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A REVIEW AND DATA UPDATE

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**August 15, 2009**

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## EXECUTIVE SUMMARY

### Changes in the Quality of Nursing Homes in the US: A review and data update

This report summarizes the literature and presents syntheses of data from over the last half decade on changes in nursing home quality as measured by staffing, process and outcome quality as well as the results of regulators' inspections. Since these changes in quality occurred within the context of substantial changes in the role of U.S. nursing homes, changes that resulted in large increases in the acuity and complexity of those being served, we also summarize changes in case-mix acuity and in the "segmentation" of the nursing home market as facilities increasingly specialized in caring for different groups of residents. In reviewing the literature, we've focused on the manner in which policies ranging from state Medicaid reimbursement to federal public reporting efforts have influenced nursing home quality since provider efforts to improve quality have not occurred in a vacuum. The report closes with recommendations made in the light of the changing role and composition of US nursing homes and the need for measures of quality that more precisely reflect the different reasons people use nursing homes and in light of impending policy changes.

We examined structural, process and outcome measures of quality. Literature and data summaries indicate that nurse staffing has increased, although this has been primarily at the low skill level. Indeed, using

existing data we observe both an increase in the proportion of homes achieving high levels of nurse staffing as well as an increase in the proportion falling below minimum levels. At the same time, most existing staffing measures ignore the fastest growing segment of facility staff – therapists who are concentrated in high Medicare facilities. Process quality measures like the use of physical restraints continued to improve with increases in both the number of "restraint" free homes and the number with high proportions of residents restrained. While use of psychotropic drugs seems to have increased, most of this is attributable to ongoing increases in anti-depressant use; growth in anti-psychotic use has leveled off. Most of the CMS reported outcome measures, particularly for the long stay population, have improved over time from ADL decline to facility acquired pressure ulcers. In contrast, incontinence among long stay residents has worsened in spite of the fact that there is evidence that toileting programs can be effective. The results of state regulators' inspections of nursing homes are not consistent with the measured outcomes; both the number and severity of deficiencies levied against nursing homes tended to increase. However, there is so much inter and intra-state variation in how the survey guidelines are apparently applied, it is difficult to understand precisely what those mean. Finally, while there is no agreement as to what the appropriate rate of hospitalization is, the outcomes of

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re-hospitalization of post-acute Medicare patients and hospitalization of long stay residents increased substantially, becoming a major policy concern.

These improvements in process and outcome quality were observed in spite of substantial evidence of increasing case-mix acuity and specialization amongst US nursing homes. The clinical complexity and functional impairment of both admitted and long stay residents has increased virtually across the board and since 2002 there was almost a doubling of the proportion of free-standing facilities serving more than 20% of Medicare patients on any given day, a phenomenon that more than offset losses in the number of hospital based facilities. Other more challenging forms of segmentation are also underway, with some facilities increasingly “specializing” in psychiatric patients and the concentration of Medicaid patients in selected facilities.

Nursing home policies that affect quality have achieved their intended effect, although not as completely as many would desire. Medicaid case mix reimbursement has improved access to many very sick patients residents and rising Medicaid payment rates appear to be associated with greater improvements in quality and lower rates of hospitalization. Public reporting of nursing homes’ quality performance has clearly stimulated many providers to institute quality improvement efforts which appear to have resulted

in greater improvements in both measured and some unmeasured quality scores but there is also evidence suggesting that public reporting has begun to “steer” those seeking nursing home care to better performing facilities, at least in the post-acute care arena.

Many challenges remain. The mixed picture of findings is at least partly related to the fact that our measures of the structure, process and outcomes of quality nursing home care continue to be very crude, uncorrelated and, therefore, seem to confuse both providers and consumers. Regulators’ inspection results don’t seem to resolve the confusion amongst the other measures and indeed, appear to be responsive to political influences at both the local and the national levels. Clearly we need better measures if we are to understand how we are making improvements and where else there are gaps to be filled. Even more importantly, if we are to respond to the growing specialization of nursing home care in the US, we must develop measures that are appropriate to the different populations of people using nursing homes for different purposes. All of this important measure development work to guide quality improvement efforts will have to be made while the industry, regulators, policy makers and researchers are struggling with the scheduled introduction of MDS 3.0 with its new emphasis on hearing the voice of the resident so that clinical care planning can be even more individualized.

## I. Introduction and Purpose

In an effort to review how nursing home quality has changed over the last decade and to place those changes within the context of broader changes in how nursing home care is rendered in the US, this paper reviews the literature on nursing home quality, identifies the policies and other trends that have influenced nursing home quality over the past decade and presents data documenting recent progress in quality. Since the role nursing homes play in providing post-acute care has expanded greatly and nursing homes appear to be increasingly “specializing” in serving certain types of residents and providing certain types of services, we characterize quality performance by these emerging specialized nursing home categories. While there are numerous types of measures of nursing home quality, this paper draws upon the published literature and presents new data based only upon publicly available information; staffing, nationally reported quality measures and selected summary deficiency information from regulatory inspections. Other measures capturing residents’ and families’ satisfaction with their experience are not included here. Finally, the paper concludes with a series of recommendations regarding future directions and challenges for better understanding how to improve nursing home quality of care.

