

1 **One year prevalence of psychotic disorders among first treatment contact patients at**  
2 **Butabika National Psychiatric Referral Hospital in Uganda.**

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15 **Key words/phrases:** Psychosis, burden, prevalence, first episode psychosis

16

17 **ABSTRACT**

18 **Introduction:** Hospital based studies for psychotic disorders are scarce in low and middle  
19 income countries. This may impact on development of intervention programs.

20 **Objective:** We aimed to determine the burden of psychotic disorders among first treatment  
21 contact patients at the national psychiatric referral hospital in Uganda.

22 **Methods:** A retrospective patient chart-file review was carried out in March 2019 for all  
23 patients presenting to the hospital for the first time in the previous year. Patients were  
24 categorised into those with and without psychotic disorders. We collected sociodemographic  
25 data on age, gender, occupation, level of education, ethnicity, religion and home district. We  
26 determined the one year prevalence of psychotic disorders among first treatment contact  
27 patients. Using logistic regression models, we also determined the association between  
28 psychotic disorders and various exposure variables among first treatment contact patients.

29 **Results:** In 2018, 63% (95% CI: 60.2 – 65.1) of all first time contact patients had a psychosis  
30 related diagnosis. Among the patients with psychotic disorders, the median age was 29 years  
31 (IQR 24 – 36). Most of the patients were male (62.8%) and unemployed (63.1%). After  
32 adjusting for patients' residence, psychotic disorders were found to be more prevalent among  
33 the female gender [OR 1.58 (CI 1.46-1.72)] and those of Pentecostal faith [OR 1.25 (CI 1.10-  
34 1.42)].

35 **Conclusion:** Among first treatment contact patients in Uganda, there is a large burden of  
36 psychotic disorders. The burden was more prevalent among females as well as people of  
37 Pentecostal faith who seemed to use their church for faith-based healing. Incidence studies  
38 are warranted to determine if this phenomenon is replicated at illness onset.

## 39 INTRODUCTION

40 Psychotic disorders that include schizophrenia spectrum disorders as well as bipolar affective  
41 disorders are the leading contributors to disease burden globally (1-3). Schizophrenia was  
42 assigned the highest disability coefficient in global burden of disease (GBD) study (4, 5).  
43 Psychotic disorders run a chronic course in the life of an individual. They usually present in  
44 early adolescence with a first episode of psychosis; and then continue with some form of  
45 disability thorough out the life of the individual (6). Patients with psychotic disorders are more  
46 likely to have worse social functioning, poor quality of life and die earlier than their peers (7-  
47 12). Correct management at initial presentation of psychotic disorders has been associated  
48 with lower relapse rates, greater functional recovery and improved quality of life (13, 14).  
49 Worldwide the prevalence for psychotic disorders has remained relatively stable between 1-  
50 3% even in low and middle income countries (LMIC) like Uganda (3). Hospital based  
51 prevalence rates for psychotic disorders especially among first time attended in LMIC are  
52 however scarce. The current literature in the Ugandan setting has mainly dwelt on people with  
53 HIV/AIDS among first time mental treatment contacts (15).

54 There is limited literature on the burden of psychotic disorders at initial mental treatment  
55 contact in LMICs (16). It is unclear if the burden of psychotic disorders is greater than that for  
56 other disorders like anxiety, mood or substance use disorders. Such information is crucial in  
57 human resource allocation and the development of specialised services in tertiary care. The  
58 sociodemographic profile of patients presenting to tertiary care in the Ugandan setting is not  
59 well described. For example, literature has shown higher incident rates for psychotic disorders  
60 among males than females (17-21). Whether this is replicated at presentation for care in our  
61 setting is unknown. Also, the clinical profiles of the various psychotic disorders are unknown.  
62 This is especially important as management differs between the different psychosis spectrum  
63 disorders (22). The majority of patients with psychotic disorders prefer alternative and  
64 complimentary therapies over western medicine (23-29). It is unclear if this preference  
65 translates to lower rates and/or different clinical profiles for psychotic disorders among patients  
66 presenting to mental health services for the first time. Such differences are important in  
67 directing policy and developing interventions to improve care for patients with psychotic  
68 disorders.

