

ORIGINAL ARTICLE

Breast screening participation and degree of spread of invasive breast cancer at diagnosis in mental health service users, a population linkage study

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Abstract

Background: Women living with mental health conditions may not have shared in improvements in breast cancer screening and care. No studies have directly examined the link between reduced screening participation and breast cancer spread in women using mental health (MH) services.

Methods: Population-wide linkage of a population cancer register, BreastScreen register, and mental health service data set in women aged 50 to 74 years in New South Wales, Australia, from 2008 to 2017. Incident invasive breast cancers were identified. Predictors of degree of spread (local, regional, metastatic) at diagnosis were examined using partial proportional odds regression, adjusting for age, socioeconomic status, rurality, and patterns of screening participation.

Results: A total of 29 966 incident cancers were identified and included 686 (2.4%) in women with MH service before cancer diagnoses. More than half of MH service users had regional or metastatic spread at diagnosis (adjusted odds ratio, 1.63; 95% CI, 1.41-1.89). MH service users had lower screening participation; however, advanced cancer was more common even when adjusting for screening status (adjusted odds ratio, 1.53; 95% CI, 1.32-1.77). Advanced cancer was more common in women with severe or persistent MH conditions.

Conclusions: Low screening participation rates explain only small part of the risk of more advanced breast cancer in women who use MH services. More study is needed to understand possible mechanisms contributing to more advanced breast cancer in women living with MH conditions. Health systems need strategies to ensure that women living with MH conditions enjoy population gains in breast cancer outcomes.

KEYWORDS

breast cancer, mammography, mental illness, metastatic, schizophrenia, screening, stage

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BACKGROUND

Breast cancer is the most common cause of cancer-related mortality and disability in women,¹ and its outcomes have improved in many countries because of advances in screening, diagnostics, and care.²⁻⁴ Mammography screening programs increase breast cancer detection before the occurrence of regional or metastatic spread and reduce mortality in eligible populations by up to 20%.^{5,6}

Women living with mental health (MH) conditions may not have shared in these gains. There is evidence that women with MH conditions have an increased incidence of breast cancer,^{7,8} reduced participation in breast cancer screening programs,^{5,9-11} and substantially increased breast cancer mortality.¹²⁻¹⁴ Low screening participation rates suggest that more advanced illness at detection may contribute to increased mortality in this group.

Few studies have examined the degree of spread of breast cancer in women with mental illness. Most have reported this as a covariate in analyses of cancer survival, describing higher rates of regional or metastatic spread¹⁵⁻¹⁹ or lymph node involvement.¹⁷ However, these studies have not adjusted for factors such as age, socioeconomic disadvantage, or rural residence that may influence both screening participation²⁰ and degree of spread,²⁰⁻²² and also covary with mental health conditions. Only one study²³ has compared breast cancer stage in women with mental illness after adjusting for these factors, unexpectedly finding that women using US Medicaid MH services had a lower adjusted rate of distant stage cancer (hazard ratio, 0.59) than women who had received other Medicaid services. To our knowledge, no study has examined both breast cancer screening participation rates and degree of cancer spread at diagnosis in women with MH conditions to assess directly how screening participation contributes to possible differences in cancer stage at presentation and hence subsequent differences in mortality.

This study aims to compare the degree of spread of newly diagnosed invasive breast cancers in women with and without recent MH service contact, after adjusting for participation in breast cancer screening and for other potential confounders. This study is part of the Mental Health Living Longer project,²⁴ an ongoing population-wide data linkage undertaken by the New South Wales (NSW) Ministry of Health, which aims to build data to understand and reduce premature mortality in people using NSW MH services.

METHODS

Project approval and governance

The study was approved by the NSW Population and Health Service Research Ethics Committee (HREC/17/CIPHS/48.CINSW Refs 2017/|HRE1105, 2019/UMB0208) and the Aboriginal Health and Medical Research Council of NSW (Ref 1564/19). The program is governed by a steering committee with representation from peak organizations representing NSW health consumers, MH service users and MH carers, and by an Aboriginal Sovereign Steering Committee.

