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Medicare Inpatient Treatment for Elderly Non-dementia Psychiatric Illnesses 1992–2002; Length of Stay and Expenditures by Facility Type

Donald R. Hoover,

Center for Health Services Research on Pharmacotherapy, Chronic Disease Management, and Outcomes, Institute for Health, Health Care Policy and Aging Research (IHHCPAR) at Rutgers, The State University of New Jersey, 30 College Avenue, New Brunswick, NJ 08901, USA
drhoover@stat.rutgers.edu

Department of Statistics and Biostatistics at Rutgers, The State University of New Jersey, New Brunswick, USA

Ayşe Akincigil,

Center for Health Services Research on Pharmacotherapy, Chronic Disease Management, and Outcomes, Institute for Health, Health Care Policy and Aging Research (IHHCPAR) at Rutgers, The State University of New Jersey, 30 College Avenue, New Brunswick, NJ 08901, USA

Prince School of Social Work at Rutgers, The State University of New Jersey, 536 George Street, New Brunswick, NJ 08901, USA aakinci@rci.rutgers.edu

Jonathan D. Prince,

Center for Health Services Research on Pharmacotherapy, Chronic Disease Management, and Outcomes, Institute for Health, Health Care Policy and Aging Research (IHHCPAR) at Rutgers, The State University of New Jersey, 30 College Avenue, New Brunswick, NJ 08901, USA

Prince School of Social Work at Rutgers, The State University of New Jersey, 536 George Street, New Brunswick, NJ 08901, USA

Ece Kalay,

Center for Health Services Research on Pharmacotherapy, Chronic Disease Management, and Outcomes, Institute for Health, Health Care Policy and Aging Research (IHHCPAR) at Rutgers, The State University of New Jersey, 30 College Avenue, New Brunswick, NJ 08901, USA
ekalay@ifh.rutgers.edu

Judith A. Lucas,

Center for Health Services Research on Pharmacotherapy, Chronic Disease Management, and Outcomes, Institute for Health, Health Care Policy and Aging Research (IHHCPAR) at Rutgers, The State University of New Jersey, 30 College Avenue, New Brunswick, NJ 08901, USA
jlucas@ifh.rutgers.edu

James T. Walkup, and

Center for Health Services Research on Pharmacotherapy, Chronic Disease Management, and Outcomes, Institute for Health, Health Care Policy and Aging Research (IHHCPAR) at Rutgers, The State University of New Jersey, 30 College Avenue, New Brunswick, NJ 08901, USA

Graduate School of Applied and Professional Psychology at Rutgers University, The State University of New Jersey, 152 Frelinghuysen Road, Piscataway, NJ 08854, USA
walkup@rci.rutgers.edu

Stephen Crystal

Center for Health Services Research on Pharmacotherapy, Chronic Disease Management, and Outcomes, Institute for Health, Health Care Policy and Aging Research (IHHCPAR) at Rutgers, The State University of New Jersey, 30 College Avenue, New Brunswick, NJ 08901, USA
scrystal@rci.rutgers.edu

Abstract

We summarize Medicare utilization and payment for inpatient treatment of non-dementia psychiatric illnesses (NDPI) among the elderly during 1992 and 2002. From 1992 to 2002, overall mean Medicare expenditures per elderly NDPI inpatient stay declined by \$2,254 (in 2002 dollars) and covered days by 2.8. However, these changes are complicated by expanded use of skilled nursing facilities and hospital psychiatric units, and decreased use of long-stay hospitals and general hospital beds. This suggests that inpatient treatment for NDPI is shifting into less expensive settings which may reflect cost-cutting strategies, preferences for less restrictive settings, and outpatient treatment advances.

Keywords

Non-dementia psychiatric illnesses; Inpatient care; Expenditures; Length of stay; Elderly

Introduction

Medicare Part A is the primary payer for elderly inpatient care, including psychiatric care, for dementia based illnesses and for other psychiatric conditions, such as major depression, bipolar disorder, schizophrenia, and substance abuse. Medicare is thus largely responsible for policies to maintain quality of inpatient health care for these conditions among the elderly while containing costs. Since hospitalization for dementia raises separate issues than those associated with non-dementia mental illnesses, this paper focuses on psychiatric illnesses excluding dementias (and mental retardation) which we now refer to as “nondementia psychiatric illnesses” or NDPIs. Medicare's policies on reimbursement of inpatient care for nondementia psychiatric illnesses (NDPIs) differ from Medicare's policies for other medical conditions including organic psychiatric conditions/dementias. As NDPIs are common in the elderly (Bartels 2003), with some estimates for prevalence of major depression alone being close to 20% (Blazer 2003), it is increasingly important to consider these in structuring and funding medical and mental health services for this vulnerable population.

Inpatient care accounts for most mental health expenditures (Mechanic et al. 1998) and the elderly account for large portions of inpatient mental health care including 45% of discharges and 53% of Medicare expenditures in 1995, a substantial portion of which is for NDPI (Cano et al. 1997). From 1988 to 1994, the portion of psychiatric hospital days of care devoted to NDPI increased from 31% to 41% (Mechanic et al. 1998). Although very burdensome, NDPIs including major depression, bipolar illness, schizophrenia, and substance abuse are underdiagnosed and undertreated among the elderly (NIH Consensus 1992; Crystal et al. 2003).