69 Describing the burden and risk factors for psychotic disorders at initial treatment contact is a  
70 crucial step in developing interventions to improve the outcomes for patients with psychotic  
71 disorders. In Uganda there is a precedent for this approach where extensive literature on the  
72 burden of HIV/AIDS in the psychiatric setting was instrumental in development of interventions  
73 for patients with severe mental illness suffering with AIDS (30-34). The current study therefore  
74 aims to determine the burden of psychotic disorders among initial treatment contact patients  
75 at the national psychiatric hospital in Uganda.

## 76 METHODS

77 The study took place at Butabika National Psychiatric Referral and Teaching Hospital, a 600  
78 bed capacity mental hospital located approximately twelve kilometres from Kampala (35). The  
79 hospital is located in the heart of the Greater Kampala Metropolitan Area (GKMA) where 10%  
80 of Uganda's population reside and responsible for a third of the country's gross domestic  
81 product (GDP) (36). Butabika National Psychiatric Referral and Teaching Hospital determines  
82 the policy agenda for mental health in the country together with the Ministry Of Health and is  
83 responsible for various levels of mental health training (37). It also plays a supervisory role

84 over all mental health provision services in the country that include 12 regional referral  
85 hospitals and 96 district hospitals. Functioning below the district hospitals are three different  
86 levels of health centres (HC) namely HC4, HC3 and HC2. Mental health provision starts at  
87 HC3 level with subsequent referrals to higher centres. Currently, the hospital has specialised  
88 services for substance use disorders at the Alcohol and drug unit, a forensic ward, a  
89 specialised child and adolescent mental health unit as well as specialised occupational  
90 therapy and psychotherapy units. In terms of human resource allocation, the national  
91 psychiatric and teaching hospital is run by 72 clinicians (psychiatrists' clinical psychologists  
92 and psychiatric clinical officers); 157 nurses, 4 social workers and 59 mental attendants. Given  
93 that it is a national referral hospital it also provides non psychiatric care like HIV/AIDS care,  
94 minor surgeries and dental services. Like in many similar facilities in LMICs there are a number  
95 of challenges in provision of services primarily due to limited budgetary allocation (37, 38).

96 We used a retrospective case analysis of chart records to determine the burden, profile and  
97 associated factors for psychotic disorders among first treatment contact patients. Approval for  
98 the study was obtained from the Uganda National Council for Science and Technology  
99 (UNCST) and the School of Medicine Research and Ethics Committee (SOMREC) of  
100 Makerere University. We also received institutional approval from the hospital to carry out the  
101 study. As this was a retrospective chart review of file records, we did not receive patient  
102 consent. All patients presenting to the hospital for the first time who had a psychiatric diagnosis  
103 on file between January 1<sup>st</sup> and December 31<sup>st</sup>, 2018 made our study population. We excluded  
104 patients presenting for the first time for non-psychiatric services like dental services, routine  
105 HIV care or minor surgeries like circumcision.

106 On a routine clinic day, the hospital records team opens a file for all patients presenting to the  
107 hospital for the first time. The patient sociodemographic variables including age, gender,  
108 ethnicity, religion, occupation and home district are recorded in the file before the patient is  
109 sent to see a clinician. The clinician then makes a diagnosis, and a decision of whether to treat  
110 the patient as an out-patient or send them to admission in one of the units described above.  
111 Once the patient has received care, the health care workers return the patient file to the  
112 records office for safe storage. Some patients receive care as in-patients, and others are  
113 treated as out-patients and return to their homes the same day.

114 We used standardized questionnaires to extract sociodemographic and diagnosis data from  
115 the chart files of all patients presenting to the hospital for the first time from January to  
116 December 2018. Diagnoses of schizophrenia spectrum and related psychoses, bipolar  
117 affective disorder and mood disorders with psychotic disorders were classified as psychotic  
118 disorders. All other diagnoses among patients presenting for the first time including but not  
119 limited to temporal lobe epilepsy, anxiety disorders, substance use disorders and depressive  
120 disorders were classified as non-psychotic disorders. We considered sociodemographic  
121 characteristics as the exposure variables and the diagnostic categories as the outcome  
122 variables. Abstracted data from the files was entered into Epidata 3.1 by a database manager  
123 and exported to Stata version 13 for analysis. Data analysis was conducted in March 2019.

