BACKGROUND PAPER:
RURAL AND URBAN DIFFERENCES IN NURSING HOME AND SKILLED NURSING SUPPLY

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RURAL AND URBAN DIFFERENCES IN NURSING HOME AND SKILLED NURSING SUPPLY

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EXECUTIVE SUMMARY

The Medicare program covers inpatient stays for skilled nursing and rehabilitation services, for a limited period of time, subsequent only to discharge from an acute care hospital, and only in a certified skilled nursing facility (SNF). Following a decade of extraordinary growth in Medicare's SNF benefit payments, the Balanced Budget Act of 1997 mandated a four year Medicare payment transition from one based on reasonable per-diem costs to one based on fixed national rates, referred to as the SNF Prospective Payment System (PPS).

As a result of the new payment system, nursing facilities that deliver a substantial amount of skilled care are facing rapid changes in financing that will inevitably affect the short-term profitability of some institutions. This working paper examines characteristics of nursing facilities and the supply of certified skilled nursing beds as the new PPS is being phased in, with particular reference to differences between urban and rural settings, to provide a background for future studies of the impact of PPS on the delivery of skilled nursing services in rural areas. The first section of this paper describes the nursing home industry and skilled nursing facilities as a component of that industry. The second section examines urban-rural differences in institutional characteristics.

As of March of 2001 there were approximately 17,000 nursing homes with 1.7 million extended care beds in the United States that were certified to provide care to Medicaid and/or Medicare beneficiaries. Nearly two-thirds of nursing homes are proprietary, twenty-seven percent are operated by non-profit organizations, and federal, state or local governments own the remainder. Twelve percent of all nursing facilities are operated as sub-units within hospitals; the rest are licensed as "freestanding" facilities.

Nursing facilities may choose to be certified for Medicaid only (NFs), or for Medicare only (SNFs), or they may choose to certify all or some of their beds for either level of care ("dual-certification"), or operate both SNF and NF units, but retain each as physically distinct entities ("distinct-part units"). In the literature, the term "skilled nursing facility" appears to be applied both to those facilities that are certified as Medicare-only and to those with both levels of certification, even though skilled level care may be only a small portion of the total care given in a nursing home with both types of beds. For purposes of national data collection and analysis, the distinction between "skilled" and other nursing days does not appear to be precise except with regard to Medicare coverage.

Rural-urban differences in the supply of long-term care beds and in the characteristics of long-term care facilities are less pronounced, in general, than rural-urban differences in acute care capacity. Approximately 5,900 nursing facilities, or 35% of the total, are located in non-metropolitan counties across the nation, and they operate nearly 500,000 certified beds, or about 29% of the total supply. Overall, 53% of rural and 58% of urban beds are certified for Medicare participation.

The freestanding, proprietary model of nursing home ownership dominates the SNF industry, regardless of location, but the proportion of government-owned facilities increases as communities get smaller, from 4.7% among metropolitan counties to 9.6% in the least rural of non-metropolitan counties, to 16.0% in the most rural. Facilities in more rural areas also tend to be smaller, regardless of ownership, with the exception of the hospital-based units, which tend to be of similar (and relatively small) size, regardless of location.

The overall nursing staff ratios (including RNs, LPNs, and aides) are somewhat lower in rural counties than in urban ones, but most of this difference is attributable to the

hospital-based facilities, which have a substantially lower ratio of RNs to other nursing staff in rural areas. However, staffing ratios are expected to vary according to each facility's particular mix of skilled and non-skilled patients. Without being able to control for differences in average acuity levels, staffing data alone cannot be used to draw any conclusions about differences in quality of care.

The aggregate national supply of certified nursing home beds to elderly residents is 50 beds per thousand. The aggregate ratio for all rural counties is 62 per thousand, which is 35% higher than the same measure for urban counties. The same pattern holds true for aggregate ratios of Medicare certified beds, which are 33 per thousand in rural areas and 27 per thousand in urban. However, there is greater inter-state variation in the supply of nursing home beds relative to population, than variation across urban influence levels.

Even though rural areas have better-than-average population-based bed supply measures, very rural counties are much more likely than larger rural or urban counties to have no nursing home or no nursing homes with certified Medicare beds. Across all non-metropolitan counties, 16.1% had no Medicare certified beds, and the nation's most rural counties are the most likely to have no certified nursing homes. However, about four in every ten counties with no certified Medicare beds had at least one swing-bed hospital, and as counties become more rural, swing beds account for an increasing proportion of Medicare SNF discharges. The role of swing beds in preserving access appears particularly strong in the sparsely populated west-central and mountain regions.

The supply of Medicare-certified skilled nursing beds does not appear to be a problem in rural areas, with the possible exception of the most rural counties (those not adjacent to metropolitan areas and with no town with more than 2,500 residents). However, assessment of the availability of skilled services is problematic due to the fact that

available data only indicate if a bed is certified for Medicare-reimbursed skilled care, but not how the bed is actually used. Several regions of the country rely heavily on hospital swing beds, rather than certified skilled beds, to meet Medicare demand for skilled care. Further analyses need to be conducted that compare staffing, lengths of stay and intensity of services provided, that may differentiate the types of care available across urban and rural areas.

INTRODUCTION

Formal long-term care refers to a variety of extended nursing and rehabilitative services provided to individuals with physical or mental disabilities, delivered in institutional, home or community-based settings. If such services were arrayed on a spectrum from least to most clinically complex, inpatient institutionally based skilled nursing care would be placed at the more complex end, somewhere between skilled home health care and the services delivered in a specialty rehabilitation hospital. Skilled nursing services are distinguished from other nursing home services by the requirement that services be provided by or under the supervision of licensed medical and nursing personnel.

The Medicare program covers inpatient stays for skilled nursing and rehabilitation services, for a limited period of time, subsequent only to discharge from an acute care hospital, and only in a certified skilled nursing facility (SNF). The Medicare skilled nursing service benefit is not designed to be a long-term care benefit, but is intended, instead, to serve as a supplement to inpatient acute hospital services [1,2]. Because of the restrictions on extended care coverage, Medicare patients typically account for less than 9% of all nursing home patients, and Medicare payments cover only about 12% of total nursing home expenditures. The majority of patients in the nation's 17,000 nursing homes are receiving chronic or custodial care, for which Medicaid is the predominant payer, but for licensed skilled care, Medicare is the dominant third-party payer [3].

The use of skilled nursing services in the Medicare program grew dramatically from 1988 to 1998, both in total and on a per-enrollee basis. In addition, although the length of stay per admission decreased over time, the intensity of services delivered per day, and hence the Medicare payments, increased rapidly. Following a decade of

extraordinary growth in Medicare's SNF benefit payments, the Balanced Budget Act of 1997 (BBA97) mandated a four year Medicare payment transition from one based on reasonable per-diem costs to one based on fixed national rates, referred to as the SNF Prospective Payment System (PPS). Like the hospital PPS that was implemented in 1983, this system bases payments on national historical average costs, adjusted for regional wage variation and case mix. A fundamental difference between the two systems, however, is that the inpatient hospital PPS unit of payment is the discharge, while SNF PPS payments are made on a per-day basis.

As a result of the new payment system, nursing facilities that deliver a substantial amount of skilled care are facing rapid changes in financing that will inevitably affect the short-term profitability of some institutions. If the rate structure is inequitable or poorly designed, PPS implementation could also threaten the viability of entire groups or classes of facilities. Prospective payment systems reward lower unit costs and less intensive utilization per episode of care. Beneficiaries' access to care could be altered if the ownership, organization or supply of skilled nursing beds is changed by these shifts in financial incentives.

The objective of this working paper is to examine characteristics of nursing facilities and the supply of certified skilled nursing beds as the new PPS is being phased in, with particular reference to differences between urban and rural settings. The paper is intended as a background piece for a follow-up study of the impact of PPS on the delivery of skilled nursing services in rural areas, to be conducted after cost and utilization data become available for the years during and after the PPS phase-in. The first section of this paper describes the nursing home industry and skilled nursing facilities as a component of that industry. The second section provides a detailed examination of urban-rural

differences in institutional characteristics. Using urban influence codes as defined by the U.S. Department of Agriculture, we compute separate statistics for facilities located in metropolitan counties, and then aggregate the data from facilities in non-metropolitan counties by town size and by county adjacency to metropolitan areas. The principal data source for our urban-rural analyses is the Online Survey, Certification and Reporting System file (OSCAR), produced and updated quarterly by the Centers for Medicare and Medicaid Services (CMS, formerly Health Care Financing Administration, or HCFA). The file used for this paper was received in March of 2001. The licensure data are supplemented by utilization data from Medicare skilled nursing facility cost reports from the federal fiscal year 1998 (the last period prior to PPS implementation). Institution-level data have been merged with county-level population figures from the 2000 census.

Under separate regulations stemming from the Omnibus Budget Reconciliation Acts of 1980 and 1987, Medicare beneficiaries in rural areas can also receive skilled nursing care in what is called a "swing bed", which can be any unoccupied medical-surgical bed located on a routine nursing unit of qualifying small rural hospitals. Hospitals that operate fewer than 100 routine-care beds, and are located in non-urbanized census areas, may qualify to use their excess capacity to provide post-acute extended care to their patients without moving them from the bed where they spent their hospital admission. The swing-bed program is intended both to encourage more efficient utilization of fixed hospital capacity, and to improve access to skilled nursing care for beneficiaries living in areas that might not have sufficient supply.

Swing beds are not counted as part of the nursing home supply since they are already part of the acute bed supply. However, they were shown to account for a substantial portion of rural Medicare SNF admissions by the late 1980s [4]. Part of our

urban-rural analysis, therefore, incorporates data from the cost reports of eligible swing-bed hospitals, in order to update estimates of the importance of swing-bed use in providing rural access to nursing home care.

OVERVIEW

Nursing Home Supply, Organization and Finance

As of March of 2001 there are approximately 17,000 nursing homes with 1.7 million extended care beds in the United States that are certified to provide care to Medicaid and/or Medicare beneficiaries (Table 1). Nearly two-thirds of nursing homes are proprietary, that is, owned by corporations or — less commonly — individuals or partnerships. Twenty-seven percent are operated by non-profit organizations, and federal, state or local governments own the remainder. Twelve percent of all nursing facilities are operated as sub-units within hospitals; the rest are licensed as "freestanding" facilities, although these may also operate home health agencies, hospice units and/or rural health clinics. The number of beds per facility ranges from 4 to nearly 1,400, but the average facility size is just over 100 beds, and one half of all facilities operate between 60 and 124 long-term care beds. The average size of freestanding facilities is 109 beds, which is twice that of hospital-based facilities. Ninety-seven percent of all proprietary nursing homes are licensed as freestanding facilities. For this reason, for-profit homes tend to be larger than those that are not for-profit homes, with the exception of a small number of very large government-owned institutions.

