



Title	Prescribing trends and indications of antipsychotic medication in Hong Kong from 2004 to 2014: General and vulnerable patient groups
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Citation	Pharmacoepidemiology and Drug Safety, 2017, v. 26 n. 11, p. 1387-1394
Issued Date	2017
URL	http://hdl.handle.net/10722/242034
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1 **Title**

2 Prescribing trends and indications of antipsychotic medication in Hong Kong from 2004 to 2014:
3 general and vulnerable patient groups

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27 **Registration**

28 The study protocol was not registered before the commencement of the study.

29 **Author Contributions**

30 KSJL, ICKW and EWC had the original idea for the study and contributed to the development of
31 the idea and study design. KSJL wrote the first draft of the study protocol. KSJL retrieved data
32 and undertook the analysis. AWYT and KKCM independently cross-checked all the analyses
33 and results. KSJL, AWYT, ICKW, KKCM, CSLC and EWC contributed to interpretation of the
34 analyses. KSJL wrote the first draft of the paper. KSJL, AWYT, ICKW, KKCM, CSLC, and
35 EWC critically reviewed the results and the manuscript. FMCB reviewed the data, the
36 presentation of the paper and provided clinical input. ICKW and EWC provided oversight to all
37 aspects of this project. KSJL and EWC are the guarantors. All authors had full access to all of the
38 data in the study and take responsibility for the integrity of the data and the accuracy of data
39 analysis.

40

41 **Support**

42 This study was partially supported by the General Research Fund, Research Grants Council,
43 Hong Kong (project reference 789813).

44 **Acknowledgements:**

45 We thank Dr Shweta Anand for editing and proofreading.

46 **Word count:** 3,265

47 **Number of tables:** 2

48 **Number of figures:** 4

49 **Number of supplementary tables:** 6

50 **Number of supplementary figures:** 0

51

52 **Abstract (250 words)**

53 *Purpose* Antipsychotic prescribing patterns remain unclear in Asia. The aims of our study were
54 to investigate prescribing trends of antipsychotic medication in the general population, children,
55 and older patients by drug generation (first or second), the prescribing trend in pregnant women,
56 the probable indication for antipsychotic prescription, and the prescribing trend by dosage form.

57 *Methods* This descriptive study identified and included all patients prescribed antipsychotic in
58 Hong Kong from 2004 to 2014 using the Clinical Data Analysis and Report System. This study
59 calculated and reported the prevalence of antipsychotic prescribing in patient groups of interest,
60 the percentage with diagnoses of mental disorders were derived, and the prevalence of
61 antipsychotic by dosage forms.

62 *Results* The study included 10,109,206 prescriptions of any antipsychotics to 256,903 patients.
63 Over the study period, the prevalence of antipsychotic prescribing increased from 1.06% to
64 1.54% in the general population, from 0.10% to 0.23% in children (3-17 years old), and from
65 2.61% to 3.26% in older patients (≥ 65 years old). The prevalence of second-generation
66 antipsychotics increased but the prevalence of first-generation antipsychotics did not. Prevalence
67 of antipsychotic prescribing in pre-pregnancy, pregnancy, and postpartum timeframes varied
68 from 0.18% to 0.38%. The percentage of incident prescriptions with a diagnosis of psychosis
69 decreased from 54.1% to 47.5%.

70 *Conclusions* Antipsychotics have been increasingly prescribed in the general population,
71 children, and older patients. There is an increase in second-generation antipsychotic prescribing.
72 Over half of incident users had a recent diagnosis of a non-psychotic mental disorder in 2014,
73 suggesting that off-label prescribing of antipsychotics might be common.

74 **1. Introduction**

75 Antipsychotic drugs (APDs) have been commonly prescribed for the management of
76 schizophrenia, bipolar disorder, and major depressive disorder¹. Safety concerns about APDs use
77 in specific patient groups including older patients, children, and pregnant women, has been
78 raised in past decades. Increased risk of mortality with the use of first-generation antipsychotics
79 (FGAs) and second-generation antipsychotics (SGAs) in older patients with dementia has been
80 reported²⁻⁶. SGAs were approved for some indications in children and adolescents recently⁷.
81 However, concerns regarding the safety of SGAs use in children (mostly focusing on metabolic
82 syndrome and cardiovascular effects) have been raised^{8,9}. Although APDs have been
83 increasingly prescribed during pregnancy, safety evidence is limited^{10,11}.

