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| **Supplementary table 1. ICD-10 codes of diseases included in Charlson comorbidity index calculation** |
| Diagnostic categories | Weight | ICD-10 code |
| Acute myocardial infarction | 1 | I21, I22, I252 |
| Congestive heart failure  | 1 | I50 |
| Peripheral vascular disease  | 1 | I71, R02, I790, I739, Z958, Z959 |
| Cerebral vascular accident | 1 | I60, I61, I62, I63, I64, I65, I66, I67, I68, I69, G46, G450, G451, G452, G454, G458, G459 |
| Dementia  | 1 | F00, F01, F02, F051 |
| Pulmonary disease | 1 | J40, J41, J42, J43, J44, J45, J46, J47, J60, J61, J62, J63, J64, J65, J66, J67 |
| Connective tissue disorder | 1 | M32, M33, M34, M35, M050, M052, M051, M053, M058, M059, M060, M063, M069 |
| Peptic ulcer | 1 | K25, K26, K27, K28 |
| Liver disease | 1 | K73, K702, K703, K717, K740, K742, K743, K744, K745, K746 |
| Diabetes | 1 | E101, E105, E109, E111, E115, E119, E131, E135, E139, E141, E145, E149 |
| Diabetes complications | 2 | E102, E103, E104, E112, E113, E114, E132, E133, E134, E142, E143, E144 |
| Paraplegia | 2 | G041, G810, G811, G819, G820, G821, G822 |
| Renal disease | 2 | N01, N03, N18, N19, N25, N052, N053, N054, N055, N056, N072, N073, N074 |
| Cancer | 2 | C0, C1, C2, C3, C40, C41, C43-C49, C5, C6, C70-C76, C80-C85, C883, C887, C889, C900, C901, C91-C93, C940-C943, C9451, C947, C95, C96 |
| Metastatic cancer | 3 | C77, C78, C79, C80 |
| Severe liver disease | 3 | K721, K729, K766, K767 |
| HIV | 6 | B20, B21, B22, B23, B24 |

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| **Supplementary table 2. List of antipsychotic medications** |
| **Classification** | **Antipsychotics** | **ATC code** |
| First Generation Antipsychotics (FGA) |  |  |
|  | haloperidol | N05AD01 |
|  | levomepromazine | N05AA02 |
|  | perphenazine | N05AB03 |
|  | pimozide | N05AG02 |
|  | chlorpromazine | N05AA01 |
|  |  |  |
| Second Generation Antipsychotics (SGA) |  |  |
|  | clozapine | N05AH02 |
|  | olanzapine | N05AH03 |
|  | risperidone | N05AX08 |
|  | sulpiride  | N05AL01 |
|  | zotepin | N05AX11 |
|  | quetiapine | N05AH04 |
|  | amisulpride  | N05AL05 |
|  | aripiprazole  | N05AX12 |
|  | ziprasidone | N05AE04 |
|  | paliperidone | N05AX13 |
| 　 | blonanserin  | - |

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| **Supplementary table 3. Results from sub distributional hazard model (Fine and Gray model)** |
|  |  |  |  | **Unadjusted** | **Adjusted** |
|  | **N** | **(case)** | **Incidence rate(N/1000 py)** | **HR (95% CI)** | **HR (95% CI)** | **HR (95% CI)** | **HR (95% CI)** |
| **Schizophrenia patients** | 224,612 | (2381) | 1.49 | 1.25 (1.20-1.31) | 1.08 (1.03-1.13) | 1.24 (1.18-1.31) | 1.06 (1.01-1.12) |
| **Other psychiatric disorders patients** | 224,612 | (2323) | 1.38 | 1.16 (1.11-1.22) | Ref | 1.17 (1.12-1.23) | Ref |
| **General population group** | 449,224 | (3824) | 1.17 | Ref | 　 | Ref　 | 　 |
| Schizophrenia: persons diagnosed with schizophrenia. Other psychiatric disorders patients: persons who have been diagnosed with psychiatric disorders, excluding the case group (diagnosis codes F10-F19, F30-F69) General population: persons who have never been diagnosed with psychiatric disorders or dementia, excluding the case group and control1 group (diagnosis codes F00-F99, G30, G31.8, G31.00) Unadjusted: crude model (matched by age), Adjusted: Charlson Comorbidity Index (CCI), insurance premiums, the number of outpatient visits per year adjusted |