Setting and context

NSW is Australia's most populous state, with a current population of approximately 8.1 million people. Data were obtained from linked population-wide collections recording: (1) cancer screening; (2) cancer degree of spread within 4 months of diagnosis; and (3) MH care in the 2 years before cancer diagnosis. Cancer screening in NSW is provided through the BreastScreen Australia program, a joint state and federal government initiative. The program provides free mammograms to women aged 40 years and over, and targets women aged 50 to 74 years with two yearly letters inviting them for a screening mammogram. Screening data are recorded in the BreastScreen NSW data collection.

Cancer care in NSW is provided through public and private cancer services and hospitals. Details of cancer diagnoses and care are mandated to be notified to the NSW Cancer Institute and recorded in the NSW Clinical Cancer Registry. This records demographic, incidence, degree of spread within 4 months of diagnosis, and care details for people diagnosed or treated with cancer in NSW. Data are received from pathology laboratories, hospitals, radiotherapy and medical oncology services, aged care facilities, and the NSW Register of Births Deaths and Marriages.

Mental health care in NSW is mainly government funded or subsidized. Approximately two thirds of hospital admissions for MH care occur in state-funded (public) hospitals. Free public community MH services provide community care for people with severe or enduring MH conditions, as well as emergency and acute community mental MH. Hospital and community MH care data are recorded in linked, statewide data collections. Commonwealth-government subsidized and privately funded services provide office-based specialist care and primary MH care through general practices by family physicians.

Inclusion and exclusion criteria

The study included all women with a diagnosis of invasive breast (cancer type C50) in the NSW Cancer Registry registered between January 1, 2008, and December 31, 2017, who were aged 50 to 74 years at cancer registration and were residents of NSW. Cancer type is derived from ICD-O-3 topography and morphology. Non-NSW residents, and women "unknown" extent of breast cancer at diagnosis were excluded. In situ cancer was excluded from primary analyses because our focus was on invasive cancer.

Statistical analysis

The primary outcome variable was "degree of breast cancer spread" at diagnosis (localized, regional, or metastatic) as recorded in the NSW Cancer Registry and assigned from the highest degree of spread identified within 4 months of the initial cancer diagnosis. This 4-month window allows classification of the degree of spread to be

based on information from postdiagnosis surgery, imaging, or pathology, and is consistent with comparable Australian studies.²²

Breast screening participation was defined as the presence of at least one mammogram recorded in the BreastScreen NSW collection. Screening participation history was categorized as “recent” (screened in the 2 years before breast cancer diagnosis), “past,” (most recent screen occurred more than 2 years before breast cancer diagnosis) or “never” (no record of screening).

Mental health service use was defined as any contact with an in-scope MH service in the 2 years before breast cancer diagnosis. In-scope services included (1) any admission to a NSW public or private hospital involving at least 1 day in a designated mental health unit, (2) admission to a NSW public or private hospital with a primary diagnosis of a nonorganic MH condition (ICD-10 F10-F99 codes), or (3) face-to-face or telephone contact with a NSW state government-operated community MH services.

Socioeconomic disadvantage was estimated from the person's area of residence, using the Australian Bureau of Statistics Index of Relative Socioeconomic Disadvantage.²⁵ This index is calculated using census-derived variables measuring income, government welfare support, education, home ownership, employment, household structure, and English language proficiency. Regions were collapsed into a binary variable, with those containing the most disadvantaged 40% of the NSW population forming the “disadvantaged” group. Remoteness was defined using the Australian Bureau of Statistics Accessibility and Remoteness Index of Australia, collapsed into three categories of (1) major cities, (2) inner regional, and (3) outer regional, remote, and very remote.

For descriptive statistics, the balance of individual variables between groups was assessed using standardized differences (Cohen's *d*), with values above 0.1 considered to represent imbalance.²⁶

Predictors of the three-level ordinal outcome variable (local disease, regional spread, metastatic disease) were examined using a partial proportional odds model.^{27,28} In this model, univariable associations between the outcome variable and individual predictors were first examined using Rao's score test, which assesses whether odds are proportional for all levels of the outcome variable. If so, odds ratios (ORs) were estimated using proportional odds regression. If odds were not proportional, ORs were estimated using multinomial logistic regression. Second, a multivariable model was examined combining demographic factors (age group, remoteness area of residence, and socioeconomic disadvantage) and MH service user status. Rao's score test was reapplied to multivariate associations, and proportional odds or multinomial regressions were then applied for each variable depending on the score test result. Finally, BreastScreen participation was added to the multivariable model to allow examination of the relative contribution of screening participation to the outcome.

For the primary analysis, MH service use was treated as a binary variable, comparing people with any in-scope MH contact to other NSW residents. Subgroup analysis was also conducted after splitting mental health service users into two groups with or without “serious or persistent mental illness,” defined as (1) at least one recorded diagnosis of a psychotic disorder (including schizophrenia,

schizoaffective disorder, brief or atypical psychoses, mania, bipolar disorder, and psychotic depression) or (2) a total span of MH treatment of more than 2 years.

Sensitivity analysis was conducted to examine possible impacts of exclusion of cancer in situ on results. The partial proportional odds model was repeated after inclusion of in situ cases, using both a four-level outcome variable (in situ, localized, regional, metastatic) and a three-level outcome variable (in situ or localized, regional, metastatic).

RESULTS

We identified 37 322 female NSW residents aged 50 to 74 years with an incident diagnosis of breast cancer during the study period. Of these, we excluded 1325 (3.5%) because degree of spread was not recorded and also excluded 6041 (16.2%) with in situ illness from the primary analysis. The proportion of cancer cases excluded was similar in mental service users (20.3%) and other NSW residents (19.7%).

After exclusions, the study cohort comprised 29 966 women with invasive breast cancer. There were roughly equal numbers of women in each 5-year age band, approximately 70% lived in major cities, and 18 216 (60%) had a BreastScreen in the 2 years before cancer diagnosis. Mental health service users (686, 2.4% of all women) were younger at cancer diagnosis: 48.4% were aged 59 years and under, compared with 39.6% of other NSW residents (Table 1). Mental health service users were also more likely to live in socioeconomically disadvantaged regions.

Compared with other NSW women, MH service users were less likely to have had recent BreastScreen participation, overall and in all age groups (Table 2). Mental health service users were also substantially more likely to have regional or metastatic disease (MH service users, 53.4%; other NSW residents, 41.0%).

Regional and metastatic spread at diagnosis were more common in women without recent breast screening (Figure 1). However, within each level of screening, MH service users were less likely to have local disease and more likely to have regional or metastatic spread. Among women with recent screening, 46% (95% CI, 41%-52%) of MH service users had regional or metastatic spread, compared with 35% (95% CI, 34%-36%) of other NSW women.

In univariable analyses (Table 3), nonparticipation in breast cancer screening was the strongest individual predictor of more advanced disease, both for regional spread (OR, 1.83; 95% CI, 1.73-1.93) and metastatic disease (OR, 4.86; 95% CI, 4.35-5.43). Recent MH contact was also associated with a significant and proportionally increased risk of both regional and metastatic disease (OR, 1.70; 95% CI, 1.47-1.96). Age and socioeconomic disadvantage were associated with different patterns of regional or metastatic spread. In multivariable analysis adjusting for these factors (model 1), screening participation and MH service user status remained the strongest predictors of advanced disease. Further adjusting for BreastScreen participation only slightly reduced the association between MH service user status and advanced disease. In subgroup analysis, the risk of regional or metastatic disease was significantly increased in

TABLE 1 NSW women aged 50-74 years with invasive breast cancer, comparing mental health service users with other NSW residents by age group, rurality, and socioeconomic disadvantage.

	Other NSW residents No. (%)	Mental health service users No. (%)	Standardized difference (Cohen's d)
Total	29,280	686	
Age group			
50-54	5831 (19.9)	172 (25.1)	0.185*
55-59	5757 (19.7)	160 (23.3)	
60-64	6658 (22.7)	127 (18.5)	
65-69	6303 (21.5)	123 (17.9)	
70-74	4731 (16.2)	104 (15.2)	
Rurality			
Major cities	20,417 (69.8)	473 (69.0)	0.024
Inner regional	6622 (22.6)	162 (23.6)	
Outer regional/ remote	2230 (7.6)	51 (7.4)	
Socioeconomic disadvantage			
Disadvantaged	11,238 (38.5)	360 (52.6)	0.286*
Not disadvantaged	17,983 (61.5)	325 (47.4)	
BreastScreen participation			
Never	8018 (27.4)	237 (34.5)	0.230*
Past	3475 (11.9)	110 (16.0)	
Recent	17,787 (60.7)	339 (49.4)	
Degree of spread			
Localized	17,266 (59.0)	320 (46.6)	0.271*
Regional	10,364 (35.4)	294 (42.9)	
Metastatic	1650 (5.6)	72 (10.5)	

*Standardized difference >0.1.