84 The prescribing prevalence of APDs in general practice (GP) settings in the United Kingdom
85 (UK) and Italy have been reported as 1% to 1.6% between 2000 and 2011¹²⁻¹⁶. In Asia, APDs
86 prescribing was only investigated in patients with psychotic disorders through a survey¹⁵⁻¹⁷, and
87 their use in the general population of patients and in vulnerable patient groups (children, older
88 patients, and pregnant women) remains unclear.

89 Concerns with respect to off-label use of APDs have also been reported. APDs, especially SGAs,
90 have been widely used off-label for the management of mental disorders including but not
91 limited to anxiety, attention deficit hyperactivity disorder, dementia, and severe agitation in older
92 adults^{18,19}. From 2007 to 2011 in UK primary care settings, over half of patients prescribed
93 FGAs had diagnoses of non-psychotic mental disorders, and a similar proportion was reported in
94 patients receiving SGAs¹³. Information regarding off-label use of APDs has not been studied in
95 Asia.

96 In addition, although there is limited evidence suggesting superior efficacy and safety of APDs
97 depot injections compared to oral dosage²⁰, depot injections were prescribed for one quarter to
98 one third of patients with schizophrenia in western countries²¹. However, we could find no
99 previous published studies of the utilization of APDs in depot injections or other dosage forms in
100 an Asian population.

101 There were four specific objectives of our study to investigate prescribing of APDs in Hong
102 Kong (HK), namely to determine the following.

103 1) The prescribing trend over time of APDs in the general patient population, children, and older
104 patients by drug generation (FGAs/SGAs).

105 2) The prescribing trend over time of APDs in pre-pregnancy, pregnancy, and postpartum
106 timeframes.

107 3) The probable indication of incident APDs prescriptions.

108 4) The prescribing trend over time of APDs by dosage forms.

109

110 **2. Method**

111 *2.1. Data source*

112 We retrieved prescription and diagnosis data from the Clinical Data Analysis and Report System
113 (CDARS), the clinical database developed by the Hospital Authority, HK, which is a statutory
114 body managing public hospitals, specialist outpatient clinics, and general outpatient clinics. The
115 Hospital Authority provides a full range of healthcare services, including primary, secondary,
116 and tertiary services to all HK residents (>7,300,000 population). Since 1995, patient data

117 including demographic information, diagnosis, payment method, prescription information,
118 admission/discharge information and laboratory test results have been made available on
119 CDARS for research and audit purposes^{22 23}. Prescription records are categorised using the
120 British National Formulary (BNF) classification in CDARS. Diseases are coded using the
121 International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) in
122 CDARS. The validity and accuracy of the CDARS database have been reported in several earlier
123 studies²⁴⁻²⁷.

124 *2.2. Antipsychotic drugs*

125 With reference to the BNF, this study included all medications under categories 4.2.1 and 4.2.2
126 and classified them as either FGAs or SGAs. The APDs not included in the BNF but prescribed
127 during the study period were classified as either FGAs or SGAs based on chemical structure or
128 according to registration information (Supplementary table 1). APDs prescriptions were further
129 categorized according to dosage form (Supplementary table 2).

130 *2.3. Study population*

131 We retrieved all prescription records of APDs from CDARS. Age was defined using mid-year
132 age, which is age on 1st July in the year of date of prescription and used to group individuals as
133 children (3-17 years old) and older patients (≥ 65 years old).

134 *2.4. Prevalence in the general population and by age group and dosage form*

135 The annual prevalence calculation was adapted from Man *et al.*²⁵; it was defined as the number
136 of patients prescribed at least one APDs per calendar year divided by the mid-year population of

137 HK. The number of patients with at least one APDs prescription during the study period of 1st
138 January 2004 to 31st December 2014 was used as the numerator in the calculation of prevalence.
139 Population statistics were requested from the Census and Statistics Department, HK. This study
140 calculated the prevalence for the general patient population, by drug generation (FGAs/SGAs),
141 age group and dosage form.

142 *2.5. Prevalence in pregnancy*

143 We identified pregnant women with records of delivery episodes from 1st January 2004 to 31st
144 December 2014 in the CDARS database and calculated prevalence of APDs use by calendar year
145 for three timeframes: pre-pregnancy (180 days before conception to conception), pregnancy
146 (from date of conception to date of delivery), and postpartum (from delivery to 180 days after
147 delivery). Delivery episodes in calendar year 2003 and 2015 were also included to investigate
148 their postpartum and pre-pregnancy timeframes overlapping with the study period (2004-2014).
149 This analysis calculated the annual prevalence of APDs by using the number of women
150 prescribed APDs during pregnancy in the respective timeframe divided by the total number of
151 women who were recorded as having been in that pregnancy timeframe during the particular
152 calendar year. Details of the pregnancy timeframes are included in supplementary material.

