Disparities in Breast Cancer Screening Uptake for Women With Mental Illness in the United Kingdom


Published in:
American Journal of Preventive Medicine

Document Version:
Peer reviewed version

Queen’s University Belfast - Research Portal:
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Introduction

Breast cancer is the leading cause of cancer mortality in women worldwide, accounting for approximately 522,000 deaths each year.\(^1\) In an effort to reduce breast cancer mortality, population-wide screening programmes have been implemented in over 27 countries globally. In the United Kingdom (UK), women aged 50-70 years are invited to attend screening every three years on the National Health Service (NHS). Despite some controversy surrounding the potential harms of breast screening, an independent review commissioned by the Department of Health and Cancer Research UK determined that breast screening contributes to a 20% reduction in breast cancer mortality.\(^2\) However, inadequate screening uptake represents a central barrier to optimising the mortality benefit of such programmes.

Cancer is one of the leading causes of death in individuals with mental illness, and although incidence rates appear comparable to the general population, there is evidence that cancer case-fatality rates are significantly higher.\(^3,4\) Given the compelling body of evidence indicating disparities in health service utilisation for individuals with mental illness, it is highly plausible that reduced participation in cancer screening may represent a significant and potentially modifiable factor contributing to the cancer mortality gap. Among other factors, this may be attributable to the continued stigmatisation of mental illness, circumstantial factors such as hospitalisation, and the varying impact of psychiatric symptoms on an individual’s ability to attend screening.

In a recent systematic review, Mitchell et al observed a 29% reduction in the odds of receiving mammography in those with mental illness.\(^5\) In stratified analyses, the authors also identified
variations in the magnitude of association according to the type of mental disorder examined: in individuals with serious mental illness (SMI), the odds of mammography were halved, whilst a 17% reduction was observed in those with mood disorders. However, the generalisability of this finding is limited as only two of the twenty-four studies included in the meta-analysis were carried out in a setting outside of North America. Given the vast disparities in healthcare organisation and screening policy, it is unlikely that this finding is generalisable to the UK where population-wide breast screening is provided free at the point of access. Woodhead et al attempted to corroborate these findings in the UK, and although these findings pointed to significant reductions in breast screening uptake for individuals with SMI, the generalisability of these findings to the wider population of individuals with mental illness is limited by the classification of the target sample as those with SMI who had accessed both primary and secondary healthcare services for their illness. It is therefore unclear whether these disparities apply to the wider body of individuals with mental illness.

This study examines the impact of mental illness on attendance at breast screening in the UK, as assessed by receipt of psychotropic medication. Analyses were also conducted to determine whether this association varies by type or duration of medication prescribed.
Methods

Study Design and Setting:

This study used the 2011 Census to define a cohort of 57,328 women eligible for breast screening in Northern Ireland (NI) and, with linkage to prescription records, followed them over one three-year screening cycle to determine whether mental illness reduced the odds of attending screening. The study was approved by the Office for Research Ethics Committee Northern Ireland (ORECNI no: 07/NIR01/90+5). Consent was not required as data were de-identified and made available only to the approved research team. Data were analyzed in 2019.

Data Sources and Measures:

Breast screening records for those invited from 1st April 2011-31st March 2014 (plus an additional 6 months to account for organisational delays) were extracted from the National Breast Screening System (NBSS), the system utilised to manage and record the outcomes of invitations to the NHS Breast Screening Programme. Information on date of invitation, whether an individual attended, and date of screening (where applicable) were as recorded on the NBSS. An encrypted Health and Care number (a unique health service identifier) was also included in the dataset which functioned as the linkage key.