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| **Supplementary table 4. Hazard ratios for breast cancer among patients with incident schizophrenia and two control groups (considering a 2 -year wash out period)** |
|  |  |  |  | **Unadjusted** | **Adjusted** |
|  | **N** | **(case)** | **Incidence rate(N/1000 py)** | **HR (95% CI)** | **HR (95% CI)** | **HR (95% CI)** | **HR (95% CI)** |
| **Schizophrenia patients** | 129,012 | (675) | 1.15 | 1.05 (0.95-1.15) | 0.96 (0.86-1.07) | 1.05 (0.96-1.15) | 0.97 (0.88-1.07) |
| **Other psychiatric disorders patients** | 129,012 | (747) | 1.19 | 1.09 (0.99-1.19) | Ref | 1.08 (1.00-1.17) | Ref |
| **General population group** | 258,024 | (1314) | 1.08 | Ref | 　 | Ref　 | 　 |
| Schizophrenia: persons diagnosed with schizophrenia. Other psychiatric disorders patients: persons who have been diagnosed with psychiatric disorders, excluding the case group (diagnosis codes F10-F19, F30-F69) General population: persons who have never been diagnosed with psychiatric disorders or dementia, excluding the case group and control1 group (diagnosis codes F00-F99, G30, G31.8, G31.00) Unadjusted: crude model (matched by age), Adjusted: Charlson Comorbidity Index (CCI), insurance premiums, the number of outpatient visits per year adjusted. |

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| **Supplementary table 5. Hazard ratios for breast cancer among patients with schizophrenia and two control groups stratified by age at index year** |
| 　 | 　 |  | **N** | **(case)** | **Incidence rate (N/1000py)** | **Unadjusted** | **Adjusted** |
|  |  |  | **HR (95% CI)** | **HR (95% CI)** | **HR (95% CI)** | **HR (95% CI)** |
| **Age\*** | **<40** | **SP** | 76,614 | (533) | 0.93 | 1.08 (0.97-1.21) | 1.00 (0.88-1.13) | 1.07 (0.95-1.20) | 1.06 (0.93-1.21) |
|  | **OP** | 76,614 | (541) | 0.93 | 1.09 (0.98-1.21) | Ref | 1.01 (0.90-1.13) | Ref |
|  | **GP** | 153,228 | (945) | 0.83 | Ref |  | Ref | 　 |
| **40-64** | **SP** | 101,993 | (1636) | 2.06 | 1.36 (1.27-1.45) | 1.11 (1.03-1.19) | 1.36 (1.26-1.46) | 1.07 (0.98-1.16) |
|  | **OP** | 101,993 | (1559) | 1.88 | 1.22 (1.15-1.30) | Ref | 1.27 (1.18-1.36) | Ref |
|  | **GP** | 203,986 | (2440) | 1.51 | Ref |  | Ref | 　 |
| **≥65** | **SP** | 46,005 | (212) | 0.94 | 1.15 (0.97-1.37) | 1.19 (0.98-1.45) | 1.14 (0.94-1.38) | 1.18 (0.96-1.46) |
|  | **OP** | 46,005 | (223) | 0.82 | 0.97 (0.82-1.14) | Ref | 0.97 (0.81-1.16) | Ref |
|  | **GP** | 92,010 | (439) | 0.86 | Ref |  | Ref | 　 |
| SP: Schizophrenia patients, OP: Other psychiatric disorders patients, GP: General population group |
| \*Age at index year |
| Unadjusted: crude model (matched by age), Adjusted: Charlson Comorbidity Index (CCI), insurance premiums, and the number of outpatient visits per year adjusted |

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| **Supplementary table 6. Sensitivity analysis of landmark analysis at various time points** |
| **Landmark time** | **Antipsychotics duration** | **N** | **(case)** | **Incidence rate (N/1000py)** | **Model1** | **Model2** |
| **HR (95% CI)** | **HR (95% CI)** | **p for trend** |
| **4-year** |  |  |  |  |  |  | 0.002 |
|  | **<0.5 year** | 30,977 | (183) | 0.71 | Ref | Ref |
|  | **0.5–1 year** | 11,859 | (90) | 0.89 | 1.30 (1.01-1.68) | 1.22 (0.95-1.58) |
|  | **1–2 years** | 31,224 | (335) | 1.08 | 1.79 (1.50-2.15) | 1.28 (1.06-1.55) |
|  | **2–3 years** | 25,844 | (238) | 0.96 | 1.54 (1.27-1.87) | 1.25 (1.03-1.52) |
|  | **≥3 years** | 58,828 | (526) | 0.97 | 1.48 (1.25-1.75) | 1.34 (1.13-1.59) |
| **6-year** |  |  |  |  |  |  | 0.010 |
|  | **<0.5 year** | 19,159 | (100) | 0.56 | Ref | Ref |
|  | **0.5–1 year** | 6,941 | (36) | 0.55 | 1.01 (0.69-1.48) | 0.97 (0.66-1.43) |
|  | **1–3 years** | 19,952 | (128) | 0.65 | 1.24 (0.95-1.61) | 1.09 (0.83-1.42) |
|  | **3–4 years** | 24,271 | (245) | 0.92 | 1.94 (1.54-2.45) | 1.32 (1.02-1.69) |
|  | **≥4 years** | 59,296 | (467) | 0.77 | 1.50 (1.21-1.87) | 1.27 (1.01-1.58) |
| Model1: age adjusted |
| Model2: (model1) + Charlson comorbidity index (CCI), insurance premiums, the number of outpatient visits per year adjusted |

