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Incidence and prevalence of psychotic disorders, a county population study of Tirana hospital admissions

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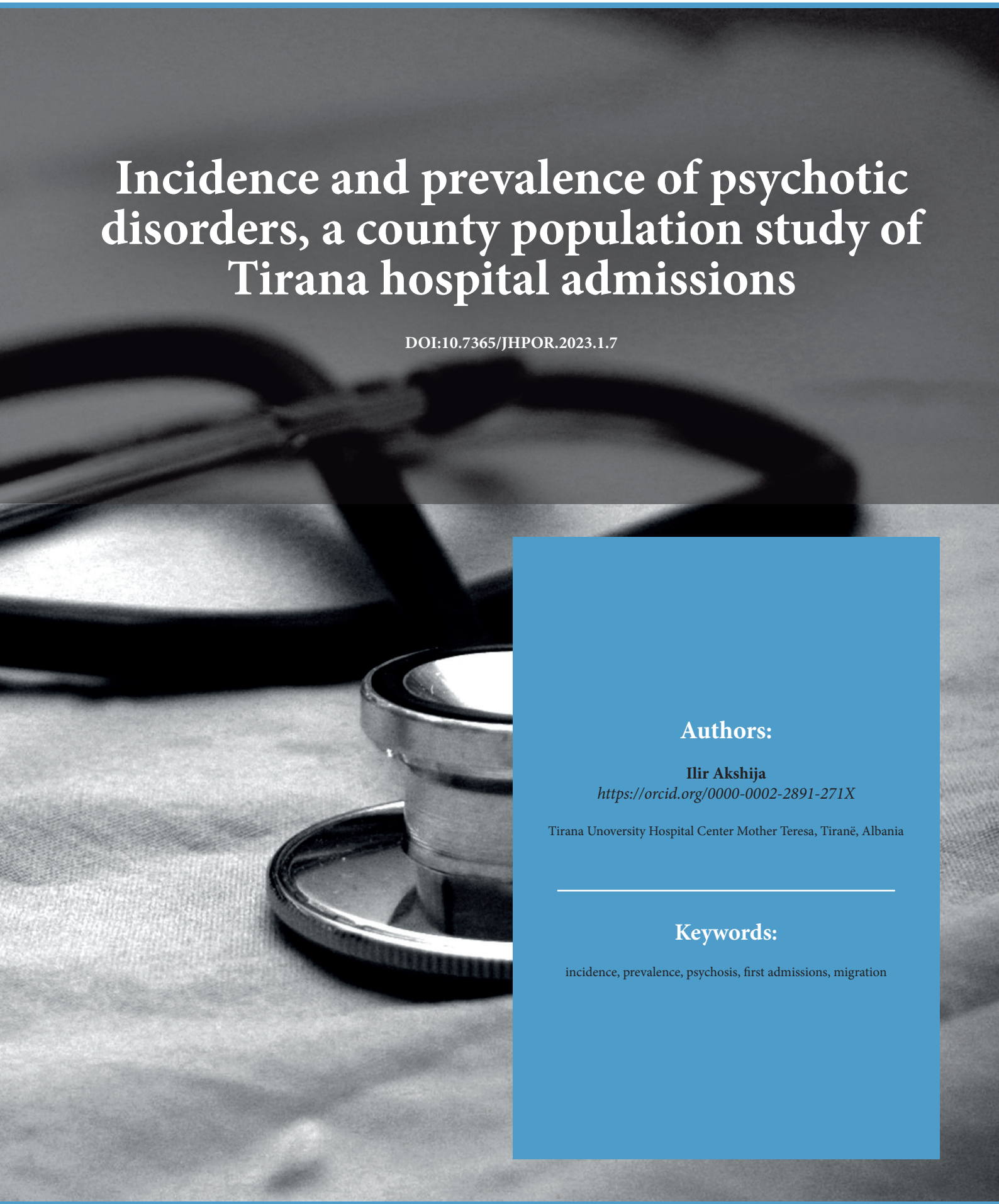

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Abstract

Objective: To estimate incidence and prevalence of first admissions for mental health diagnoses in the Tirana county catchment area and related admissions from other Albania counties to Tirana University Hospital Center "Mother Teresa".