Mental illness was identified by psychotropic medication records. Pharmacological treatment represents the most common avenue of treatment for mental illness in the UK7, and prescribing data is readily available, cost-effective, and can be linked to external databases for research purposes. The correlational and predictive validity of psychotropic medication uptake as an
indicator of mental illness has been demonstrated in previous studies. Individual-level data on
diagnosis or non-pharmacological treatment pathways are not available for research purposes in
NI. Prescribing data was obtained from the Enhanced Prescribing Database (EPD), the central
electronic repository of prescriptions dispensed by pharmacies in NI since 2008. Data on the
monthly uptake of psychotropic medication, recorded as monthly defined daily dose (DDD),
between January 2011-December 2014 were extracted. Psychotropic medication was identified
by British National Formulary (BNF) classifications 4.3 (antidepressants), 4.1.2 (anxiolytics),
4.2.1 and 4.2.2 (antipsychotics), 4.1.1 (hypnotics), and 4.1.3 and 4.2.3 (other psychotropic
medications).

Covariates were derived from 2011 Census returns contained within the Northern Ireland
Longitudinal Study (NILS) database, a large-scale, representative dataset containing information
on approximately 28% of the population of NI (~508,000 individuals). The NILS has been
described in greater detail previously. Covariates were selected on the basis of previous
association with screening uptake. Age was defined at the time of the Census, categorised
into five-year age bands from 50-70, with the inclusion of an ‘under 50’ group as some
individuals aged under 50 on Census day reached eligibility for screening in the following three
years. Marital status was defined as ‘currently married’, ‘separated, widowed or divorced’, or
‘never married’. The social gradients in screening uptake are well recognised and were
defined according to (i) National Statistics-Socioeconomic Classification (NS-SEC); (ii) housing tenure; (iii) educational attainment, and (iv) number of cars in the household which
functioned both as a measure of affluence and means of access to screening units. An indicator
of urban-rural residence based on the Northern Ireland Statistics and Research Agency (NISRA)
classification of Settlements (grouped as living within the Belfast Metropolitan Area (BMA) or
elsewhere in NI) was included as previous research has demonstrated significantly reduced uptake of breast screening in the BMA.\textsuperscript{15}

Breast screening records were linked to prescribing records within the host health services organisation and subsequently to the NILS database within NISRA. Linkage was based on exact matching via encrypted Health and Care Numbers (Figure S1).

Statistical analysis:

Mental illness was defined as having received at least one prescription for a psychotropic medication in the three months preceding screening invitation, though additional analyses were conducted to identify variations in uptake by duration of medication receipt (1-3 months).

Descriptive statistics were used to compare the socio-demographic characteristics of individuals who were and were not prescribed psychotropic medication. Crude breast screening uptake rates were calculated to enable comparison of uptake for individuals by psychotropic medication receipt. This was calculated as the percentage of women who attended breast screening of the total number of women invited.

Logistic regression was employed to calculate age-only and fully-adjusted ORs and 95% CIs of attendance at screening for individuals prescribed any psychotropic medication in the three months preceding screening invitation compared to those not prescribed psychotropic medication. Individual models were generated to examine the ORs of attendance by type of psychotropic medication, and subsequently by duration of prescription.
Results

Breast screening uptake in women prescribed any psychotropic medication

30.6% of women were prescribed psychotropic medication in the three months preceding screening invitation. Women prescribed medication were more likely to be older, divorced, separated or widowed, and to come from a less affluent background (as measured by NS-SEC, number of cars in the household, housing tenure, and educational attainment) (Table 1). Additionally, prescription of medication was higher in women living in the BMA compared to the rest of NI (32.2% vs 29.7%).

Table 2 demonstrates that the crude screening uptake rate for individuals prescribed psychotropic medication was just under 7% lower than those not prescribed psychotropic medication (80.7% vs 73.8%). In age-only adjusted analyses, the odds of attending were 33% lower in those prescribed psychotropic medication (OR=0.67; 95% CI 0.64–0.70, p<0.001). In the fully-adjusted analyses, the odds of attending were 15% lower in women prescribed psychotropic medication (OR=0.85; 95% CI 0.81–0.88, p<0.001).

