Hospitalization for drug-related disorders in Italy: trends and comorbidity

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ABSTRACT

BACKGROUND: The drug abuse has several health, social and economic effects. Hospital discharge records(HDR) collected by the Ministry of Health represent a major source of epidemiological data. In this paper we used this source in order to assess drug abuse hospitalization patterns and trends in Italy by means of the study of comorbidity at discharge.
METHODS: Analysis are based on the National HDR Register and refers to data from 1999 to 2011 for the Ital-ian resident population. Two approaches have been followed: the *main diagnosisand the comorbidity approach* based on the analysis of all diagnoses reported on the HDR. As a measure of the association between drug-related disorders and specific conditions reported, an estimation of age-standardised relative risk (RR) has been used.
RESULTS: The number of hospitalizations for drug-related diagnosis declined from 10,968 cases in 1999 to 6,180 in 2011.Using the comorbidity approach we found that in the period 2009-2011 the number of HDR with a mention of drug use is 2.8 times higher than the number based only on the main diagnosis.The conditions more strongly associated to the group of drug users are mental disorders, alcohol abuseand infectious diseases such as HIV disease and viral hepatitis.
CONCLUSIONS: These data can provide important information about the epidemiology of drug problems and the impact of drug policies.In addition the strong evidence of association of drug abuse and mental health provides a solid underpinning for planning more coordinated interventions of prevention and public health.

Key words: comorbidity, hospital discharge records, drug-related hospitalization

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INTRODUCTION

The drug abuse has several health, social and economic effects [1]. The impact on health, especially for the association of drug abuse with HIV and some other infectious disease, is well documented both in Italy and at European level by the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) [2, 3]. A strong association of drug abuse with other mental

disorders is also reported in some studies [4]. Others refer to the impact on hospitalization resources and on the determinants of healthcare consumptions of drug addiction [5, 6] In Italy, data on drug abuse are provided by territorial health services for the drug dependences and by the hospital discharge records [7, 8].These latterare collected in a database managed by the Ministry of Health constituting a major source of epidemiological data for the country. Each hospital discharge record, referred to a single event of hospitalization, holds the information on the main diagnosis together with up to five other secondary diagnoses, which represent coexisting disorders and conditions developed during the hospitalization. This data source allows not only to determine the burden of specific conditions on the health system but also to study the comorbidity patterns. Comorbidity refers to several disorders or illnesses that occur in the same person, simultaneously or sequentially. It also implies interactions between the illnesses that affect the course and prognosis of both [4, 9, 10]. Comorbidity has been associated with heavy costs for individuals, family and society, and there is urgent need for further research to understand the comorbid outline of drug and health problems and to determine effective intervention and treatment approaches.

The aim of this study is to assess drug abuse hospitalization patterns and trends in Italy. By means of the study of comorbidity at discharge, it aims to provide a more comprehensive picture of all cases directly or indirectly related to drug addiction and to estimate the statistical significance of these relationships.

Therefore the paper presents trend as well as geographical, gender and age differences on the hospitalization data for drug-related disorders in Italy using two different approaches, one based on the main diagnosis as registered in the hospitalization records and the second based on the comorbidity approach.

METHODS

Data

Analysis presented in this paper are based on the National Hospital Discharge Register managed by the Italian Ministry of Health since 1995. The study refers to data from 1999 to 2011 for the Italian resident population.

The Hospital Discharge Register contains data on the patient (gender, date and place of birth, place of residence, etc.) and information about the episode of hospitalization, such as diagnosis, surgical procedures, and diagnostic and therapeutic interventions, coded according to the International Classification of Diseases 9th revision, Clinical Modification (ICD-9-CM) [11].

In addition to the main diagnosis, up to five secondary diagnoses can be reported in the form. The main diagnosis is the condition identified at the end of hospitalization episode which required the treatment and the procedures provided by the hospital. The secondary diagnoses are those conditions that coexisted at the time of admission or that were developed during the treatment.

The selection of ICD-9-CM codes used for the analysis of hospitalizations for drug abuse follows the definition of the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA– selection B) [12]. The selection includes: drug psychoses (code 292); drug dependence (codes 304.0, 304.2-9); nondependent drug abuse (codes 305.2-3, 305.5-7, 305.9); poisoning by analgesics, antipyretics, and antirheumatics: opiates and related narcotics (code 965.0); poisoning by other central nervous system depressants and anesthetics: surface and infiltration anesthetics, cocaine, lidocaine, procaine, tetracaine (code 968.5); poisoning by psychotropic agents: psychodysleptics, cannabis, lysergide (LSD), marihuana, mescaline, psilocin, psilocybin (code 969.6) and psychostimulants, amphetamine, caffeine (code 969.7).

For the analysis of hospitalization by substance, the diagnoses were classified as follows: opioid type consumption (including heroin, methadone and opium - ICD-9-CM codes 304.0, 305.5, 965.0), cocaine (304.2, 305.6, 968.5), cannabis, amphetamine and other psychostimulant substances (304.3, 304.5, 305.2, 305.3, 969.6) and for mixed or unspecified substances.

Data refers to events (hospital discharges) and not to patients, then if a person is re-admitted during the year he/she is counted more than once.

Statistical analysis

The *main diagnosis approach* has been used for analysing the trends of drug-induced

hospitalization and the differences of these by gender, age and geography, in the period 1999-2011. *Main diagnosis* indicators used are the following:

- Absolute number of hospitalizations.
- Standardised hospitalization rates. They are calculated with the direct method with five year age groups, considering separately age 0 and the last class 90 years and over (0, 1-5, 5-9,... , 90+); the standard population used refers to Italian census 2001. This indicator is used for gender and geographic comparisons.
- Age specific hospitalization rates for age groups 15-24, 25-44, 45-54 and 55-64.

Comorbidity analysis is an innovative approach for the study of hospitalizations that allows to take into account all reported diagnosis in the hospital discharge records. This approach considers as "drug-related hospitalization" all those discharge records containing one of the selected ICD-9CM codes included in EMCDDA selection B definition, both as the main and associated diagnoses.

Comorbidity data refers to Italian resident population aged from 15 to 64 years, pooled for years 2009-2011 and compared with similar data for years 2006-2008

For the study of hospitalization levels comparing the main diagnoses approach with the comorbidity approach the following indicators have been used:

- Number of discharges obtained with the two methods
- Crude rates (age-specific and total)
- Standardised rates
- Ratio "all to main" defined as the number of discharges obtained with comorbidity approach divided by the number of discharges obtained with main diagnoses approach (age-specific and total).

For the period 2009-2011 an analysis of conditions associated to drug-related diagnosis has been performed. For this analysis two groups of hospital discharge records have been identified:

1. drug-related hospitalization records (drug users);
2. non drug-related hospitalization records (non-drug users).

The measure of the association between drug-related disorders and specific conditions reported on hospital discharge records is the estimation of age-standardised relative risk (RR). This indicator is defined as the ratio between the following proportions: proportion of hospital discharges mentioning the specific morbid condition A among discharges of drug users (d); proportion of hospital discharges with mention of the condition A among discharges of non-drug users ($\bar{d}$).This indicator is a measure of the strength of association of a certain condition with drug-related diagnosis.

$$R = \frac{\hat{D}_{dA}}{D_d} / \frac{\hat{D}_{\bar{d}A}}{D_{\bar{d}}} = \frac{\hat{p}_{dA}}{\hat{p}_{\bar{d}A}}$$

where:

$\hat{D}_{\bar{d}A}$ number of estimated hospital discharge records mentioning both: the diagnosis A and drug-related diagnosis d

D_d number of hospital discharge records mentioning drug-related diagnosis d

$\hat{D}_{\bar{d}A}$ number of estimated hospital discharge records mentioning the diagnosis A without mention of drug-related diagnosis d

$D_{\bar{d}}$ number of hospital discharge records without mention of drug-related diagnosis d.

Hospitalizations are estimated on the basis of the age distribution of hospitalizations for the general population according to the following formulas:

$$\hat{D}_{\bar{d}A} = \sum_x {}_x\hat{D}_{dA} = \frac{{}_xD_{dA}}{{}_xD_{\bar{d}}} \times \frac{{}_xD}{D} \times D_{\bar{d}}$$

estimate of hospitalizations with drug-related diagnosis and associated condition A

$$\hat{D}_{\bar{d}A} = \sum_x {}_x\hat{D}_{\bar{d}A} = \frac{{}_xD_{\bar{d}A}}{{}_xD_{\bar{d}}} \times \frac{{}_xD}{D} \times D_{\bar{d}}$$

estimate of hospitalizations without drug-related diagnosis and associated condition A.

The confidence intervals have been calculated using the log-normal distribution as:

$$CI_{95\%}(\ln RR) = \ln RR \pm 1{,}96 \ \ ES(\ln RR) \quad \text{where} \quad ES(\ln RR) = \sqrt{\frac{(1-\hat{p}_{dA})}{\hat{D}_{dA}} + \frac{(1-\hat{p}_{\bar{d}A})}{\hat{D}_{\bar{d}A}}}$$

Finally, the percentages of mention of each condition both in drug users and non-drug users have been calculated.

RESULTS

Main diagnosis approach

In Italy the number of hospitalizations for drug-related diagnosis has been steadily declining from 10,968 cases in 1999 to 6,180 in 2011. The decrease was sharp between 1999 and 2003, while afterwards it smoothed (Figure 1).

The crude hospitalization rate in the same period decreased from 19.3 to 10.3 per 100,000 residents.

The analysis of standardised hospitalization rates performed for the resident population shows the same trend from the highest value in 1999 (18.5 hospitalizations per 100,000 residents) to the most recent in 2011 (10.3).

Italian data shows that men present higher hospitalization rates than women, but the gender gap reduced over time: in 1999 men were admitted in a hospital 2.3 times more frequently than women, while in 2011 the gap was about 1.3.

In figure 2 standardised hospitalization rates per 100,000 residents confirm the differences by gender, with men showing higher hospitalization rates for drug diagnosis. In 1999 the standardised hospitalization rate was 25.7 per 100,000 residents for men and

11.2 for women. In 2011 the rates were respectively 12 and 8.5.

The trend is similar to that observed for the absolute number of hospitalizations, above all for males, while for females the hospitalizations for drug disorders slightly raised since 2006 onwards.

Higher hospitalization rates for drug disorders are observed in the age group 25-44 years in the all period of study (Figure 3). Until 2009 the age group 15-24 years was the second in the rank of hospitalization rates, but afterwards the 45-54 years hospitalization rates raised reaching similar values. The most relevant decrease is observed for the age group 25-44 years, while for ages 45 years and over an increase occurred since 2006 onwards; due to these trends, gaps among age groups reduced over time.

Concerning geographical differences, hospitalization rates for drug disorders are higher in Northern and Central Italy compared with Southern regions and Islands (Figure 4), but different trends are shown. In the South of Italy and in the Islands a smoothed decrease is observed during all the period of the study. In the other geographical areas hospitalization rates declined sharply before 2003, but afterwards the decline has slowed down. Since 2006 a significant increase regarded the North-West of Italy.

FIGURE 1

NUMBER OF HOSPITALIZATIONS FOR DRUG-RELATED DISORDERS IN ITALY. YEARS 1999-2011
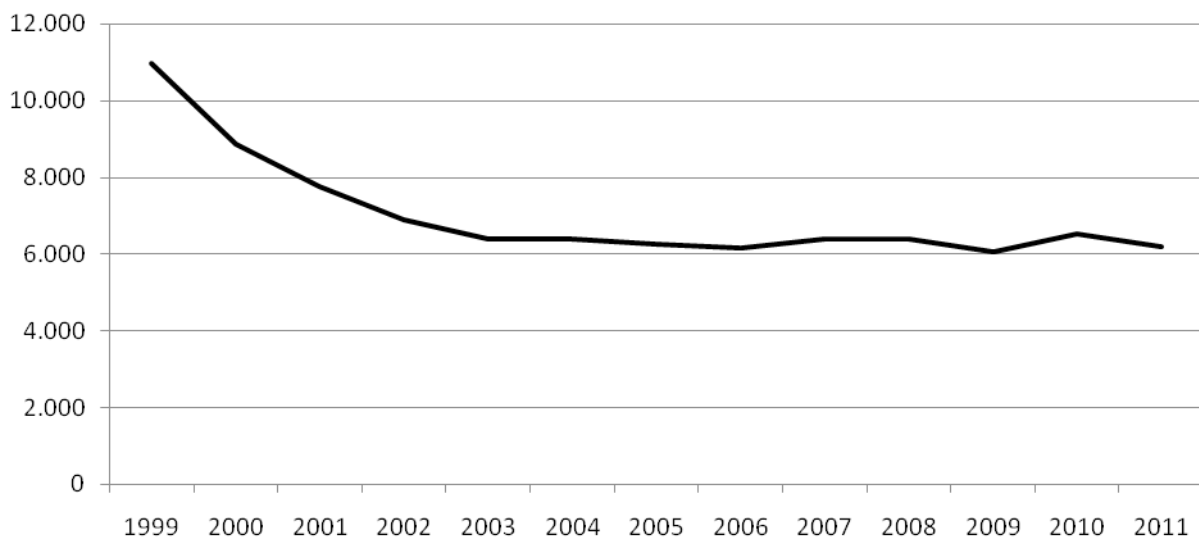
Sources: Istat elaboration on Ministry of Health data, Hospital Discharge Register

Comorbidity approach

Table 1 shows that in the period 2009-2011 the number of hospital discharges with mention of drug use or poisoning in at least one diagnosis is 45,379; this is 2.8 times higher than the number based only on the main diagnosis (16,422). Among age groups, this ratio (all diagnosis divided by main diagnosis) ranges from 2.2 for the group 55-64 years to 3.0 for 45-54 years. Gender differences are relevant as well: the value among men is 3.1 and in women 2.2. This result shows that there are gender differences in reporting the drug disorder as main diagnosis or as one of the secondary, reflecting the impact on health due to different style of drug consumption in men and women As observed for the main diagnosis and for all ages, the gender gap is confirmed also by the standardised hospitalization rates for the age group 15-64 years: considering the main diagnosis the standardised rate for men is 1.5 times higher than women (18.6 per 100,000 residents vs. 12.2, respectively), while for all diagnosis the ratio is 2.1 (51.6 vs. 24.7). These gender differences reduce with age and the female rate for the age group 55-64 years is even higher than the male rate.

Comparing the rates for drug-related hospitalizations referred to all diagnoses in two periods (2006-2008 and 2009-2011), we observe decreasing trends in both genders, with a greater decrease for men (-14.2%) than for women (-11.4%). The main diagnosis trend, instead, is decreasing for men (-14.3%) and increasing for women (+17.4%). This could be attributable to the progressive divergence in the pattern of substance use between men and women leading to a different recourse to the hospitalization. In fact, in the period of study, the propensity of women to be discharged for conditions directly due to drug use (reported as main diagnoses) has increased compared to the discharges due to other health problems with drug use reported as secondary diagnosis.