Table 1: Total Certified Facilities, Beds and Average Capacity, by Ownership and Location

Category	Facilities		Total Certified Beds	Beds Per Facility	
	Number	(%)		Mean (*)	Median
All Nursing Homes	16,848	(*100%*)	1,720,098	102	96
For-Profit	10,992	(*65%*)	1,162,508	106	100
Private, Non-Profit	4,514	(*27%*)	416,213	92	75
Government	1,342	(*8%*)	141,377	105	70
		(*100%*)			
Free-Standing	14,841	(*88%*)	1,614,432	109	100
Hospital-Based	2,007	(*12%*)	105,666	53	30
		(*100%*)			
Rural	5,941	(*35%*)	496,420	84	78
Urban	10,907	(*65%*)	1,223,678	112	102
		(*100%*)			

(*) *Un-weighted average, computed across all facilities within group*
Source: Authors' calculations from OSCAR file, as of March 2001

Individual states are responsible for licensure of their long-term care facilities and state survey agencies are empowered, as part of their periodic survey function, to determine if facilities meet the conditions of participation for both Medicare and Medicaid programs.[1] Medicaid certification options can vary from state to state according to local licensure regulations. Facilities may choose to be certified for Medicaid only ("nursing facilities", or NFs), or for Medicare only ("skilled nursing facilities", or SNFs), or they may choose to certify all or some of their beds for either level of care ("dual-certification"). In some states facilities may also choose to operate both SNF and NF units, but retain each as physically distinct entities ("distinct-part units"). Within the limitations

[1] The National Center for Health Statistics estimated in its National Nursing Home Survey (NNHS) for 1997 that there were approximately 700 nursing homes (or about 4% of their total) that were also licensed by their state regulatory agencies but not certified [16]. These homes do not admit Medicare or Medicaid patients. The NNHS sample size was not sufficient to estimate characteristics of these homes or their patients, nor do the OSCAR files provide information about them. Throughout this paper we refer only to the set of nursing homes that is certified by either Medicare or Medicaid or both agencies.

imposed by individual state laws, the choice of bed certification is a decision made by the individual institution that is partly a matter of efficient care management (for example, grouping patients with similar staffing needs within a single physical location), but primarily a matter of reimbursement strategy. [2]

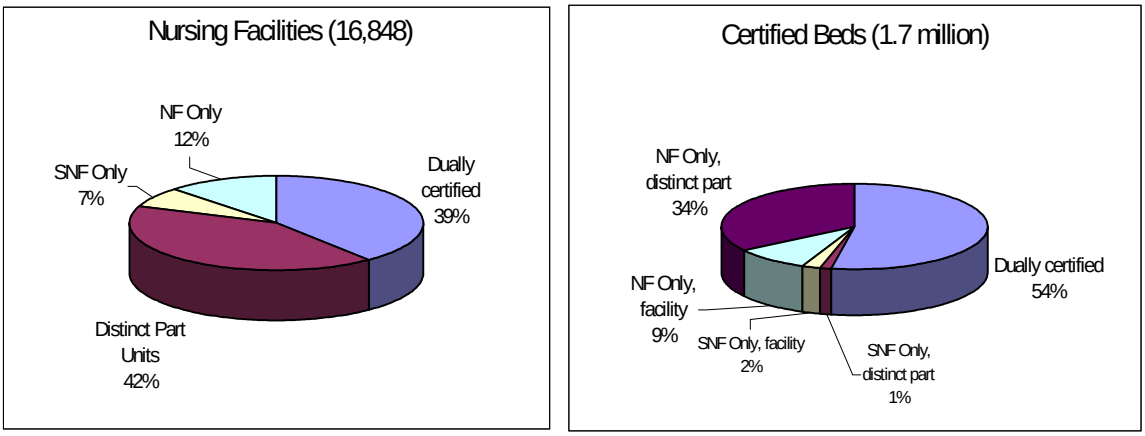
In the literature, the term "skilled nursing facility" appears to be applied both to those facilities that are certified as Medicare-only and to those with both levels of certification, even though skilled level care may be only a small portion of the total care given in a nursing home with both types of beds. A Medicare-only facility or distinct-part Medicare unit is likely to provide a more complex mix of skilled nursing and rehabilitation services than is a dual-certified unit, and its patients will be primarily, though not exclusively, Medicare beneficiaries. A Medicaid-only facility or unit is likely to provide care at a lower level of intensity, over much longer periods of time, and although it is not prevented from providing more complex care to non-Medicare patients if the clinical resources are available, it is less likely to do so.

The great majority of facilities obtain certification for both levels of care, either through dual certification or by maintaining both types of units (Figure 1). A relatively small proportion of total nursing homes are certified for SNF care only, and two-thirds of these facilities are based in general short-stay or rehabilitation hospitals. Over 600,000 beds (36% of total) were assigned to distinct-part units within nursing homes, but of these,

[2] The principal purpose of distinct-part units is to allow the facility to manage its level of participation in the Medicare and Medicaid programs. Under the old cost-based SNF reimbursement rules, separating Medicare and Medicaid patients had certain cost accounting advantages that are no longer present under prospective payment. A Medicare-only unit provides only skilled level services and is not certified to admit and receive payment for a Medicaid patient. A Medicaid-only unit, however, might care for any level of services needed by a Medicaid patient, including skilled care. According to a report from the Office of the Inspector General [5], 29 states allowed nursing homes to maintain Medicare-only distinct units in the year 2000.

only 25,000 (1.4%) were restricted as Medicare-only beds.

Figure 1: Distribution of Certified Nursing Facilities and Beds by Type of Certification, Year 2000



Source: Authors' calculations from OSCAR file, March 2001

For purposes of national data collection and analysis, the distinction between "skilled" and other nursing days does not appear to be precise except with regard to Medicare coverage. In total, less than 4% of certified bed capacity is designated as Medicare/SNF only, which is a small proportion compared to the 54% of capacity that is dual-certified. Since Medicare accounts for about 9% of all nursing home patients and these are likely to be preferentially placed in the dedicated Medicare units, Medicare is likely to account for an even smaller proportion of care in the dual-certified facilities and units. It is not possible to identify the proportion of non-Medicare nursing home days that is attributable to skilled level services, since skilled care that is paid for by private or other public sources is not distinguishable from other levels of care delivered in a dually certified unit.

The proportion of beds dedicated solely to Medicare has remained stable in the last few years, but there is a recent trend to convert Medicaid-only beds into dual-certified

capacity. A study by the Office of the Inspector General (OIG) that used OSCAR files from 1998 reported 58% of beds as NF/Medicaid only and 38% as dual-certified [5]; by the beginning of 2001, these figures were 43% and 54%, respectively. This is not surprising since much of the motivation for maintaining distinct part units lay in certain cost accounting advantages that were present under Medicare's previous reimbursement methods, but have since been removed by the implementation of PPS. The trend has potentially important implications, however, for the interpretation of cost report data. Moving increasing numbers of Medicaid-only beds into dually-certified units is likely to lower the per-diem costs on the post-PPS Medicare cost reports, because average nursing costs will be computed over a mix of skilled and non-skilled care. Any attempts to use aggregate cost report data to draw conclusions about efficiency effects of PPS will need to control for these organizational reporting changes.

Summarizing data from the National Long Term Care Survey, the American Health Care Association reported that more than half of nursing home residents in 1997 were 85 years of age or older, their average length of stay at the time of the survey interview was nearly two and one-half years, and patients with full recovery of their conditions accounted for about 10% of total discharges, while deaths accounted for 27% [3]. The subset of Medicare patients admitted for skilled services is clearly very distinct from the general population of elderly nursing home residents. According to the 1998 data published by CMS, only 35% of Medicare-covered patients were 85 years or older, the average duration of their Medicare covered stay was only 26 days, and less than 8% were discharged as deceased [6]. However, a patient that is "discharged" from Medicare SNF has ceased to receive covered Medicare services, but is not necessarily discharged from the facility. Some of these patients will have transferred to a lower level of care (no longer covered by

Medicare), or — having exhausted their maximum allowable SNF benefit of 100 days per episode of illness — have taken private responsibility for their remaining skilled care.

Data from the National Health Care Expenditures Survey estimates payments for nursing home care in 1999 were $90 billion, or 7.4% of all national health expenditures [7]. The proportion of nursing home expenditures to total national health expenditures has remained between 7.1% and 7.8% over the last two decades. Dramatic changes have occurred, however, in the sources for those payments, as shown in Table 2.

Table 2: Total Expenditures and Funding Sources for Nursing Homes(*)

	1979	1989	1999
Total Nursing Home Care Expenditures	$15.3 billion	$45.7 billion	$90.0 billion
Funding Sources:			
Medicare	2%	5%	11%
Medicaid (fed + state)	51%	44%	47%
Other Public (**)	2%	2%	2%
Private:			
Health Insurance	1%	5%	8%
Out-of-Pocket	40%	36%	27%
Philanthropy	4%	7%	5%
Total	100%	100%	100%

(*) *Sample includes all facilities in the survey, including some non-certified.*
(**) *Includes Disability, Worker's Compensation, Veteran's Administration, Department of Defense, Vocational Rehab and Maternal/Child Health Funds*
Source: National Health Expenditures Survey, Office of the Actuary, Health Care Financing Administration [7]

Medicare's share of nursing home payments grew five-fold, from 2% in 1979 to 11% in 1999. The increasing importance of Medicare reflects the substantial growth in the use of post-acute rehabilitative services compared to increases in use of extended chronic care. The rapid increase in SNF and other post-acute services have been attributed to a combination of factors. Staff analysts at CMS and other government agencies attributed

the initial increases to a series of administrative coverage policy changes in the late 1980s and early 1990s that clarified eligibility for services, established higher standards for staffing and increased the availability of rehabilitation services [1,8,9]. Reports from the Office of the Inspector General (OIG) identified unintended reimbursement incentives coupled with poor regulatory oversight, that encouraged the expansion of supplemental (Part B) benefits for ancillary therapy services provided to SNF residents [2,10]. Recent reports from the Medicare Payment Advisory Commission (MedPAC) focused on the role of Medicare's DRG-based payments to hospitals, which created financial incentives to shorten acute-care lengths of stay by transferring increasing amounts of recuperative care to other settings [11].