Breast screening uptake by type of psychotropic medication prescribed

Antidepressants were the most prescribed psychotropic medication, with approximately one in four individuals prescribed this medication in the three months preceding screening invitation. Approximately one in twelve individuals were prescribed anxiolytics and hypnotics, whilst 2.4% were prescribed hypnotics, and 0.5% were prescribed another form of psychotropic medication (Table 3).
The odds of attendance varied by type of psychotropic medication prescribed. In age-only
adjusted models, the prescription of antipsychotics was associated with the greatest reduction in
attendance (OR=0.40; 95% CI 0.36–0.45, p<0.001), followed by anxiolytics (OR=0.45; 95% CI
0.42–0.48, p<0.001), and hypnotics (OR=0.51; 95% CI 0.48–0.55, p<0.001). Adjustment for
socio-demographic attributes attenuated the associations observed for all medication types yet
remained statistically significant. In fully-adjusted analyses, the prescription of anxiolytics
contributed to the greatest disparity in attendance (OR=0.61; 95% CI 0.57–0.66, p<0.001). The
odds of attendance were 37% lower in women who were prescribed antipsychotics (OR=0.63;
95% CI 0.56–0.70, p<0.001), and 32% lower in those prescribed hypnotics (OR=0.68; 95% CI
0.63–0.72, p<0.001). The prescription of antidepressants was associated with the smallest
reduction in the odds of attending screening (OR=0.90; 95% CI 0.85–0.94, p<0.001).

Duration of psychotropic medication use and breast screening uptake

Figure 1 demonstrates that gradients in the odds of attending screening were generally evident
with increasing duration of prescription. In the fully-adjusted analyses, there were no significant
differences in the odds of attending for those prescribed any psychotropic medication for just
one month compared to those not prescribed psychotropic medication (OR=1.00; 95% CI 0.93–
1.07). However, the prescription of any psychotropic medication for two or three months
contributed to a respective 16% (OR=0.84; 95% CI 0.78–0.90, p<0.001), and 26% (OR=0.74;
95% CI 0.70–0.79, p<0.001) reduction in the odds of attending.

Stratified analyses revealed the same trend for individuals who were prescribed antidepressants.
For individuals who were prescribed anxiolytics or hypnotics, the fully-adjusted OR of attending
screening reduced considerably from one to two-month prescriptions (from OR=0.77; 95% CI 0.69–0.86, p<0.001 to OR=0.53; 95% CI 0.47–0.61, p<0.001 for anxiolytics, and OR=0.80; 95% CI 0.70–0.90, p<0.001 to OR=0.65; 95% CI 0.57–0.73, p<0.001 for hypnotics). However, further reductions in the odds of attending were not evident with three-month prescriptions of anxiolytics (OR=0.52; 95% CI 0.46–0.58, p<0.001) or hypnotics (OR=0.62; 95% CI 0.56–0.68, p<0.001). Although the odds of attending screening reduced considerably from one to two-month prescription of antipsychotics (from OR=0.70; 95% CI 0.55–0.88, p=0.003 to OR=0.57; 95% CI 0.47–0.70, p<0.001), the odds of attending were greater for individuals prescribed this medication in all three months preceding screening invite compared to those prescribed antipsychotics for two out of the three months (OR=0.64; 95% CI 0.53–0.76, p<0.001).
Discussion

This study demonstrates that nearly a third of women of eligible breast screening age were prescribed psychotropic medications and this was associated with significantly reduced participation in screening. After adjustment for variations in socio-demographic characteristics, the odds of attending screening were 15% lower in women prescribed psychotropic medication despite the availability of universal healthcare. There was also evidence that the degree of disparity varied according to the type of medication prescribed, with the largest reductions in attendance observed in those prescribed anxiolytics and antipsychotics.