153 *2.6. Indication analysis*

154 Using the ICD-9-CM, mental illnesses were categorized as organic psychotic conditions (290-
155 294), other psychoses (295-299), neurotic disorders, personality disorders and other
156 nonpsychotic mental disorders (300-316), and intellectual disabilities (317-319). Since diagnosis
157 records of chronic mental disorders are more likely to be omitted in non-incident prescriptions,

158 this analysis only included new users of APDs. As indication information is not available in
159 CDARS, all mental illnesses diagnosed within 180 days before or after incident prescriptions
160 (the first prescription during the study period) were retrieved and considered as probable
161 indications. As such, it is possible that one APDs prescription could have been mapped to
162 multiple mental illness categories as probable indications. This analysis calculated the
163 percentages of patients with probable indications by category. Since a APDs prescription can
164 belong to multiple mental illness categories, the percentage of patients with probable indications
165 may sums up exceeding 1.

166 *2.7. Statistical analysis*

167 This descriptive study calculated prevalence (%) using the number of patients in the respective
168 category divided by the total general population, and then multiplied by 100%. Annual
169 prevalence of antipsychotic prescribing was calculated and reported with 95% confidence
170 intervals (95% CI), estimated using Poisson regression. We tested trends in prevalence over time
171 using the t-test on the change in annual prevalence, with significance level of 0.05. Statistical
172 power for the trend test was calculated. Considering data included in trend test is limited (11 data
173 points), some of the analyses might be underpowered to detect the trend. Statistical computing
174 software R (version 3.1.2, R Core Team) and SAS software (version 9, SAS Institute Inc.) was
175 used for data manipulation and analysis. Data was analysed by KSJL using R and independently
176 cross-checked by AWYT and KKCM.

177 This study protocol was approved by the Institutional Review Board of the University of Hong
178 Kong/Hospital Authority Hong Kong West Cluster (reference number: UW 15-619).

179 **3. Results**

180 From 2004 to 2014, there were 10,109,206 APDs prescriptions issued to 256,903 patients (Table
181 1). Haloperidol (20.7%), chlorpromazine (9.5%) and sulpiride (7.6%) were the most frequently
182 prescribed FGAs in HK over this period, while risperidone (12.1%), quetiapine (11.3%) and
183 clozapine (7.1%) were the three most commonly prescribed SGAs (Supplementary table 1).

184 The prevalence of APDs prescribing in the general population increased 45% from 1.06% (2004)
185 to 1.54% (2014). The prevalence of FGAs prescribing decreased 13% from 0.95% (2004) to
186 0.83% (2014), while SGAs prescribing increased by 480% from 0.19% (2004) to 0.91% (2014).
187 The trend test for any APDs and SGAs showed statistically significant results (Figure 1 and
188 Supplementary table 3). The statistical power of the trend test of FGAs prescribing prevalence in
189 the general patient population was 0.42. The statistical power of trend tests in this groups was
190 less than 0.8, which indicates that the real trend might be undetectable due to lack of statistical
191 power. Subsequent analyses with statistical power less than 0.8 should be interpreted as
192 underpowered similarly.

193 In children, there was an increase in the prevalence of APDs prescribing from 0.10% (2004) to
194 0.23% (2014) by 2.3 times. The prevalence of FGAs prescribing decreased 57% from 0.07%
195 (2004) to 0.03% (2014), while the prevalence of SGAs increased from 0.04% (2004) to 0.21%
196 (2014) by more than 5 times. Changes in the trends of APDs, FGAs, and SGAs prescribing were
197 statistically significant (Figure 2 and Supplementary table 4).

198 In older patients, the prevalence of APDs prescribing increased 24% from 2.61% (2004) to
199 3.23% (2010) and was then stable at 3.26% (2014). The prevalence of FGAs was stable from

200 2004 to 2010, followed by an 18% decrease from 2.45% (2010) to 2.01% (2014). The prevalence
201 of SGAs increased from 0.39% (2004) to 1.52% (2014) by about 4 times. FGAs were more
202 frequently prescribed than SGAs in this age group throughout the study period. The changes in
203 prescribing trends of any APDs and SGAs were statistically significant (Figure 3 and
204 Supplementary table 5). Statistical power of the trend test of FGAs prescribing prevalence in
205 older patients was 0.28.

206 There were 320,739 delivery episodes from 319,564 pregnant women identified with at least one
207 pregnancy timeframe during the study period. Among these, 1,749 women were prescribed
208 APDs during relevant pregnancy timeframes. From 2004 to 2014, 0.18% to 0.32% of women
209 were prescribed APDs during the pre-pregnancy timeframe, 0.18% to 0.27% during the
210 pregnancy timeframe, and 0.30% to 0.38% during the postpartum timeframe (Figure 4 and
211 Supplementary table 6). There were no statistically significant changes in trends in any annual
212 APDs prescribing in pre-pregnancy, pregnancy, or postpartum timeframes over the study period.
213 The highest statistical power of the trend tests of the three timeframes was 0.21.

214 For the indication analysis, 201,371 new APDs users were identified, among which 104,451 had
215 a diagnosis of a mental disorder identified within the period of 180 days before or after the date
216 of the incident prescription (51.9%). The percentage of incident prescriptions associated with the
217 diagnosis of other psychoses decreased from 54.1% (2004) to 47.5% (2014). The percentage of
218 incident prescriptions for organic psychotic conditions increased from 38.5% (2004) to 46.1%
219 (2010), then decreased to 40.4% (2014). For neurotic disorders, personality disorders and other
220 nonpsychotic mental disorders, this percentage increased from 25.4% to 33.9%. The percentage

221 of incident APDs prescriptions for intellectual disabilities decreased from 2.7% (2004) to 2.0%
222 (2014) (Table 2).

223 Results of prescribing trend by dosage forms showed that the majority of APDs were
224 administered orally as a tablet or capsule. The annual prevalence increased from 1.00% (2004) to
225 1.45% (2014) by 45%. The prevalence of depot injection prescribing increased from 0.15%
226 (2004) to 0.18% (2005) by 20% and remained stable through 2005 to 2014. Prescribing
227 prevalence of immediate injection increased from 0.08% (2004) to 0.12% (2014). The
228 prevalence remained stable at 0.02% for oral solutions. Statistically significant change was
229 detected only in the prevalence in the oral tablet/capsule subgroup (Supplementary table 2). The
230 highest statistical power of the trend tests for oral solutions, immediate injection, and depot
231 injection prescribing prevalence was 0.48.

232

233 **4. Discussion**

234 APDs prescribing is increasing in HK in the general population, children, and older patients. The
235 prevalent usage and increase are particularly notable in older patients. Although an increase in
236 SGAs prescribing was found, SGAs prescribing was less prevalent in HK compared to western
237 countries. During the study period, the percentage of incident prescriptions for organic psychotic
238 conditions increased, as did the prescriptions for nonpsychotic disorders. Finally, the most
239 commonly prescribed dosage form, which was oral tablets/capsules, increased over the study
240 period, while the prevalence of depot injections remained stable.

241 *4.1. Interpretation and comparison with other studies*

242 We found that 1.06% (2004) to 1.54% (2014) of the HK population were prescribed at least one
243 APDs and that there was a statistically significant change in prevalence. In comparison, the
244 annual prevalence of APDs prescribing in patients from GP settings in Italy was reported as
245 having increased from 1.33% (2000) to 1.74% (2005)¹⁴. Using a community population sample
246 from the Clinical Practice Research Datalink database in the UK, the prescribing prevalence of
247 APDs and medication used for treating mania was reported as 1.0% and 1.4% in males and
248 females, respectively, in 2010¹². Information from GP settings shows a similar increase in APDs
249 prescribing to the data in our study, which provides a comprehensive view of drug prescribing
250 from outpatient, inpatient, and emergency departments. However, comparison between our
251 results and data from other sources needs to take full account of the differences of data source in
252 the groups studied.

253 Differences in APDs prescribing were found in specific age groups, including children and older
254 patients, when comparing the results of our study to those from other regions. Results of a survey
255 study conducted in the US showed that 1.83% of children (0-13 years old) and 3.76% of
256 adolescents (14-20 years old) who visited a physician between 2005 and 2009 were prescribed
257 APDs²⁸, which are higher percentages than the results of our study. The prevalence of APDs
258 prescribing in older adults (65 years old and above) from GP settings was reported as 3.6% in
259 Italy in 2005¹⁴. APDs were prescribed to 12.7% and 12.8% of the older population (≥ 65 years
260 old) in Taiwan inpatient and outpatient settings in 2004 and 2005, respectively²⁹. Results of our
261 study showed that 2.70% of older patients were prescribed APDs, which was lower than the
262 prevalence reported in Italy and Taiwan. These discrepancies of APDs prescribing in specific age
263 group could be associated with various factors including local practice. Patient care in regions
264 may vary due to different clinical guidelines followed. Clinical practice guidelines of early onset

265 psychoses (less than 18 years old) in US and UK recommend SGAs as treatment option^{30 31},
266 while HK local guideline for children and adolescents has not yet been developed.

