Schizophrenia Research 110 (2009) 28–32

Contents lists available at ScienceDirect

Schizophrenia Research

journal homepage: www.elsevier.com/locate/schres

Epidemiological trends in psychosis-related Emergency Department visits in the United States, 1992–2001

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ARTICLE INFO

Article history:
Received 27 August 2008
Received in revised form 12 December 2008
Accepted 17 December 2008
Available online 20 March 2009

Keywords:
Psychosis
Epidemiology
Emergency Departments
NHAMCS
Mental health

ABSTRACT

Mental health visits represented an increasing fraction of all Emergency Department (ED) visits in the U.S. between 1992 and 2001. This study used the National Hospital Ambulatory Medical Care Survey, a 4-staged probability sample of ED visits from geographically diverse hospitals around the U.S., to assess the contribution of all psychosis-related visits to this overall trend. Unlike other mental-health-related ED visits, the rate of psychosis-related visits did not increase. This lack of change is notable in the context of dramatic changes in both healthcare financing and antipsychotic prescribing practices during this period. There was an unexpected decrease in Medicare-funded psychosis-related ED visits at a time of increasing Medicare enrollment overall. An important demographic trend over this decade was the increasing urbanization of psychosis-related ED visits coincident with a relative decrement in such visits within rural areas.

1. Introduction

Mental illness constitutes the second-largest disease burden in the United States (Hansen and Elliott, 1993). Changes in financing since 1990 have ushered in an era where treatment for these diseases is restricted, fragmented, managed, outpatient, and out-of-pocket: access remains an issue (Appelbaum, 2003; Lamb and Weinberger, 2005; New Freedom Commission on Mental Health, 2003).

A few population data characterize prevalence or trends in acute service utilization among patients with serious mental illness (SMI). The Healthcare for Communities Survey showed increased ED use by SMI patients, but the study was cross-sectional, of small sample size ($n = 170$) and lacked annual, population-based, longitudinal data (Mechanic and Bilder, 2004). The only nationally-representative study of trends in mental health services in the 1990s reported increased utilization (12% in 1990–92 to 20% in 2000–02) (Kessler et al., 2005), independent of both socio-demographic factors and illness severity. However, this survey lacked information about ED utilization for psychosis. Understanding ED utilization is important: In the U.S. only EDs provide this vulnerable population with guaranteed access to medical care (Centers for Medicare and Medicaid Services: *EMTALA*; Fields et al., 2001).

From 1992 to 2001 ED mental health visits increased overall (38%) (Larkin et al., 2005), as did visits for anxiety (Smith et al., 2008) and suicide attempts (Larkin et al., 2008). However, no studies have examined national trends in psychosis-related ED visits from 1992–2001. We sought to address this gap using a national probability sample.

2. Methods

Conducted annually, the National Hospital Ambulatory Medical Care Survey's (NHAMCS) ED component measures

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doi:10.1016/j.schres.2008.12.015

emergency health care utilization, employing a 4-stage probability sample of visits to U.S. non-institutional general and short-stay hospitals, excluding federal, military, and Veterans Affairs facilities (Ciompi, 1987; Cohen, 1993; Cohen et al., 2000, 1996; Cohen and Kochanowicz, 1989; Cohen and Talavera, 2000; Cohler and Beeler, 1996; Cohler and Ferrono, 1987). NHAMCS covers geographic primary sampling units (approximately 112), hospitals within primary sampling units (approximately 600 total), EDs within hospitals, and patients within EDs (http://www.cdc.gov/nchs/about/major/ahcd/ahcd1.htm). Data are collected by hospital staff during annual, randomly-assigned, 4-week periods, and coded using ICD-9-CM (International Classification of Diseases, 9th Revision, Clinical Modification, 1991).

ED visits from 1992–2001were categorized as mental-health-related if records met any of the three criteria:

1. Diagnosis-based psychiatric problems (ICD-9-CM diagnoses 290.0–305; 307–310; 311–319.0 or V-codes 61.1–71.02);
2. NCHS-assigned Patient Reason-for-Visit Classification codes related to mental health (79), 1100.0–1199.9; or
3. Injury E-codes related to suicide/suicide attempts, E950.0–E959.9.

Visits not meeting at least one of the above criteria were deemed non-mental-health visits. ICD-9-CM codes 290–319 were excluded if they lacked corresponding DSM-based diagnoses.

Psychotic disorder-related visits were assigned specific DSM-compatible categories: ICD 9 CM: 295–295.9 (Schizophrenia), 297.3 (*Folie á deux*), 298.8 (Brief Psychotic Disorder), 298.9 (Atypical Psychosis, or Psychosis NOS), and the non-DSM-based code used by the National Center for Health Statistics (NCHS) to describe reasons-for-visit 1155.0 (delusions or hallucinations).