124 Proportions of patients by different diagnostic categories were calculated to determine the one  
125 year prevalence of psychotic disorders. Using bivariate analysis we compared the proportions  
126 of participants with psychotic disorders to non- psychotic disorders along various exposures.  
127 No variables exhibited any collinearity and the dataset had no outliers. We used a modified  
128 Poisson regression model to establish factors associated with psychotic disorders given that

129 it has robust standard errors and therefore gives more accurate confidence intervals. Variables  
 130 with a level of significance less than 0.2 were included in the multivariate analysis. However,  
 131 region of origin was assessed for any possible confounding effects as ethnicity has been  
 132 shown to have a genetic biological risk factor for psychotic disorders At multi-variate analysis  
 133 a level of significance of less than 0.05 was used to test for significance between different  
 134 exposures and FEP.

## 135 RESULTS

136 Between January 1<sup>st</sup>, 2018 and December 31<sup>st</sup>, 2018; 1685 patients accessed services from  
 137 Butabika for the first time. A total of 201 (11.93%) patients lacked a diagnosis in their records  
 138 and were excluded from the final analysis. The total number of records reviewed for this study  
 139 was 1484. On average there were 5 new patients each day accessing the hospital for the first  
 140 time during the year 2018. Figure 1 shows the proportions of patients seen by month and  
 141 gender. Other baseline characteristics of all new participants are highlighted in table 1. Among  
 142 all new patients, the commonest diagnosis was a non-affective psychosis accounting for  
 143 32.01% of the total sample closely followed by substance use disorder at 30.39%. Anxiety  
 144 disorders were the least common final diagnosis at 0.47%. The frequencies of different  
 145 diagnoses among the total sample are highlighted in Figure 2.

146 *Figure 1: Bar Graph of number of participants by month of the year and gender*

147 *Table 1: Background characteristics of all patients who reported for the first time in 2018.*

Variable	Number (N)	Percentage (%)
≤ 29	757	52.9
> 29	674	47.1
<b>Gender</b>		
Male	930	62.8
Female	549	37.1
<b>Religion</b>		
Protestant	404	32.3
Catholic	407	32.5
Moslem	242	19.3
Seventh day Adventist	29	2.3
Pentecostal/Born again	123	9.8
Other religions	46	3.7
<b>Occupation</b>		
Student	89	6.4
Formal	108	7.8
Non-formal	270	19.4
Unemployed	922	66.4
<b>Region</b>		
Central	1,093	79.9
Eastern	102	7.5
Northern	30	2.2
Western	143	10.5

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149 *Figure 2: A pie chart showing the different diagnostic categories for the whole sample.*

150 **Burden of psychotic disorders.**

151 Approximately two-thirds [62.7% (95% CI: 60.2 – 65.1)] of all patients had a psychotic disorder.  
 152 Among the patients classified as having psychotic disorders, 51.08% were classified as having  
 153 schizophrenia spectrum disorders, 30.75% as bipolar affective disorders and 18.17% as an  
 154 organic psychosis. The median age for patients with psychotic disorders was 29 years (IQR  
 155 24 – 36) with almost twice as many males as females. Most participants (76.03%) were  
 156 between the 30 to 39 age range with only 4.54% of patients below the age of 18 years. Other  
 157 baseline characteristics of the patients with psychotic disorders are shown in table 2.