267 Compared to HK, SGAs were generally more frequently prescribed in other regions. Our study
268 showed that the SGAs prevalence did not exceed the FGAs prevalence until 2014. With respect
269 to the proportion of prescriptions in other regions, SGAs represented 82% of overall APDs
270 prescriptions in 2002 in Canada³² and 84% in 2002 in the US³³. Similar to our findings, and in
271 contrast to the results from North America, SGAs prescribing lagged behind FGAs prescribing in
272 inpatient settings in other Asian countries and regions including China, HK, Japan, Korea,
273 Singapore, and Taiwan^{15 16}. However, the prevalence of SGAs prescribing in HK increased,
274 while FGAs prescribing decreased over the study period, in the general patient population,
275 children, and older patient groups. The increase in prescribing SGAs and decrease in FGAs were
276 also reported in Australia from 2000 through 2011³⁴. This indicates that the increase in SGAs
277 largely accounted for the overall increase in APDs prescribing. This increase in the prescribing
278 of SGAs could be explained by several factors. In the 2000s, SGAs were recommended as first-
279 line treatment for several mental disorders (e.g. schizophrenia and bipolar disorder) in clinical
280 practice guidelines^{20 35-38}, including HK local guidelines³⁹, because of their better tolerability
281 profile and perceived superior efficacy compared to FGAs^{40 41}. The better tolerability profile also
282 may have decreased the likelihood of treatment discontinuation, which would have lengthened
283 the duration of prescription and therefore may have increased prevalence, as suggested in a
284 previous study⁴². Other reasons could be an increase in the approved indications of SGAs, which
285 are now approved for the treatment of bipolar mania, adolescent schizophrenia, and behavioural
286 disturbance associated with autism or intellectual disability in children and adolescents⁷.

287 With regard to APDs prescribing in pregnancy, it was expected that the prevalence would take
288 the “U-shape” pattern (statistically significantly higher prevalence in the timeframes of pre-
289 pregnancy and postpartum, compared to the pregnancy timeframe)⁴³. However, this was not the
290 case in our study. Although no statistically significant change was detected, our study indicates
291 that APDs prescribing remains common during the pre-pregnancy, pregnancy, and postpartum
292 timeframes.

293 We found that 45.9% of APDs incident prescriptions in 2004 were associated with a diagnosis of
294 non-psychotic mental disorders, and this number further increased to 52.5% in 2014. These
295 results may suggest that the off-label prescribing of APDs is expanding, since APDs have not
296 received approval for most of the mental disorders under these two categories, including
297 dementia, anxiety disorder, and obsessive compulsive disorder. Since “black-box warnings” have
298 been issued in relation to the increased mortality in older patients with dementia prescribed
299 APDs, these drugs should be used with caution in older patients. Close monitoring and more
300 frequent follow-up should be implemented when APDs are prescribed to patients for unapproved
301 indications, especially in older patients.

302 Oral capsule/tablet was the most common route of administration of APDs in HK. Audits and
303 surveys from 1996 to 2009 reported that from a quarter to a third of sampled patients were
304 prescribed depot injections in the United States, Europe, Australia, and New Zealand²¹. It is
305 noteworthy that a survey reported that 36.7% of sampled stable patients with schizophrenia from
306 HK outpatient clinics in 2005 and 2006 were prescribed APDs depot injections⁴⁴. As shown in
307 our results, no statistically significant change was detected in the annual prevalence of APDs
308 depot injection prescribing.

309

310 *4.2. Strength of this study*

311 To our knowledge, this is the first study describing APDs prescribing trends using population-
312 based database in Asia. Apart from providing information on APDs prescribing in the general
313 patient population and patient groups of interest, this study also provides prescribing data by
314 dosage form and on the probable indication of incident APDs prescriptions. Although there are
315 publications on surveys/audits of APDs prescribing/utilization conducted in Asia at local
316 hospitals or certain regional clinics, we could find no previous publications on population-based
317 data. In contrast, data used in this study were derived from CDARS, which consists of medical
318 records from the HK public healthcare sectors, including inpatient, outpatient, and emergency
319 department prescriptions.