The analysis of the trend of the age specific rates for all diagnosis highlights that the decrease observed for the age group 15-64 years is due only to the reduction of hospitalizations for drug disorder of people aged 15-44 years (-18.4%), while an increase occurred for people aged 45-54 years (+4.1%) and 55-64 years (+10.1%).

Data by substance reported in table 2 show that in the hospital discharge records the type of substance is reported in the 64.3% of the cases, then for a large share of discharges it is not possible to know what kind of drugs determined the admission to the hospital.

In 2009-2011 the ranking of the hospitalizations by type of substance was almost the same of that observed in 2006-2008,
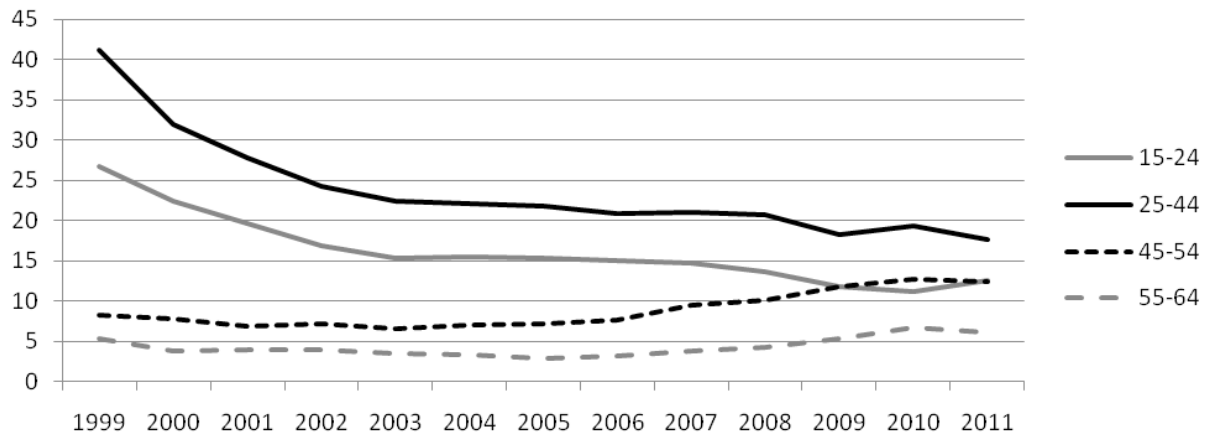
TRENDS IN HOSPITALIZATION FOR DRUG DISORDERS BY GENDER. RESIDENT POPULATION IN ITALY. YEARS 1999-2012. STANDARDISED HOSPITALIZATION RATES PER 100,000 RESIDENTS
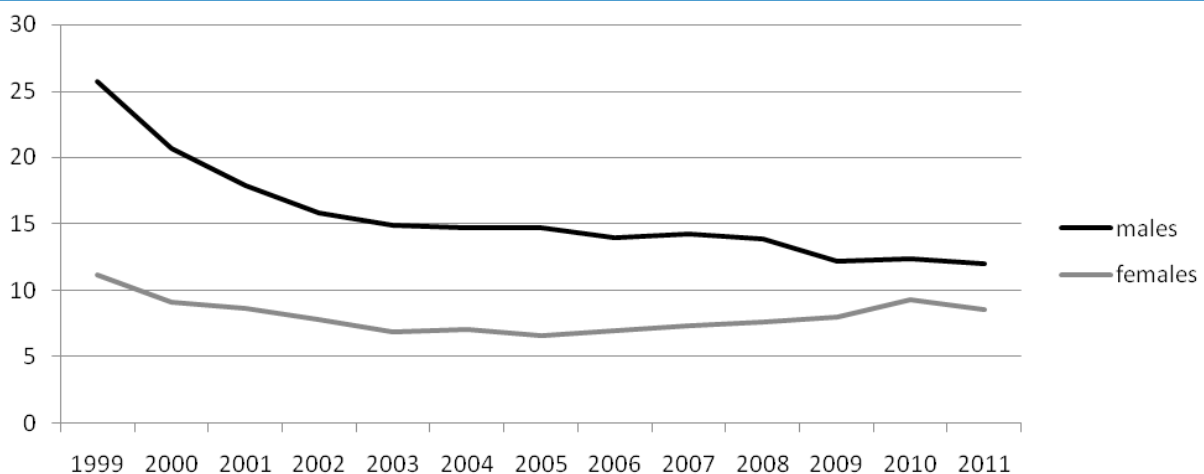
Sources: Istat elaboration on Ministry of Health data, Hospital Discharge Register

FIGURE 3

TRENDS IN HOSPITALIZATION FOR DRUG DISORDERS BY GEOGRAPHICAL AREA. RESIDENT POPULATION IN ITALY. YEARS 1999-2012. STANDARDISED HOSPITALIZATION RATES PER 100,000 RESIDENTS