Although the observed proportion of individuals receiving psychotropic medication was high, the nature of the cohort examined, in terms of their gender and age distribution, have been shown to exhibit increased help-seeking behaviour compared to the general population. Additionally, whilst medication uptake appears to be higher than that observed in other countries, this finding is in keeping with the increased prevalence of mental illness in NI, and with the findings of other studies utilising psychotropic prescribing data in NI.

The findings of the current study compare favourably with the international literature. A meta-analysis by Mitchell et al revealed that receipt of mammography was 29% lower in individuals with mental illness. Although the magnitude of association observed in that study was larger, there are several reasons for this finding. As noted by the authors themselves, the vast majority of the studies used to estimate the pooled value were conducted in the US and, given the extensive disparities in healthcare organisation, particularly the additional financial barriers to accessing mammography, it is plausible that the observed disparities would be magnified.
Furthermore, it is conceivable that the alleviation of psychiatric symptoms associated with the use of psychotropic medication may lessen the psychological and physical barriers to accessing screening, thus contributing to increased participation in pharmacologically treated individuals. Additionally, it is possible that the help-seeking behaviour characterised by individuals receiving treatment is indicative of increased engagement in other positive health behaviours, including routine cancer screening.

Woodhead et al attempted to corroborate these findings in the UK, and although the authors observed a 31% reduction in the odds of receiving breast screening, these findings were limited to individuals with SMI known to both primary and secondary care, limiting the generalisability of these findings to the wider population of individuals with mental illness. Whilst the restriction of this study to individuals with SMI (for whom the more severe psychological manifestations of their illness would likely create additional obstacles to accessing screening) would largely explain the greater effect magnitude compared to the current study, the authors were also unable to adjust for socio-demographic factors which have been previously identified as key determinants of screening uptake.

The findings of the current study provide novel evidence of variation in the magnitude of disparity in screening attendance according to the type of psychotropic medication prescribed. Notably, the inequality in uptake was greatest in individuals prescribed anxiolytics, for whom a 39% reduction in the odds of attending was observed. Although the underlying relationship between anxiety and screening attendance is yet to be elucidated, it is plausible that the avoidance behaviours which commonly develop as a coping mechanism in individuals with anxiety disorders predominantly explain this reduced participation. This hypothesis reflects the
qualitative evidence which suggests that anxiety and fear of pain associated with mammography, and with potentially receiving a cancer diagnosis are deterrents to attendance. In keeping with the available literature, considerable disparities in attendance were also observed for those with SMI, as identified by the receipt of antipsychotics. In their meta-analysis, Mitchell et al observed a 45% reduction in the odds of mammography for individuals with SMI, and in the UK, Woodhead et al observed a 31% reduction in the receipt of mammography for women with SMI. The large effect size observed for individuals with SMI most likely reflects the manifestation of more life-limiting symptoms, such as psychosis, which would impede an individual’s ability to participate in screening, and in severe cases may contribute to circumstantial barriers to attendance e.g. hospitalisation. Interestingly, the disparities were similar for those prescribed antipsychotics, anxiolytics, and hypnotics. This finding is not unexpected as the identification of those with mental illness based on pharmacological treatment would select for those with more severe or life-limiting anxiety. It is also important to note that individuals with SMI are characteristically more socially disadvantaged therefore the disparity observed for antipsychotics may be overadjusted.

The disparity in attendance observed for individuals prescribed antidepressants was considerably lower than other types of medication. The mechanism through which depression is associated with reduced participation in screening, and why the magnitude of association is lower than that observed for other types of mental disorder is unclear but it is possible that the high rates of successfully treated individuals and the management of symptoms lessened the inequalities. The current study findings suggest that the association between depression and attendance at screening may be driven by the severity of the disorder and the affiliated symptom profile, as
demonstrated by the increasing magnitude of effect with increasing duration of antidepressant prescription.