Medicare Participation in Skilled Nursing Services

Summary data on Medicare SNF services appear in the Statistical Supplement of the Health Care Financing Review each year. The most recent data were published in 2000, and these reflect services delivered during the calendar year 1998 [6]. In the decade from 1988 to 1998 both the number of covered SNF admissions and the 12-month likelihood of a SNF admission more than quadrupled (Table 3). Although the average number of covered days per stay declined (consistent with increased use of SNF settings for recuperative care), the number of covered SNF days per beneficiary still grew at an astounding average annual rate of 10% for the period from 1990 to 1998.

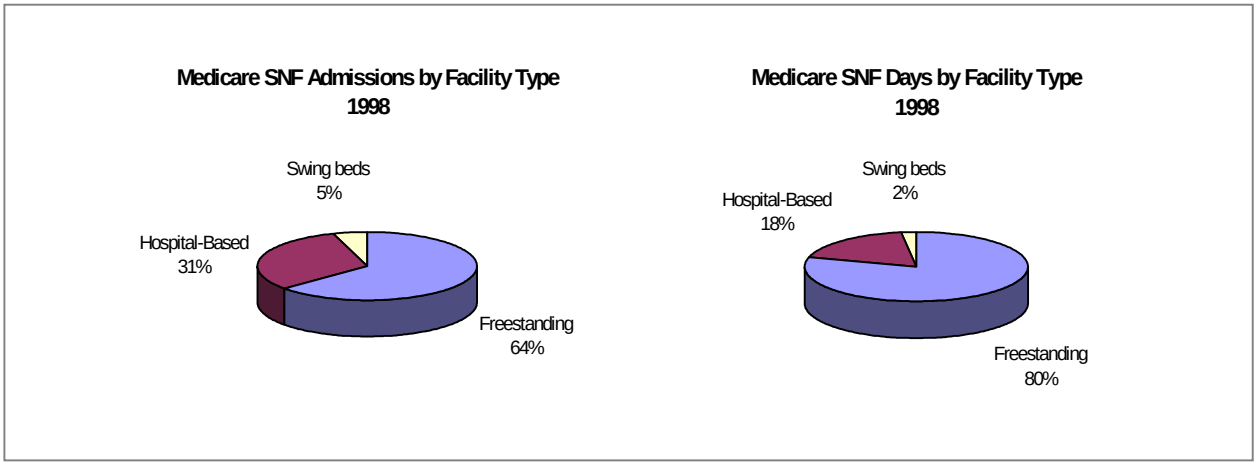
Table 3: Summary Utilization Statistics for Medicare-Covered SNF Services

	FFY 1988	FFY 1998	% change (over 10 yrs)
# SNF admissions	445,000	1,985,000	+ 346%
Admissions / 1,000 beneficiaries	14	62	+ 343%
Admissions / short-stay hospital discharge	4.3	16.5	+ 284%
Average length of stay (number of Medicare-covered days)	26.5	22.9	– 14%

Source: Health Care Financing Review, Statistical Supplement, 1992 and 2000.

Sixty-four percent of Medicare/SNF admissions in 1998 were to freestanding facilities, but because the length of stay is longer in these settings, they accounted for 80% of the Medicare covered days. The hospital-based facilities accounted for 31% of admissions, and patients admitted to hospital swing beds accounted for another 5% (Figure 2). The importance of swing beds is understated by this last measure, however, since this option is only permitted in rural settings and SNF admissions to facilities in non-metropolitan counties accounted for a little more than one-fifth all Medicare SNF admissions. The swing-bed benefit did not become available until 1982, and was not widely adopted by rural hospitals until the middle of that decade. By 1987, just before the period of rapid expansion in nursing home capacity began, swing-bed admissions accounted for 9.7% of all Medicare SNF cases. There was, however, great geographic variation in this measure. Across the predominantly rural states of the West North Central region, the average was 35%, and in Mississippi it was as high as 89% [12]. The role of swing beds in the delivery of skilled nursing services is discussed in greater detail in a later section of this paper.

Figure 2: Shares of Medicare Skilled Nursing Care, 1998



Source: Health Care Financing Review, Statistical Supplement (2000)

Nursing homes, hospital-based units and hospital swing beds may not represent entirely substitutable alternatives, as there is some evidence of systematic differences in the level or type of care provided in each of these settings [4,13]. Although the relative shares of covered days across facility type have not changed dramatically during the last decade, hospital-based facilities have gained an increasing share of the total admissions, rising from 21% in 1990 to 31% by 1998. The gap between the average length of stay in hospital-based units and in freestanding units has widened, as the new or expanded hospital SNF capacity appears to have taken on cases with a shorter recovery period and more intense rehabilitation services. As shown in Table 4, hospital-based covered stays in 1998 were one-half as long as those in freestanding facilities (13.5 days compared to 28.6). At the same time, the average hospital-based Medicare payment per day was nearly 50% greater ($337 compared to $247). In 1997, the last complete year during which Medicare payments were based on documented reasonable cost, hospital-based payments per day were 66% greater than freestanding payments per day.

Table 4: Characteristics of Medicare SNF Care in Calendar 1998, by Type of Setting

	Admissions	Days of Care	Mean Covered L.O.S.	Program Payments	
				Per Day	Per Case
All Sites	1,985,000	45,422,000	23.6 days	$248	$5,908
Freestanding	1,263,000	36,080,000	28.6	$247	$6,539
Hospital-Based	622,000	8,389,000	13.5	$337	$4,616
Swing beds	100,000	953,000	9.5	$205	$1,960

Source: Health Care Financing Review, Statistical Supplement, 2000.

SNF admissions to hospital swing beds were the shortest of all three settings, averaging only 9.5 covered days per admission. The Medicare SNF payments per swing-bed admission averaged only $1,906, or about 30% of the average payment for a stay in a freestanding facility. The pattern of short stays for swing-bed patients has been consistent since the beginning of the swing-bed program. Early evaluations of swing-bed utilization using 1987 claims data identified that these admissions were more likely to be for patients with intensive rehabilitation needs for whom there was difficulty finding placements with sufficient therapeutic capabilities, and that swing-bed admissions were more likely to serve as "holding" arrangements while more suitable placements were found [13,14]. Similar research on admissions in the 1990s, subsequent to the expansion of both total nursing home and rehabilitative care capacity, has unfortunately not been published.

URBAN-RURAL DIFFERENCES

Definitions

The remainder of this paper focuses on urban-rural differences in nursing home characteristics and supply measures. We define rurality by using the Urban Influence

Codes (UIC) developed by the U.S. Department of Agriculture's Economic Research Service [15]. These codes originally classify counties into nine levels, of which the first two are urban (located in metropolitan areas of greater than or less than one million population) and the next seven are non-metropolitan counties grouped first by adjacency to large or small metropolitan areas, and further according to the size of the largest city within each county. To simplify the tables and figures in this paper, we have aggregated these codes to five groups, defined as follows.

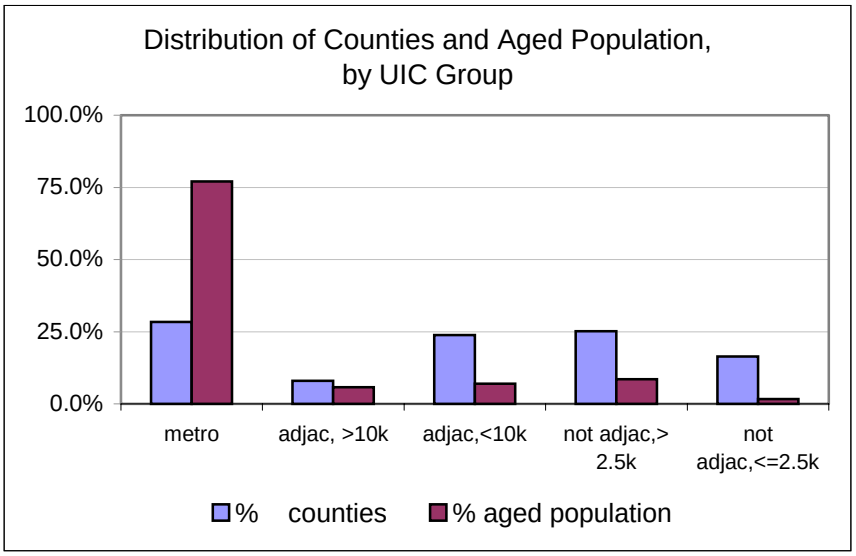
1) Urban (all metropolitan areas)
2) Rural, adjacent to any metropolitan areas, with a city of ≥10,000 residents
3) Rural, adjacent to any metropolitan areas, with a city of <10,000 residents
4) Rural, not adjacent to any metropolitan areas, with a city of ≥ 2,500 residents
5) Rural, not adjacent to any metropolitan areas, w/no town or w/town < 2,500 residents

We use the urban influence codes as revised in 1997. These are based on town-size estimates from census projections for 1997, but they retain a "first cut" designation as metropolitan or non-metropolitan that is still based on the 1993 MSA assignments from the Office of Management and Budget (OMB). In any material where we have dichotomized the data into "urban" and "rural" or "metropolitan" and "non-metropolitan"(used interchangeably), we have based the dichotomy on this 1993 designation as used by the UIC.[3]

[3] The OMB periodically redefines MSAs based on changes in population and/or employment commuting patterns. A total of 112 nursing facilities in the 2001 OSCAR file were located in 18 counties that were not included in MSAs as of 1993, that were later included as parts of existing or newly created MSAs. We treat these facilities as "rural" in order to retain consistency with the urban influence code groups, but for prospective payment rate setting purposes, Medicare will have considered them as "urban".

Seventy-two percent of counties in the United States are identified as non-metropolitan in the UIC grouping scheme. As of the 2000 census, there were 34.5 million residents aged 65 years or older, and 24% of them lived in these non-metropolitan areas. The distribution of counties and their relative shares of the aged population, across all levels of our UIC groups, is presented in Figure 3.

Figure 3: Distribution of Counties and Population Across Urban Influence Groups



Source: U.S. Bureau of the Census, 2000

Urban-Rural Differences: Distribution of Facilities

Approximately 5,900 nursing facilities, or 35% of the total, are located in non-metropolitan counties across the nation, and they operate nearly 500,000 certified beds, or about 29% of the total supply. The distribution of facilities and certified beds across UIC groups is presented in the upper section of Table 5. Twelve percent of facilities nationwide are not certified for Medicare skilled services at all, but the distribution of Medicare-

participating facilities across UIC groups, presented in the lower section of the table, is not substantially different from that of all certified facilities

Table 5: Distribution of Nursing Facilities and Beds Across Urban Influence Groups

All Nursing Homes:	Number of facilities	% total	Number of beds	% total	% aged population

All Nursing Homes:	Number of facilities	% total	Number of beds	% total	% aged population
Metro	10,907	65%	1,223,678	71%	77%
Non-metro:					
Adjacent, >10,000	1,241	7%	115,804	7%	6%
Adjacent, <10,000	1,793	11%	152,445	9%	7%
not adjacent, >= 2,500	2,297	14%	189,180	11%	8%
not adjacent, <2,500	610	4%	38,991	2%	2%
Subtotal, non-metro	5,941	35%	496,420	29%	23%
Total	16,848	100%	1,720,098	100%	100%

Medicare-Participating Only	Number of facilities	% total	Number of beds	% total	% aged population
Metro	9,982	68%	1,144,852	73%	77%
Non-metro:					
Adjacent, >10,000	1,072	7%	102,191	7%	6%
Adjacent, <10,000	1,464	10%	128,109	8%	7%
not adjacent, >=2,500	1,843	12%	156,062	10%	8%
not adjacent, <2,500	426	3%	29,019	2%	2%
Subtotal, non-metro	4,805	33%	415,381	27%	23%
Total	14,787	100%	1,560,233	100%	100%

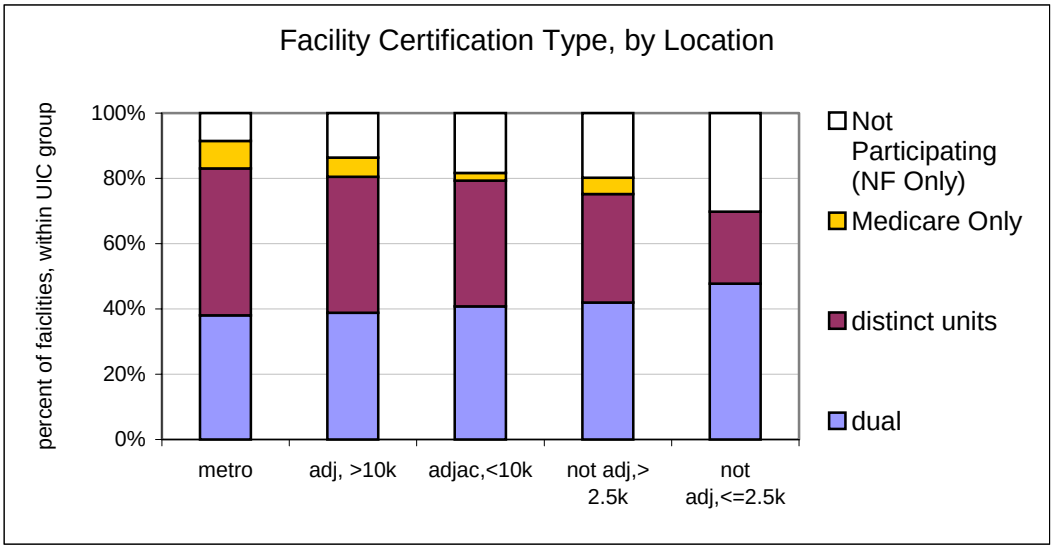
In order to retain consistency with the urban influence code groups, but for prospective payment rate setting purposes, Medicare will have considered them as "urban".
Source: Authors' calculations from OSCAR file, March 2001.

At the national level, both total nursing home beds and Medicare-certified beds appear to be distributed across UIC groups in a manner that is consistent with expectations based on the distribution of the elderly population. There are some substantial differences in the nursing home bed-to-population ratios across geographic regions and at the state

level, which appear to be independent of urban-rural characteristics. The regional supply differences are analyzed in greater detail later in this paper.

Although twelve out of one hundred nursing homes nationwide do not participate in Medicare at all, this proportion varies somewhat by location (Figure 4). Rural facilities are more likely to be certified Medicaid or NF only (19% of all rural facilities, compared to 9% of all urban), but the impact of this on Medicare beds is somewhat offset by the fact that rural facilities are also less likely to make use of distinct-part units. Overall, 53% of rural and 58% of urban beds are certified for Medicare participation.

Figure 4: Percent of Nursing Facilities with Medicare Certification, By Location



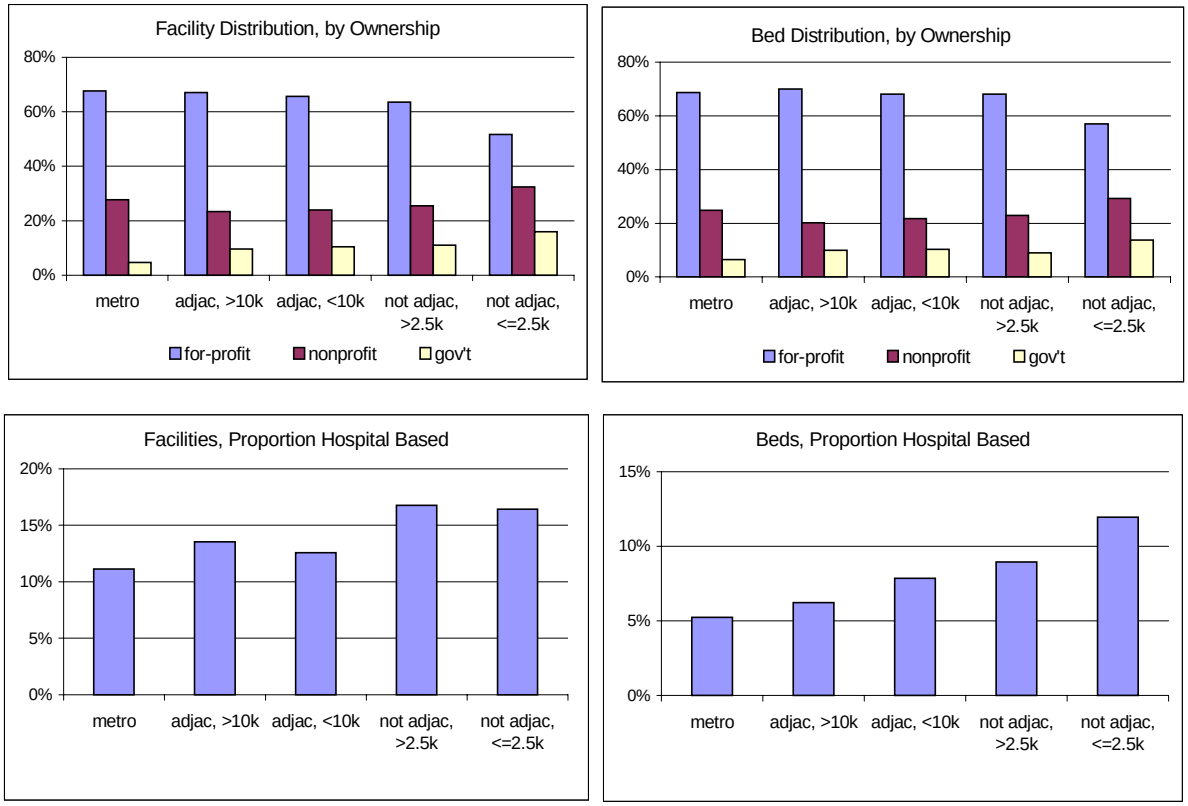
Source: Authors' calculations from OSCAR file,

Urban-Rural Differences: Characteristics of Skilled Nursing Facilities

The charts in Figures 5 through 8 are restricted to data on the 14,787 Medicare-participating facilities that operate at least some Medicare-certified beds. Figure 5 compares patterns of ownership and affiliation by UIC group, while Figures 6 through 8

graphically present stratified measures of average capacity, occupancy and staffing ratios, by UIC groups within types of facilities.

Figure 5: Urban-Rural Differences in Ownership and Affiliation (Medicare-Participating Nursing Facilities Only)



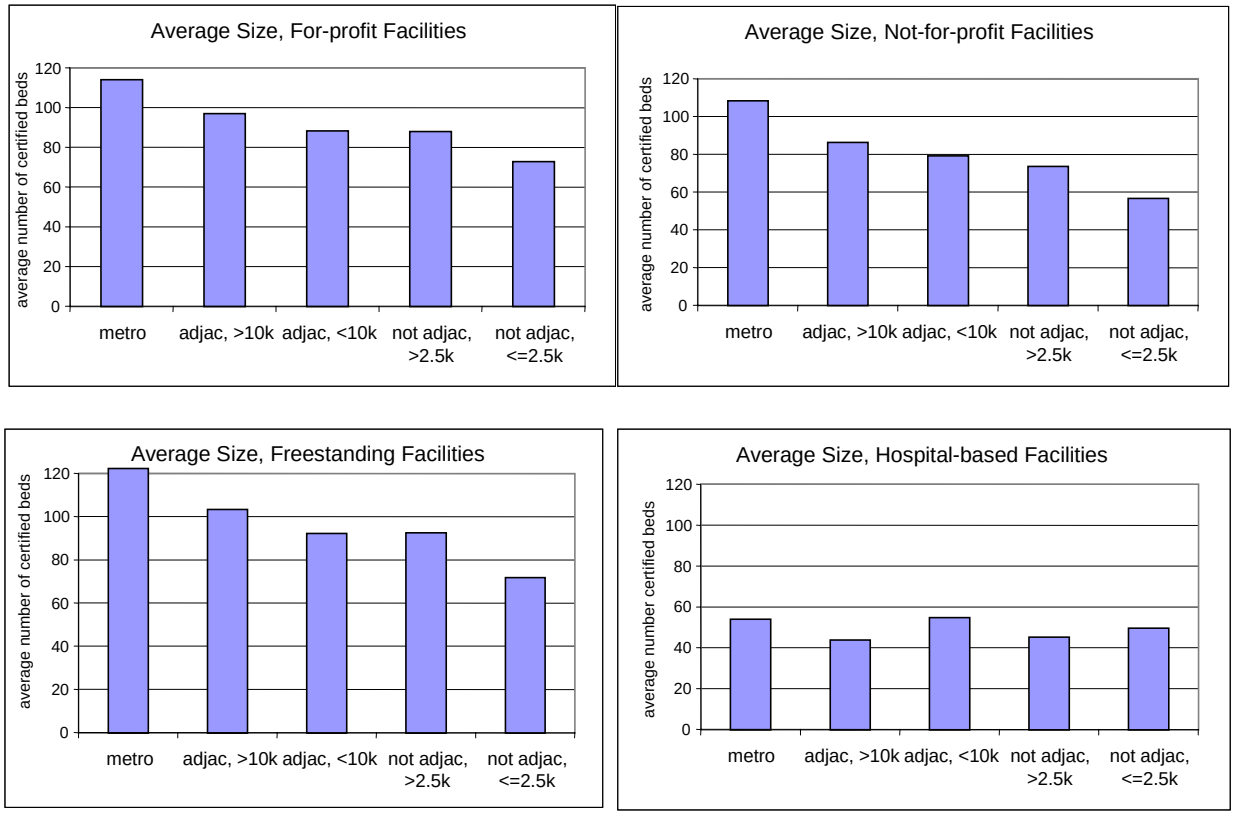
Source: Authors' calculations from OSCAR file, March 2001