Method: We used the historic dataset of mental health diagnoses composed of electronic patient records discharges. Tirana county, was the focus of the age standardized mean annual incidence (first admissions) per 100,000 population per region for ICD-9 three-digit codes - 295 (Schizophrenic psychoses), 296 (Affective psychoses) and 295-299 (Other psychoses), 2007 – 2021. Taking in consideration internal migration and emigration trends of the Albanian population we subdivided the study period in three periods, PI (2007-2011), PII (2012-2016), PIII (2017-2021). Mean annual incidence (first admissions) per 100,000 population per region and period prevalence, Albania, 2005 – 2021 were calculated.

Results: During the study period, 2005 – 2021, resulted 21,287 diagnoses discharged as Mental Disorders (290-319) - ICD, 9th edition, period 2005-2021. First admissions were 12,251 cases, which were responsible for 57.6% of total admissions, of which 6,525 (53.3%) were males. Mean age (median) first admissions was 37.0 ± 15.5 (36.3) years.

Age standardized mean annual incidence (first admissions) per 100,000 population (95% CI), Tirana county, Schizophrenic psychoses, Affective psychoses and Other psychoses, were respectively PI (15.48 [12.68 - 18.29], 19.38 [16.21 - 22.54] and 48.92 [43.69 - 54.16]), PII (10.05 [7.90 - 12.20], 14.29 [11.73 - 16.85] and 32.82 [28.93 - 36.71]) and PIII (9.24 [7.30 - 11.18], 18.82 [15.89 - 21.75] and 34.25 [30.29 - 38.20]). Tirana county, 17-year prevalence, of first hospitalizations was respectively by code, 224.8, 323.2 and 666.7 per 100,000 population.

Conclusion: This aproach, from a tertiary hospital first admissions viewpoint can serve as a posible aproximation towards holistic studies. The synchronic study produces suficient backgroud information for next prospective level longitudinal studies.

1. Introduction

Evaluation of incidence and prevalence of psychiatric disorders in a country with limited economic and professional resources, like Albania, remains a necessary challenge. Longtime attempts to measure the burden of psychiatric disorders have tough us that what is momentarily impossible to realize is an indication to attempt alternative approaches. Projections and approximations are useful techniques in social and economic fields of research but not well accepted in medicine. However, when the lack of local data creates gaps in regional maps it is tended to use techniques, approximating bordering countries data to create somewhat acceptable numbers, considering neighboring countries similar in terms of cultural, climatic, etc., terms. When filling missing data with approximations of neighbors' data results can be misleading, as is the example if breast cancer data. The mistake originated from the simplistic approach that Balkan women share nowadays similar lifestyles but forgetting that the majority of female breast cancer patients lived in a period when lifestyle differences between countries were significant.[1, 2]

Sources of this study data consist of admitted cases retrieved from TUHC psychiatric department electronic medical records, discharged with psychiatric diagnoses during 2005-2021 period. The psychiatric patient contacts the hospital services through the emergency department, where he/she is admitted or returned home or he/she is admitted through elective hospital admission procedures. Basic demographic data, county of residence and diagnosis codes are registered for every patient. For every patient results a column registered as final diagnosis written by hand, by the doctor, in a non-formal style.

Incidence estimation

It is not possible to calculate incidence and prevalence of psychiatric diagnoses for the population of Albania, or the capital Tirana. The data we dispose make possible an approximation through a projection starting from hospital data, which make possible the calculation of the incidence of hospitalization (first admissions) of psychotic disorders, and the limited follow-up permits the calculation of 17-year prevalence of hospitalized psychotic disorders for the county of Tirana. Mental health services in Albania are difficult to manage and this is reflected in the information filed. The Ministry of Health Document,

"2003, Policy for mental health services development in Albania", considered mental health services in Albania as dramatic, charging 66% of mental health expenditures for psychotropic medicines. Methodologically, early studies point to the importance of first admission for incidence calculation, even they are certainly unreliable for incidence evaluation or changes. Some of the reasons are; the psychotic patient never reaches the system, they contact the system but not the mental health worker, many are diagnosed but never admitted to the hospital, etc. Some difficulties are surpassed with the help of technology, as in the case of discriminating between an admission or a readmission. Sharp social impact is seen following suicide attempts and forced admissions. The suicide peaks on the first year of psychosis and is reduced if treatment programs were in place. But half of those patients do not require inpatient treatment. On the other hand, voluntary and involuntary psychiatric admissions oscillate. In some cases, voluntary admissions were found to increase over time. Other, population-based studies find it decreasing. The prevalence of involuntary admissions was found in some cases to be as high as 77.1%.