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| **Supplementary table 7. Landmark analysis of breast cancer incidence by duration of antipsychotics use by generation** |
| **Class** | **Antipsychotics duration** | **N** | **(case)** | **Incidence rate (N/1000py)** | **Model1** | **Model2** |
| **HR (95% CI)** | **HR (95% CI)** | **p for trend** |
| **FGA** |  |  |  |  |  |  | 0.011 |
|  | **<0.5 year** | 107,152 | (790) | 0.77 | Ref | Ref |
|  | **0.5–1 year** | 6,416 | (46) | 0.73 | 0.98 (0.72-1.31) | 0.87 (0.64-1.13) |
|  | **1–3 years** | 18,181 | (209) | 1.06 | 1.55 (1.33-1.80) | 1.19 (1.01-1.40) |
|  | **3-4 years** | 4,776 | (62) | 1.21 | 1.74 (1.34-2.25) | 1.39 (1.07-1.81) |
|  | **≥4 years** | 6,085 | (61) | 0.97 | 1.32 (1.02-1.71) | 1.15 (0.88-1.49) |
| **SGA** |  |  |  |  |  |  | 0.147 |
|  | **<0.5 year** | 38,016 | (296) | 0.82 | Ref | Ref |
|  | **0.5–1 year** | 9,823 | (61) | 0.67 | 0.81 (0.62-1.07) | 0.86 (0.65-1.14) |
|  | **1–3 years** | 36,762 | (327) | 0.89 | 1.16 (0.99-1.35) | 1.02 (0.87-1.20) |
|  | **3-4 years** | 17,949 | (132) | 0.75 | 0.95 (0.77-1.17) | 0.93 (0.76-1.14) |
|  | **≥4 years** | 41,228 | (352) | 0.88 | 1.08 (0.93-1.27) | 1.13 (0.97-1.33) |
| Landmark time: 5 years after index date. FGA(first generation antipsychotics), SGA(second generation antipsychotics)Model1: age adjusted |
| Model2: (model1) + Charlson comorbidity index (CCI), insurance premiums, the number of outpatient visits per year adjusted |

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| **Supplementary table 8. Antipsychotics treatment durations according to groups (schizophrenia patients vs other psychiatric disorders patients)** |
|  | **Schizophrenia patients** | **Other psychiatric disorders patients** |
| **N** | **(%)** | **N** | **(%)** |
| **0 (without antipsychotics)** | 222 | (0.10) | 205158 | (91.34) |
| **0<year≤1** | 69461 | (30.92) | 15772 | (7.02) |
| **1<year≤2** | 24336 | (10.83) | 1581 | (0.70) |
| **2<year≤3** | 17274 | (7.69) | 742 | (0.33) |
| **3<year≤4** | 14028 | (6.25) | 409 | (0.18) |
| **4<year≤5** | 11587 | (5.16) | 261 | (0.12) |
| **5<year≤6** | 10709 | (4.77) | 217 | (0.10) |
| **6<year≤7** | 10303 | (4.59) | 148 | (0.07) |
| **7<year≤8** | 9550 | (4.25) | 95 | (0.04) |
| **8<year≤9** | 10154 | (4.52) | 81 | (0.04) |
| **9<year≤10** | 22673 | (10.09) | 61 | (0.03) |
| **10<year≤11** | 8620 | (3.84) | 38 | (0.02) |
| **11<year≤12** | 15740 | (6.99) | 49 | (0.02) |
| The duration of antipsychotics treatment was calculated between the index date and the earliest of the dates of death, loss to follow-up, or event occurrence. |

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**Supplementary figure 1. Flow chart of study population**

The initial pool included 234,718 women with schizophrenia, 234,718 women with other psychiatric disorders, and 469,436 women from the general Korean population. Schizophrenia patients were matched with two control groups (other psychiatric disorders and general population) in a 1:1:2 ratio based on the index date and exact age at the index date.

During the matching process, if any one of the four members in a group (schizophrenia patient, other psychiatric disorder patient, and two general population members) met any of the exclusion criteria, all four members of that group were excluded. Specifically, if any member was diagnosed with breast cancer before the index date or within 1 year after the index date, the entire matched group was excluded.

The number of schizophrenia patients, other psychiatric patients, and general population who were diagnosed with breast cancer before the index date (or within 1 year after the index date) was 3354, 2731, and 4276, respectively. Consequently, a total of 10,106 groups (N=40,424 individuals) were excluded from the study.

This flow chart details the process of identifying and excluding individuals based on the criteria mentioned, ensuring that the final study population was appropriately selected for analysis.