Inpatient psychiatric care covered by Medicare Part A for NDPIs is provided in four institutional facility settings: (1) *General Hospital (or scatter) beds*—Medical/surgical units within general hospitals which primarily service non-psychiatric patients; (2) *Psychiatric units*—Distinct units within general hospitals staffed specifically to care for patients with psychiatric

disorders; (3) *Long-stay hospitals*—Separate specialized hospitals treating patients with psychiatric disorders; and (4) *Skilled nursing facilities* (SNFs)—caring for patients who need specialized post-acute/rehabilitative psychiatric and nursing care. While formal guidelines for which type of facility should treat a given patient do not exist, *long-stay hospitals* and *psychiatric units* of general hospitals serve patients needing more specialized and intense psychiatric care, *general hospital* beds are for persons requiring less intensive psychiatric care and/or having medical conditions that need non-psychiatric medical expertise, and *SNFs* under Medicare Part-A serve persons short-term who also need post-acute skilled nursing and rehabilitative services.

Medicare uses different reimbursement policies for NDPI care according to the facility type where care is given, and changes in Medicare policies have not been implemented uniformly across facility types (Lave 2003). There is a 190-day lifetime cap and a 100-day annual cap on Medicare reimbursement for NDPI hospitalization at long-stay hospitals and SNFs, but not for general hospital scatter beds or psychiatric units (Health Care Financing Administration 1997). In order for Medicare to cover NDPI treatment at a SNF, a patient must have a three-day (or longer) hospitalization (usually within 30 days prior to admission to the SNF) which typically cannot be at a psychiatric hospital. Specific justification must also be given on why the patient needs treatment at a SNF.

In 1983, Medicare began implementing prospective payment systems (PPS) to reimburse inpatient care. These systems predetermine payment amounts in advance based on diagnoses, patient classification and other criteria (Lave 2003). However, PPS was implemented at different times for different facility types. Initially, PPS systems were applied only to general hospital beds. Reimbursement for SNF psychiatric care was moved to PPS from 1997 to 1999. Finally, the Balanced Budget Refinement Act of 1999 mandated PPS reimbursement for care in long-stay psychiatric hospitals and psychiatric units of general hospitals; this change should be fully enacted by 2008 (Lave 2003).

Besides Medicare policy, other pressures to reduce number and duration of NDPI stays exist. Beginning in the late 1950s, public long-stay mental hospitals reduced resident populations with many being transferred to SNFs (Mechanic and McAlpine 2000). But the 1987 Omnibus Reconciliation Act of 1987 (OBRA 1987) limited admissions of persons with psychiatric illnesses into SNFs. Managed care, which aims to decrease medical expenditures including inpatient care, emerged in the 1980s (Mechanic et al. 1998; Lave 2003). Today, most behavioral health care in the United States is reimbursed by managed behavioral health care organizations which have achieved sizable decreases in behavioral inpatient care spending by reducing payments, admissions, and lengths-of-stay (Frank and Lave 2003). Although most Medicare beneficiaries continue to receive care under fee-for-service arrangements, the impact of managed care on mental health care practice is so pervasive that it may spill over onto treatment patterns for patients who are not in managed care plans (Baker 2003).

Psychiatric treatment advances in the 1990s including new drugs, partial hospitalization, residential facilities, and other treatment philosophy changes may independently act to reduce need for and duration of inpatient care for nondementia psychiatric illnesses (Frank and Glied 2006; Huskamp 2006). But as adequate recognition and treatment of psychiatric disorders gains greater credibility and public support (Mechanic et al. 1998), the numbers and duration of inpatient stays for NDPI might otherwise be expected to increase.

Large reductions in inpatient length of stay and costs for elderly adults with psychiatric illness (NDPI as well as dementias) occurred during the early 1990s (Semke et al. 1996)—a general trend also apparent among the non-elderly (Mechanic et al. 1998; Bao and Sturm 2001; Fleming et al. 2003). For example, the average length-of-stay for hospital inpatient mental health care

(NDPI and dementias combined) reported to the National Association of Psychiatric Health Systems declined from 25.6 days in 1990 to 10 days in 2000 (National Association of Psychiatric Health Systems 2002) with declines in length of stay occurring in general hospital beds, psychiatric units and long-stay psychiatric hospitals (Mechanic et al. 1998). But this was accompanied by some increase in mental health admissions. Looking at all ages and payers combined, hospital discharges with mental illness (both NDPI and dementias) as a primary diagnosis increased from 1.4 to 1.9 million from 1988 to 1994, with most of this increase being in private non-profit hospitals and some decline in public hospitals (Mechanic et al. 1998). Over roughly the same period (1985–1995), numbers of SNF residents with depression increased while numbers with schizophrenia declined (Mechanic and McAlpine 2000).

This paper examines recent trends in non-dementia psychiatric inpatient care in the elderly, using person-level data on inpatient stays reported to Medicare from the Medicare Provider Analysis and Review (MEDPAR) files produced by the Centers for Medicare and Medicaid Services (CMS). Use of this data source provides detailed and precise information on evolving patterns of inpatient care, including trends across various facility types. Of particular interest here is whether previously reported declines in Medicare admissions and expenditures for elderly NDPI inpatient care continued into the 2000s, and whether these declines were differentiated by facility type and ownership.