2. Material and Methods

We use the best available historic dataset on mental health diagnoses in Albania, composed of electronic patient records discharged from Tirana University Hospital Center "Mother Teresa". It is acceptable to use hospital admission data to provide surrogate epidemiological results in absence of general population inadequate information. Tirana University Hospital Center "Mother Teresa", in Tirana serves as a secondary level hospital for the county of Tirana and as tertiary mental health care for all Albania. Because this institution covers for all psychiatric hospitalization services for the county of Tirana, excluding the possibility of admission in private hospitals and the unlikeliness of patient flow from Tirana, the capital to other districts, we consider Tirana county as our study's catchment area. Hospital admission electronic patient files were coded using International Classification of Diseases, 9th edition (ICD-9), three-digit codes, consisting on the shortened version composed of three numerical codes and all admissions were coded as first admissions and readmissions.

Our focus were data determined by the ICD-9 three-digit codes as Other psychoses (295–299), especially Schizophrenic psychoses (295) and Affective psychoses (296). Psychotic diagnosis diagnosed as Schizophrenic psychoses coded later than the first admission were considered as Schizophrenic psychoses, following previous similar examples. Considering the continuous internal migration and emigration trends of the Albanian population we subdivided the study period in three periods, PI – period 2007-2011, PII – period 2012-2016, PIII – period 2017-2021. Denominator data on population of Albania and Tirana county for the study period were retrieved from the Albanian Institute of Statistics database.

Frequency of diagnoses retrieved from the database permitted the calculation of mean annual incidence (first admissions) per 100,000 population per region and period prevalence for codes 295, 296 and 295-296, Albania, 2007 – 2021 and the period prevalence (17 years) of first admissions per 100,000 population by county, codes 295, 296 and 295-296, 2005-2021. The age standardized mean annual incidence (first admissions) per 100,000 population per region for codes 295, 296 and 295-296, Tirana county, Albania, 2007 - 2021, was based on age-standardized incidence rates per 100,000 population for all ages using the 2012 European Standard Population (ESP).

This kind of results were found to be examples for further epidemiological mature indicators and important social impact effect. Statistical analysis was performed through IBM® SPSS® Statistics software.

3. Results

During the study period, 2005 – 2021, resulted 21,287 diagnoses coded as Mental Disorders (290-319), period 2005-2021. First admissions, 12,251 cases, were responsible for 57.6% of total admissions, of which 6,525 (53.3%) were males. Mean age (median) first admissions was 37.0 ± 15.5 (36.3) years. Mean age (median) for first admissions males (n=6,525), 35.6 ± 15.3 (34.4) years, females (n=5,726), 38.6 ± 15.6 (38.8), p<0.001. Mean age (median) for first admissions males, capital Tirana (n=3,852), 36.4 ± 15.4 (35.3) years, females (n=3269), 39.6 ± 15.6 (39.7), p<0.001. Mean age (median) for first admissions males, other counties (n=2,673), 34.5 ± 15.0 (33.2) years, females (n=2,457), 37.3 ± 15.7 (37.5), p<0.001.

Table. 1 Distribution of diagnoses coded as Mental Disorders (290-319), period 2005-2021.

	First admission		
Mental Disorders	no	yes	Total
Organic psychotic conditions (294–290)	194(2.1%)	471(3.8%)	665 (3.1%)
Other psychoses(299–295)	7710 (85.3%)	8989(73.4%)	16699 (78.4%)
Neurotic disorders ,personality disorders ,and other non-psychotic mental disorders (316–300)	1013 (11.2%)	2237(18.3%)	3250 (15.3%)
Mental retardation- 317) (319	119(1.3%)	554(4.5%)	673 (3.2%)
Total	9036 (100%)	12251(100%)	21287 (100%)

Table. 2 Mean age and median (years) by first admission, sex and county (Capital vs. other counties), of diagnoses coded as Other psychoses (295–299), period 2005-2021.