158 *Table 2: Background characteristics of the sample of participants classified as having psychosis.*

Variable	All first time patients (N)	FEP [ n(%)]	95% CI
<b>Age</b>			
≤ 29	757	459 (60.6)	57.1 – 64.1
> 29	674	436 (64.7)	61.0 – 68.2
<b>Gender</b>			
Male	930	486 (52.3)	49.0 – 55.5
Female	549	442 (80.51)	77.0 – 83.6
<b>Religion</b>			
Protestant	404	230 (56.9)	52.0 – 61.7
Catholic	407	261 (64.1)	59.3 – 68.7
Moslem	242	143 (59.1)	52.8 – 65.1
Seventh day Adventist	29	17 (58.6)	40.0 – 75.0
Pentecostal/Born again	123	95 (77.2)	69.0 – 83.8
Other religions	46	29 (63.0)	48.2 – 75.8
<b>Occupation</b>			
Student	89	43 (48.3)	38.1 – 58.7
Formal	108	63 (58.3)	48.8 – 67.3
Non-formal	270	174 (64.4)	58.5 – 69.9
Unemployed	922	582 (63.1)	60.0 – 66.2
<b>Region</b>			
Central	1,093	675 (61.8)	58.8 – 64.6
Eastern	102	67 (65.7)	55.9 – 74.3
Northern	30	17 (56.7)	38.5 – 73.2
Western	143	93 (65.0)	56.8 – 72.4

159  
 160 At bi-variate analysis, psychotic disorders were found to be more prevalent among the female  
 161 gender [Prevalence ratio (PR) 1.54 (confidence interval 1.43-1.66)] as well as patients who  
 162 reported to subscribe to the Catholic [PR 1.13 (CI 1.01-1.26)] or Pentecostal faiths [PR 1.36  
 163 (CI 1.19-1.54)]. Psychotic disorders were also more prevalent among patients of non-formal  
 164 employment, the unemployed as well as those presenting in the month of November. Other  
 165 associations are highlighted in Table 3.

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168 *Table 3: Bivariate analysis of the association between patients with a psychosis diagnosis and different sociodemographic*  
 169 *variables.*

Variable	Total (N)	FEP Prevalence n(%)	Prevalence ratio	95% CI	P-value
<b>Age</b>					
≤ 29	757	459 (60.6)	1	0.98 – 1.16	0.113
> 29	674	436 (64.7)	1.07		
<b>Gender</b>					
Male	930	486 (52.3)	1.00	<b>1.43 – 1.66</b>	<b>&lt; 0.001</b>
Female	549	442 (80.51)	1.54		
<b>Religion</b>					
Protestant	404	230 (56.9)	1.00		
Catholic	407	261 (64.1)	1.13	<b>1.01 – 1.26</b>	<b>0.037</b>
Moslem	242	143 (59.1)	1.04	0.91 – 1.19	0.588
Seventh day Adventist	29	17 (58.6)	1.03	0.75 – 1.41	0.857
Pentecostal/Born again	123	95 (77.2)	1.36	<b>1.19 – 1.54</b>	<b>&lt; 0.001</b>
Other religions	46	29 (63.0)	1.11	0.87 – 1.40	0.399
<b>Occupation</b>					
Student	89	43 (48.3)	1.00		
Formal	108	63 (58.3)	1.21	0.92 – 1.58	0.168
Non-formal	270	174 (64.4)	1.33	<b>1.06 – 1.68</b>	<b>0.015</b>
Unemployed	922	582 (63.1)	1.31	<b>1.05 – 1.63</b>	<b>0.018</b>
<b>Region</b>					
Central	1,093	675 (61.8)	1.00		
Eastern	102	67 (65.7)	1.06	0.92 – 1.23	0.414
Northern	30	17 (56.7)	0.92	0.67 – 1.26	0.594
Western	143	93 (65.0)	1.05	0.93 – 1.20	0.4321

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171 In the final multi-variate model, gender [Prevalence ratio (PR) 1.58 (confidence interval 1.46-  
 172 1.72)], and Pentecostal faith [PR1.25 (CI1.10-1.42)] remained significant after controlling for  
 173 the region of the country the patient was from. Other associations are highlighted in table 4.