Abbreviation: NSW, New South Wales.

TABLE 2 NSW women aged 50-74 years with invasive breast cancer, comparing mental health service users with other NSW residents by age group and BreastScreen participation status.

Age group	Other NSW residents, No. (%)			Mental health service users, No. (%)			Rate ratio (MH users: other)		
	Never	Lapsed	Regular	Never	Lapsed	Regular	Never	Lapsed	Regular
50-54	2223 (38.1)	446 (7.7)	3162 (54.2)	79 (45.9)	16 (9.3)	77 (44.8)	1.20	1.21	0.83
55-59	1536 (26.7)	628 (10.9)	3593 (62.4)	51 (31.9)	21 (13.1)	88 (55.0)	1.19	1.20	0.88
60-64	1570 (23.6)	724 (10.9)	4364 (65.6)	39 (30.7)	20 (15.8)	68 (53.5)	1.30	1.45	0.82
65-69	1448 (23.0)	635 (10.1)	4220 (67.0)	30 (24.4)	22 (17.9)	71 (57.7)	1.06	1.77	0.86
70-74	1241 (26.2)	1042 (22.0)	2448 (51.7)	38 (36.5)	31 (29.8)	35 (33.7)	1.39	1.35	0.65

Note: Percentages are by row within mental health group.

Abbreviations: MH, mental health; NSW, New South Wales.

women with severe or persistent mental illness (adjusted OR, 1.65; 95% CI, 1.39-1.96) but not in women with other MH conditions (OR, 1.21; 95% CI, 0.90-1.63).

In sensitivity analysis, including in situ cancers (CIS) in the analysis did not change any the study's findings (Tables S1 and S2). When examining CIS either separately or combined with localized

