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# A Retrospective Analysis of Structural and Geographical Admissions with Psychiatric Codes during 11-Year Period at Tirana UHC, Albania

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**Abstract**

**Introduction**: Changes in mental health policy with a focus in decentralization and deinstitutionalization require a vision backed with specific new datasets and indicators. A set of data generated at Tirana University Hospital Center "Mother Teresa" (TUHC) as well some new recommendations according to our system concerns are presented in this paper.

**Methods**: Clinical and demographic characteristics of mental health patients were extracted from the hospital electronic patients database concerning 17,216 admissions from November 2004 to November 2015. A new set of indicators as, Average Length of Stay (ALOS) by diagnosis and hospitalizations by district per 100,000 inhabitants per year were introduced.

**Results**: Schizophrenic disorders (n=4,159) and Episodic mood disorders (n=4,867) were the principal diagnoses accompanied by a period of 215,292 hospital days. Males were responsible for 95.9% of alcohol and drug dependence admissions. The burden of hospitalized psychiatric patients for Tirana is 132.7 admissions per 100,000 inhabitants per year. Readmissions for schizophrenic women from other districts (*p=0.174)* are lower than first admissions, compared to Tirana population.

**Discussion:** The actually compiled dataset is a progressive step in confront with the usual traditional data in hospital mental health care in Albania. This study shows that policy driven production of new indicators improves managerial efficiency and disclose important concealed issues as gender and regional inequity issues.

**Conclusions**: Building of new qualitative databases to support political decisions making is indispensable and immediate. Our study shows that managerial efficiency and equity issues emerge as new indicators

**Key words:** Psychiatric codes, mental health, hospital admissions, Albanian patients, mental disorders

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## INTRODUCTION

The burden of mental and substance use disorders is actually almost impossible to evaluate in Albania due to the limited data as well as their quality. In the actual situation the electronic administrative database of Tirana University Hospital Center "Mother Teresa" is a reliable font for analysis. For the first time we dispose data on demographics, age distribution and Average Length of Stay (ALOS) by diagnosis for eleven consecutive years. Serving as a secondary hospital care to the district of Tirana and a tertiary hospital care for all Albania we presume, the structure and geography of admissions are an interpretable reflection of the whole country picture. Data are retrieved on the International Classification of Diseases (ICD 9) basis appertaining to the mental disorders group, coded by three digit codes, from 290 to 319. The changing conception of mental health management revolves around this tertiary institution although other big psychiatric hospitals are functional in Shkodra, Vlora and Elbasan districts. "Mental health action plan in Albania 2013-2022" has the clear objective of decentralization and deinstitutionalization of mental health services (1). Psychiatric beds exist in all district hospitals. Admissions in TUHC (Tirana University Hospital Center) depend also from the referral system, a set of rules which describe patient pathway through the health system services (2). The Mental Health Law and administrative decrees make it obligatory to respect. We generally refer to international data due to our limited data. These data are of an essential importance to clinical outcomes and also managerial ones. The economic impact of mental health in global terms is serious. We found that global burden of mental, neurological and substance use disorders is represented from mental disorders to account for the largest proportion of DALYs (The disability-adjusted life year) (56.7%), followed by neurological disorders (28.6%) and substance use disorders (14.7%) (3). Speaking in global terms, mental, neurological and substance use disorders exact a high toll, accounting for 13% of the total global burden of disease in the year 2004 (4). The new indicators can be used in improving policy related issues as, accessibility, accommodation and affordability.

## METHODS

Clinical and demographic characteristics were extracted from the TUHC electronic patients database comprising 17216 admissions coded as psychiatric disorder from November 2004 to November 2015. Psychiatric diagnoses are found in psychiatric settings and other departments as well. Nomination of departments refers as 'Psychiatric' to all psychiatric services offered from Psychiatric hospital, 'Other', are all other departments outside Psychiatric hospital, ex., 'Transient organic psychotic conditions (code nr. 293) in endocrinology department, meanwhile the abbreviation 'Tox-Alc' was used for Toxicology and Alcohology departments. We must underline that admission in

'Psychiatric' and 'Other' departments cover the period 2004-2015, while admissions of 'Tox-Alc' are from 2011 and onward. These data deficiencies are taken in consideration and careful explanation is made over each data presentation. Our coding and billing system codes only one discharge diagnosis which doesn't permit to make any assumptions about co-morbidity.