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180 *Table 4: Multivariate analysis of the association between FEP and selected exposures.*

Variable	Prevalence ratio	95% CI	P-value
<b>Age</b>			
≤ 29	1.00	0.92 – 1.09	0.971
> 29	0.99		
<b>Gender</b>			
Male	1.00	1.46 – 1.72	<b>&lt; 0.001</b>
Female	1.58		
<b>Religion</b>			
Protestant	1.00		
Catholic	1.11	1.00 – 1.24	<b>0.050</b>
Moslem	1.04	0.91 – 1.18	0.603
Seventh day Adventist	1.00	0.74 – 1.36	0.857
Pentecostal/Born again	1.25	1.10 – 1.42	<b>0.001</b>
Other religions	1.14	0.87 – 1.48	0.340

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182 **DISCUSSION**

183 ***Mental health service requirements for patients with psychotic disorders:*** Over two-  
184 thirds (67%) of all admissions presenting to the hospital for the first time in 2018 had a  
185 psychotic disorder. To our knowledge this is the first published study highlighting the large  
186 burden of psychotic disorders in the Ugandan setting among patients presenting for the first  
187 time at a mental facility. The burden for psychotic disorders was greater than that for mood  
188 disorders as well as substance use disorders. This suggests that there may be benefit in  
189 introducing specialised early intervention services for psychotic disorders at the hospital.  
190 Specialised services for psychotic disorders especially at the first episode of psychosis usually  
191 lead to better outcomes for patients (39-42). Currently the hospital has specialised services  
192 for substance use disorders, and it would be important to determine the benefit of similar  
193 services for psychotic disorders. Future work on necessary components for an early  
194 intervention psychosis clinic as well as cost benefit analyses of such a program are  
195 recommended (13, 21, 42, 43). It is also known and often observed that psychotic disorders  
196 tend to present with aggression and violence injuring staff and fellow patients (44, 45). Acute  
197 psychiatric units or psychiatric intensive care units have been shown to be especially effective  
198 in containing such potentially dangerous behaviour (44), hence calling for such care facilities  
199 as useful additions to mental hospitals as opposed to just locked seclusion rooms as is the  
200 practice at this facility (44, 45).

201 ***Time of presentation and duration of untreated illness:*** The low numbers of patients  
202 presenting to the hospital younger than 18 years of age is worrying as it may point to delay in  
203 presentation for services. The course of psychotic disorders is characterised by a psychosis  
204 prodrome before onset of illness usually in the late teens or early adulthood (40, 46). That

205 most of our patients present outside this age range may imply that either the onset of  
206 psychosis is late in this population or that there is a long duration of untreated psychosis  
207 (DUP). The latter theory is probably more likely since DUP has been reported to be longer in  
208 Sub-Saharan Africa compared to high income countries (47-49). This is important for future  
209 intervention programs given that DUP is a key predictor of outcomes for patients with psychotic  
210 disorders (14, 46, 50).

211 **Gender and initial presentation to care with psychotic disorders:** Females were more  
212 likely to present to the hospital than males with a psychotic illness. The incidence of psychotic  
213 disorders is higher in males than females in previous literature (17-21). Greater prevalence  
214 among the female gender might be due to the difference in care seeking between males and  
215 females rather than greater incidence in the community. This, however, would need  
216 confirmation with longitudinal studies. It is also important to note that it is unlikely that a patient  
217 with psychosis brought themselves to the hospital. Further studies are therefore required to  
218 understand why there is preference for bringing females to the hospital than males.

219 **Culture and initial presentation to care with a psychotic disorder:** Culture plays an  
220 important role in symptom presentation, care seeking and access to health services (51, 52).  
221 From this study, it is not possible to determine why there is greater prevalence for initial  
222 presentation at the hospital for psychotic disorders over non-psychotic disorders. Previous  
223 literature by Abbo et al (2009) highlighted that patients are more likely to use both African  
224 traditional therapies and biomedicine if the patient has a severe illness or poor global  
225 functioning (23). It is therefore possible that the patients coming to the hospital are the ones  
226 who were very ill and generally disruptive in the communities in which they lived.  
227 Unfortunately, this chart review could not answer this question but further highlights that  
228 patients may be coming late with long duration of untreated psychosis. Previous literature has  
229 highlighted the preference for alternative and complementary therapies for the initial  
230 management of psychotic disorders in this setting (23, 24, 26, 27).