Methods

Inpatient Stay Data

Inpatient stay data were obtained from the 1992 and 2002 MEDPAR inpatient and denominator files which summarize Medicare claims submitted to CMS for all admissions to acute care and long-stay hospitals and to SNFs during a calendar year (1992 or 2002). While hospitalizations include only completed stays discharged during the same calendar year, SNF stays include both completed and ongoing stays as discharge dates from SNFs are not always known. From here on, these inpatient care episodes are collectively denoted as “stays”. Only stays with an International Classification of Diseases-9th Revision-Clinical Modification (ICD-9-CM) primary diagnosis of a nondementia psychiatric illness at discharge (as described below) were included in this analysis. While this excludes patients that have NDPI only as a secondary diagnosis, the NDPI disorder in such patients ostensibly plays a smaller role in the inpatient stay than does their primary diagnosis. Elderly enrolled in health maintenance organizations (HMOs) were excluded from these analyses as HMOs typically do not submit claims to Medicare for hospital services. In 1992 and 2002, these individuals constituted about 7% and 14% of all elderly Medicare beneficiaries, respectively. Only those enrolled in Medicare Part-A throughout the year (or until death) were included.

Patient Illness and Stay Characteristics

For each inpatient stay, MEDPAR files provide patient demographics (age, sex, and race); admission dates; and primary plus up to 10 ICD-9-CM codes of secondary discharge diagnoses. Non-dementia psychiatric diagnoses were grouped into the following 5 categories using ICD-9-CM codes: *Depression* (296.2, 296.3, 298.0, 300.4, 309.0, 309.1, and all 311s), *Schizophrenia* (all 295s), *Bipolar disorder* (296.0, 296.1, 296.4, 296.5, 296.6, 296.7, 296.8), *Substance abuse* (drug, alcohol, or nondependent; all 291s except 291.2, all 292s, 303s, 304s, and 305s), and *Other* (293.0, 293.1, 293.9, 296, 296.9, 297, 297.0, 297.1, 297.2, 297.3, 297.8, 297.9, 298, 298.1, 298.2, 298.3, 298.4, 298.8, 298.9, all 299s, all 300s except 300.4, all 301s except 301.83, all 302s, all 306s, all 307s, all 308s, all 309s except 309.0, 309.1, all 310s, all 312s, all 313s, all 314s, all 315s, all 316s). We also noted when stays had at least one secondary diagnosis that was not an NDPI.

Amounts that Medicare paid for inpatient stays (including pass through charges for technology acquisition, education, etc.) were calculated using interim payments which represent the best payment estimates by fiscal intermediaries before a final settlement. This most likely underestimates final payments for two reasons. First, non-PPS reimbursed facilities receive bonus payments when their costs fall under specified target amounts. Second, many hospitals obtain exemption payments after their cost reports are settled. Beneficiary payments were calculated as the sum of out of pocket (cf. deductible expenses and co-insurance payments). We adjusted 1992 expenditures to 2002 dollars using the medical care consumer price index to identify real changes rather than inflation. The number of Medicare covered days (including for SNFs even when the date of discharge was not known) was also known and recorded.

Facility Characteristics

Treatment facility was classified as *general hospital* (regular “scatter” bed in a general hospital), *psychiatric unit* of general hospital, *long-stay* (i.e., psychiatric) *hospital* and *SNF* (including SNF swing units in hospitals, although this involves very few stays). The type of ownership or fiduciary control of the facility was obtained from the merged 1992 and 2002 Provider of Service (POS) files and classified as *for-profit* organization, *non-profit* organization or government (federal, state or local).

Data Presentation and Analysis

Numbers of stays and means of continuous variables, such as length of stay, are reported. To calculate rates of elderly inpatient stays for NDPI, the MEDPAR denominator file (including persons 65 years and older as of January 1st of the respective year who were enrolled in Medicare Part-A throughout the year or until death if they died during the year, and had no HMO coverage during the year) was used. *P*-values are not reported as this is a population-based analysis. Due to the large sample sizes, however, most differences are significant at $P \leq 0.001$.

Results

The inclusion criteria yielded 27,733,310 beneficiaries aged 65 years and older in 1992 and 28,510,520 in 2002. Table 1 summarizes elderly inpatient stays with a primary NDPI diagnosis by facility type and ownership. The number of these stays fell from 193,962 in 1992 to 183,505 in 2002, which corresponds to a decline from 699 stays per 100,000 eligible Medicare beneficiaries 65 years or older in 1992 to 644 stays per 100,000 in 2002. The number of different facilities having at least one inpatient stay from an eligible beneficiary rose from 10,684 in 1992 to 13,112 in 2002, due to an increase in number of SNF facilities from 3,931 in 1992 to 6,896 in 2002.

During the same period, the total number of elderly NDPI stays in SNFs rose from 8,542 to 17,312 (mostly due to increased use of for profit owned SNFs). This corresponds to an average of only ~2 stays per SNF facility during these years. Large portions of all inpatient NDPI stays were in psychiatric units of general hospitals; 41.7% (on average 62.7 stays per facility having at least one stay) in 1992 rising to 51.7% (on average 67.3 stays per facility having at least one stay) in 2002. From 1992 to 2002, the portion of all elderly NDPI stays in general hospital beds declined from 34.5% to 27.4% and in long-stay units declined from 19.5 to 11.3% (mostly due to decreased use of for profit owned long-stay hospitals), while the mean number of stays (per facility having at least one stay) for long-stay hospitals declined from 51.5 to 21.6.

Looking at all elderly NDPI stays combined, from 1992 to 2002, mean ($\pm$ standard error of mean) Medicare charges per stay (in 2002 dollars) declined from \$8,461 ($\pm$ \$31) to \$6,207 ($\pm$ \$21) (Table 1) and mean charges to beneficiaries declined from \$955 ($\pm$ \$4.5) to \$692 ($\pm$ \$3.2)

(data not shown). During this same time period, for all stays collectively, mean numbers of Medicare covered days per stay declined from 14.9 (± 0.03) to 12.1 (± 0.03). In general, comparable declines in mean Medicare expenditures, covered days and beneficiary expenditures occurred from 1992 to 2002 in long-stay hospitals, psychiatric units and general hospital beds. But for SNFs, from 1992 to 2002, mean Medicare covered days remained stable around 26 per stay while mean Medicare covered costs rose from \$4,153 to \$6,375.

In 2002 Medicare covered on average the least mean days per elderly NDPI stay (5.5 days) for general hospitals and comparable mean days per stay for long-stay hospitals (14.1) and psychiatric units (12.5). Similarly, in 2002 mean Medicare expenditures for general hospital bed stays (\$3,770) were about half the mean Medicare expenditures for long-stay hospitals (\$6,482) and psychiatric units (\$7,462). In 1992 and 2002, elderly beneficiaries in SNFs were charged on average \$1,916 and \$1,490 per NDPI stay, respectively, while other facilities charged these elderly on average \$788–\$1,017 in 1992 and \$565–\$797 in 2002 (data not shown).

There were some relatively minor changes in the distribution of primary diagnoses associated with elderly NDPI stays from 1992 to 2002 (Table 2). Major depression dropped from 40.4% of all such stays in 1992 to 37.4% in 2002, while substance abuse dropped from 14.5 to 13.4%, bipolar illness rose from 9.2% to 10.9%, schizophrenia rose from 8.2 to 10.6%, and “other conditions” held constant at 27.7% during this period. The biggest disparity in the distribution of NDPI diagnoses by facility type was seen between SNFs and other facilities: for 65% of SNF stays in 1992 and for 48% in 2002, the primary diagnosis was of “other NDPI condition” whereas only ~26% of primary diagnoses fell in this category for stays at all other facilities combined during these years (data not shown). In general, in 1992 and 2002, stays for primary diagnoses of schizophrenia, bipolar disorder and depression were associated with higher Medicare charges and more covered days than were stays for substance abuse and “other” diagnoses. But mean Medicare costs and covered days per stay declined for all diagnoses from 1992 to 2002. In 2002, schizophrenia stays were associated with the greatest mean Medicare charges and days (\$7,793 and 16.2 days, respectively), and substance abuse stays with the least (\$3,786 and 6.7 days, respectively).

We further analyzed 1992 and 2002 reimbursement of elderly NDPI inpatient stays by both primary diagnosis and facility type (data not shown). In general, for each NDPI primary diagnosis stay, Medicare covered the most number of days in SNFs (mean always > 20 days) and the least days (mean usually < 10) in general hospital scatter beds. Between 1992 and 2002, for all primary NDPI diagnoses at SNFs, mean Medicare covered costs per stay increased, while mean beneficiary charges decreased and mean Medicare covered days remained relatively stable. During this same time period, for elderly stays at long-stay hospitals, acute psychiatric units and general hospital beds; mean Medicare costs, Medicare covered days and beneficiary charges per stay tended to decline for all NDPI primary diagnoses.

Table 3 describes characteristics of elderly NDPI stays by gender, race, age group and non-NDPI secondary diagnoses. From 1992 to 2002, the portion of elderly NDPI stays from patients aged 65 to 74 declined from 54.1 to 46.8% while those from patients 85 or older rose from 10.6% to 14.9%. In both 1992 and 2002, NDPI stays in SNFs as compared to stays in other institutions tended to involve relatively older patients. Nevertheless, SNF stays in 2002 were by patients who tended to be somewhat younger than the NDPI patients seen in SNFs in 1992. From 1992 to 2002, the portion of SNF stays with a primary NDPI diagnosis involving patients aged 65–74 increased from 22.8 to 26.5%, and the portion involving patients aged 85+ declined from 32.1 to 29.6%.

Overall, the portion of elderly NDPI stays from White patients declined from ~89% in 1992 to ~87% in 2002 as the portion from Black patients rose from ~7 to ~9%, with similar changes seen across all facility types. Qualitatively, both overall and within facilities, Medicare covered days and charges per stay did not differ dramatically or consistently by racial group. Overall, in both 1992 and 2002, (a) about 65% of the elderly inpatient NPDI stays were by women and stays by women entailed on average about 2 more covered Medicare days and \$1,000 more Medicare expenditures than did stays by men, and (b) psychiatric units, which overall had the highest mean costs and duration per stay, had the greatest gender disparity with close to 70% of stays being by women, while general hospital scatter beds, which overall had low mean costs and duration per stay, had the least gender disparity with 58.5% of stays being by women.

From 1992 to 2002, the portion of NDPI stays with non-NDPI secondary diagnoses noted rose from 45.8 to 66.3%. While SNFs had high proportions of stays for which secondary illnesses were reported (75% or more) in both 1992 and 2002, the proportion of such stays increased to a similar level in 2002 in both general hospital scatter beds and general hospital psychiatric units. Overall (all facility types combined), elderly NDPI stays with secondary diagnoses were not linked to greater Medicare expenditures at either time point, and in fact had fewer Medicare covered days than did those without secondary conditions. When comparing stays within each facility type, there were no consistent or dramatic associations linking stays with secondary diagnoses to differential amounts of Medicare expenditures or of covered days. Despite the high rate at which they tended to have secondary diagnoses noted, stays in general hospital beds and SNFs had lower Medicare expenditures and involved fewer covered days than did stays in the other two, more psychiatrically specialized facility types.