Sources: Istat elaboration on Ministry of Health data, Hospital Discharge Register
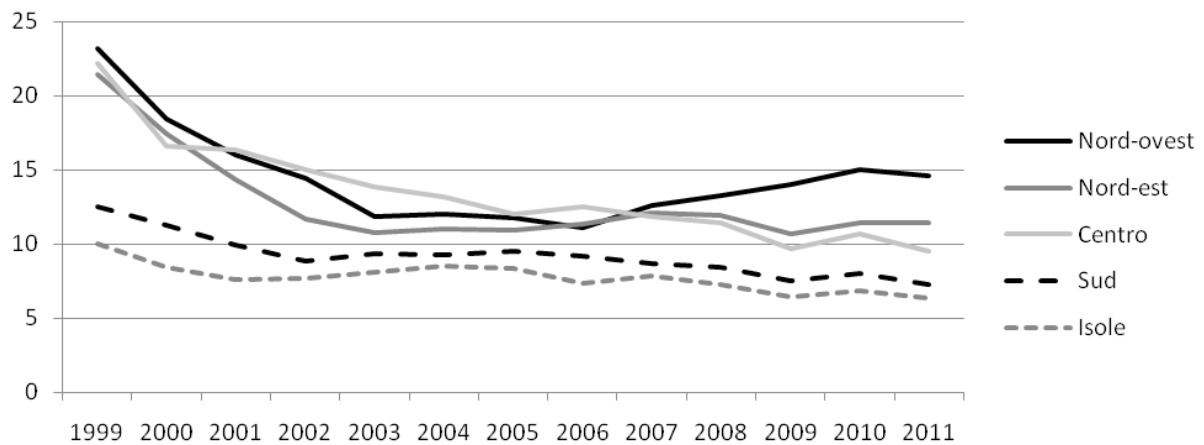
FIGURE 4

TRENDS IN HOSPITALIZATION FOR DRUG DISORDERS BY GEOGRAPHICAL AREA. RESIDENT POPULATION IN ITALY. YEARS 1999-2012. STANDARDISED HOSPITALIZATION RATES PER 100,000 RESIDENTS

Sources: Istat elaboration on Ministry of Health data, Hospital Discharge Register

with about 35% of discharges due to opioid type cases,17% to cocaine and the remaining 12% to cannabis and other psycho stimulant substances (it was 10.3% in 2006-2008).

When the type of substance is specified, the ratio between all diagnosis and main diagnosis is higher than that of whole hospitalization:: from 2.8 for the whole hospitalizations it raises to 3.9 for cocaine, to 4.1 for opium type substances and up to 8.2 for cannabis and other psychostimulants. Then cannabis consumption is frequently reported as secondary diagnosis.

The standardized hospitalization rates for all diagnosis are higher for opioid type cases, but a reduction of 20% occurred between 2006-2008 and 2009-2011. Also the hospitalization for cocaine consumption significantly reduced (-14.8%), while that for cannabis, amphetamine and other psychostimulant substances slightly raised (+2%).

For all the three groups of substances considered, the gender ratio between

TABLE 1

DRUG-RELATED HOSPITALIZATIONS IN SELECTED AGE GROUPS AS MAIN DIAGNOSIS AND MULTIPLE DIAGNOSIS. ABSOLUTE NUMBERS, CRUDE AND STANDARDISED RATES (PER 100,000). RESIDENT POPULATION IN ITALY. YEARS 2006-2008, 2009-2011

Age	Main diagnosis							All diagnosis							Rate All/Main	
	discharges		crude rate		standardized rate			discharges		crude rate		standardized rate				
	Males															
	2006-2008	2009-2011	2006-2008	2009-2011	2006-2008	2009-2011		2006-2008	2009-2011	2006-2008	2009-2011	2006-2008	2009-2011		2006-2008	2009-2011
15-44	9,923	7,781	27.4	21.9				29,336	23,140	80.9	65.1				3.0	3.0
45-54	1,199	1,584	9.9	12.2				5,266	6,123	43.7	47.0				4.4	3.9
55-64	285	466	2.7	4.3				1,015	1,400	9.7	12.9				3.6	3.0
Tot (15-64)	**11,407**	**9,831**	**19.4**	**16.6**	**21.7**	**18.6**		**35,617**	**30,663**	**60.6**	**51.6**	**66.7**	**57.3**		**3.1**	**3.1**
	Females															
15-44	3,911	4,020	11.1	11.5				11,385	9,471	32.2	27.2				2.9	2.4
45-54	1,023	1,681	8.3	12.6				3,359	3,604	27.3	27.0				3.3	2.1
55-64	526	890	4.8	7.7				1,638	1,641	14.8	14.3				3.1	1.8
Tot (15-64)	**5,460**	**6,591**	**9.3**	**11.0**	**10.4**	**12.2**		**16,382**	**14,716**	**27.9**	**24.7**	**30.8**	**27.2**		**3.0**	**2.2**
	Total															
15-44	13,834	11,801	19.3	16.8				40,721	32,611	56.8	46.3				2.9	2.8
45-54	2,222	3,265	9.1	12.4				8,625	9,727	35.4	36.8				3.9	3.0
55-64	811	1,356	3.8	6.1				2,653	3,041	12.4	13.6				3.3	2.2
Tot (15-64)	**16,867**	**16,422**	**14.4**	**13.8**	**16.1**	**15.4**		**51,999**	**45,379**	**44.2**	**38.1**	**48.9**	**42.3**		**3.1**	**2.8**