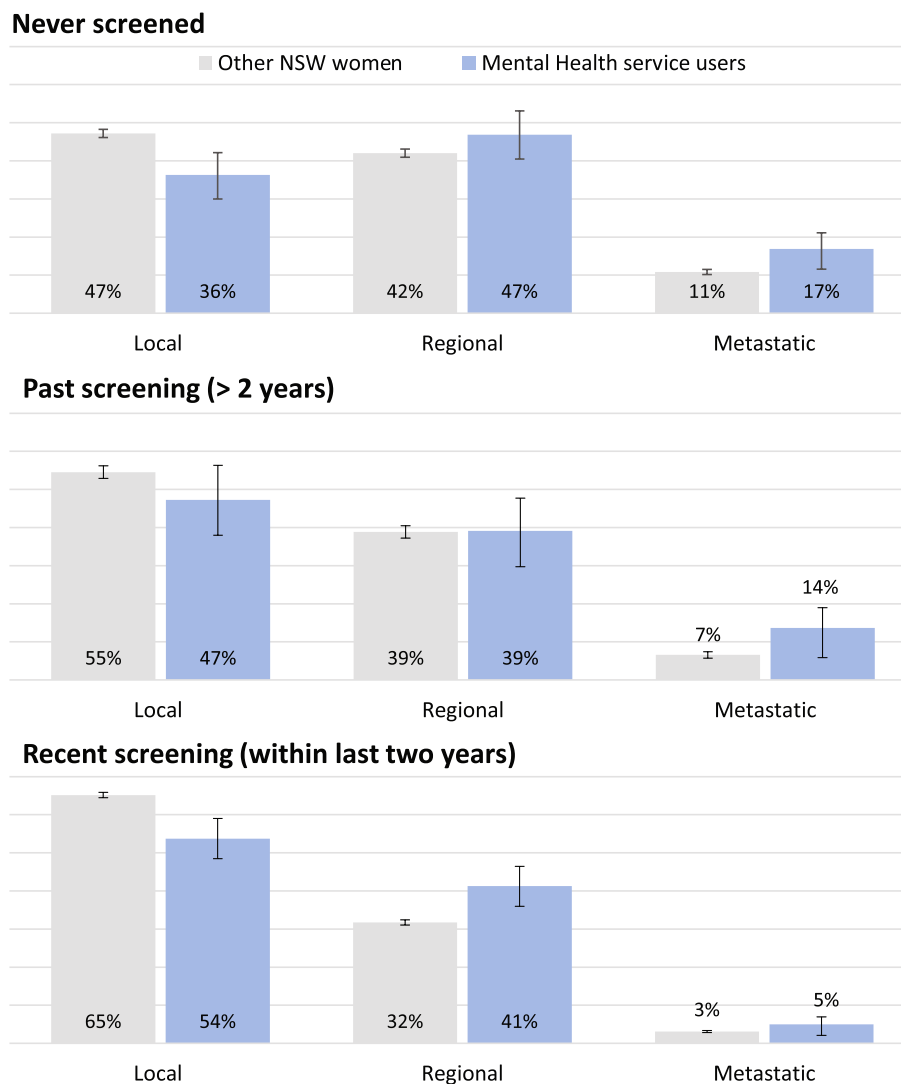


FIGURE 1 Degree of spread at breast cancer diagnosis by BreastScreen status, comparing women using NSW mental health services with other NSW women aged 50-74 years.

disease, the association between MH service use and greater risk of regional or metastatic spread at diagnosis remained significant. All estimates (ORs and 95% CIs) from sensitivity analyses overlapped those from the main analysis in univariate, demographic-adjusted and BreastScreen-adjusted models, and when examining MH subgroups (serious or persistent mental illness compared with other MH service users). In all analyses, the relative risk of advanced disease in MH service users was slightly but nonsignificantly lower when CIS was included. This is consistent with the study's finding that MH services are more likely to have advanced disease at diagnosis.

DISCUSSION

We found that after adjusting for age and demographic differences, NSW women with recent MH service contact had 63% greater odds of having regional or metastatic disease at first diagnosis compared with other NSW women. Mental health service users also had

substantially lower rates of BreastScreen participation before cancer diagnosis. However, even after adjusting for BreastScreen participation, MH service users had 50% greater odds of having advanced breast cancer. This suggests that reduced screening participation contributed to but did not fully explain the increased risk of more advanced cancer in MH service users.

Our findings are consistent with increased unadjusted rates of advanced disease reported in previous population studies,¹⁵⁻¹⁹ suggesting that previous findings are not merely due to differences in demographics or screening participation. Our findings contrast with those of Koroukian et al.,²³ who found a lower adjusted risk of advanced disease in women accessing MH services. The authors of that study speculated that their findings may have reflected the use of a comparison group who had significant health and social problems (women accessing US Medicaid services for non-MH conditions).

Our findings suggest that reduced breast screening participation contributes to more advanced cancer at presentation in women living with MH conditions. Therefore, it is important to develop strategies

TABLE 3 Predictors of regional or metastatic breast cancer spread at diagnosis using partial proportional odds regression.