The freestanding, proprietary model of nursing home ownership dominates the industry, regardless of location (Figure 5). However, the proportion of government-owned facilities increases as communities get smaller, from 4.7% among metropolitan counties to 9.6% in the least rural of non-metropolitan counties, to 16.0% in the most rural. The distribution of total certified beds follows a similar pattern, with the percent of public hospital-based beds rising from 5.2% in the metropolitan areas to 6.2% in the least rural

counties, and 12.0% in the most rural counties. Counties and local health districts are the most common public entities to own nursing homes, but there are also several city-owned facilities.

Facilities in more rural areas tend to be smaller (Figure 6). This is true among for-profit as well as not-for profit facilities, and among all freestanding facilities regardless of

Figure 6: Urban-Rural Differences in Bed Capacity, by Ownership & Affiliation (Medicare-Participating Nursing Facilities Only)



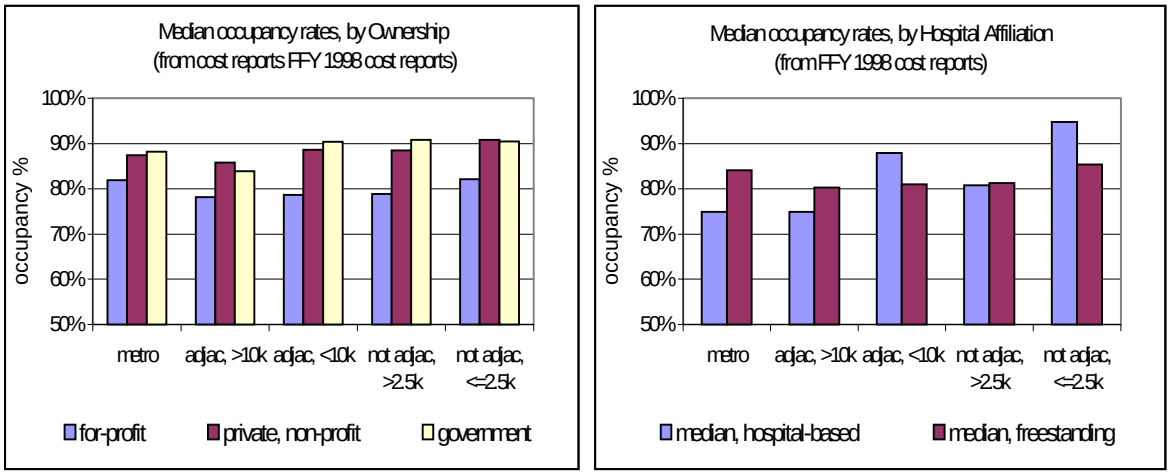
Note: Averages are computed across facilities within group.
Source: Authors' calculations from OSCAR file, March 2001

ownership. In contrast, the hospital-based units tend to be of similar (and relatively small) size, regardless of location. Within each of the UIC groups shown in Figure 6, the

distribution of average capacity across hospital-based facilities is highly skewed by the presence of a few very large units. The median bed capacity for hospital-based units in metropolitan areas is only 28 beds (compared to a mean value of 56 beds) while across all non-metropolitan facilities, the median size is 32 beds, compared to a mean value of 48.

Data on capacity utilization are shown in Figure 7. These are medians within group, and the information comes from Medicare cost reports and pertains to a period that is one to two years earlier than the OSCAR data. Although we know that changes in total bed capacity since 1998 have not been great, we do not yet have data on what may have happened to admission rates and length of stay since 1998. Occupancy tended to be lower for the proprietary homes than for government and non-profit, at all rural and urban levels, but occupancy rates were high for all types of facilities and in all areas. Among the non-profit and publicly owned facilities, half the facilities in the most rural counties were operating above 90% capacity.

Figure 7: Urban-Rural Differences in Occupancy rates, by Ownership and Affiliation (Medicare-Participating Nursing Facilities Only)



Source: Authors' calculations from Medicare SNF Cost Reports, filed for federal fiscal year 1998.

The licensure survey files include data on nurse staffing that are taken from a single payroll period and reflect the number of full-time equivalents for the entire nursing facility, including both SNF and NF units. Using this information we computed FTE-per-bed ratios for RNs, LPNs and Nurse Aides for each facility, and summarized these by affiliation and location (Figure 8).[4] The overall nursing staff ratios are somewhat lower in rural counties than in urban ones, but most of this difference is attributable to the hospital-based facilities.

Figure 8: Urban-Rural Differences in Nurse Staffing Ratios, by Affiliation (Medicare-Participating Nursing Facilities Only)

Source: Authors' calculations from OSCAR file, March 2001.

[4] 3.5% of urban and 2.1% of rural facilities reported nursing FTE data that were out of reasonable range (from 2 to 245 FTEs per certified bed). These facilities were excluded from our computations.

In freestanding homes the ratios show very little urban-rural variation, in total or within categories of nurse training; nurse-aides, regardless of location, deliver thirty to thirty-five percent of the nursing care. In hospital-based settings there is considerably more variation in the staffing mix. The average ratio of RNs to total nursing personnel in these units is 0.34 in the urban areas, compared to 0.11 in units found in non-adjacent counties. Some of the rural difference undoubtedly reflects shortages of registered nurses in the rural areas. The magnitude of the difference, however, and the fact that it is not nearly as pronounced in the more numerous freestanding nursing homes, suggest that hospital-based units in urban settings may be fulfilling a different role than the one they serve in rural communities. From cost report data we know that the proportion of Medicare to total long-term care patient days is much lower in the hospital-based units of smaller rural counties than it is in the units located in larger rural communities or in urban areas. It is likely that in urban settings, the hospital-based units are more often operated with the objective of reducing the affiliated hospital's acute care length of stay, and are therefore engaged in more rehabilitation-oriented or post-procedure recuperative care. Hospital-based units located in less densely populated areas provide more of a mix of skilled and non-skilled care and may be functioning more in the traditional role of the community nursing home. The reasons behind staffing differences between urban and rural hospital-based facilities should be further investigated with detailed cost report and claims data.

There are also some interesting differences in staffing ratios by type of ownership. In freestanding facilities the ratio of RNs to total nursing staff was slightly lower in proprietary homes (0.11) than in private non-profit (0.13) or public homes (0.12), and similar differences were found across all UIC levels. In the hospital-based settings,

however, the opposite was true. There were only 277 for-profit hospital-based units in our OSCAR data (and three-fourths of them were in urban areas) but their RN ratio averaged 0.34, compared to 0.30 for non-profits and 0.20 for units in the public hospitals, possibly a reflection of increased participation in sub-acute care by proprietary hospitals that are under more pressure to manage their acute-care length of stay.

In reviewing staffing levels it is well to keep in mind that the ratios are expected to vary according to each facility's particular mix of skilled and non-skilled patients. Without being able to control for differences in average acuity levels, staffing data alone cannot be used to draw any conclusions about differences in quality of care.

Urban-Rural Differences: Population-Bases Measures

In an industry that is predominantly for-profit, market participation and overall bed supply should be responding to expected return on investment. Expected returns are sensitive both to the financial and regulatory environment and to expected demand. While demand can shift as a result of changes in third-party financing or in response to changes in medical practice patterns, demand is also fundamentally shaped by demographics. It is difficult to assess the reasonableness of the intense growth that has occurred in this industry, or the impact of the industry response since 1997, without examining the supply of nursing home care relative to the size of the elderly population. This section, therefore, examines current population-based nursing home supply measures across all U.S. counties, relative to the size of the elderly population. The means in Table 6 reflect average county-level data. The aggregate ratios (computed as the sum of all beds divided by the sum of all residents) are somewhat lower. The aggregate national supply of certified nursing home beds to elderly residents is 50 beds per thousand. The aggregate ratio for all rural counties

is 62 per thousand, which is 35% higher than the same measure for urban counties. Ratios are higher for rural than for urban areas in 39 of the 50 states. The same pattern holds true for aggregate ratios of Medicare certified beds, which are 33 per thousand in rural areas, 27 per thousand in urban, and 28 per thousand overall.