Despite a high prevalence of hypnotic use in the population, little is understood about the healthcare activities of individuals prescribed these medications. One potentially significant factor which may explain the observed disparities in uptake is the side-effects commonly associated with hypnotics, including drowsiness, memory impairments, and psychomotor limitations which would restrict an individual’s ability to attend screening. It is also recognised that hypnotic use is strongly linked to other psychiatric disorders such as depression and schizophrenia, therefore the observed effect may represent those underdiagnosed and undertreated for these conditions.

Limitations

This study represents the first population-wide study examining the impact of mental illness on breast screening uptake in the UK. The strengths of this study include the use of validated breast screening records which eliminates recall bias associated with self-reported measures. Linkage to the 2011 Census provided a wealth of information on cohort members. However, given the decennial nature of the Census and the potential for contextual information to change over time, more recent data could not be examined. The availability of recognised pharmaceutical categories enabled the examination of the impact of receiving different types of psychotropic medication which act as proxy indicators for mental disorders. The primary limitation of this study is the lack of information on the condition for which a prescription was made. Although the majority of psychotropic medications are prescribed for the treatment of mental illness,
there are alternative indications for certain medications. Furthermore, the identification of individuals based on prescriptions excludes those who are undiagnosed or untreated, and those undergoing standalone psychological therapies, thus potentially underestimating the impact of mental illness on screening uptake. However, there remains great difficulty in identifying these individuals among the wider population, and many previously utilised measures have yet to be validated, and/or are subject to the limitations of self-report such as poor response rates, small sample sizes, and responder and recall biases. It is also important to note that medication data was based on prescriptions filled. Although the current study was unable to assess rates of primary adherence, prescriptions in NI are provided free of charge thus eliminating the central barrier to adherence. Compliance with medication regimen was not examined in the current study.

**Conclusion**

This study advances the current understanding of the factors contributing to suboptimal breast screening uptake, confirming the existence of disparities in uptake for individuals with mental illness in the UK despite the availability of universal healthcare. This is of particular concern given the increasing global burden of mental illness and the growing body of evidence suggesting disparate cancer mortality rates amongst these individuals. The early detection rates achieved through screening are a central factor contributing to reduced breast cancer mortality, thus targeted interventions are required to ensure equitable access.
Acknowledgements

The help provided by the staff of the Northern Ireland Longitudinal Study (NILS) and the NILS Research Support Unit is acknowledged. The NILS is funded by the Health and Social Care Research and Development Division of the Public Health Agency (HSC R&D Division) and NISRA. The NILS-RSU is funded by the ESRC and the Northern Ireland Government. The authors alone are responsible for the interpretation of the data and any views or opinions presented are solely those of the author and do not necessarily represent those of NISRA/NILS. The authors have no conflicts of interest to declare. This work was funded by a studentship from the Department for Employment and Learning (DEL), Northern Ireland. The funding body had no role in study design; collection, analysis, and interpretation of data; writing the report; and the decision to submit the report for publication. DOR and MD conceptualised the study. AMairs and CH facilitated data extraction. ER and AMaguire obtained and prepared data for analysis. ER conducted the statistical analyses and with support from DOR, interpreted the results and wrote the manuscript. All authors approved the final submitted version. The authors confirm that these findings have not been presented elsewhere. No financial disclosures were reported by the authors of this paper.
References


Figure Legend

Figure 1. ORs (95% CIs) of attending breast screening by type and duration of psychotropic medication prescribed. ORs adjusted for age, marital status, National Statistics-Socioeconomic Classification (NSSEC), number of cars, housing tenure, educational attainment, and area of residence. Boldface indicates statistical significance (* p<0.01, **p≤0.001)
Table 1: Socio-demographic characteristics of women in the cohort by psychotropic medication receipt.