## II. Background of Policy Changes in the Nursing Home Arena since OBRA ‘87

Concerns about inadequate quality provided to nursing home residents have been discussed in the lay media and the professional literature for decades (U.S. Senate 1974). In 1986, the Institute of Medicine (IOM) published its landmark report that called for major revisions in the way nursing home quality is monitored (Vladeck 1982; (IOM) 1986). It recommended the continuation of the existing system that periodically monitors quality through a survey process with deficiency citations but called for more emphasis on quality of life as well as quality of care

and encouraged the use of outcome indicators to assess quality. Implementation of many of the IOM recommendations began in 1987 with the passage of the Nursing Home Reform Amendment to the Omnibus Budget Reconciliation Act (OBRA). This mandated a new system of standards of care, including increased minimum staffing regulations, and quality of care monitoring (Harrington & Carrillo, 1999). These efforts culminated in the 1991 nationwide implementation of the Resident Assessment Instrument (RAI) system, which is the corner stone of the CMS (Centers for Medicare & Medicaid Services) Health Care Quality Improvement Program (HCQIP) for nursing homes. The RAI was designed to improve quality by requiring nursing homes to develop individual care plans, protocols for follow-up care and algorithms to “trigger” residents’ potential care needs. The Minimum Data Set (MDS), a component of the RAI, is used to collect information about patients’ physical and mental health status as well as specific treatments at regular time intervals. In addition to structuring resident care planning, the MDS made it possible to compare health outcomes of nursing home residents across facilities and to compare trends over time using more detailed resident level data rather than relying upon the cruder facility level reports.

Despite documented improvements in various aspects of nursing home quality following passage of OBRA, including reductions in the use of physical restraints (Phillips, Hawes et al. 1996; Castle, Fogel et al. 1997; Hawes, Mor et al. 1997; Mor 2002), psychotropic drug use (Rovner, 1992; Shorr, 1994), catheter use (Hawes, Mor et al. 1997; Harrington, Swan et al. 1999) and pressure ulcers (Fries, Hawes et al. 1997), opportunities for improvement remained (IOM 2001). The literature from that period documented quality problems ranging from malnutrition, (Abbasi & Rudman, 1994; Crogan, Shultz, Adams, & Massey, 2001) and dehydration, (Kayser-Jones, Schell, Porter, Barbaccia, & Shaw, 1999) to medication errors

(Gurwitz, Field, Avorn, et al. 2000) and pain (Teno, Weitzen et al. 2001). These mixed findings related to nursing home quality have been attributed to many different phenomenon including small samples drawn from different parts of the country, poor and inconsistent measurement and inadequate controls for the variation in resident acuity

One factor underlying the inconsistent findings regarding changes in nursing home quality over the last several decades has been the growing heterogeneity of US nursing homes. First, due to federal and state policy changes in reimbursement as well as the emergence of community based services, particularly the rise of assisted living, the acuity of the nursing home resident population has increased dramatically and the length of stay of most patients is now less than 90 days (Decker 2005; Feng, Grabowski et al. 2006; Mor, Zinn et al. 2007). Secondly, there is considerable heterogeneity among facilities with respect to the mix of residents they serve, for example how many are short-stay, post-acute, Medicare patients, and even their location in poor communities appears to have a significant impact on staffing, deficiencies and the outcomes residents experience (Grabowski and Castle 2004; Mor, Zinn et al. 2004; Smith, Feng et al. 2007; Zinn, Mor et al. 2009). Regional variation in medical practice as well as the availability of alternative long term care resources also appears to affect who enters nursing homes and their likelihood of hospitalization (Baicker, Chandra et al. 2004; Mor, Zinn et al. 2007; Teno, Feng et al. 2008). Finally, states' policies, ranging from Medicaid payment rates to Medicaid reimbursement models and rules clearly affect the composition of patients served, the services facilities offer and the rate of outcomes like hospitalization and selected indicators of care quality (Grabowski, Angelelli et al. 2004; Intrator and Mor 2004; Intrator, Feng et al. 2005; Feng, Grabowski et al. 2006; Gruneir, Mor et al. 2007). Throughout this report, we emphasize that findings regarding changes in the qual-

ity of care of US nursing homes must be considered in light of both the changing heterogeneity of facilities as well as changes in the overall composition of the nursing home population. Furthermore, these changes have occurred relatively quickly, making it all the more important to consider these influential factors.

### **III. Changing Roles of Nursing Homes in the Last Decades**

Since the introduction of Medicare's hospital prospective payment policy in the early 1980's, nursing homes in the US have increasingly served as a "release valve" for hospitals, permitting more rapid discharge into a setting where patients could recuperate in controlled circumstances. Initially this phenomenon was largely restricted to hospital based skilled nursing facilities, but by the early 1990's, free-standing facilities began investing in the staff expertise allowing them to specialize in post-acute care. At around the same time, assisted living facilities began to emerge throughout the country, providing an alternative residential care setting to nursing homes. Finally, as a new generation of elderly persons began requiring long term care, their preferences for home care were increasingly met by states' investments in home and community based services. In the following paragraphs, we briefly summarize each of these developments and their implications for assessing improvements in the quality of nursing home care.

#### **a. Increasing Case Mix Acuity**

Numerous studies have documented the increasing acuity of nursing home residents over the last several decades (Davis, Freeman et al. 1998; IOM 2001; Grabowski 2002; Decker 2005; Feng, