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Trends in Long-Term Acute Care Hospital Use in Texas from 2002-2011

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Abstract

Objective: To assess regional trends in long-term acute care hospital (LTAC) use over time.

Design, Setting, Participants: Retrospective study using 100% Texas Medicare data. Separate cohorts were created for each year from 2002-2011, which included all beneficiaries residing in 23 hospital referral regions (HRRs) with continuous enrollment in Parts A and B in the previous and current year, or until death.

Measurements: LTAC utilization rate was defined as the number of individuals with a LTAC stay per 100,000 Medicare beneficiaries residing in the HRR. Baseline LTAC use at the HRR-level was categorized by tertiles of use in 2002.

Results: Overall, LTAC use increased 35% from 2002-2011 and coincided with major Medicare policy changes. However, there were marked regional differences in LTAC utilization trends. From 2002-2011, HRRs in the lowest tertile of baseline LTAC use, which included regions with 0 to 1 LTAC facilities in 2002, had an increase in utilization by 211%, from 190 to 591 individuals per 100,000 persons. In contrast, HRRs in the highest tertile of baseline LTAC use, which included some of the most densely LTAC-bedded regions in the country, experienced a 21% decline (915 to 719 individuals per 100,000 persons; $p < 0.001$ for interaction of LTAC utilization and tertile of baseline use).

Conclusion: These findings suggest substantial regional variation in the trends in LTAC use over time. Further research is needed to estimate how much of this variation is due to differences in clinical need due to increasing number of severely ill older adults versus regional market supply.

INTRODUCTION

Over the past three decades, there has been a rapid rise in long-term acute care hospital (LTAC) use in the U.S., with considerable variation across geographic regions [1]. Increasing evidence suggests that LTAC use is not only driven by clinical need but also by proximity, financial incentives, and state policies [2,3]. However, it is unclear whether the increase in LTAC use over time is occurring in regions with an existing abundance of LTAC facilities, implying potential overuse of LTACs by less ill patients. In this study, we sought to describe trends in LTAC use by hospital referral regions from 2002 to 2011, and examine whether temporal trends in LTAC utilization differed by baseline regional LTAC use.

MATERIALS AND METHODS

Using 100% Texas Medicare claims data, we developed

separate cohorts for each federal fiscal year from 2002 to 2011. Each fiscal year cohort included fee-for-service Medicare beneficiaries who were Texas residents with continuous enrollment in Medicare Parts A and B in the previous and current fiscal year or until death. We defined per capita LTAC use rates as the number of individuals with a LTAC hospitalization per 100,000 Medicare beneficiaries in the hospital referral region (HRR). HRRs represent regional health care markets for tertiary medical care [4]. Utilization was assigned to the HRR of the beneficiary's residence. We identified LTACs using the Medicare Provider Analysis and Review provider number (3rd and 4th digit in provider number equal to '20', '21', or '22'). To examine the effect of baseline LTAC use on changes in LTAC use over time, we used linear regression where the predictor of interest was the interaction term of year and tertile of baseline LTAC use in 2002, accounting for clustering by HRRs. STATA version 12.0

(StataCorp LP) and SAS version 9.3 (SAS Institute Inc.) were used for all analyses. This study was approved by the University of Texas Medical Branch institutional review board.

RESULTS

From 2002 to 2011, the absolute number of individuals with at least 1 LTAC hospitalization increased by 34.7% from 10,595 to 14,280 individuals (Table 1), with a corresponding large per capita rate increase from 689 individuals per 100,000 Medicare beneficiaries in 2002 to 773 in 2003 (12.2% increase), coinciding with increases in Medicare reimbursement for LTACs (Figure 1). This increase in utilization continued but at a lower growth rate through 2005 and subsequently plateaued through 2007. There was a slow decline in use after 2007 with a CMS moratorium on new LTAC beds and facilities.

There were marked regional differences in trends in LTAC use (Figure 2). From 2002-2011, HRRs in the lowest tertile of baseline LTAC use, which consisted of regions with 0 to 1 LTAC facilities in

2002, had an increase in the per capita use rates by 211%, from 190 individuals to 591 individuals per 100,000 persons. HRRs in the middle tertile had an increase in the per capita LTAC use rate by 43%, from 473 to 675 individuals per 100,000 persons. In contrast, HRRs in the highest tertile of baseline LTAC use, which included some of the most densely LTAC-bedded regions in the country (i.e. Dallas, Fort Worth), experienced a 21% decline in the per capita LTAC utilization rate from 915 to 719 individuals per 100,000 persons ($p < 0.001$ for interaction of LTAC utilization trends between tertiles).

DISCUSSION

Using 100% Medicare claims data from the second largest state in the US with over 3 million beneficiaries; we observed an overall 35% increase in the number of individuals with a LTAC admission from 2002 to 2011. There was a large increase in LTAC use from 2002 to 2005, plateauing of rates from 2005 to 2007, and gradual decline through 2011. These trends observed during the study period coincided with two major Medicare policy

Table 1: Number of Texas Medicare beneficiaries included per fiscal year.