Sources: Istat elaboration on Ministry of Health data, Hospital Discharge Register

TABLE 2

DRUG-RELATED HOSPITALIZATIONS BY SUBSTANCE (DEPENDENCE, ABUSE AND POISONING) AS MAIN DIAGNOSIS AND MULTIPLE DIAGNOSIS. ABSOLUTE NUMBERS, CRUDE AND STANDARDISED RATES (PER 100,000). RESIDENT POPULATION IN ITALY. YEARS 2006-2008, 2009-2011

Substance dependence, abuse and poisoning (a)	Main diagnosis							All diagnosis							Ratio All/Main	
	discharges		crude rate		standardized rate			discharges		crude rate		standardized rate				
	Males															
	2006-2008	2009-2011	2006-2008	2009-2011	2006-2008	2009-2011		2006-2008	2009-2011	2006-2008	2009-2011	2006-2008	2009-2011		2006-2008	2009-2011
Opioid type (Heroin, Methadone, Opium, etc.)	3.660	2.968	6,23	5,00	6,92	5,57		15.232	12.126	25,92	20,41	28,02	22,12		4,2	4,1
Cocaine	2.190	1.662	3,73	2,80	4,18	3,16		7.392	6.227	12,58	10,48	14,00	11,76		3,4	3,7
Cannabis, Amphetamine and other psychostimulant	593	520	1,01	0,88	1,15	1,01		4.416	4.510	7,51	7,59	8,59	8,79		7,4	8,7
Tot (15-64)	**11.407**	**9.831**	**19,41**	**16,55**	**21,68**	**18,57**		**35.617**	**30.663**	**60,61**	**51,61**	**66,72**	**57,25**		**3,1**	**3,1**
	Females															
Opioid type (Heroin, Methadone, Opium, etc.)	1.023	923	1,74	1,55	1,99	1,80		4.541	3.782	7,73	6,33	8,57	7,09		4,4	4,1
Cocaine	505	331	0,86	0,55	0,99	0,66		1.738	1.576	2,96	2,64	3,38	3,07		3,4	4,8
Cannabis, Amphetamine and other psychostimulant	185	148	0,31	0,25	0,36	0,29		958	951	1,63	1,59	1,88	1,88		5,2	6,4
Tot (15-64)	**5.460**	**6.591**	**9,29**	**11,04**	**10,36**	**12,16**		**16.382**	**14.716**	**27,88**	**24,65**	**30,75**	**27,23**		**3,0**	**2,2**
	Total															
Opioid type (Heroin, Methadone, Opium, etc.)	4.683	3.891	3,98	3,27	4,47	3,69		19.773	15.908	16,82	13,35	18,34	14,61		4,2	4,1
Cocaine	2.695	1.993	2,29	1,67	2,60	1,92		9.130	7.803	7,77	6,55	8,72	7,43		3,4	3,9
Cannabis, Amphetamine and other psychostimulant	778	668	0,66	0,56	0,76	0,65		5.374	5.461	4,57	4,58	5,27	5,36		6,9	8,2
Tot (15-64)	**16.867**	**16.422**	**14,35**	**13,79**	**16,09**	**15,40**		**51.999**	**45.379**	**44,24**	**38,09**	**48,89**	**42,31**		**3,1**	**2,8**

(a) Excluded hospitalizations for dependence, abuse and poisoning by mixed or unspecified substances.

Sources: Istat elaboration on Ministry of Health data, Hospital Discharge Register

standardized hospitalization rates for all diagnoses is higher than the overall ratio: for all cases the male standardized rates are about twice higher than the female ones; this ratio rises to 3.1 for opium type discharges, to 3.8 for cocaine discharges and to 4.7 for cannabis and

TABLE 3

MEASURES OF ASSOCIATION OF CONDITIONS WITH DRUG-RELATED DISORDERS (DEFINED AS EMCDDA SELECTION B) MENTIONED ON THE HOSPITAL DISCHARGE RECORDS. AGE GROUP 15-64 YEARS. YEARS 2009-2011. (A)