Absolute numbers of ED visits were estimated using census-based, NCHS-assigned patient weights. ED visit rates per-population were calculated using denominator estimates of the civilian, non-institutionalized US population, adjusted for under-enumeration (Census U Bot).

We analyzed cases by age, sex, race/ethnicity, insurance status, location in a metropolitan statistical area (MSA), and region of the country. We report only estimates with a relative standard error less than 30% and more than 29 raw data records per cell (Hing et al., 2003; McCaig, 2004). Confidence intervals (95%CI) for visit rates were calculated using the relative standard error of the estimate, controlling for weighting, four-stage sampling, and cluster effects using generalized estimating equations from SUDAAN-8.0 (Research Triangle Park, NC). "Least squares" linear regression was used for trend analysis (STATA 7.0, StataCorp, College Station, TX). Differences in continuous variables were assessed using two-tailed independent samples *t*-tests or repeated measures ANOVA. Bonferroni corrections ($p<0.01$) were used to adjust for multiple comparisons between groups.

Table 1
Average rates for all mental health-related ED visits (MHRV) and psychosis-related ED visits.

	All mental health related visits (MHRV)				All psychosis visits	
Total number estimated in 1000's (N_{est}); 95% confidence interval (CI)	N_{est} = 52,774; 95%CI = 49,676, 55,872				N_{est} = 5245; 95% CI = 4577, 5913	
Mean age (SE) years	39.5 (0.2) years				45.0 (0.7) years	
	N (actual sampled visits)	%	/1000 ED visits	Rate per 1000 US population (95% CI)	Rate per 1000 US population (95% CI)	% of MHRV
Overall	16,774	100	54.2	19.7(18.6,20.9)	2.0(1.7,2.2)	10.0
<15 years old	1451	8.7	21.6	8.1(7.1,9.1)	0.2(0.1,0.3)	2.5
15–29 years old	3951	23.6	51.8	21.6(19.7,23.4)	1.8(1.2,2.4)	8.3
30–49 years old	7212	43	81.7	26.4(24.4,28.3)	2.9(2.4,3.4)	10.9
50–69 years old	2411	14.4	58.1	16.5(14.8,18.1)	1.8(1.3,2.3)	10.9
70+ years old	1749	4.4	54.1	25.6(23.0,28.2)	3.6(2.5,4.6)	14.1
Female	8164	48.7	52.1	19.5(18.2,20.8)	1.8(1.5,2.1)	9.2
Male	8610	51.3	56.5	19.9(18.6,21.3)	2.2(1.8,2.5)	11.0
White, non-Hispanic	10,346	61.7	69.2	18.6(17.4,19.8)	1.7(1.4,2.0)	9.1
Black, non-Hispanic	3862	23	65.5	31.2(27.4,34.9)	4.2(3.2,5.2)	13.5
Hispanic (All)	1990	11.9	56.2	17.6(15.6,19.5)	1.3(0.8,1.8)	7.4
Other, non-Hispanic	576	3.4	64.5	12.0(9.4, 14.6)	1.5(0.4,2.6)	12.5
Northeast U.S. region	5502	32.8	66.4	24.6(22.5,26.7)	2.5(1.9,3.0)	10.2
Midwest U.S. region	3473	20.7	50.4	20.7(18.9,22.6)	2.4(1.8,2.9)	11.6
Southern U.S. Region	4368	26	47	17.4(16.1,18.7)	1.7(1.3,2.1)	9.8
Western U.S. Region	3431	20.5	60.5	18.1(16.6,19.7)	1.6(1.1,2.0)	8.8
Metropolitan EDs	14,850	88.5	55.7	19.7(18.5,20.9)	2.1(1.8,2.4)	10.7
Non-metropolitan EDs	1924	11.5	48.9	19.8(18.1,21.6)	1.6(1.1,2.0)	8.1

	N (actual sampled visits)	Sample % (unweighted)	Population-based % of MHRV	% of psychosis visits
Insurance status				
Private	4552	27.1%	29(27,30)%	15(10,19)%
Medicare	2758	21.8%	17(16,19)%	30(26,35)%
Medicaid	3657	21.8%	20(19,21)%	24(18,30)%
Self-pay	3747	20.7%	21(19,22)%	15(12,20)%
Other	2333	13.9%	13(12,15)%	16(10,20)%
Injury/poisoning visit	2726	16.3%	30(29,32)%	18(13,23)%