320 *4.3. Limitations of this study*

321 Since the database used in this study was derived from the public healthcare system,
322 antipsychotic prescriptions in private clinics were not included, implying that the prevalence of
323 APDs prescribing may have been underestimated. A previous study suggested that public
324 healthcare institutions were the mainstay of the mental health service in HK⁴⁵. As APDs are
325 generally chronic treatment and patients who require long-term follow-up are more likely to use
326 public healthcare due to the lower costs, the CDARS data in this study are likely to have
327 captured most of the APDs prescriptions in HK. In cases where the change in trend over time
328 was not statistically significant, the analyses were underpowered. Results of this study might not
329 be generalizable to healthcare systems of other countries/regions due to different local practice of
330 patient care and age distribution in study population.

331

332 **5. Conclusion**

333 Our study has confirmed an increasing trend in APDs prescribing to older patients, suggesting
334 that attention should particularly focus on the safety and tolerability profile of APDs in this age
335 group. Further evidence to support the effectiveness and safety of off-label utilization of APDs is
336 required. With the changes in APDs prescribing over time it is important to determine not only
337 the differences in beneficial effects but also differences in adverse effects, particularly for
338 serious, rare, and delayed adverse effects, which may only emerge after considerable clinical
339 experience has been accumulated. Future observational studies using population-based data
340 could be of great value in this regard.

341

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470

471

Table 1. Patient Characteristics

Patients with APDs (%)	
Sex	
Male	123,983 (48.3%)
Female	132,920 (51.7%)
Age (years)	
Median (IQR)	60 (38)
Children (3 to 17 years old)	6,996 (2.7%)
Older patients (65 years old and above)	113,935 (44.3%)
Total patients with APDs	256,903 (100%)
APDs prescriptions (%)	
FGAs	5,706,118 (56.4%)
SGAs	4,403,088 (43.6%)
Total APDs prescriptions	10,109,206 (100%)

472 Age: age at first prescription during study period; APDs: antipsychotic drugs;

473 FGAs: first generation antipsychotics; SGAs: second generation antipsychotics.

474

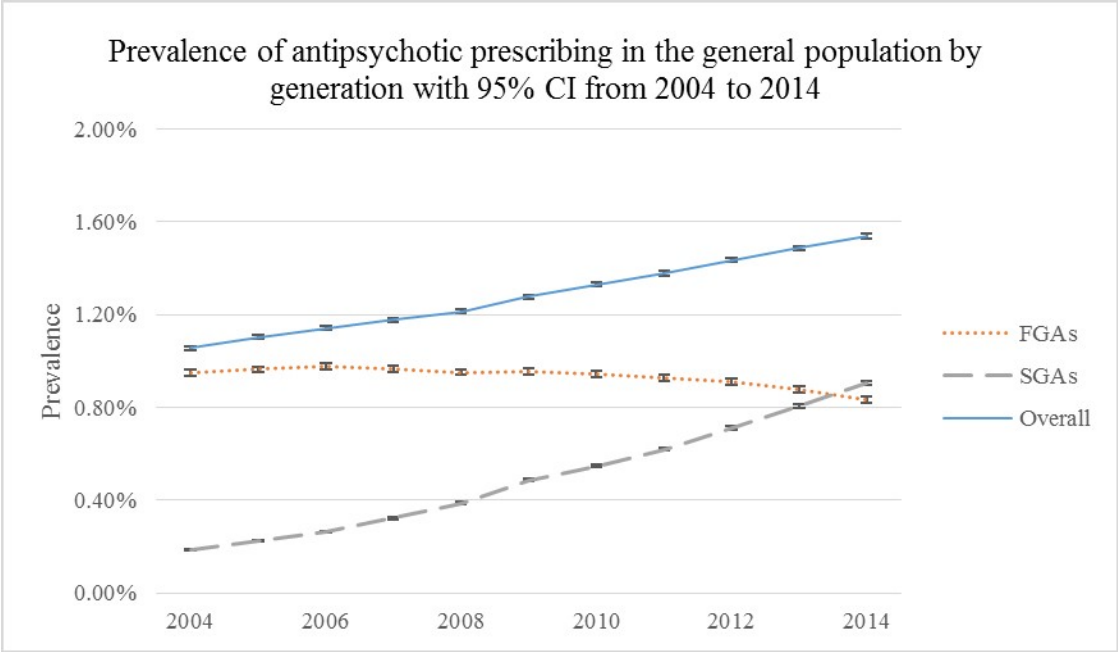
Table 2. Percentage of incident users by indication category from 2004 to 2014