231 Psychotic disorders were more prevalent among people of the Pentecostal faith. It is important  
232 to clarify that this finding does not mean that people of this faith are more at risk for psychotic  
233 disorders. Rather the findings suggest that people of Pentecostal faith with psychotic disorders  
234 were more likely than other faiths to seek care from the national referral and psychiatric  
235 hospital. Another plausible explanation might be due to explanatory models for mental illness  
236 in our setting characterised by beliefs in supernatural causations of psychotic disorders (53).  
237 This may make patients resort to this faith because of its supposed ability to heal mental  
238 disorders through prayer hence leading to more psychotic cases there eventually presenting  
239 to the hospital (54, 55).

240 Ethnicity has a strong association to genetic risk which is a key biological risk factor for  
241 psychotic disorders (56, 57). Psychotic disorders were not found to be more prevalent in any  
242 particular ethnic grouping or region of origin. Uganda is one of the most ethnically diverse  
243 societies in the world (58) and this sample had more than 30 different tribes. It would therefore  
244 require larger sample sizes to determine an association between a specific ethnicity and onset  
245 of psychotic disorders. Currently a large genetic study is underway in Uganda to try and  
246 determine the genetic risk for psychotic disorders (59).

247 **Limitations of the study:** A major limitation of the study was its retrospective study design  
248 which could cause information bias. The information however collected was primarily on  
249 sociodemographic characteristics which are not usually prone to bias. Also, failure to confirm



250 the diagnoses with a standardized tool could lead to misclassification bias. However, Butabika  
251 is a national referral hospital with expertise in mental health care service provision and the  
252 diagnoses were made by qualified psychiatrists; so we were fairly confident in the diagnoses  
253 made.

## 254 **CONCLUSION**

255 There seems to be a large burden of psychotic disorders (67%) among patients presenting to  
256 the national psychiatric hospital in Uganda for the first time. Many of the participants were  
257 female calling for further studies to understand this phenomenon in our setting. More studies  
258 are also needed to define the duration of untreated psychosis in this population given that  
259 most of the first time patients were older than the normal onset for psychotic disorders. Finally,  
260 there may be benefits in introducing specialised intervention services for psychotic disorders  
261 at the national referral hospital in the form of specialised early intervention services as well as  
262 “safe wards models” as acute psychiatric units or psychiatric intensive care units at such large  
263 mental health facilities

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## 275 **Competing Interests**

276 The authors declare no competing interests.

277 **Author contributions:** EKM, NN and SM conceptualised the research idea. EKM, AN, JN  
278 and JLG supervised the data extraction exercise. PB and DA advised on the analysis of the  
279 results. All authors were involved in writing the manuscript and approved the final manuscript  
280 for submission.

## 281 **Data Availability**

282 The data underlying the results presented in the study are available from the corresponding  
283 author on request.

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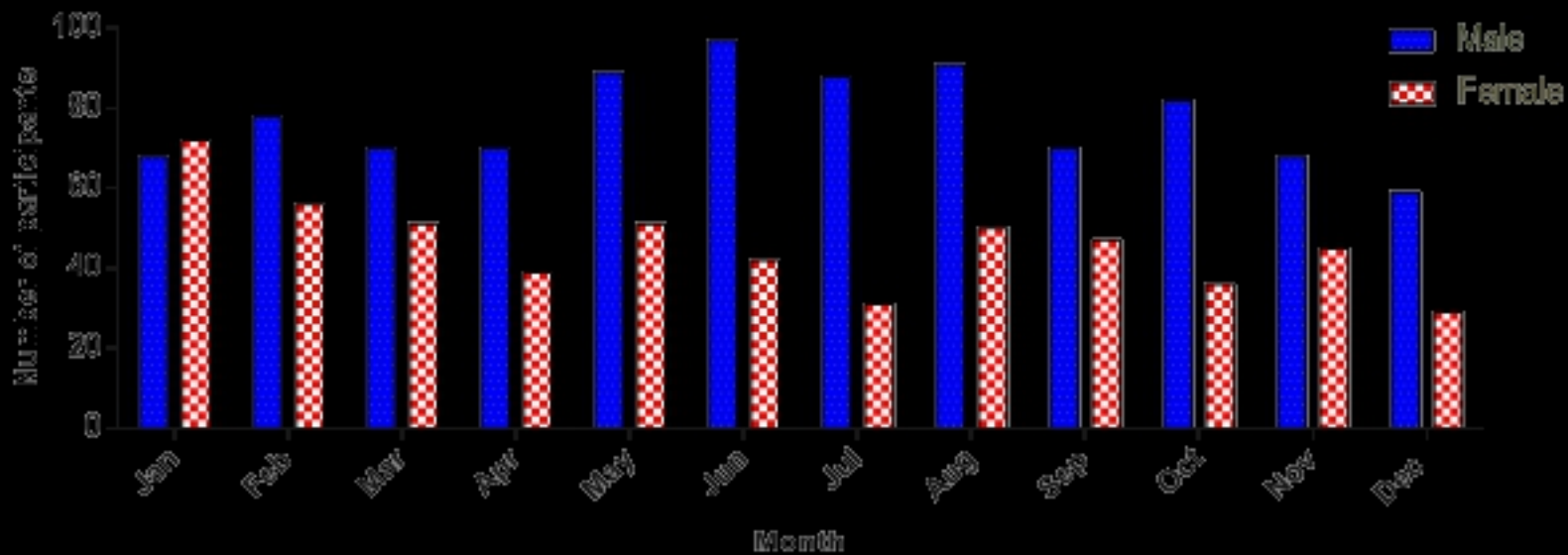