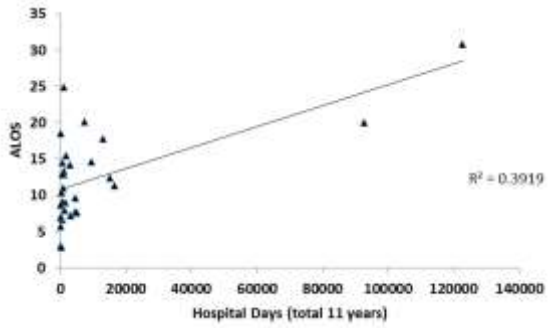
**Statistical analysis**

Descriptive statistical methods are used to represent activity data. When age at first admission was analyzed, duplicate data referring to multiple admissions were excluded saving the first admission. Mapping of respective data, used the map division of Albania in 12 districts with respective population from census 2011, INSTAT. $P<0.05$ was defined as statistically significant. Statistical analysis was performed using Kruskal-Wallis H test and Mann-Whitney U-test. IBM SPSS 20.0 software is used to conduct data analysis.

## RESULTS

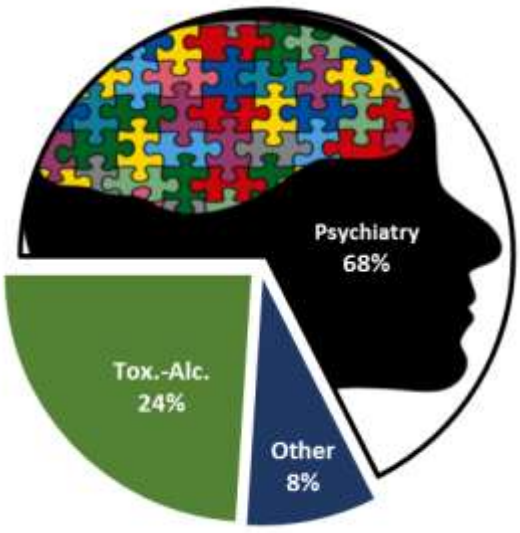
Results are at first focused in picturing the whole burden of hospital admissions November, 2004 – November, 2015, the number of psychiatric diagnoses were (n=17,216) (Tab. 1). During the study period 8729 (65.3%) of 13,376 psychiatric department admissions were emergencies, of which 7,776 (58.1%) males and 5,600 (41.9%) females, 1,682 from 'Other departments' of which 901 (53.6%) males and from 'Tox.-Alc' were 2,158 admissions of which 2,069 (95.9%) males.

**Figure 1.** *Scatter diagram shows* a positive correlation between 'ALOS' and 'total hospital days'.




'Schizophrenic disorders' and 'Episodic mood disorders' are the heaviest burden in hospital care combining largest ALOS and hospital days as the compound indicator of readmissions.

**Figure 2.** Percent of admission share, mean by year, between segments of TUHC covering mental health diagnoses, November, 2004 – November, 2015.




As Toxicology and Alcohology departments are only attached to this structure from year 2011, the data represent mean number of admissions from 2011.

**Table 1.** Psychiatric diagnoses as percent of each major division and their burden in 'total length of stay' and 'ALOS', November, 2004 – November, 2015.

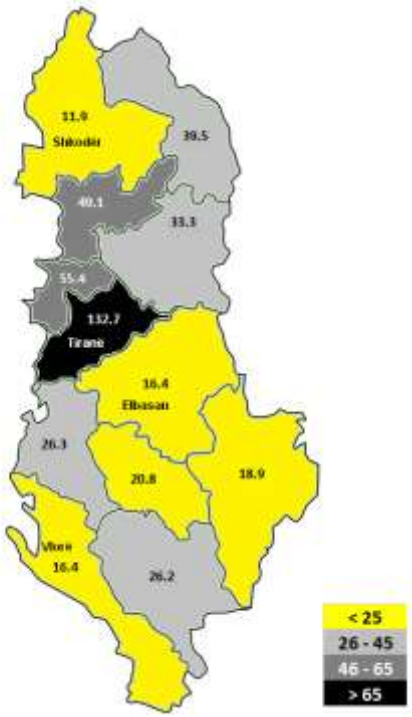
| | ICD-9 diagnosis | ICD-9 code | % of Psychiatry | % of Other | % of Tox.-Alc. | Total | % of total | Total length of stay | ALOS |
|---|---|---|---|---|---|---|---|---|---|
| Psychosis (290–299) | Dementias | 290 | 0.4 | 7.3 | 0.0 | 177 | 1.0 | 1546 | 9.0 |
| | Alcoholic psychoses | 291 | 0.4 | 0.5 | 0.1 | 64 | 0.4 | 565 | 9.1 |
| | Drug psychoses | 292 | 0.6 | 0.0 | 0.1 | 85 | 0.5 | 1029 | 12.9 |
| | Transient organic psychotic conditions | 293 | 0.8 | 0.3 | 0.0 | 114 | 0.7 | 1750 | 15.5 |
| | Other organic psychotic conditions (chronic) | 294 | 0.6 | 0.5 | 0.1 | 87 | 0.5 | 985 | 13.3 |
| | Schizophrenic disorders | 295 | 31.0 | 0.7 | 0.0 | 4159 | 24.2 | 122681 | 30.9 |
| | Episodic mood disorders | 296 | 36.0 | 2.9 | 0.3 | 4867 | 28.3 | 92611 | 20.1 |
| | Paranoid states | 297 | 2.8 | 0.4 | 0.0 | 379 | 2.2 | 7416 | 20.2 |
| | Other nonorganic psychoses | 298 | 5.6 | 0.8 | 0.0 | 761 | 4.4 | 12891 | 17.8 |
| | Psychoses with origin specific to childhood | 299 | 2.6 | 14.6 | 0.0 | 590 | 3.4 | 4494 | 7.7 |
| Neurotic disorders, personality disorders, and other nonpsychotic mental disorders (300–316) | Neurotic disorders | 300 | 5.7 | 29.2 | 0.2 | 1263 | 7.3 | 14993 | 12.4 |
| | Personality disorders | 301 | 5.0 | 0.8 | 0.0 | 682 | 4.0 | 9361 | 14.7 |
| | Sexual deviations and disorders | 302 | 0.0 | 0.1 | 0.0 | 2 | 0.0 | 37 | 18.5 |
| | Alcohol dependence syndrome | 303 | 0.5 | 1.2 | 65.8 | 1504 | 8.7 | 16441 | 11.4 |
| | Drug dependence | 304 | 0.1 | 0.4 | 33.0 | 735 | 4.3 | 5082 | 7.6 |
| | Nondependent abuse of drugs | 305 | 0.0 | 0.4 | 0.0 | 8 | 0.0 | 25 | 3.1 |
| | Physiological malfunction arising from mental factors | 306 | 0.1 | 3.2 | 0.0 | 68 | 0.4 | 431 | 6.7 |
| | Special symptoms or syndromes, NOS | 307 | 0.2 | 0.7 | 0.0 | 41 | 0.2 | 567 | 14.5 |
| | Acute reaction to stress | 308 | 0.2 | 6.5 | 0.0 | 135 | 0.8 | 372 | 2.8 |
| | Adjustment reaction | 309 | 1.4 | 1.1 | 0.0 | 209 | 1.2 | 2831 | 14.2 |
| | Specific nonpsychotic mental disorders following organic brain damage | 310 | 0.2 | 0.5 | 0.0 | 41 | 0.2 | 972 | 24.9 |
| | Depressive disorder, not elsewhere classified | 311 | 0.3 | 0.4 | 0.0 | 42 | 0.2 | 530 | 12.9 |
| | Disturbance of conduct, not elsewhere classified | 312 | 0.6 | 4.1 | 0.0 | 147 | 0.9 | 1162 | 8.0 |
| | Disturbance of emotions specific to childhood and adolescence | 313 | 0.4 | 1.0 | 0.0 | 72 | 0.4 | 704 | 11.0 |
| | Hyperkinetic syndrome of childhood | 314 | 0.0 | 0.4 | 0.0 | 11 | 0.1 | 96 | 8.7 |
| | Specific delays in development | 315 | 0.2 | 1.4 | 0.0 | 48 | 0.3 | 427 | 10.4 |
| | Psychic factors associated with diseases classified elsewhere | 316 | 0.0 | 0.1 | 0.0 | 5 | 0.0 | 28 | 7.0 |
| Mental retardation (317–319) | Mild mental retardation | 317 | 2.0 | 12.2 | 0.0 | 475 | 2.8 | 4432 | 9.7 |
| | Other specified mental retardation | 318 | 2.2 | 8.3 | 0.0 | 428 | 2.5 | 3058 | 7.3 |
| | Unspecified mental retardation | 319 | 0.1 | 0.4 | 0.0 | 17 | 0.1 | 97 | 5.7 |
| | **Total** | | | | | **17216** | | **307614** | |

* Diagnoses covered by Toxicology-Alcohology wards are representative of years 2011 and onward, underestimating the true share of this component.

Fig. 2 has to be analyzed concomitantly with Tab. 1 as from Toxicology and Alcohology departments are retrieved only psychiatric diagnoses to complete the picture of psychiatric codes admitted in our institution, meaning that

almost all 'Alcohol dependence syndrome' and 'Drug dependence' admission are located in this clinics. The same logic applies to the slice named 'Other'.

**Figure 3.** Admissions per *year, per 100,000 inhabitants* by district, November, 2004 – November, 2015.




**Districts**: Shkodra (11.9), Kukësi (39.5), Dibra (33.3), Lezha (49.1), Tirana (132.7), Durrësi (55.4), Elbasani (16.4), Fieri (26.3), Berati (20.8), Korça (18.9), Gjirokastra (26.2), Vlora (16.4) admissions per*year, per 100,000 inhabitants.*

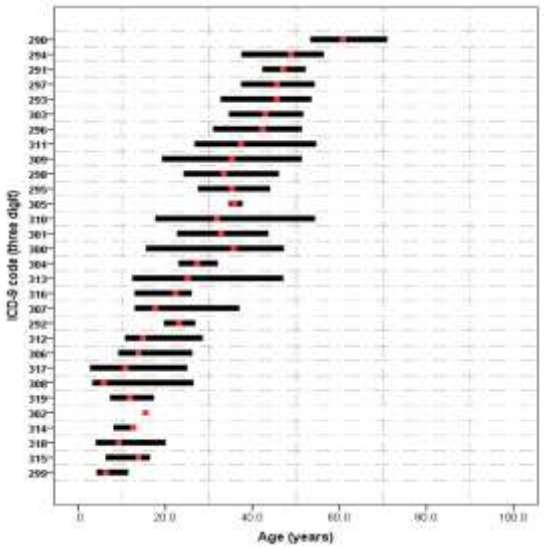
The entire population was classified in two categories, Tirana (the capital) and other districts. Total number of admissions correlates with department (p<0.001), ICD-9 codes (p<0.001), age (p<0.001), year (p=0.244), and sex (p=0.015), while the same comparison for first admissions results in department (p<0.001), ICD-9 codes (p=0.002), age (p<0.001), year (p<0.001), and sex (p=0.174).