Table 6: Distribution of Certified Beds per Thousand Population Aged 65 and Over

All Certified Beds:	Mean (*) (un-weighted)	Distribution		
		25th percentile	50th percentile	75th percentile
Metro	51.9	38.2	49.1	64.3
Non-metro:				
Adjacent, >10,000	62.3	44.8	61.6	79.4
Adjacent, <10,000	67.3	43.1	63.0	88.1
not adjacent, > 2.5,000	68.5	45.8	65.0	87.5
not adjacent, <=2.5,000	65.2	35.4	65.1	95.0
Subtotal, non-metro	66.7	43.1	64.0	88.3
All Facilities	62.8	41.4	58.5	81.1

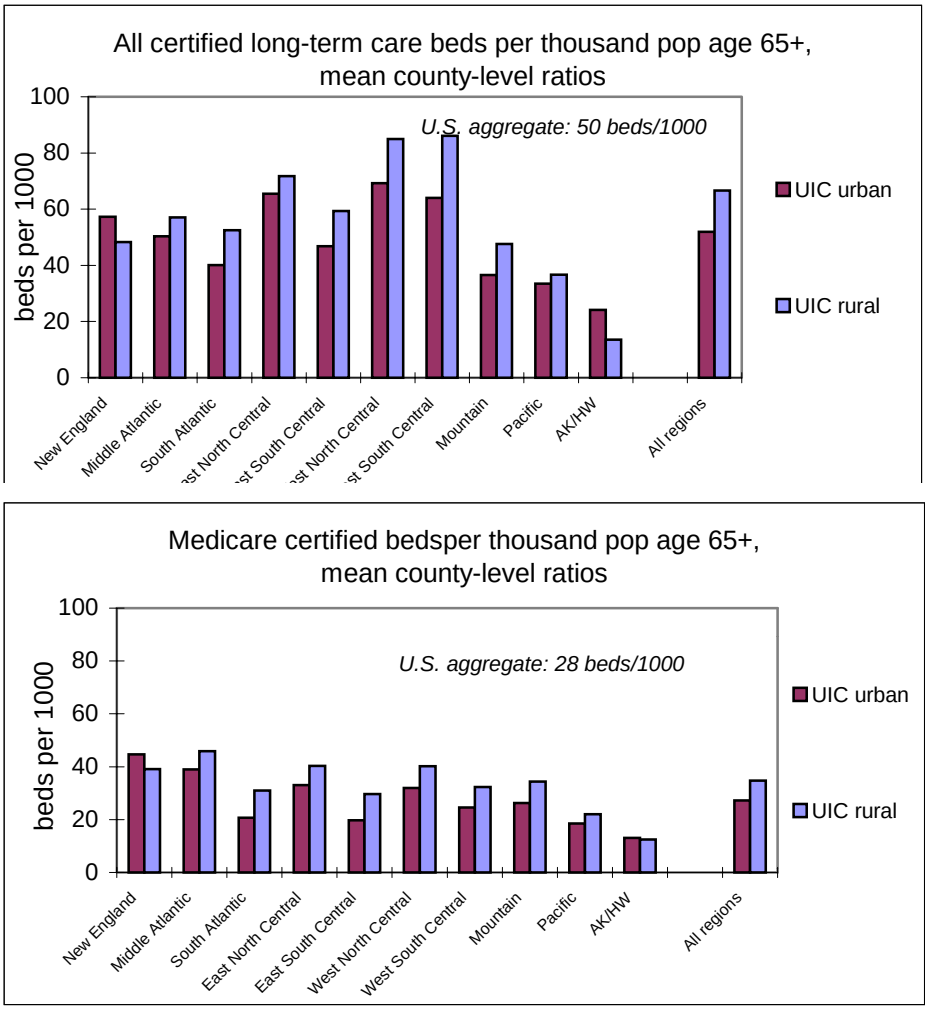
Medicare Certified Beds:	Mean (*) (un-weighted)	Distribution		
		25th percentile	50th percentile	75th percentile
Metro	27.2	14.6	23.9	37.6
Non-metro:				
Adjacent, >10,000	31.6	14.4	27.1	45.7
Adjacent, <10,000	34.8	10.4	28.5	50.2
not adjacent, > 2.5,000	36.0	12.8	31.8	55.0
not adjacent, <=2.5,000	34.3	0	16.0	60.4
Subtotal, non-metro	34.8	9.0	27.6	52.6
All Facilities	32.8	11.0	26.4	47.5

(*) *Means are averages computed across all counties within group, without weighting by county population.*
Source: Authors' calculations from OSCAR file, March 2001 and U.S. Census, 2000.

Some regional geographic patterns emerge from the population-based data when it is examined across census divisions, as presented in Figure 9. The bed-to-population summary measures in these two sets of bar graphs are un-weighted averages across all counties within each division, so they can be interpreted as measures of tendency among

rural versus urban counties. The pattern of higher ratios for rural than urban counties is present in all census divisions except New England (and Alaska and Hawaii, which have been separated in these charts from the remaining states in the Pacific division, because their unusual circumstances make them difficult to group). Rural ratios tend to be higher both for total nursing home beds (upper chart) and for Medicare-certified beds (lower chart), but the differences across census divisions are less pronounced for the Medicare ratios than they are for the total bed ratios.

Figure 9: Urban and Rural Bed-to-Population Ratios by Census Division

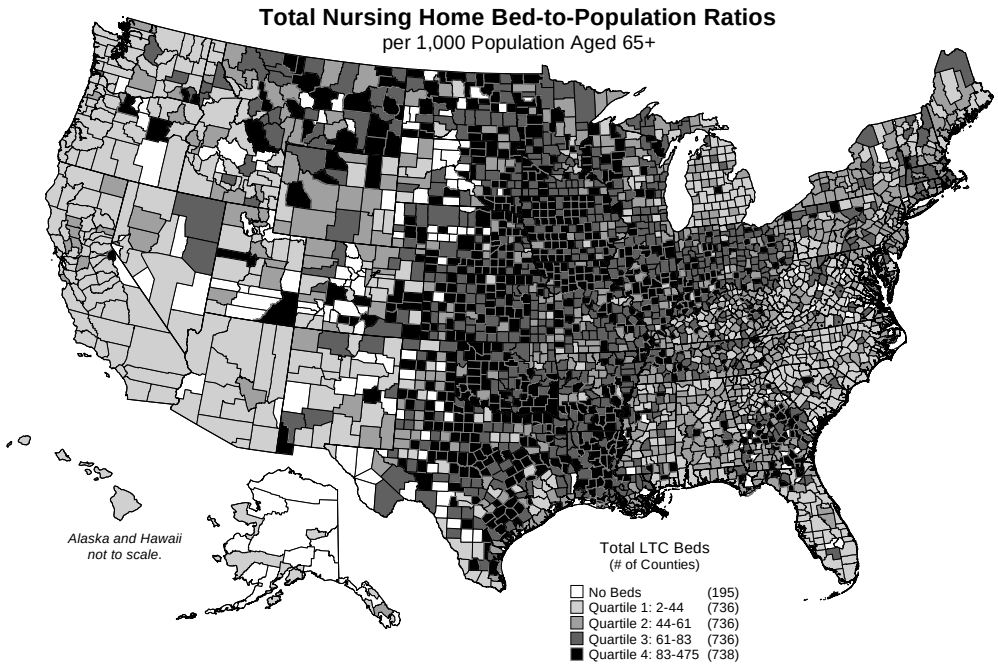


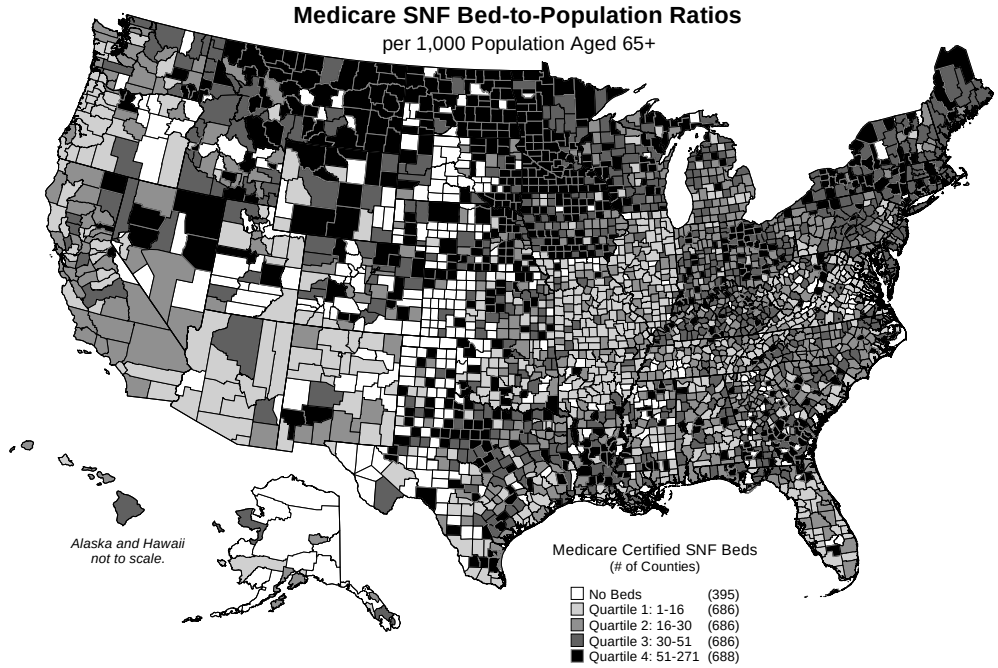
Source: Authors' calculations from OSCAR file, March 2001 and U.S. Census, 2000.

The nursing home industry is heavily influenced by state-level regulation, both because of Certificate-of-Need laws that often restrict nursing home bed licensure, and because of the industry's general reliance on state-run Medicaid programs for funding. As a consequence, there is greater inter-state variation in the supply of nursing home beds relative to population, than variation across urban influence levels. Aggregate bed-to-aged population ratios by state vary nearly four-fold, from 21 to 80 per thousand. The highest ratios are found in Iowa, North Dakota, Louisiana, Nebraska, Indiana and Oklahoma (all between 74 and 80 beds per thousand) while the lowest are in Florida, Oregon, Arizona, Nevada, Hawaii and Alaska (all below 30 beds per thousand). In the two maps in Figure 10 we present bed-to-elderly population ratios by quartiles, for each county of the United States.

These maps present some startling patterns in the distribution of nursing home supply. The upper map highlights the extent to which total bed supply is a regional, but not a metropolitan/non-metropolitan, phenomenon. Further research is needed to assess the extent to which differences in the Certificate-of-Need laws may account for the heavily bedded middle region of the country compared to the consistently low ratios to the west. There is also considerable inter-state variation in the Medicare-certified bed-to-population ratio (lower map). Although there are also regional patterns discernible in this distribution, the two maps are not similar. It is predominantly the north-central areas that have the greatest relative supply of Medicare-certified beds, although there are also groups of contiguous counties covering surprisingly large land areas, with no certified SNF beds.

Figure 10: Certified Nursing Home Beds per Thousand Elderly Population





Sources: OSCAR Files 2001; US Census Bureau 2000.

Produced By: North Carolina Rural Health Research Program, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.

We find no significant correlation between the population-based ratios of total certified beds and those of Medicare-certified beds, when these statistics are computed from aggregated state data.[5] It is difficult to interpret the different geographic distributions of the total bed ratios and the Medicare ratios, because so much of the difference may be regulatory artifact rather than true differences in supply. As the cost accounting advantage to distinct-part units disappears and more of the Medicaid-only beds convert to dual-certified status to take advantage of administrative simplicity, the map of Medicare certified bed supply will likely begin to look more like that of total bed supply.