		First admissions	no			yes		
Sex	Tirana	Mental Disorders	N	Age)years(Mean	Age) years(Median	N	Age)years(Mean	Age) years(Median
female	no	Organic psychotic conditions(294–290)	11	47.6	51.6	68	44.1	41.9
		Other psychoses(299–295)	889	41.4	40.7	1777	40.2	40.4
		Neurotic disorders ,personality disorders ,and other non-psychotic mental disorders(316–300)	134	37.6	37.8	527	28.7	20.9
		Mental retardation(319 - 317)	11	24.1	16.1	85	23.4	16.0
	yes	Organic psychotic conditions(294–290)	26	48.7	50.7	61	52.6	53.3
		Other psychoses(299–295)	2231	44.0	44.0	2407	41.5	41.4
		Neurotic disorders ,personality disorders ,and other non-psychotic mental disorders(316–300)	306	40.6	40.9	658	34.9	34.4
		Mental retardation(319 - 317)	30	30.3	30.9	143	24.0	21.7
male	no	Organic psychotic conditions(294–290)	39	34.2	29.7	129	39.4	34.8
		Other psychoses(299–295)	1225	37.9	35.7	1962	36.0	34.3
		Neurotic disorders ,personality disorders ,and other non-psychotic mental disorders(316–300)	111	36.2	36.0	450	30.9	27.9
		Mental retardation(319 - 317)	18	25.6	25.8	132	19.5	15.7
	yes	Organic psychotic conditions(294–290)	118	37.0	31.1	213	39.7	34.8
		Other psychoses(299–295)	3365	39.4	38.1	2843	36.9	35.5
		Neurotic disorders ,personality disorders ,and other non-psychotic mental disorders(316–300)	462	38.4	36.2	602	37.5	36.8
		Mental retardation(319 - 317)	60	35.2	33.3	194	21.9	18.2

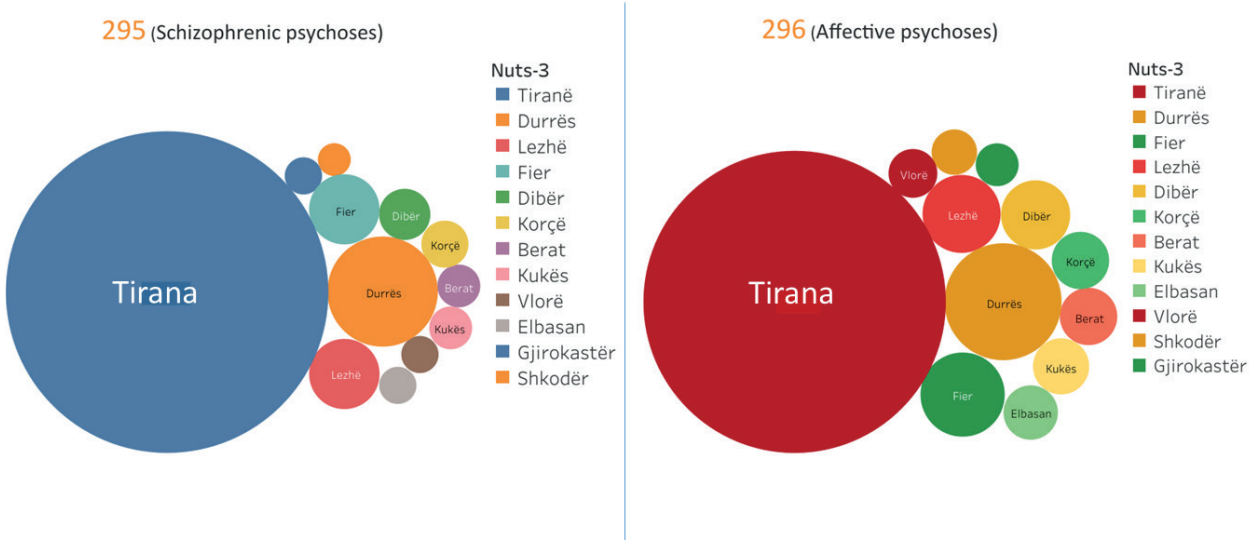

Figure 1. Burden of Schizophrenic psychoses (295) and Affective psychoses (296) by county, 2005-2021.

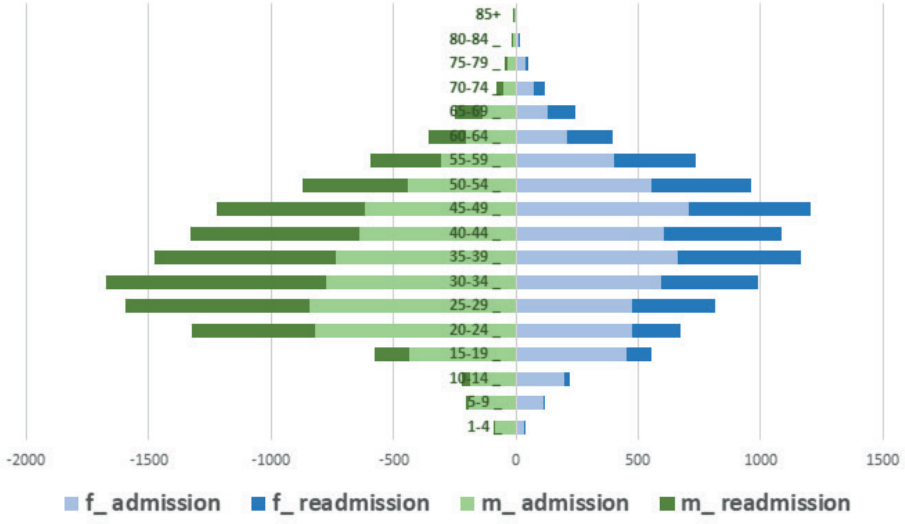

Figure 2. First admissions and readmissions population pyramid showing distribution by age and split by sex, Mental Disorders (290-319), period 2005-2021

Table. 3 Mean annual incidence (first admissions) per 100,000 population per region and period prevalence of codes 295, 296 and 295-299, Albania, 2007 - 2021.

ICD 9-three-digit code		female			male			Total			
	County	P I	P II	P III	P I	P II	P III	P I	P II	P III	Prev17.
Schizophrenic	Tiranë	11.9	9.7	9.0	21.6	11.6	11.6	16.7	10.7	10.3	224.8
psychoses295 -	Other County	2.0	2.3	2.1	2.9	3.2	3.2	2.4	2.8	2.7	51.2
Affective	Tiranë	18.7	16.7	20.1	22.3	13.1	17.1	20.5	14.9	18.6	323.2
psychoses296-	Other County	4.9	6.0	5.8	4.7	3.7	4.6	4.8	4.8	5.2	92.9
Other psychoses	Tiranë	38.4	34.0	33.4	57.4	34.2	33.8	47.8	34.1	33.6	666.7
(299–295)	Other County	7.9	10.3	9.0	9.1	9.5	9.7	8.5	9.9	9.3	169.5

** PI – period 2007-2011, PII – period 2012-2016, PIII – period 2017-2021.*
** * Prev.17 is the 17-year study prevalence of first hospitalizations for the respective codes.*

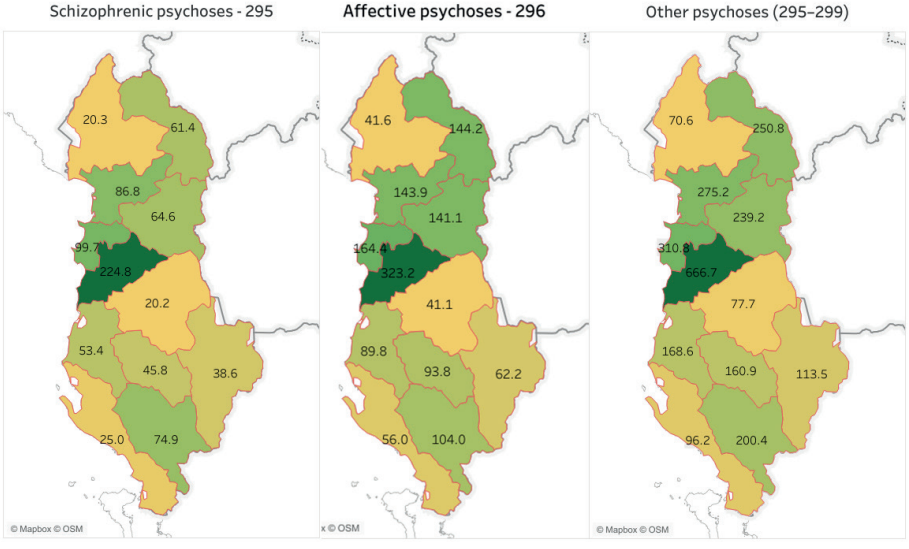

Figure 3. Period prevalence (17 years) of first admissions per 100,000 population by county, codes 295, 296 and 295-299, 2005-2021.

Table. 4 Age standardized mean annual incidence (first admissions) per 100,000 population per region of codes 295, 296 and 295-299, Tirana county, 2007 - 2021.

ICD 9-three-digit code	Sex	Period(2007-2011)	Period(2012-2016)	Period(2017-2021)
Schizophrenic	female	11.17(14.53 - 7.82)	9.34(12.26 - 6.42)	8.07(10.61 - 5.53)
psychoses295 -	male	20.05(24.61 - 15.49)	10.77(13.92 - 7.61)	10.46(13.40 - 7.52)
	Total	15.48(18.29 - 12.68)	10.05(12.20 - 7.90)	9.24(11.18 - 7.30)
Affective	female	17.66(21.95 - 13.38)	17.78(19.56 - 11.99)	20.46(24.76 - 161.7)
psychoses296 -	male	21.19(25.89 - 16.50)	12.77(16.20 - 9.34)	17.12(21.09 - 13.15)
	Total	19.38(22.54 - 16.21)	14.29(16.85 - 11.73)	18.82(21.75 - 15.89)
Other psychoses	female	38.12(44.54 - 31.70)	32.78(38.25 - 27.30)	34.23(39.79 - 28.66)
(299–295)	male	59.72(68.01 - 51.43)	32.81(38.33 - 27.29)	34.22(39.84 - 28.60)
	Total	48.92(54.16 - 43.69)	32.82(36.71 - 28.93)	34.25(38.20 - 30.29)

The burden of psychiatric disorders (Table 1) considered all admissions which is a registration compliant to standard administrative databases. Constructed mainly for billing purposes this kind of database is not interested directly in individual patients' aspects of morbidity. Thus, for epidemiological purposes and individual patient evaluation the whole database was recoded as 'first admissions' or 'more than one admission' per patient (Table 2) making possible calculation of incidence and prevalence.

A clear division is made between Tirana county and other counties when analyzing the data, because Tirana population is entirely covered from this institution, Tirana University Hospital Center "Mother Teresa" (Table 3), while other counties take advantage of their local institutions and the Tirana institution, making possible to show the true period prevalence (Figure 3) for Tirana county and the burden of the incoming patients from other counties for the rest of the map. Considering Tirana population and Albanian population in general as unstable the division of the data in three periods (2007-11, 2012-16 and 2017-21) is considered as better representing the annual incidence of first admissions (Table 4).

Regarding the 19 hospital death of patients classified in the group of Other psychoses (coded as 295-299), we didn't find any verified suicide from data on the database, although there is informal information of at least one case of hospital inpatient suicide. Literature reports at least 3.2 suicides for 100,000 admissions. During a text search of final diagnoses, written by hand in the patient's paper files by the doctor, we found 199 times the denomination, Morbus Bleuler. and the expression, attempted suicide in admission, 212 times (0.99% of total admissions) and 122 times for first admissions (0.99% of total firs admissions).

4. Discussion

The policy document, "Mental health action plan in Albania 2013-2022", opts for decentralization and deinstitutionalization, directing mental health care towards community health services but saving major psychiatric wards and hospitals situated in Tirana, Elbasan, Vlora and Shkodra.

Lack of studies drives towards making decisions based in opinions and false beliefs as is the example of a statement extracted from "2003, Policy for mental health services development in Albania", that 'the new generations of health professionals prefer to remain jobless rather than work with the mentally ill'. Supporting evidence of this style of policymaking are the inconsistent data on psychiatrist's workforce count. Different documents reported the number of psychiatrists per 100,000 as 2.2, 3.2 or 1.0.

The Albanian population with a change from baseline of -8.8%, (year 2001, population 3,063,320), and Tirana county with an increase of 54.1% (year 2001, population 596,704) can be considered highly unstable. The social exclusion accompanying internal migration and emigration can have a pathogenic role in relation to psychiatric disorders but needs special investigation. The example of Canada where positive selection of migrants protects those migrating from Europe more than those migrating from developing countries becomes a risk factor, or the special case of Israel where inclusion has protective effect, are good benchmarks to evaluate the Albanian situation. Urbanization in itself is accompanied with increased rates of depression and psychosis.[15, 16] The majority of the 322,807 Tirana new inhabitants come from rural areas and the counties urbanization during this period is undisputable. The other major migration flow trend was towards EU countries like Greece and Italy, working as illegal workers in most cases, which means that they turn home for treatment if encounter a mental illness. Health

system review of Germany, 2019, considered undocumented migrants as being at risk of lacking health insurance coverage. Age standardized mean annual incidence rate of psychotic disorder per 1,000 (Tirana county) in three periods we found first to decrease and later on to remain somewhat stable; PI - 0.60 per 1,000 (95% CI; 0.51-0.68), PII - 0.33 per 1,000 (95% CI; 0.27-0.38) and PIII - 0.34 per 1,000 (95% CI; 0.28-0.40). This needs further investigation because good political strategies and improved professional care can be masked by population relocation effects. Different migration types, different emigrants' skills and entrepreneurship possibilities among them makes whole population policies results vulnerable and differently effective to the expected results.