	Regional disease, OR (95% CI)			Metastatic disease, OR (95% CI)		
	Univariate associations	Model 1: demographics + mental health care	Model 2: model 1 + BreastScreen participation	Univariate associations	Model 1: demographics + mental health care	Model 2: model 1 + BreastScreen participation
Age group^a						
50-54	1.43 (1.32-1.55)	1.36 (1.26-1.47)	1.34 (1.24-1.45)	1.01 (0.85-1.18)	0.89 (0.76-1.05)	0.84 (0.71-0.99)
55-59	1.28 (1.18-1.39)	1.23 (1.14-1.33)	1.30 (1.20-1.41)	1.00 (0.85-1.18)	0.92 (0.79-1.08)	1.00 (0.85-1.17)
60-64	1.11 (1.03-1.20)	1.09 (1.01-1.17)	1.17 (1.09-1.27)	0.94 (0.80-1.10)	0.92 (0.79-1.08)	1.05 (0.90-1.23)
65-69	0.96 (0.89-1.04)	0.95 (0.88-1.03)	1.03 (0.95-1.11)	0.86 (0.73-1.01)	0.88 (0.75-1.03)	1.00 (0.85-1.17)
70-74	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)
Socioeconomic disadvantage^a						
Most disadvantaged 40%	1.06 (1.01-1.11)	1.14 (1.09-1.20)	1.13 (1.08-1.19)	1.47 (1.33-1.62)	1.45 (1.32-1.61)	1.40 (1.27-1.55)
Least disadvantaged 60%	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)
Remoteness area^b						
Major cities	1.07 (0.97-1.18)	1.19 (1.09-1.30)	1.14 (1.05-1.25)	1.07 (0.97-1.18)	1.19 (1.09-1.30)	1.14 (1.05-1.25)
Inner rural	1.14 (1.05-1.25)	1.10 (1.00-1.21)	1.09 (0.99-1.21)	1.14 (1.05-1.25)	1.10 (1.00-1.21)	1.09 (0.99-1.21)
Outer rural/remote	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)
BreastScreen participation^a						
Recent	1.00 (Ref)	-	1.00 (Ref)	1.00 (Ref)	-	1.00 (Ref)
Lapsed	1.46 (1.35-1.57)	-	1.59 (1.48-1.71)	2.60 (2.22-3.05)	-	2.18 (1.87-2.55)
Never	1.83 (1.73-1.93)	-	2.05 (1.94-2.16)	4.86 (4.35-5.43)	-	3.79 (3.40-4.23)
Mental health service use (primary analysis)^b						
No MH care	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)
MH care	1.70 (1.47-1.96)	1.63 (1.41-1.89)	1.53 (1.32-1.77)	1.70 (1.47-1.96)	1.63 (1.41-1.89)	1.53 (1.32-1.77)
Severe and persistent mental illness (subgroup analysis)^b						
No MH care	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)
Other MH	1.28 (0.96-1.71)	1.26 (0.94-1.68)	1.21 (0.90-1.63)	1.28 (0.96-1.71)	1.26 (0.94-1.68)	1.21 (0.90-1.63)
Severe or persistent MH	1.87 (1.58-2.21)	1.78 (1.50-2.11)	1.65 (1.39-1.96)	1.87 (1.58-2.21)	1.78 (1.50-2.11)	1.65 (1.39-1.96)

Note: For regional disease, reference category is local disease (not shown in table), and for metastatic disease reference category is regional disease. Abbreviations: MH, mental health; OR, odds ratio.

^aVariables not meeting proportional odds assumptions: ORs are from multinomial logistic regression and differ for regional and metastatic disease.

^bVariables meeting proportional odds assumptions: ORs are from proportional odds regression and are the same for regional and metastatic disease.

to support screening participation. Several studies have found low breast and cervical cancer screening participation in women living with MH conditions.^{5,9,10} Some have speculated that anxiety or distress, potentially compounded by past trauma, may lead to lower rates of help-seeking or screening participation. However, Mitchell et al.⁵ argue that “current distress (or anxiety) is probably not the explanation for low receipt of mammography” (p. 432) in this group. Strategies for improvement should also consider possible health system and relationship barriers to screening participation. These

include cost, physical accessibility, provider attitudes, and knowledge regarding mental illness, concerns about stigma, past negative experiences of health care, and lack of integration between MH and primary health care services.^{10,29,30} To our knowledge, no study has evaluated programs to increase screening participation in this important group.

Unexpectedly, we found that reduced screening rates only explained a small proportion of the increased risk of advanced cancer in MH service users. Even in women with recent screening in our

cohort, nearly half of MH service users had regional or advanced spread at diagnosis, compared with approximately one third of other women in NSW. Some studies have found greater incidence of breast cancer in women with MH conditions,^{7,8} but this does not explain a higher incidence of advanced disease at equivalent levels of screening. Our data do not directly explain this finding. It is possible that our three-level measure of screening (recent/past/never) does not capture important differences in individual screening patterns over time: women with regular screening over long periods or a shorter average time between screens may be less at risk of advanced disease. If women living with MH conditions face other barriers in access to primary care, they may be more likely to have cancers diagnosed through free screening programs rather than through clinical examination by a physician. Further analysis could explore alternative measures or distinguish between cancers diagnosed at screening and "interval" cancers diagnosed through other means.