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Not in receipt of psychotropic medication (n = 39,807)</th>
<th>In receipt of psychotropic medication (n = 17,521)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 50</td>
<td>3,993 (10.0)</td>
<td>1,676 (9.6)</td>
<td>0.025</td>
</tr>
<tr>
<td>50-54</td>
<td>11,215 (28.2)</td>
<td>4,789 (27.3)</td>
<td></td>
</tr>
<tr>
<td>55-59</td>
<td>9,190 (23.1)</td>
<td>4,088 (23.3)</td>
<td></td>
</tr>
<tr>
<td>60-64</td>
<td>8,945 (22.5)</td>
<td>3,983 (22.7)</td>
<td></td>
</tr>
<tr>
<td>65-70</td>
<td>6,464 (16.2)</td>
<td>2,985 (17.0)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Not in receipt of psychotropic medication (n = 39,807)</th>
<th>In receipt of psychotropic medication (n = 17,521)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>28,024 (70.4)</td>
<td>10,027 (57.2)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Divorced/Separated/Widowed</td>
<td>8,486 (21.3)</td>
<td>6,065 (34.6)</td>
<td></td>
</tr>
<tr>
<td>Never Married</td>
<td>3,279 (8.2)</td>
<td>1,429 (8.2)</td>
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<table>
<thead>
<tr>
<th>National Statistics-Socioeconomic Classification (NSSEC)</th>
<th>Not in receipt of psychotropic medication (n = 39,807)</th>
<th>In receipt of psychotropic medication (n = 17,521)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managerial, Administrative and Professional</td>
<td>11,991 (30.1)</td>
<td>3,582 (20.4)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Intermediate</td>
<td>8,067 (20.3)</td>
<td>2,887 (16.5)</td>
<td></td>
</tr>
<tr>
<td>Small Employers and Own Account</td>
<td>2,358 (5.9)</td>
<td>725 (4.1)</td>
<td></td>
</tr>
<tr>
<td>Lower Supervisory and Technical</td>
<td>1,570 (3.9)</td>
<td>787 (4.5)</td>
<td></td>
</tr>
<tr>
<td>Semi-Routine/Routine</td>
<td>13,783 (34.6)</td>
<td>7,706 (44.0)</td>
<td></td>
</tr>
<tr>
<td>Never worked/Unemployed/Full-time Student</td>
<td>2,038 (5.1)</td>
<td>1,834 (10.5)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Cars</th>
<th>Not in receipt of psychotropic medication (n = 39,807)</th>
<th>In receipt of psychotropic medication (n = 17,521)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two+</td>
<td>21,282 (53.5)</td>
<td>6,312 (36.0)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>One</td>
<td>14,282 (35.9)</td>
<td>7,296 (41.6)</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>4,243 (10.7)</td>
<td>3,913 (22.3)</td>
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</table>

<table>
<thead>
<tr>
<th>Housing Tenure</th>
<th>Not in receipt of psychotropic medication (n = 39,807)</th>
<th>In receipt of psychotropic medication (n = 17,521)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner</td>
<td>33,955 (85.3)</td>
<td>12,259 (70.0)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Private Renter</td>
<td>2,577 (6.5)</td>
<td>1,801 (10.3)</td>
<td></td>
</tr>
<tr>
<td>Social Renter</td>
<td>3,275 (8.2)</td>
<td>3,461 (19.8)</td>
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</table>

<table>
<thead>
<tr>
<th>Educational Attainment</th>
<th>Not in receipt of psychotropic medication (n = 39,807)</th>
<th>In receipt of psychotropic medication (n = 17,521)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree+</td>
<td>10,494 (26.4)</td>
<td>2,837 (16.2)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>A-Level</td>
<td>2,996 (7.5)</td>
<td>972 (5.5)</td>
<td></td>
</tr>
<tr>
<td>GCSE</td>
<td>10,704 (26.9)</td>
<td>3,938 (22.5)</td>
<td></td>
</tr>
<tr>
<td>Area of Residence</td>
<td>Rest of Northern Ireland</td>
<td>Belfast Metropolitan Area</td>
<td>P-value</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------------------</td>
<td>---------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>None</td>
<td>15,613 (39.2)</td>
<td>9,774 (55.8)</td>
<td></td>
</tr>
<tr>
<td>Rest of Northern Ireland</td>
<td>26,811 (67.4)</td>
<td>11,309 (64.5)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Belfast Metropolitan Area</td>
<td>12,996 (32.6)</td>
<td>6,212 (35.5)</td>
<td></td>
</tr>
</tbody>
</table>

GCSE: General Certificate of Secondary Education
Table 2: ORs (95% CIs) of attending breast screening by psychotropic medication receipt.