Because dual-certified beds can be used for Medicaid and Medicare populations, differences in the ratio of Medicare-certified beds to elderly population are not necessarily good indicators of variation in beneficiary access or Medicare SNF demand. In CMS' most recently published national statistics on admission rates, for example, Massachusetts, Kansas, Missouri and Rhode Island had the first through fourth highest state average SNF admission rates per Medicare beneficiary [6], yet ranked 12th, 25th, 48th and 8th, respectively, in state-level ranking of Medicare certified beds per 1000 elderly, from the OSCAR data. There is better correlation between the Medicare SNF bed-to-population ratios and the SNF admission rates at the lower end of the spectrum; states with the lowest supply measures do tend to rank among those with the lowest admission rates, and it is these areas that should be of most interest to us. Overall, there is a modest, statistically significant correlation between state-level measures of certified Medicare beds and SNF admissions per beneficiary.[6]

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[5] Pearson's correlation coefficient is only 0.06. A t-test of the null hypothesis that these two measures are independent yields p=0.70. This does not preclude, however, a possibility that the two are related at the county level; estimates on state-level aggregate measures may be subject to aggregation bias.

[6] Pearson's correlation coefficient is 0.42, p=.002.no long-term care facilities, but these were located on the outer areas of MSAs and accounted for 0.1% of the urban elderly population.

The Role of Swing Beds

The swing bed program was designed to fill two policy objectives. It offers small rural hospitals a chance to put unused bed capacity to work, thereby reducing unit costs for all its patients; and it offers a way to improve access to skilled nursing care, at very low marginal cost, for residents of rural areas that have little or no skilled nursing capacity. There is evidence that the swing bed program is successful in providing access to skilled care in many of the counties where there are no certified beds.

Even though rural areas have better-than-average population-based bed supply measures, very rural counties are much more likely than larger rural or urban counties to have no nursing home or no nursing homes with certified Medicare beds (Table 7). Failing to have any nursing home within a county does not necessarily indicate a problem of access, apart from increased travel between the nursing home and patients' (or families') residences. In very rural areas the county level may be too small a unit to provide meaningful comparisons, since in sparsely populated areas, nursing homes may need to cover multiple counties in order to achieve a minimum viable size. The populations of many counties that have no nursing homes, or have no Medicare-certified beds, may still be adequately served by the bed supply in neighboring counties. Across all areas in the non-metropolitan UIC groups, 7.5% of counties had no nursing home, but these counties accounted for only 1.4% of the total rural population aged 65 and over. The comparable figures for rural counties with no certified Medicare beds were 16.1% of counties and 4.7% of elderly population. There were also 13 metropolitan counties (1.6% of all urban) with no long-term care facilities, but these were located on the outer areas of MSAs and accounted for 0.1% of the urban elderly population.

Table 7: County-level Population to Bed Ratios by Urban Influence Group

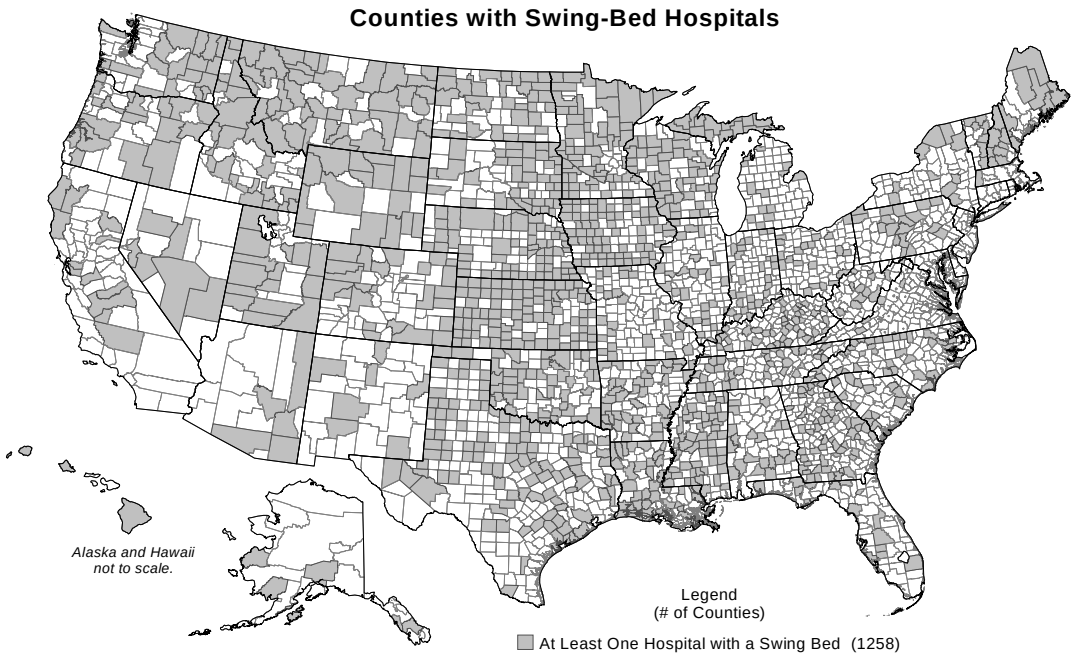
Urban Influence Group	# counties	Median beds per 1000 pop 65+		Percent counties without beds:	
		All nursing home beds	Medicare certified beds	% with no long term care	% with no Medicare
Metro	833	49.1	23.9	2%	2%
Non-metro:					
adjacent, >10,000	251	61.6	27.1	1%	2%
adjacent, <10,000	746	63.0	28.5	6%	13%
not adjacent, > 2.5,000	787	65.0	31.8	3%	9%
not adjacent, <=2.5,000	515	65.1	16.0	20%	39%
Total, All Counties	3,132	58.5	26.4	6%	12%

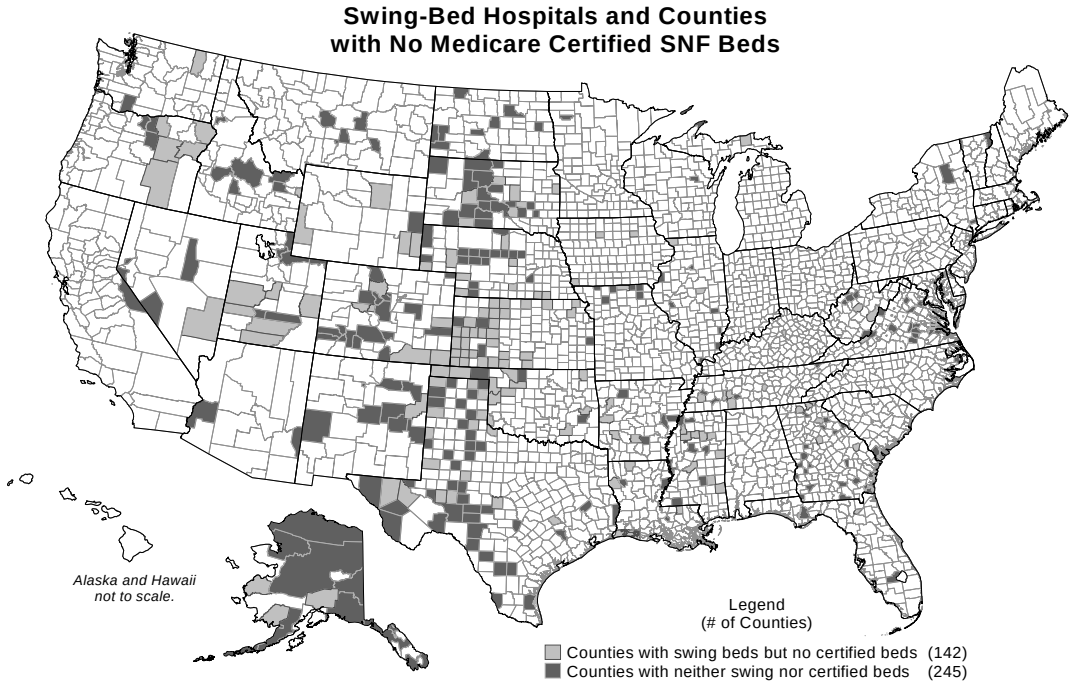
Source: Authors' calculations from OSCAR file, March 2001 and U.S. Census, 2000.

According to the OSCAR files there were 1,309 hospitals across the country with approval to use swing beds at the beginning of 2001, of which 90% were located in non-metropolitan counties.[7] These hospitals were widely distributed across the country, as shown in the upper map in Figure 11. The lower map in this figure identifies counties where there are no certified SNF beds. The lighter shaded areas indicate counties with swing-bed hospitals that may serve as substitutes; the darker shaded counties have neither SNF beds nor swing beds.

[7] The original provisions of the swing bed legislation allowed this option in any hospital with fewer than 100 routine care beds that is located in an area that is not "urbanized", by the definitions of the Bureau of the Census. "Urbanized areas" are identified by census tract. They generally include the central, or core, areas of MSAs, but not their outlying regions [17].

Figure 11: Swing-Bed Hospital Location and Counties without Medicare Skilled Nursing Beds





Produced By: North Carolina Rural Health Research Program, Cecil G. Sheps
Center for Health Services Research, University of North Carolina at Chapel Hill.
Source: Medicare HCRIS Files, PPS Year 15; OSCAR Files 2001; US Census Bureau 2000.