ICD9CM code	Condition	Prevalence in hospitalizations for drug disorders	Prevalence in hospitalizations NOT for drug disorders	Age standardized RR	Inf95	sup95	Hospital discharge records with mention of the condition among hospitalizations for drug disorders	Hospital discharge records with mention of the condition among hospitalizations for drug disorders
	INFECTIOUS AND PARASITIC DISEASES (001-139)							
042	Human immunodeficiency virus [HIV] disease	7.77	0.53	13.08	12.63	13.53	3528	84891
070	Viral hepatitis	11.38	0.76	12.55	12.19	12.91	5162	122429
112	Candidiasis	1.51	0.10	15.11	13.98	16.34	684	15242
	MENTAL DISORDERS (290-319)							
295	Schizophrenic disorders	4.86	0.73	5.57	5.32	5.82	2204	116380
296	Affective psychoses	10.70	0.93	11.51	11.20	11.83	4854	148499
298	Other nonorganic psychoses	3.65	0.29	11.11	10.55	11.70	1656	45845
300	Neurotic disorders	7.75	0.87	11.42	11.10	11.74	3518	140218
301	Personality disorders	19.37	0.54	28.92	28.28	29.58	8790	86948
303	Alcohol dependence syndrome	8.31	0.33	21.81	21.08	22.57	3772	52699
307	Special symptoms or syndromes, not elsewhere classified	3.35	0.27	17.08	16.36	17.82	1520	43711
309	Adjustment reaction	1.63	0.13	12.81	11.91	13.77	741	20596
	DISEASES OF THE NERVOUS SYSTEM AND SENSE ORGANS (320-389)							
345	Epilepsy	1.68	0.63	2.57	2.39	2.76	762	101490
346	Migraine	12.78	0.19	100.07	97.91	102.27	5799	31077
	DISEASES OF THE CIRCULATORY SYSTEM (390-459)							
401	Essential hypertension	3.12	4.70	1.33	1.29	1.38	1417	754090
	DISEASES OF THE RESPIRATORY SYSTEM (460-519)							
486	Pneumonia, organism unspecified	1.00	0.26	3.84	3.50	4.21	456	41539
491	Chronic bronchitis	1.20	1.09	1.68	1.57	1.80	545	175185
518	Other diseases of lung	2.34	1.16	2.24	2.12	2.37	1062	186355
	DISEASES OF THE DIGESTIVE SYSTEM (520-579)							
571	Chronic liver disease and cirrhosis	6.27	1.90	3.35	3.23	3.47	2845	304529
	SYMPTOMS, SIGNS, AND ILL-DEFINED CONDITIONS (780-799)							
780	General symptoms	2.44	1.39	1.84	1.74	1.95	1107	222367
	INJURY AND POISONING (800-999)							
965	Poisoning by analgesics, antipyretics, and antirheumatics	2.31	0.01	313.35	288.93	339.84	1050	1225
969	Poisoning by psychotropic agents	1.38	0.05	28.02	25.79	30.45	627	7474
	SUPPLEMENTARY CLASSIFICATION OF FACTORS INFLUENCING HEALTH STATUS AND CONTACT WITH HEALTH SERVICES (V01-V82)							
V02	Carrier or suspected carrier of infectious diseases	1.12	0.18	5.76	5.25	6.31	510	28436

(a) Conditions reported in the table are those with a significant RR>=1 and a prevalence in drug user>=1%.

other psycho stimulant substances.

In table 3 the prevalence percentages of mention of each condition both in drug users and non-drug users are shown together with the age standardised relative risk (RR).

The conditions more strongly associated to the group of drug users are:

- conditions of mental disorders as personality disorders (RR=28.9, prevalence 19.4%), alcohol dependence syndrome (RR=21.8, prevalence 8.3%), affective psychoses (RR=11.5, prevalence 10.7%), neurotic disorders (RR=11.4, prevalence 7.7%), schizophrenic disorders (RR=5.6, prevalence 4.9%);
- conditions related to infectious diseases as candidiasis (RR=15.1, prevalence 1.5%), human immunodeficiency virus (HIV) disease[1] (RR=13.1, prevalence 7.8%), viral hepatitis (RR=12.6, prevalence 11.4%);
- conditions related to injuries and poisoning as poisoning by other central nervous system depressants and anesthetics (RR=512.9, prevalence 0.5%), poisoning by analgesics, antipyretics and antirheumatics (RR=313.3, prevalence 2.3%), poisoning by psychotropic agents (RR=28.0, prevalence 1.4%);
- other conditions as migraine (RR=100.1, prevalence 12.8%), pneumonia -organism unspecified- (RR=3.8, prevalence 1%), chronic liver disease and cirrhosis (RR=3.3, prevalence 6.3%), epilepsy (RR=2.6, prevalence 1.7%), other diseases of lung (RR=2.2 prevalence 2.3%),

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[1] Including AIDS cases because in the ICD-9CM there is no a specific code for AIDS.

chronic bronchitis (RR=1.7, prevalence 1.2%), essential hypertension (RR=1.3, prevalence 3.1%).

DISCUSSION

Theuse of psychotropic substances has serious health implications and a strong impact on the healthcare system. The medical treatment of drug addicted patients is delegated to outpatient care services and to hospital facilities.

This paper analyses the impact of drug use on the Italian hospital system, both describing time changes and the characteristics of hospitalizations. The number of hospitalizations for drug-related disorders sharply decreased over the past 13 years.The decline in hospitalizations may be only partly due to the increase of treatment of patients for drug-related disorders in the outpatient facilities, while more likely reflects the declining trend in the consumption of drugs in Italy, like in other European countries [3].