The same procedure analyzed first admissions by district provenience and age comparison for the major diagnoses; Schizophrenic disorders (p<0.001), Tirana, 37.4 ±11.2 years and other districts, 33.8 ±10.9 years, Episodic mood disorders (p=0.398), Psychoses with origin specific to childhood (p=0.332), Alcohol dependence syndrome (p=0.759), Drug dependence (p=0.248).

An interesting finding is the Male-Female ratio respectively; of 'Alcohol dependence syndrome' was 27.9:1, p<0.001 and 'Drug dependence'18.3:1, p<0.001.

Age of first admission for autism spectrum disorders (299) is 7.21 ± 4.32.

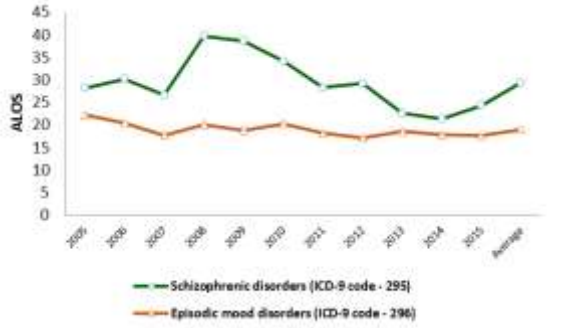
**Figure 4**. Age in admission, data are median (IQR)




Age in admission is represented in median and IQ range. The graph represents the coded data

not in code number order, but in median age of first admission, aiming to range diagnosis by age. As expected dementias, coded 290 have the higher age of admission.

**Figure 5**. Schizophrenic and mood disorders admissions by year




In four years 2008-2012 the ALOS for Schizophrenic disorders is too elevated because during this period the so called chronic patients, who were people using psychiatric hospital beds 365 days a year, are calculated. After 2012 they are placed in a new outside hospital facility considered as a community mental health care service.

Saving the first admission and excluding others, serving of this as a reference diagnosis, is a weakness of the study.

## DISCUSSION

Data of our study focuses in diagnoses frequencies and their burden in hospital care, age distribution and geography. This standard of data processing although it can be considered routine or rudimental in modern structures is a good output for Albania. Informed decision making is a priority of WHO and our data fulfill basic requirements of reporting recommended, ex., health data disaggregated by sex and age (5). The same body of data structure and quality has to be implemented in the whole system, adding in the near future upgrade of the coding, as a core process of fair financing. Mental disorders and medical illness are interrelated so the interventions have a broader impact in the population health (6). Also the neighboring Kosovo, composed of Albanian ethnic majority, can be subject to reflect policy changes in Albania. Kosovo is a country were mental health need aren't well estimated (7).

Data in mental health statistics in Albania are sometimes very unclear. In three different documents we found the number of psychiatrist per 100,000 people to be 2.2 (year of document compilation, 2007), 3.2 (year of document compilation, 2006) and 1.0 (year of document compilation, 2007) (8, 9,10). Also in the same documents the proportion of mental health budget (% of total health budget) ranges from 3-6%. These types of data are at least misleading. Also the true burden of certain disorders it is not truly reflected because of the impossibility of our system to catch these patients. If 95.9% of alcohol and drug dependence admitted patients are males the answer it is not the absence of these phenomenon's among women. It could be true for some diagnoses as in the case of schizophrenia. Males used to spend more time in the hospital and were at significantly higher risk for re hospitalization than schizophrenic women (11).

One of most specific traits of Albanian population is migration from countryside to big cities peripheries, associated with respective changes in social and economic status. While moving towards more socio-economically deprived areas increases mental health problems, one of the most prominent diagnoses in psychiatric hospitals, lifetime prevalence of schizophrenia is much lower in rural areas (12, 13). Effects of migration in mental health are country specific and still a large area of exploration. Also mental health services are unequally developed throughout Albania making even more complex the analysis. Patients flow tends to increase towards higher quality centers as TUHC. Flow from districts doesn't change even if policies change (p=0.244). Also specific diseases ex. schizophrenic patients, show age differences between Tirana, 37.4±11.2 years and other districts, 33.8 ±10.9, (p<0.001). We think Tirana patients are treated ambulatory for many years after diagnosis while other districts bring the difficult cases early. Implementation of modern techniques as telepsychiatry could be a method to lower the pressure of admissions (14).