Discussion

We evaluated recent changes in Medicare inpatient stays for the elderly with primary non-dementia psychiatric diagnoses in light of continuing financial and regulatory pressures to influence the provision of such care. There were small declines in the number of elderly inpatient stays with a primary NPDI illness from 699 stays per 100,000 eligible beneficiaries in 1992 down to 644 stays per 100,000 beneficiaries in 2002. The overall mean number of Medicare covered days and Medicare expenditures (in 2002 dollars) per elderly NDPI inpatient stay dropped from 14.9 days and \$8,461 in 1992 to 12.1 days and \$6,207, respectively, in 2002. The mean amount paid by beneficiaries per stay also declined from \$955 in 1992 to \$692 in 2002.

This pattern for NDPI is consistent with continuation of overall declines in treatment, payment and length of stays previously reported for all psychiatric illnesses (Semke et al. 1996; Mechanic et al. 1998; Mechanic and McAlpine 2000; Bao and Sturm 2001; Fleming et al. 2003), with perhaps some slowing of the pace of these declines in the late 1990s. It is difficult to put these declines in the context of changing demand for treatment of NDPIs, since information on use of outpatient treatment for the elderly is limited. However, during about the same time period (1992–2002), others have observed that general population levels of elderly NDPI illness have remained roughly the same, but there have been large (up to 3-fold) increases in use of outpatient psychiatric services and medications (Crystal et al. 2003; Harman et al. 2003; Olsson et al. 2004; Kessler et al. 2005), perhaps suggesting some impact of these alternatives in reducing inpatient psychiatric care.

But the overall, 1992–2002 changes in inpatient care for NDPIs in the elderly subsume different patterns across the four types of facilities treating psychiatric inpatients. Consistent with other studies (Cano and Hennessy 1997; Ettner and Herman 1998) we observed that general hospital beds received only about half the amount of Medicare reimbursement (and in 2002 had less than half the covered days) per elderly NDPI stay than did psychiatric units and long-stay

hospitals. However, skilled nursing facilities had the largest number of mean Medicare covered days per stay (~26 in both 1992 & 2002) but on average received less Medicare dollars per stay than did psychiatric units and long-stay hospitals. Contrary to declining Medicare reimbursement from 1992 to 2002 at the other three facility types, mean Medicare reimbursements to SNFs per elderly NDPI stay increased by about \$2,000 from 1992 to 2002.

Despite Medicare restrictions (OBRA 1987) on inpatient care in SNFs and some overall declines in psychiatric populations in SNFs during the 1990s (Mechanic and McAlpine 2000), we observed a significant increase in the total number of elderly NDPI stays in SNFs (8,542–17,312) from 1992 to 2002. This expansion of Medicare NDPI inpatient stays and reimbursement in SNFs could reflect improved ability of SNF facilities to obtain Medicare reimbursement in general. In 1987, only about half of all nursing facilities were certified for Medicare, but by 1999, 90% of nursing home beds were certified for Medicare (Rhoades and Krauss 1999; Harrington et al. 2006). The general consensus is that Medicare reimbursed residents are associated with higher profit margins relative to Medicaid and this has promoted Medicare SNF bed growth (Miller and Mor 2006). Future studies on changes in the numbers of hospital and SNF stays associated with other types of primary diagnoses could identify whether similar expansion of SNF use occurred for other illnesses over the same general time period. Still our data may underestimate NDPI care in SNFs. As the OBRA-1987 restricts inpatient NDPI care in SNFs, there may be low compliance with state Preadmission Screening and Resident Review Programs (PASSR; OBRA restrictions) as was recently reported (Linkins et al. 2006), and underreporting of SNF treatment for these illnesses (i.e., inpatients with NDPI psychiatric illnesses may be shifted to other primary diagnoses to facilitate admissions and reimbursement).

The 1992–2002 increase in number of elderly NDPI stays in psychiatric units (from 80,818 to 94,851) and comparable decline (from 37,749 to 20,979) of stays in long-stay hospitals may be in response to the 190 day Medicare lifetime cap on long-stay hospital use. The decline of about 17,000 in long-stay hospital inpatient stays from 1992 to 2002 is mostly accounted for by a decline of ~12,000 stays in for profit long-stay hospitals and may also reflect a shift in for profit long-stay psychiatric hospitals toward treating dementias or other chronic conditions for which it may be easier to justify extended specialized care and which may also be more profitable. However, it should be noted that combining both general hospital scatter beds and psychiatric units within general hospitals, 76–79% of stays occurred in general hospitals for both years; increased stays in general hospital psychiatric units from 1992 to 2002 roughly offset reduced stays in general hospital scatter beds.

The 1992–2002 shift of elderly inpatient NDPI stays toward older age groups, coupled with fewer stays for whites and more stays for blacks, mirror the changing demographics of the elderly, and we observed no striking associations of demographic characteristics with Medicare reimbursement and covered days for elderly NDPI inpatient stays. The distribution showing a preponderance of stays by women in both 1992 and 2002, as well as longer and costlier stays for women during these years, is consistent with the literature indicating that women tend to be more frequently diagnosed and treated for mental illness (HRSA 2007).

From 1992 to 2002, there was a large shift in the proportion of elderly NDPI stays that had secondary diagnoses noted, with about 2/3 having secondary diagnoses in 2002 as compared to about 45% in 1992. While this could indicate that NDPI patients were more likely to have medical illnesses in 2002, it seems more plausible that facilities became better able or motivated to identify, treat and/or request reimbursement related to comorbidities. Such a trend may also apply to the recording of NDPI as secondary diagnoses. In further analyses of the MEDPAR dataset we looked at all elderly stays that *did not have* an NDPI primary diagnosis. We found

that while 853,165 stays (or 9% of all those examined) had an NDPI secondary diagnosis in 1992, this number rose to 2,456,544 (or 21% of eligible stays) in 2002.

Non-NDPI secondary diagnoses were less commonly associated with NDPI stays in long-stay hospitals in 2002 than in SNFs, general hospital beds, and psychiatric units; they were also considerably less common in conjunction with psychiatric unit stays in 1992. While referrals of elderly NDPI cases to various facility types may be based in part on the evident presence or absence of medical secondary conditions, it may also be true that general hospitals and SNFs are better able to identify, treat, and secure reimbursement for non-psychiatric conditions in patients with primary NDPI diagnoses. Surprisingly, both overall and even within some facility types, elderly NDPI patients with medical comorbidities did not have higher Medicare expenditures or more covered days. This suggests that patients diagnosed with comorbidities may have less severe NDPI illness or that expenditures on the comorbidities may be minimal. This issue could be studied further by multivariate models of stay expenditures and duration using other data which contain indicators for severity of NDPI illnesses.

While MEDPAR data represent perhaps the best information available, some important limitations of this study exist. First, the Medicare payments reported are interim amounts, as final adjudication is later decided collectively for all stays at a facility combined and is not broken down per stay. Second, MEDPAR data are based on facility reports to CMS and filling out the forms may not be the top priority of facility staff who are often very busy. These facility reports may be subject to random error including underreporting of secondary diagnoses or perhaps even gaming, for example if having a certain primary or secondary diagnosis is more or less likely to hinder reimbursement. The data presented here also do not include Medicare Part B payments to individual practitioners for services provided to inpatients or inpatient stays of patients covered by HMOs. As 14% of beneficiaries were covered by HMOs in 2002 versus only 7% in 1992, exclusion of HMO covered patients could introduce a small bias for comparison across years if NDPI inpatient treatment should differ by HMO use.

It should also be noted that, as with most economic data, the distributions of Medicare covered days and expenditures data seen here are very skew with extreme values. However, due to the very large numbers of observations that we have, our estimates of the sample means are very precise. For example, in both 1992 and 2002, the ratios [(standard error of the mean)/mean] for overall expenditures and length of stays in 1992 and 2002 were always ~ 0.003 . Finally, since we are unable to obtain precise breakdowns of expenditures for each day of stay and expenditures are often higher during the first days of a stay, we are unable to analytically evaluate changes in the relationship between covered days and expenditures per day.

In conclusion, we observed declines in Medicare covered days and expenditures of 2.8 days and \$2,254, respectively, per elderly NDPI inpatient stay from 1992 to 2002. While these may reflect continuation of previously noted patterns of decline in costs and duration of NDPI and other stays, we have no pre-1992 data for comparison. However, these changes in NDPI inpatient care differed by facility type. Within the general hospital complex there was a decline in use of scatter beds in medical/surgical wards and a roughly equal expansion of psychiatric unit stays. There has also been an increase of NDPI inpatient treatment for elderly Medicare beneficiaries in SNFs, where stays are typically longer but the cost of NDPI care less, along with declines in long-stay hospital usage (particularly evident in long stay hospitals with for-profit ownership). These changes collectively may reflect cost-cutting strategies, preferences for less restrictive settings, and/or increased outpatient treatment usage.

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Table 1

Volume, duration and costs of non-dementia psychiatric illness (NDPI) inpatient stays of elderly medicare beneficiaries in 1992 and 2002 by facility ownership and type^a