This reduction is mainly attributable to the decrease in hospitalizations for men, in younger age groups (15-44 years) and in the Centre-North of the country, that is, groups of people who in the late 90s had higher hospitalizations for drug disorders. On the contrary there is a slight increase in hospital admissions in recent years in women, between people of older age (45 years and over) and in the North-East of Italy.

In this study the use of all clinical information of the hospital discharge records has made it possible to provide a more realistic picture of the actual spread of the drug addiction in the Italian population and to investigate the relations between drug abuse and other diseases (comorbidity approach). The conditions more strongly associated to hospitalizations for drug abuse belong to the group of mental disorders, to injuries and poisoning and to infectious diseases. Other conditions as migraine, chronic liver disease and cirrhosis and epilepsy are relevant too.

Some limitations of the study are related to the data source used for the analysis.The possibility to register at last five secondary diagnoses could impact on the choice of diseases or conditions to report in the hospital discharge record.

The quality and completeness of the diagnosis in the hospital discharge record could varyamong different regions and among hospitals within the same region, with an impact on the comparability of data at territorial level.

The secondary diagnoses are those conditions that coexisted at the time of admission or that were developed during the treatment, with a relevance for the hospitalization episode. Therefore some diseases not relevant for the hospital treatment could be omitted and not reported. This implies that the results of the study can be related only to the comorbidity of hospital admissions and may differ from those of the entire population of drug users. Moreoveras not all drug abusers require hospitalization, those admitted in hospitals could be not representative of the whole population of drug addicted.

With regard to the source of the data, the hospital discharge record was introduced in 1995 to collect all the necessary information for the hospital financing system based on the number and type of hospital services provided classified according to the Diagnosis Related Group system (DRGs). The hospital discharge record is therefore a data source primarily created for administrative purposes. Its use for statistical purposes, and especially for epidemiological purposes, requires special caution.

However, after almost 20 years since the collection of hospital discharge data was started, the quality of the data source widely improved. The coverage is nearly 100% complete and it became highly reliable. Therefore the risks related to its use for epidemiological purposes reduced. This enabled us to perform a robust comorbidity analysis in the field of hospitalization for drug abuse. Hospital discharge record is currently the only health data source with national coverage that allows epidemiological analysis, alternative and complementary to those traditionally performed with mortality data. A major strength of our study is therefore the possibility to use high quality hospital drug-related discharge data as a valuable indicator of drug abuse and associated health conditions. These data can provide important information about the epidemiology of drug problems and the impact of drug policies.In addition the strong evidence of association of drug abuse and mental health provides a solid underpinning for planning more coordinated interventions of prevention and public health.

References

[1] United Nations Office on Drugs and Crime. World Drug Report 2012, New York.

[2] Dipartimento per le politiche antidroga. Relazione annuale al Parlamento 2013. Uso di so-stanze stupefacenti e tossicodipendenze in Italia. 2013.

[3] European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). European Drug Report; 2014.

[4] National Institute of Drug Abuse (NIDA). Comorbidity: Addiction and Other Mental Ill-nesses. Research Report Series 2010.

[5] Giordano GN, Ohlsson H, Kendler KS, Winkleby MA, Sundquist K, Sundquist J. Age, peri-od and cohort trends in drug abuse hospitalizations within the total Swedish population (1975–2010).Drug and Alcohol Dependence 2014; 134: 355– 361.

[6] Walley AY, Paasche-Orlow M, Lee EC, Forsythe S, Chetty VK, Mitchell S, Jack BW.Acute care hospital utilization among medical inpatients discharged with a substance use disorder diagno-sis. J AddictMed 2012 Mar; 6(1): 50-6.

[7] Ministero della Salute.Rapporto annuale sull'attività di ricovero ospedaliero 2013 available fromhttp://www.salute.gov.it/portale/temi/p2_6.jsp?lingua=italiano&id= 1237&area=ricoveriOspedalieri&menu=vuoto[accessed 22 September 2014].

[8] Istituto Nazionale di Statistica (Istat).I.Stat, Salute e sanità, Ricorso ai servizi sanitari, Ospedalizzazione per disturbi psichiciavailable fromhttp://dati.istat.it/[accessed 22 September 2014].

[9] National Institute of Drug Abuse (NIDA). Assessing drug abuse within and across commu-nities. Community Epidemiology Surveillance Networks on Drug Abuse. Second edition, 2006.

[10] Rice DP,Kelman S. Measuring,comorbidity and overlap in the hospitalization cost for alco-hol and drug abuse and mental illness. Inquiry, The Economics of Mental Health 1989; 26 (2): 249-260.

[11] Ministero della Salute. La classificazione delle malattie ICD9CM available from http://www.salute.gov.it/ricoveri-Ospedalieri/paginaMenuRicoveriOspedalieri.jsp?menu=clas sificazione&lingua=italiano[accessed 22 September 2014].

[12] European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). Methods and defi-nitions available from http://www.emcdda.europa.eu/stats07/DRD/meth-ods [accessed 22 September 2014].

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