<table>
<thead>
<tr>
<th></th>
<th>No. Invited (% uptake)</th>
<th>Age-Only Adjusted OR (95% CI)</th>
<th>+Marital status</th>
<th>+Socio-economic status&lt;sup&gt;a&lt;/sup&gt;</th>
<th>+Area of residence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not prescribed psychotropic medication</td>
<td>39,807 (80.7)</td>
<td>1.00 (Ref)</td>
<td>1.00 (Ref)</td>
<td>1.00 (Ref)</td>
<td>1.00 (Ref)</td>
</tr>
<tr>
<td>Prescribed psychotropic medication</td>
<td>17,521 (73.8)</td>
<td>0.67 (0.64 – 0.70)</td>
<td>0.72 (0.69 – 0.75)</td>
<td>0.85 (0.81 – 0.88)</td>
<td>0.85 (0.81 – 0.88)</td>
</tr>
</tbody>
</table>

<sup>a</sup>Adjusted for National Statistics-Socioeconomic Classification (NSSEC), number of cars in the household, housing tenure, and educational attainment

Boldface indicates statistical significance (p<0.001)
Table 3: ORs (95% CIs) of attending breast screening by type of psychotropic medication prescribed.

<table>
<thead>
<tr>
<th></th>
<th>No. Invited (% pop)</th>
<th>No. Attended (% Uptake)</th>
<th>Age-Only Adjusted OR (95% CI)</th>
<th>Fully-Adjusted OR$^a$ (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No Medication</strong></td>
<td>39,807 (69.4)</td>
<td>32,136 (80.7)</td>
<td>1.00 (Ref)</td>
<td>1.00 (Ref)</td>
</tr>
<tr>
<td><strong>Medication Type</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antidepressants</td>
<td>14,175 (24.7)</td>
<td>10,581 (74.7)</td>
<td>0.70 (0.67 – 0.73)</td>
<td>0.90 (0.85 – 0.94)</td>
</tr>
<tr>
<td>Anxiolytics</td>
<td>4,229 (7.4)</td>
<td>2,747 (65.0)</td>
<td>0.45 (0.42 – 0.48)</td>
<td>0.61 (0.57 – 0.66)</td>
</tr>
<tr>
<td>Antipsychotics</td>
<td>1,388 (2.4)</td>
<td>870 (62.7)</td>
<td>0.40 (0.36 – 0.45)</td>
<td>0.63 (0.56 – 0.70)</td>
</tr>
<tr>
<td>Hypnotics</td>
<td>4,716 (8.2)</td>
<td>3,210 (68.1)</td>
<td>0.51 (0.48 – 0.55)</td>
<td>0.68 (0.63 – 0.72)</td>
</tr>
<tr>
<td>Other</td>
<td>278 (0.5)</td>
<td>197 (70.9)</td>
<td>0.58 (0.44 – 0.75)</td>
<td>0.76 (0.58 – 0.99)</td>
</tr>
</tbody>
</table>

$^a$Adjusted for age, marital status, National Statistics-Socioeconomic Classification (NSSEC), number of cars in the household, housing tenure, educational attainment, and area of residence.

Boldface indicates statistical significance (p<0.001)
Appendix Figure S1. Flow diagram to illustrate data linkage procedure.

These individuals were aged <50 at the time of the 2011 Census and did not reach eligible screening age during the study period.