</li> <li>- Relative risk of hospitalisation: studies generally found CoC (including visiting an outpatient clinic within 180 days of discharge, outpatient contact within five days of discharge) reduced rates of rehospitalisation. One study found increased</li> </ul> |

| Title and authors | Aim | Study type | Sample details  | Main findings  |
|-------------------|-----|------------|---|--|
|                   |     |            | <ul style="list-style-type: none"> <li>○ Functional (quality of life, employment, general community functioning)</li> </ul> | <p>service utilisation (larger number of service contacts) was associated with increased risk of readmission.</p> <p><b>Symptom severity</b><br/>Eight studies assessed the link between CoC and symptom severity. Four found an association:</p> <ul style="list-style-type: none"> <li>- More contact and fewer gaps in care were associated with reduced Brief Psychiatric Rating Scale (BPRS) scores 12 months after discharge</li> <li>- People with pre-discharge contact with their outpatient clinician were more likely than those with no contact to have lower BPRS scores after three months</li> <li>- The other two studies show mixed findings (one showing worse symptom severity in the intervention group than the control group, the other showing mixed results)</li> </ul> <p><b>Social functioning</b><br/>Eight studies found an association between CoC and social functioning. Results generally indicate that better CoC was associated with better functioning in the community (measured by Global Assessment of Functioning and Multnomah Community Ability Scale)</p> <p><b>Other outcomes</b><br/>One study found an association between better CoC and lower mortality rates.<br/>There were mixed findings for all other outcomes, with some studies showing significant and others showing non-significant associations. Outcomes include service satisfaction, quality of life, substance use</p> |

| Title and authors  | Aim  | Study type  | Sample details  | Main findings  |
|--|--|---|---|--|
|  |  |   |   | reduction, medication adherence, life satisfaction, better patient-provider therapeutic relationship, and patient needs met.   |
| Discharge planning in mental health care: A systematic review of the recent literature<br><br>Steffen et al., 2009 | To determine and estimate the efficacy of discharge planning interventions in mental health care from in-patient to outpatient treatment on improving patient outcome, ensuring community tenure, and saving costs | Systematic review and meta-analysis   | N = 11 studies (six RCTs, three controlled clinical trials, two cohort studies; 5,655 participants)<br><br>Inclusion criteria:<br><ul style="list-style-type: none"> <li>- Adults aged 18+ in mental health care</li> <li>- RCT, CCT, or cohort study</li> <li>- Included multicomponent or single intervention</li> <li>- Aimed to prevent, facilitate, or solve problems in outpatient care</li> </ul> Outcomes related to readmission rates, connection to outpatient treatment, length of stay, health, costs | In the six studies which assessed readmission to inpatient mental health treatment, individual study risk ratios (RRs) ranged from 0.30 to 0.72. Readmission proportions ranged from 15% to 46% in control groups, and 7% to 25% in intervention groups. The pooled RR between intervention to control groups was 0.66, meaning the relative risk reduction was about 34% in favour of the intervention group.<br><br>Among studies examining adherence to outpatient treatment and continuity of care, individual study RRs ranged from 1.02 to 2.23. Proportions of adherent participants ranged from 21% to 76% in control groups, and 47% to 95% in intervention groups. The pooled RR between intervention to control groups was 1.25, meaning the probability of adherence increased by 25% in favour of the intervention group. |
| <b>Individual studies</b>  |  |   |   |  |
| Reducing 28-day mental health readmissions<br><br>NSW Government, 2017<br><br>Australia                            | To reduce 28-day mental health readmissions in Western Sydney Local Health District (WSLHD) by identifying key issues which lead to high readmission rates   | Implemented practical changes to admissions, care coordination, and discharge processes at an acute | The project takes place in two WSLHD hospitals. Implemented three main solutions:<br><ol style="list-style-type: none"> <li>1) Senior Psychiatry led re-admissions process supported by the multidisciplinary team</li> <li>2) Proactive and predictive flow management between settings</li> </ol> Engagement of Consumers and Carers in Care Planning   | At the time of writing, implementation had taken place in one hospital.<br><br>Readmission rate at Cumberland Hospital dropped from around 14% at the start of implementation in September 2016 to 8% in February 2017.  |

| Title and authors   | Aim   | Study type   | Sample details  | Main findings  |
|---|---|--|---|--|
|   | To implement targeted solutions to address these factors  | mental health facility                                     |   |  |
| <p>Care pathways in the transition of patients between district psychiatric hospital centres (DPCs) and community mental health services</p> <p>Sather et al., 2017</p> <p>Norway</p> | To explore healthcare personnel's experience of care pathways n patient transition between inpatient and community mental health services | Descriptive qualitative study using focus group interviews | <p>Twelve health employees from seven community health care settings (1 urban, 6 rural)</p> <p>All were women with at least 10 years experience</p> <p>Nine nurses, two carers, one social worker</p> | <p>Two main areas (and additional sub-themes) of concern about care pathways between DPCs and community mental health services.</p> <ol style="list-style-type: none"> <li>1) The need for integrated care <ol style="list-style-type: none"> <li>a. Information</li> <li>b. Documentation</li> <li>c. Teamwork/ambulant</li> <li>d. Resources</li> </ol> </li> <li>2) The need for patient activation or empowerment <ol style="list-style-type: none"> <li>a. User involvement and autonomy</li> <li>b. Mutual learning and training</li> <li>c. Relationships</li> </ol> </li> </ol> <p><b>Integrated care</b></p> <p>Allows health care professionals to treat individual patients as a whole rather than on the basis of their separate conditions. Different dimensions play complementary roles: clinical integration, professional and organisational integration, and system integration.</p> <ul style="list-style-type: none"> <li>- Emphasised importance of implementing standardised protocols and utilising opportunities to: <ul style="list-style-type: none"> <li>o increase cooperation between staff in DPCs and community services to exchange information</li> <li>o provide quality health care</li> <li>o increase continuity across care</li> <li>o increase correspondence between provided care and standards of evidence-based mental health care</li> </ul> </li> </ul> |

| Title and authors | Aim | Study type | Sample details | Main findings   |
|-------------------|-----|------------|----------------|---|
|                   |     |            |                | <ul style="list-style-type: none"> <li>- Need for new evidence-based protocols for the discharge process</li> </ul> <p>Participants perceived a cultural and power discrepancy between DPCs and community mental health services. DPCs traditionally have greater 'power' to identify patients' needs when discharged, but power should shift to community services after discharge.</p> <p>Participants noted the lack of resources needed to give quality mental health care, including time, financial resources, and training.</p> <p><b>Patient activation</b><br/>Involves giving patients information that they can understand and act on, providing them with support customised to their needs, equipping them to learn how to manage their own health, and engaging them in their own healthcare process.</p> <p>Participants recognise people find the transition from inpatient to community settings overwhelming due to reduced round-the-clock support. Other people feel healthy enough that they refuse (necessary) follow-up care which could lead to relapses. Identified importance of having an action plan in place for people whose mental health worsens after being discharged.</p> <p>Coordinated visits to recently discharged patients that involve both inpatient and community staff are useful, particularly when the person is new to receiving community mental health services. These visits can involve discussions on treatment and further follow-ups, and involve people's families and settings.</p> |

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