475

Year	Other psychoses	Non-psychotic mental disorder	Intellectual disabilities	Organic psychotic conditions
	Percentage, %			
2004	54.14	25.36	2.67	38.47
2005	53.16	26.15	2.35	40.29
2006	52.18	26.05	2.49	40.89
2007	52.83	26.59	2.35	41.79
2008	50.20	25.82	2.00	44.13
2009	49.00	26.79	2.47	44.41
2010	47.66	27.56	2.33	46.10
2011	46.87	29.29	2.50	45.82
2012	48.01	29.98	2.26	43.55
2013	47.98	32.63	2.25	42.11
2014	47.45	33.89	1.95	40.39

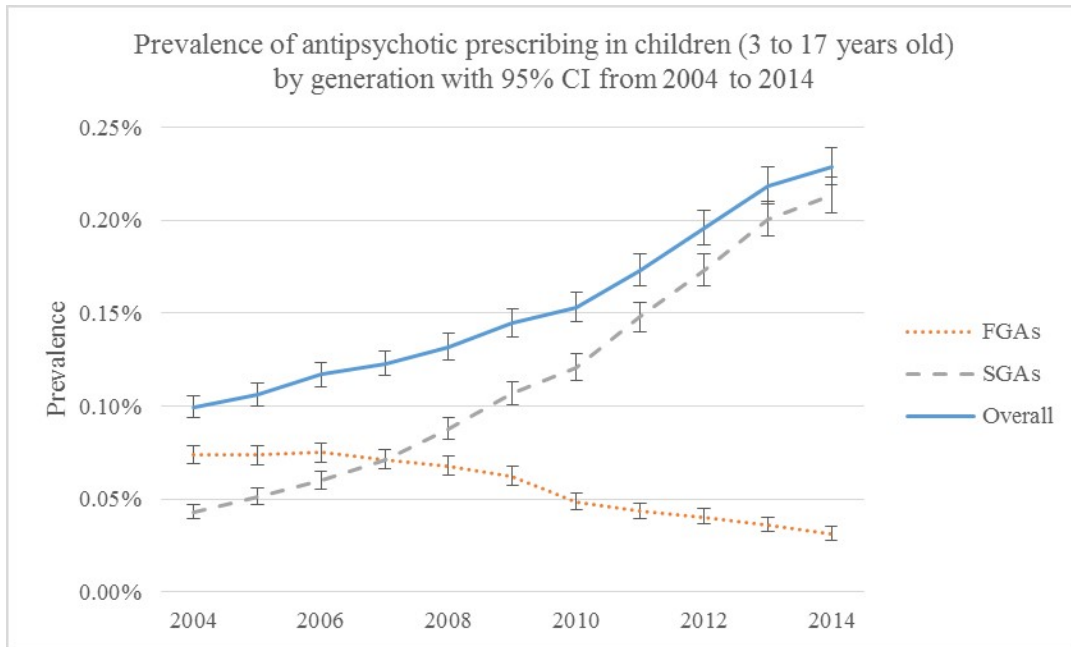
476 Other psychoses (ICD-9-CM 295-299). Nonpsychotic mental disorder (ICD-9-CM 300-316). Intellectual
 477 disabilities (ICD-9-CM 317-319). Organic psychoses conditions (ICD-9-CM 290-294). ICD-9-CM,
 478 International Classification of Diseases, 9th Revision, Clinical Modification.