A summary of hospital data by diagnosis is represented in Tab. 1, opening the discussion of ALOS as this indicator is calculated for the first time. Although discharge diagnoses are common to other studies in countries similar to Albania, ALOS is quite different. (15) Of all admissions Schizophrenic disorders represent 24.2% and Episodic mood disorders 28.3 %. Data of schizophrenia ALOS have great variability by year and country. Schizophrenic patients admitted to London mental hospitals in 1950s in 35% of cases were retained two years or more and ALOS equaling 134.8 days in 1980s (16, 17). Fig. 5 shows typical oscillations in ALOS at TUHC psychiatric hospital depending also in policy change with an average of 29.4 days for Schizophrenic disorders (ICD-9 code - 295) and 18.9 for Episodic mood disorders (ICD-9 code - 296).

This data must be interpreted at least in association with gravity, age, sex and comorbidity.

Fig. 4 shows age in admission as median and IQ range offering a ranging of diagnoses by first admission age. Age of first admission could be a comparative benchmark to age of diagnosis, ex. Our data show age of first admission for autism spectrum disorders to be 7.21 ± 4.32 years and compared to one study from Medicaid enrolled children, age of diagnosis of autism was 64.9 months (18).

It's easy to close institutions and to promise community based mental health care. If needs are not calculated properly the utilization of such new structures can aggravate the already infamous inequity monster, living many patients in prison cells or the side of streets. It's not unusual to encounter psychiatric patients among homeless people. The vicious cycle of homelessness which is a promoter of mental health problems or the opposite can be better understood if the phenomenon is quantified (19).

Psychiatric diagnoses are associated with short- and long-term absenteeism and presenteeism. Despite the economic burden (3 and 4 per cent of gross national product (GNP) for the former EU–15 (Gabrieland Liimatainen 2000). Legal abuse has to be mentioned in alibi creation and illegal profit from invalidity founds. Although mental health founding institutions increasingly are asking for more data and restrictions patient and family must be taken always in consideration. Self referral of patients is an ongoing experience in Norway (20). The same would be totally incompatible with increasing set of rules of our referral system. Also good experiences are the conceptualization of services in collaboration with family which is associated even with decreased hospital utilization and always taking an eye in equity (21, 22).

Admissions per year, per 100,000 inhabitants by district is the new recommended indicator as a comparator between psychiatric hospitals and number of admissions by year.

The strong correlation of 'Schizophrenic disorders' and 'Episodic mood disorders' with ALOS and hospital stay makes imperative the analysis of this groups of diagnoses because little modifications in approaching them could have visible impact in hospital management outputs.

Recording of comorbidity as a standardized requirement is an important recommendation in its high presence in psychiatric disorders as comorbidity it's not the sum of two diagnoses (23).

Social, economic, cultural and geographic components must be taken in consideration evaluating mental health burden and needs. Economic recession, strong relation of mental health spending to income by country, geography and differences in culturally different communities are already proven (24, 25, 26). Our recommendation is to collect information in those fields based in new indicators and added to already existing medical information.

## CONCLUSION

Medical databases and policy changes evolve simultaneously staying focused in stewardship principles towards individual and population health. Study results are a condensation of hospital data base capabilities and make known to future users of mental health hospital statistics the capabilities to furnish them with data. The new dataset and indicators are a new helpful inside in mental health for Albanian policymakers. We hope to entice somewhat policymakers in using this format of data and start to build statistical data frameworks and new indicators second mental health users' necessities.

**Conflict of interest:** None

**Acknowledgements:** None

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