Figure 1

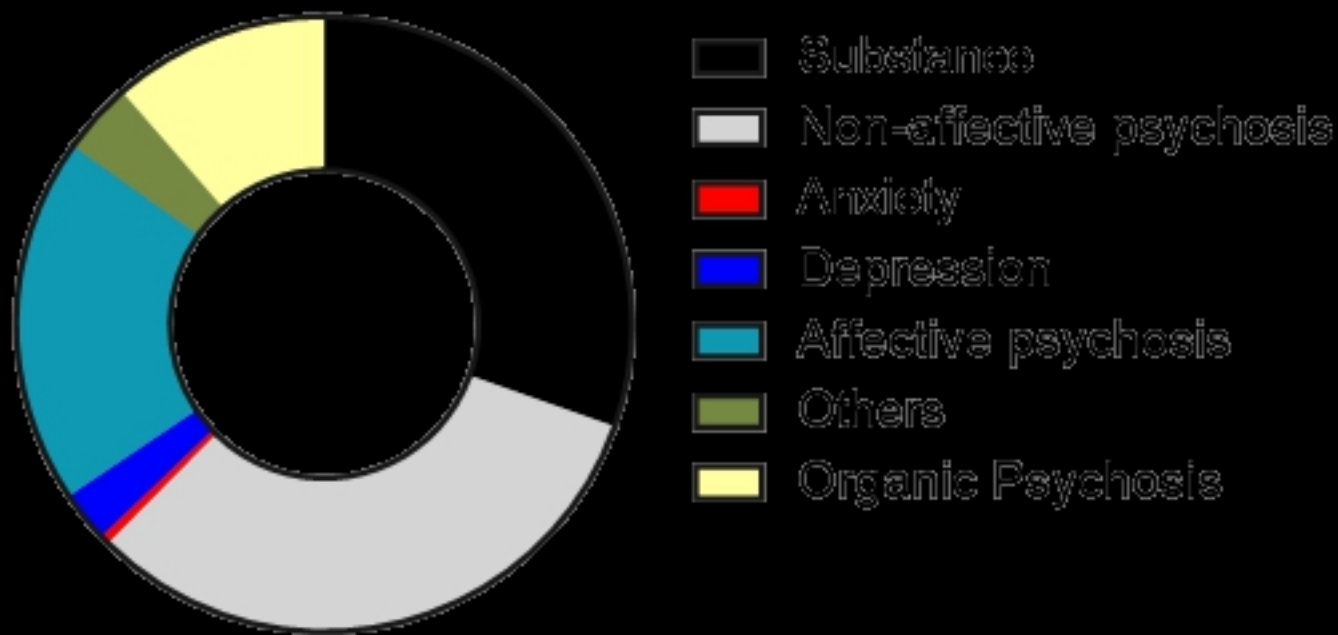


Figure 2