	Number of facilities ^b		Total number of stays (Percentage of group)		Mean number of stays per facility ^b		Mean medicare ^c covered days per stay		Mean medicare ^c expenditures per stay	
	1992	2002	1992	2002	1992	2002	1992	2002	1992	2002
<i>Stays not broken down by facility ownership</i>										
In all facility types combined	10,684	13,112	193,962 (100%)	183,505 (100%)	18.2	14.0	14.9	12.1	\$8,461	\$6,207
General hospital beds	4,732	3,836	66,853 (34.5%)	50,363 (27.4%)	14.2	13.1	9.0	5.5	\$5,568	\$3,770
Psychiatric units	1,288	1,409	80,818 (41.7%)	94,851 (51.7%)	62.7	67.3	17.5	12.5	\$10,838	\$7,462
Long-stay hospitals	733	971	37,749 (19.5%)	20,979 (11.3%)	51.5	21.6	17.3	14.1	\$9,468	\$6,482
Skilled nursing facilities	3,931	6,896	8,542 (4.5%)	17,312 (9.4%)	2.2	2.5	26.0	26.2	\$4,153	\$6,375
<i>Stays in for profit owned facilities</i>										
In all facility types combined	3,638	5,736	41,967 (100%)	44,102 (100%)	11.5	7.7	17.3	16.3	\$8,934	\$6,581
General hospital beds	619	524	6,450 (15.4%)	5,267 (11.9%)	10.4	10.0	7.6	5.1	\$5,268	\$3,481
Psychiatric units	150	186	9,145 (21.9%)	17,092 (38.6%)	70.0	91.9	17.5	12.3	\$12,049	\$7,639
Long-stay hospitals	351	234	20,979 (50.1%)	8,729 (19.7%)	59.1	37.3	17.2	13.4	\$9,934	\$6,186
Skilled nursing facilities	2,518	4,819	5,263 (12.6%)	13,200 (29.8%)	2.2	2.7	28.5	27.9	\$4,380	\$6,710
<i>Stays in non profit owned facilities</i>										
In all facility types combined	5,018	5,436	124,537 (100%)	114,599 (100%)	24.8	24.8	14.5	10.6	\$8,826	\$6,188
General hospital beds	2,851	2,430	49,255 (39.5%)	37,751 (32.9%)	17.3	15.5	9.4	5.6	\$5,692	\$3,738
Psychiatric units	918	961	62,252 (50.0%)	64,578 (56.4%)	67.8	67.2	17.5	12.6	\$10,959	\$7,492
Long-stay hospitals	152	358	10,807 (8.7%)	8,703 (7.6%)	71.1	24.3	18.5	13.1	\$11,830	\$7,414
Skilled nursing facilities	1,097	1,687	2,283 (1.8%)	3,567 (3.1%)	2.1	2.1	21.5	21.7	\$3,974	\$5,502
<i>Stays in government owned facilities</i>										
In all facility types combined	2,008	1,800	27,220 (100%)	24,636 (100%)	13.6	13.7	13.1	11.3	\$6,087	\$5,633
General hospital beds	1,256	878	11,161 (41.0%)	7,340 (29.8%)	8.9	8.4	8.2	5.5	\$5,200	\$3,454
Psychiatric units	220	261	9,421 (34.6%)	13,179 (53.5%)	42.8	50.1	16.9	12.3	\$8,865	\$7,086
Long-stay hospitals	220	373	5,979 (22.0%)	3,534 (14.3%)	27.2	9.5	15.5	18.5	\$3,720	\$4,915
Skilled nursing facilities	312	288	659 (2.4%)	583 (2.4%)	2.1	2.0	20.3	19.7	\$2,844	\$4,558

^aInformation presented was obtained from the 1992 and 2002 Medicare Provider Analysis and Review and merged 1992 and 2002 Provider of Service Datasets

^b Distinct facilities that have at least one elderly NDPI inpatient stay reported to CMS during the given calendar year

^c Medicare Part A

Volume, duration and costs of non-dementia psychiatric illness (NDPI) inpatient stays of elderly medicare beneficiaries in 1992 and 2002 by primary diagnosis^a

Table 2

Primary diagnosis	Total number of stays (Percentage of group)		Mean medicare ^b covered days per stay		Mean medicare ^b expenditures per stay	
	1992	2002	1992	2002	1992	2002
All NDPI diagnoses	193,962 (100%)	183,505 (100%)	14.9	12.1	\$8,461	\$6,207
Major depression	78,386 (40.4%)	68,542 (37.4%)	17.4	12.9	\$10,344	\$6,859
Bipolar	17,832 (9.2%)	20,002 (10.9%)	18.1	14.6	\$9,743	\$7,652
Schizophrenia	15,824 (8.2%)	19,466 (10.6%)	17.6	16.2	\$8,890	\$7,793
Substance abuse	28,044 (14.5%)	24,675 (13.4%)	10.3	6.7	\$5,911	\$3,786
Other	53,776 (27.7%)	50,800 (27.7%)	11.8	10.9	\$6,552	\$5,236

^aInformation presented was obtained from the 1992 and 2002 Medicare Provider Analysis and Review Datasets

^bMedicare Part A

Table 3

Volume, duration and costs of non-dementia psychiatric illness (NDPI) inpatient stays of elderly medicare beneficiaries in 1992 and 2002 by facility ownership and patient characteristics^a

Patient characteristic by facility type	Total number of stays (Percentage of group)		Mean medicare ^b covered days per stay		Mean medicare ^b expenditures per stay	
	1992	2002	1992	2002	1992	2002
<i>Age</i>						
All stays						
65–74	104,916 (54.1%)	85,932 (46.8%)	14.7	11.4	\$8,315	\$5,966
75–84	68,521 (35.3%)	70,190 (38.2%)	15.2	12.4	\$8,873	\$6,459
85+	20,525 (10.6%)	27,383 (14.9%)	14.8	13.1	\$7,831	\$6,315
Stays in general hospital beds						
65–74	35,002 (66.8%)	23,877 (47.4%)	9.3	5.8	\$5,574	\$3,678
75–84	23,691 (35.4%)	18,800 (37.3%)	9.0	5.5	\$5,617	\$3,725
85+	8,160 (12.2%)	7,656 (15.2%)	8.0	5.0	\$5,404	\$3,507
Stays in psych units						
65–74	44,153 (54.6%)	45,084 (47.5%)	17.2	12.3	\$10,191	\$7,164
75–84	29,525 (36.5%)	37,108 (39.1%)	17.9	12.7	\$11,677	\$7,727
85+	7,140 (8.8%)	12,659 (13.3%)	17.3	12.3	\$11,379	\$7,746
Stays in long-stay hospitals						
65–74	23,792 (63.0%)	12,389 (59.1%)	17.2	14.2	\$9,228	\$6,036
75–84	11,501 (30.5%)	6,680 (31.8%)	17.6	14.4	\$9,910	\$7,196
85+	2,456 (6.5%)	1,910 (9.1%)	16.6	12.4	\$9,717	\$6,883
Stays in SNFs						
65–74	1,969 (22.8%)	4,582 (26.5%)	24.5	25.1	\$3,951	\$5,912
75–84	3,804 (45.1%)	7,606 (43.9%)	26.2	26.3	\$4,254	\$6,382
85+	2,769 (32.1%)	5,128 (29.6%)	26.8	27.2	\$4,158	\$6,778
<i>Gender</i>						
All stays						
Male	68,245 (35.2%)	65,558 (35.7%)	13.5	11.0	\$7,676	\$5,666
Female	125,417 (64.8%)	117,947 (64.3%)	15.7	12.6	\$8,887	\$6,508
Stays in general hospital beds						
Male	27,764 (41.5%)	20,886 (41.5%)	8.7	5.6	\$5,544	\$3,730

Patient characteristic by facility type	Total number of stays (Percentage of group)		Mean medicare ^b covered days per stay		Mean medicare ^b expenditures per stay	
	1992	2002	1992	2002	1992	2002
Female	39,089 (58.5%)	29,477 (58.5%)	9.2	5.5	\$5,585	\$3,634
Stays in psych units						
Male	23,832 (29.5%)	30,643 (32.3%)	16.2	11.6	\$10,087	\$6,875
Female	56,986 (70.5%)	64,208 (68.7%)	18.1	12.9	\$11,153	\$7,742
Stays in long-stay hospitals						
Male	13,673 (36.2%)	8,039 (38.3%)	16.0	13.0	\$5,593	\$5,838
Female	24,076 (63.8%)	12,940 (61.7%)	18.0	14.8	\$9,964	\$6,883
Stays in SNFs						
Male	2,976 (34.8%)	5,990 (34.6%)	23.9	24.6	\$4,054	\$6,030
Female	5,566 (65.2%)	11,322 (65.4%)	27.2	27.1	\$4,206	\$6,558
<i>Race</i>						
All stays						
White	172,740 (89.0%)	159,493 (86.9%)	14.9	11.9	\$9,486	\$6,852
Black	14,213 (7.3%)	17,676 (9.6%)	15.2	13.2	\$9,326	\$6,761
Other	7,099 (3.7%)	6,336 (3.5%)	14.4	12.7	\$9,426	\$7,339
Stays in general hospital beds						
White	58,671 (87.8%)	43,566 (86.5%)	8.9	5.4	\$5,446	\$3,529
Black	5,669 (8.5%)	5,106 (10.1%)	9.8	6.5	\$6,528	\$4,553
Other	2,513 (3.8%)	1,691 (3.4%)	9.0	6.2	\$5,773	\$4,355
Stays in psych units						
White	73,832 (90.2%)	82,980 (87.5%)	17.5	12.3	\$10,899	\$7,397
Black	5,299 (6.5%)	8,638 (9.1%)	17.7	13.3	\$10,216	\$7,903
Other	2,687 (3.3%)	3,233 (3.4%)	17.2	13.5	\$10,431	\$7,958
Stays in long-stay hospitals						
White	33,589 (89.0%)	17,717 (84.5%)	17.2	13.8	\$9,513	\$6,419
Black	2,586 (6.9%)	2,293 (10.9%)	17.7	16.6	\$8,814	\$7,288
Other	1,574 (4.2%)	969 (4.6%)	17.5	14.1	\$9,077	\$5,744
Stays in SNFs						
White	7,648 (89.5%)	15,230 (85.3%)	25.5	25.9	\$4,057	\$6,311
Black	659 (7.7%)	1,639 (9.2%)	32.8	28.5	\$5,230	\$6,883

Patient characteristic by facility type	Total number of stays (Percentage of group)		Mean medicare ^b covered days per stay		Mean medicare ^b expenditures per stay	
	1992	2002	1992	2002	1992	2002
Other	235 (2.8%)	443 (5.4%)	23.3	27.8	\$6,015	\$6,675
<i>Medical secondary diagnoses</i>						
All stays						
Had secondary diagnoses	88,852 (45.8%)	121,622 (66.3%)	14.1	11.7	\$7,947	\$6,253
No secondary diagnoses	105,110 (54.2%)	61,883 (33.7%)	15.6	12.6	\$8,896	\$6,115
Stays in general hospital beds						
Had secondary diagnoses	41,431 (62.1%)	39,280 (78.0%)	8.7	5.5	\$5,574	\$3,760
No secondary diagnoses	25,332 (37.9%)	11,083 (22.0%)	9.6	6.0	\$5,558	\$3,348
Stays in psych units						
Had secondary diagnoses	36,073 (44.6%)	63,611 (77.1%)	18.2	13.9	\$11,017	\$7,632
No secondary diagnoses	44,745 (55.4%)	31,240 (32.9%)	17.5	12.3	\$10,695	\$7,116
Stays in long-stay hospitals						
Had secondary diagnoses	4,510 (11.9%)	5,886 (28.1%)	18.1	13.9	\$10,897	\$7,793
No secondary diagnoses	33,239 (88.1%)	15,093 (71.9%)	17.2	14.2	\$9,273	\$5,972
Stays in SNFs						
Had secondary diagnoses	6,748 (79.0%)	12,845 (75.0%)	26.7	26.2	\$4,154	\$6,342
No secondary diagnoses	1,794 (21.0%)	4,467 (25.8%)	23.7	26.4	\$4,148	\$6,471

^aInformation presented was obtained from the 1992 and 2002 Medicare Provider Analysis and Review Datasets

^bMedicare Part A