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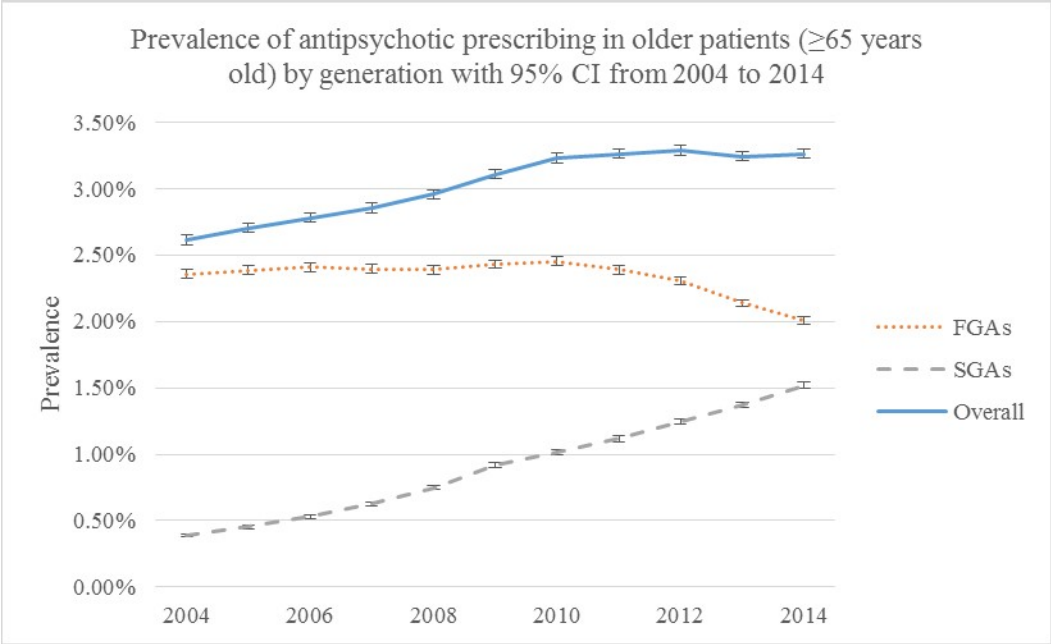
480

481 Figure 1. Prevalence of antipsychotic prescribing in the general population by generation with 95%
 482 confidence intervals from 2004 to 2014.



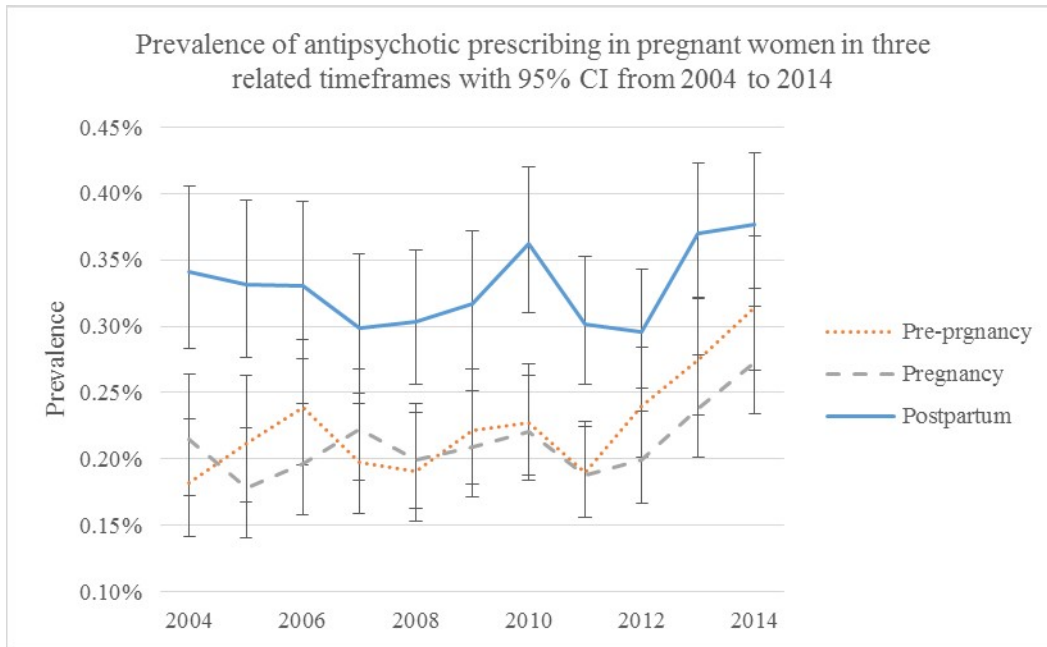
483

484 Figure 2. Prevalence of antipsychotics prescribing in children (3 to 17 years old) by generation with 95%
 485 confidence intervals from 2004 to 2014.



486

487 Figure 3. Prevalence of antipsychotic prescribing in older patients (≥ 65 years old) by generation with 95%
 488 confidence interval from 2004 to 2014.



489

490 Figure 4. Prevalence of antipsychotic prescribing in pregnant women in pre-pregnancy, pregnancy, and
 491 postpartum timeframes with 95% confidence intervals from 2004 to 2014.