Other possible explanations for this finding are speculative. Mental health service users may differ systematically in smoking status, cultural background, reproductive history, or the use of prolactin-affecting medications, all of which may be associated with variations in breast cancer incidence or outcome.^{20,22,31,32} Women with serious MH conditions also have premature mortality because of many other causes: if MH services users with early or undetected breast cancer were more likely to die from other causes, this could potentially create a bias toward detection of more advanced cancer in this group.

Limitations

Despite examining a population of nearly 8 million over almost 20 years, the number of women in the target age range who had both breast cancer and MH service use in our study was modest (686). This limited our ability to examine subgroups and interactions. This also required the use of simplified predictor variables, such as a binary measure of disadvantage, which may obscure potential interactions.

Our primary outcome measure was degree of spread as recorded in a cancer notification register. We did not have access to more detailed clinical staging or histology data, which may have provided more precise description of cancer severity.

The screening register used in this study included all participants in a national publicly funded screening program. It did not include women who chose to have mammography privately outside of that program, who are estimated to comprise up to 9.5% of NSW women in this age group. Private mammography is associated with out-of-pocket costs and is more likely in economically advantaged areas. Its exclusion may contribute to the higher proportion of women living in disadvantaged areas in the MH cohort (Table 1). However, between-group differences persisted after adjusting for socioeconomic disadvantage in multivariable analysis (Table 3), suggesting that this is unlikely to explain our findings.

We used a simple three-level measure of individual screening history (never, past, recent). Breast cancer mortality may be predicted not just by the timing of a person's most recent screen but also by overall screening history and pattern of screening.³³ Future analyses could examine more complex measures of screening history such as time from the last screening assessment, or composite measures of screening regularity and adherence over the last two or more screening cycles.³³

The study data sets do not include measures of some potentially important risk factors that may be associated with screening participation or cancer stage and may also vary systematically with MH service use status. These include smoking status, reproductive history, cultural identification, or medication use. We assessed socioeconomic disadvantage using a broad index based on the person's local area of residence, with data on factors including employment, income, education level, and English language proficiency. However, we do not have data for individuals on any of these important factors.

Conclusions

Women who use MH services have lower rates of participation in breast cancer screening and higher risk of advanced disease at cancer diagnosis. These associations are not simply from differences in age or socioeconomic disadvantage. A greater risk of advanced cancer at diagnosis persisted even after adjusting for individual screening participation. Women living with serious or persistent MH conditions were at even greater risk of advanced disease. Health systems need targeted strategies to ensure that all women living with MH conditions can participate in breast cancer screening. More study is needed to understand possible mechanisms and interactions contributing to more advanced breast cancer in women living with MH conditions.

AUTHOR CONTRIBUTIONS

Grant Sara: Conceptualization; methodology; supervision; writing – original draft; and writing – review and editing. **Chris Lambeth:** Data curation; formal analysis; and writing – original draft. **Philip Burgess:** Methodology; and writing – review and editing. **Jackie Curtis:** Conceptualization; and writing – review and editing. **Richard Walton:** Methodology; and writing – review and editing. **David Currow:** Conceptualization; methodology; and writing – review and editing.

ACKNOWLEDGMENTS

This work was completed while Chris Lambeth was employed as a trainee on the NSW Biostatistics Training Program, NSW Ministry of Health, on placement with the System Information and Analytics Branch, NSW Ministry of Health. No external funding was received for the conduct of this study.

Open access publishing facilitated by University of New South Wales, as part of the Wiley - University of New South Wales agreement via the Council of Australian University Librarians.

CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to declare.

DATA AVAILABILITY STATEMENT

Access to NSW Health data is available to researchers only with the specific approval of the NSW Population and Health Services Research Ethics Committee (www.cancer.nsw.gov.au/research-and-data/nswpopulation-health-services-research-ethics-com). That approval does not permit sharing of unit record data with other researchers.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Sara G, Lambeth C, Burgess P, Curtis J, Walton R, Currow D. Breast screening participation and degree of spread of invasive breast cancer at diagnosis in mental health service users, a population linkage study. *Cancer.* 2023;1-9. doi:[10.1002/cncr.35002](https://doi.org/10.1002/cncr.35002)