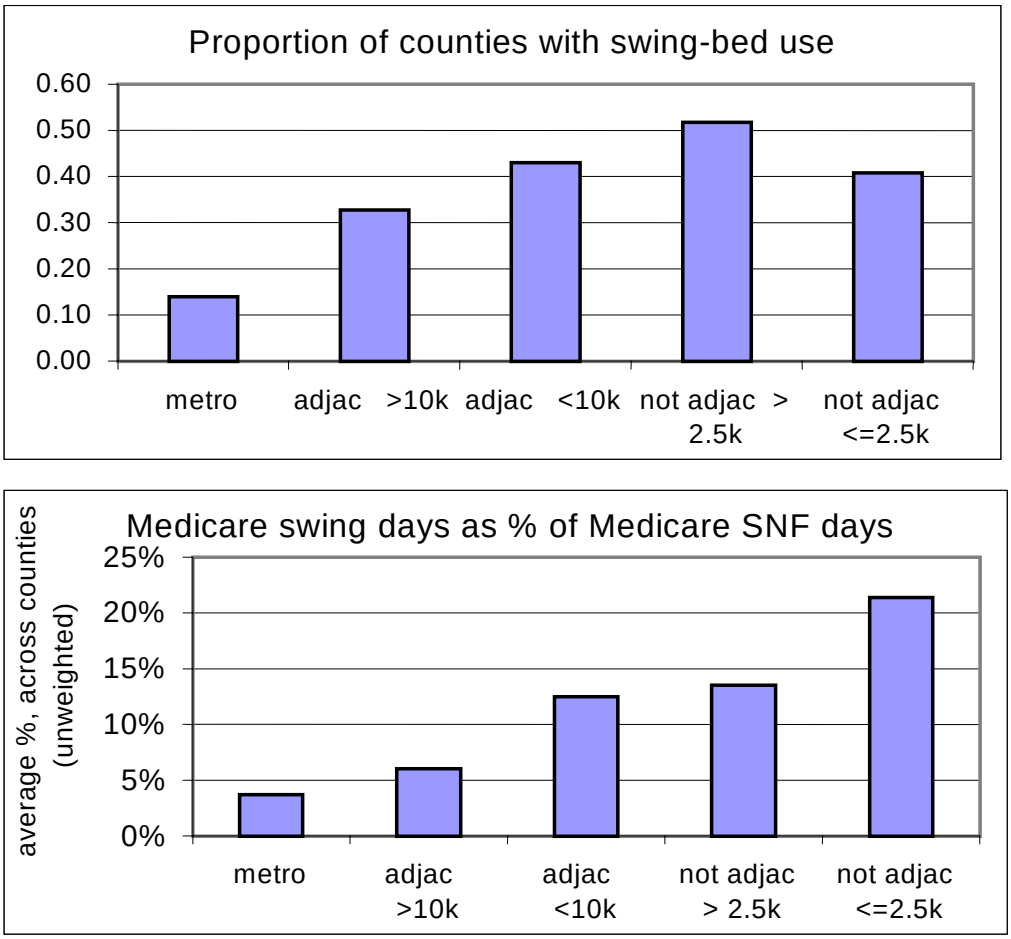
Overall, about four in every ten counties with no certified Medicare beds had at least one swing-bed hospital. The role of swing beds in preserving access may be particularly strong in the sparsely populated west-central and mountain regions. There are individual states that clearly make extensive use of swing beds to equalize access to skilled care. In Kansas, for example, where 34 out of 105 counties have no Medicare-certified beds, 30 of the 34 do have swing-bed hospitals.

OSCAR files provide information on licensure but not on actual utilization. We examined the filed cost reports for Medicare-participating SNFs and for swing-bed hospitals for FFY 1998, to gain some insight into where, and how extensively, the swing beds are used compared to other certified SNF capacity. In the 1998 cost report file, 61% of all hospitals in rural UIC groups were approved for swing beds and 96% of these reported at least some actual use during the year. Within eligible hospitals, however, the intensity of use is not very high; the average swing-bed census was only 2.4 patients per day, and less than 25% of all swing-bed hospitals had an average census above 3 patients. One-fourth of the rural swing-bed hospitals also operated hospital-based skilled nursing units. The advantage to operating both is unclear unless the skilled beds are often full (so that the swing beds functioned as holding areas until a placement could be found), and/or this is a way of expanding long-term care capacity in states with restrictive CON or other licensure rules. The average swing-bed census was similar, whether or not there was a separate SNF unit in the hospital. However, occupancy in the rural SNF units of hospitals that also used swing beds averaged 86% of capacity, compared to 73% in those of hospitals without swing beds.

The charts in Figure 12 show participation in swing-bed care for Medicare skilled nursing services only, by UIC group. The first chart shows the average proportion of

counties that have swing-bed hospitals, across all counties in that UIC group. The second chart shows the percent of total Medicare-covered SNF days delivered in those counties that is care delivered in swing beds. It is important to keep in mind that the data are identified by the location of the care given, not the residence of the patient. Nevertheless, it is evident from these charts that the swing-bed program increases in importance as counties become more rural.

Figure 12: Level and Intensity of Swing-Bed Use by Urban Influence Group

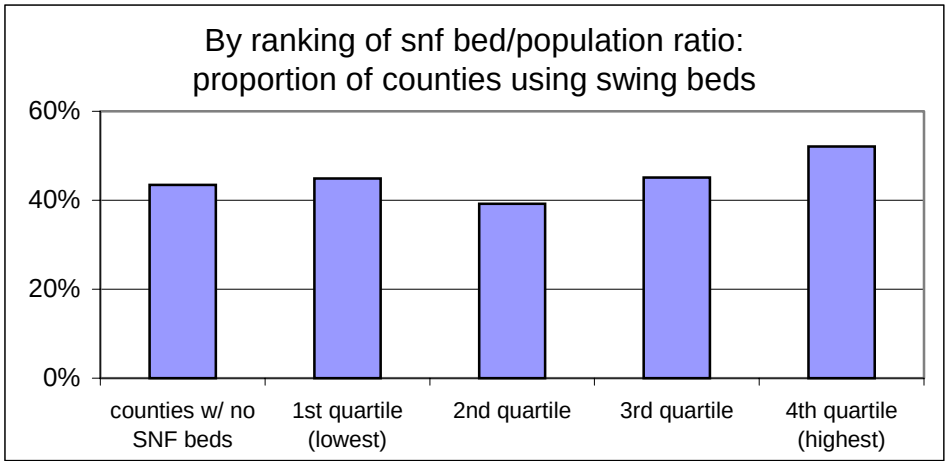


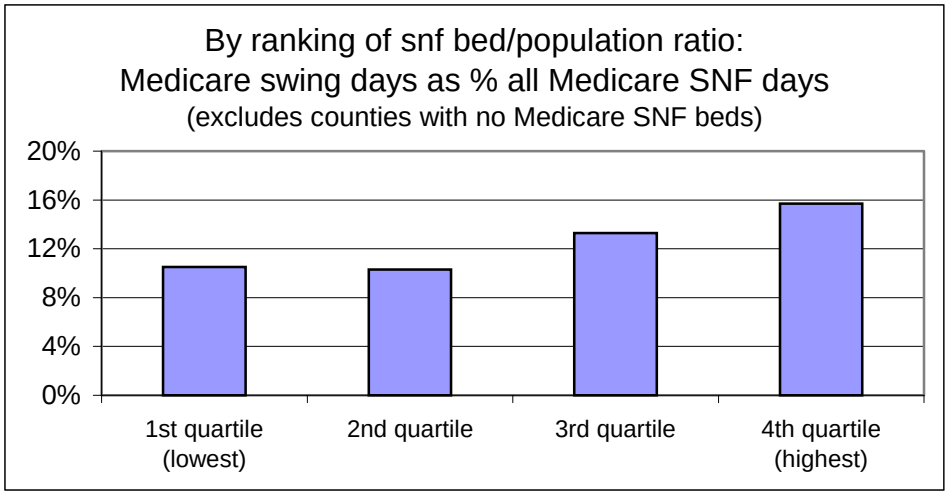
Source: Authors' calculations from FFY 1998 Medicare Cost Reports

The drop that can be seen in the proportion of counties with swing-bed hospitals — from 52% in non-adjacent counties with towns greater than 2,500 to 41% in non-adjacent counties with no towns — is due to the fact that counties in this last column are less likely to have a hospital at all. On average, twenty-one percent of all the Medicare-covered SNF days of care that were delivered in the most rural UIC counties were delivered in swing beds.

A slightly different, and possibly more complex, picture emerges when we examine this data relative to the population-based measures of bed supply discussed earlier in this paper. Using the quartile distributions of Medicare-certified beds per thousand elderly residents (the same as were used in the map in Figure 10, based on counties with at least one certified bed), the charts in Figure 13 indicate that swing bed use is not, as might be expected, inversely correlated with certified bed supply. Without a study of actual claims data, that can provide information on case mix, prior diagnoses and charges for individual services, it is not possible to determine the extent to which swing beds serve as substitutes for, or complements to, existing SNF capacity.

Figure 13: Level and Intensity of Swing-Bed Use by Bed-to-Population Ranking





Source: Authors' calculations from FFY 1998 Medicare Cost Reports

SUMMARY AND CONCLUSIONS

This working paper provides an overview of the characteristics and geographic distribution of skilled and non-skilled nursing facilities and beds. Rural-urban differences in the supply of long-term care beds and in the characteristics of long-term care facilities are less pronounced, in general, than rural-urban differences in acute care capacity. When examining the differences between urban and rural nursing facilities a number of points emerge:

- The supply of skilled nursing beds and of other nursing care beds per thousand

residents over age 65 is higher on average in rural areas than in urban areas. The density of nursing beds appears to be a state-level phenomenon, rather than one directly related to the rurality of a given county.

- The nation's most rural counties are the most likely to have no certified nursing homes. There are still some large areas in the mid-western and western states where there are no Medicare-certified beds, and where hospital swing beds provide the only access to skilled nursing care.
- As counties become more rural, swing beds account for an increasing proportion of Medicare SNF discharges. There are individual states that make extensive use of swing beds to maintain access to skilled nursing care.
- Long-term care facilities located in the most rural counties are more likely than those in larger counties to be hospital-based, and to be non-profit or publicly owned.
- Consistent with having a smaller population base to support them, facilities in more rural areas tend to be smaller. However, occupancy rates in nursing facilities and skilled nursing facilities are high, across all ownership types and in all types of locations.
- Differences between hospital-based and freestanding facilities appear to be less pronounced in rural settings than in urban ones. The hospital-based units in urban areas have both a higher proportion of Medicare patients to total patients and a higher proportion of RNs to total nursing staff, than other nursing homes, while the hospital-based units in rural areas tend to look more like the freestanding facilities.

The supply of nursing facilities does not appear to be a problem in rural areas, with the possible exception of the most rural counties (those not adjacent to metropolitan areas and with no town with more than 2,500 residents). Although the supply of Medicare-certified skilled nursing beds also does not appear to be a concern, assessment of the availability of skilled services is problematic due to the fact that available data only indicate if a bed is certified for Medicare-reimbursed skilled care, but not how the bed is actually used. Several regions of the country rely heavily on hospital swing beds, rather than certified skilled beds, to meet Medicare demand for skilled care. Further analyses need to be conducted that compare staffing, lengths of stay and intensity of services provided, that may differentiate the types of care available across urban and rural areas.

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