The quest for incidence and prevalence estimation remains delicate. Generally, it is a question of underestimation, as there is the case, similar with our study, when first-episodes of non-affective psychotic disorders incidence was estimated solely from the psychiatric services data or the finding that cases of cystic echinococcosis were four-fold higher than the number reported form The European Surveillance System (TESSy).[19, 20] To add more to this uncertainty on estimates, it expands to all variables on the dataset. For example, international incidence for all psychiatric disorder shows an incidence rate ratio by sex higher for men, 1.44, and non-affective psychotic disorders higher for men, 1.60, but not for psychotic disorders, 0.87. Heterogeneity is substantial to study design also.

The presentation of the patient for the first time to the mental health services, similar to our study, can be found with a median age of 29.0 years. The age of hospital admission is more advanced, in our case median age was 37.7 years. The cultural and the quality of services must not be forgotten as confounding factors. Albanians hesitate to admit their family members to the psychiatric hospitals because of stigma and low quality services. When compared to other studies our rate of schizophrenia at first admission is higher, a concomitant finding with increased age in admission, which permits the needed time to decide the diagnosis. Although the age of hospitalization is not a good indicator of the disease start it is comparable with western hospitals age admissions. A US study, period 2005-2014, analyzing length of schizophrenic patients stay in hospitals found that the most prevalent were admitted individuals ages 45–64 (38.8%) with nearly equivalent gender distribution. Social deprivation was found to be strongly correlated to prevalence and incidence of psychosis admissions, although nonlinear, showing stronger than the expected linearity for the group of the above average social deprivation. Unfortunately we don't have data to support this important finding.

Studies based on hospital discharge databases bring results on lifetime prevalence estimate of schizophrenia around 6.9 per 1000, Turkey, while we report a 17-years prevalence of 2.248 per 1000, for Tirana county catchment area. A 1999, French Bordeaux's psychiatric hospital, study reports a raw incidence rate of psychotic disorders 0.37 per 1,000 (95% CI; 0.28-0.46). We found similar mean annual incidence respectively for each period, 0.478, 0.341 and 0.336 per 1,000. The general trend of admissions in all Tirana University Hospital "Mother Teresa" departments, especially surgical wards, show the ever increasing flow from other counties, overcrowding the sole tertiary healthcare structure in Albania. Migration or traveling to the capital for health care solutions, because of lack of local services, are considered life events. These events can further be positively related to acute/subacute schizophrenia.

When comparing population, we must be careful. Some confounding factors are treatment protocols, cultural and income differences. [29, 30, 31] Also the psychotic patient is a special patient compared to other groups. He/she is more fragile or in some cases shows different behavior toward risk factors. For example, it was found that schizophrenia patients show reduced risk of cancer.

5. Conclusions

When talking of schizophrenia incidence and prevalence we must consider a spectrum of results and opinions. Most extreme conclusions range from similar incidence and prevalence of schizophrenia between populations to ten-to-twelvefold variation. The lifetime prevalence (LTP) of both schizophrenia and bipolar I (BPI) disorder is often assumed to be about 1%. Compared to 17 years' prevalence of 666.7 per 100,000 population (first admissions), Tirana county, we might pretend to have an approximate prevalence of the real situation.

Standardization of epidemiological studies is good when possible. Our aproach from a tertiary hospital first admissions viewpoint is a necessary step towards holistic studies. This kind of synchronic studies create suficient backgroud information for next prospective level longitudinal studies. In other cases, the combination of hospital admission was used in combination with available epidemiologic reports. The evolution of psychotic disorders trends is not linear. First data about admissions show the rise till the end of 19th century and decline at the beginning of 21st century.

Notes:
All authors declare that there are no conflicts of interest.
All authors declare that this research did not receive any funding for the research.

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