Fiscal Year	Total number of Medicare Beneficiaries	Continual enrollment in Parts A & B (not Part C) in current and previous year (% of previous column)	Persons with ≥ 1 LTAC admission (% of previous column)	Persons with ≥ 1 LTAC admission per 100,000 Texas beneficiaries
2002	2,469,880	1,536,246 (62.20%)	10,595 (0.69%)	689
2003	2,523,768	1,683,210 (66.70%)	13,020 (0.77%)	773
2004	2,589,601	1,772,443 (68.44%)	14,100 (0.80%)	795
2005	2,682,399	1,798,402 (67.04%)	14,572 (0.81%)	810
2006	2,765,030	1,758,392 (63.59%)	14,177 (0.81%)	806
2007	2,857,187	1,732,950 (60.65%)	13,998 (0.81%)	807
2008	2,947,700	1,731,742 (58.75%)	13,569 (0.78%)	783
2009	3,045,430	1,747,635 (57.39%)	13,392 (0.77%)	766
2010	3,148,523	1,786,376 (56.74%)	14,232 (0.80%)	796
2011	3,283,249	1,824,570 (55.57%)	14,280 (0.78%)	782

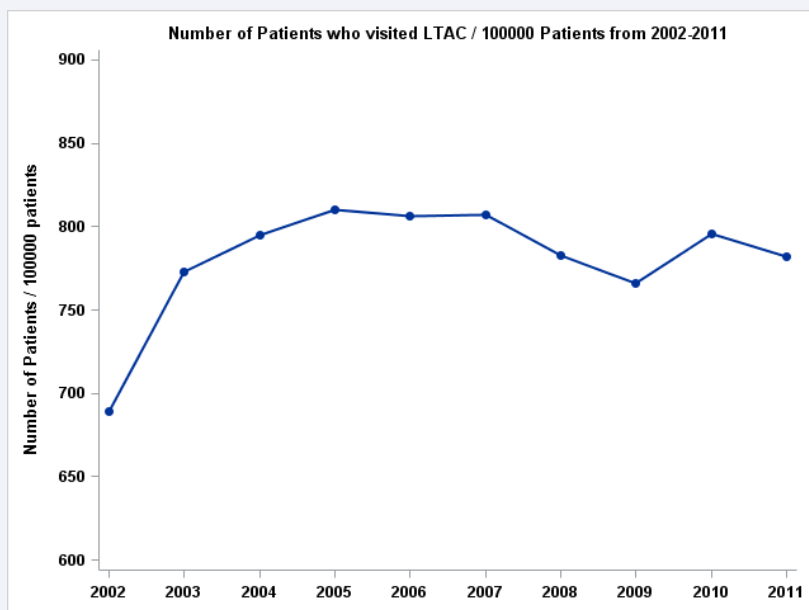


Figure 1 Long-term acute care hospitalization use in Texas from 2002 to 2011.

Abbreviations: TEFRA, Tax Equity and Fiscal Responsibility Act; PPS: Prospective Payment System; LTAC: long-Term Acute Care hospital

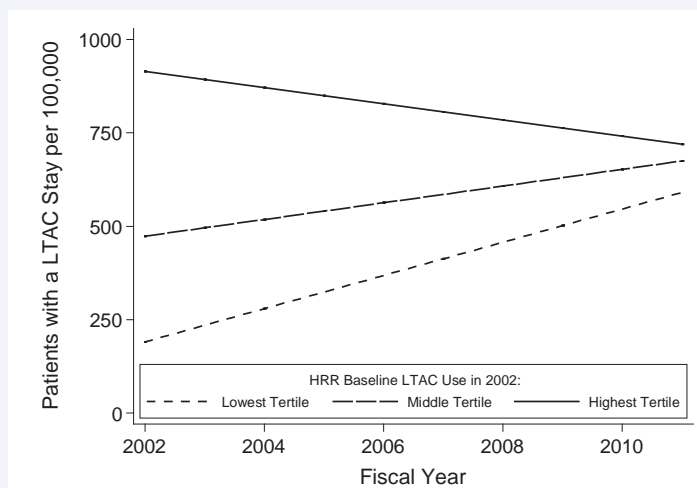


Figure 2 Regional trends in LTAC use from 2002 to 2011 stratified by baseline LTAC utilization*

*23 HRRs in Texas were included in this analysis. All HRRs in the lowest tertile of baseline LTAC use had 0 to 1 LTAC facilities in 2002. HRRs in the highest tertile of baseline LTAC use included regions having among the highest LTAC bed supply in the United States (e.g. Dallas, Fort Worth, and Houston).

changes, and mirrored the national experience in LTAC use over this time period [1]. We also found marked regional variation in trends in LTAC use across Texas, a state with the highest LTAC use rates in the US [5]. Regions with the lowest baseline LTAC use (with no or 1 LTAC) had significant growth over time, while regions with the highest baseline LTAC use had a modest decline in use despite more favorable financial reimbursement.

Limitations of this study are the exclusion of individuals with Medicare Advantage plans or private insurance. However, fee-for-service beneficiaries account for nearly 70% of overall LTAC use; and are the only available national data source for studying LTAC use [6]. Findings also may not be nationally representative. However, Texas is an ideal state to study regional trends in LTAC utilization given its large population, high LTAC utilization rates, and multiple different urban, suburban, and rural regions.

CONCLUSION

These findings suggest substantial regional variation in the trends in LTAC use over time. However, the reasons for this variation are not well understood, and may be due to differences in patient, provider, and regional factors. Future research is needed to estimate the degree of variation due to differences in clinical need due to aging and critical illness, hospital and provider referral patterns, and regional market supply. Furthermore, the rising prevalence and substantial variation in LTAC use mandates greater attention to determine whether the clinical and rehabilitation outcomes among adults treated in LTACs differ among similarly ill patients treated in other less resource intensive post-acute care settings.

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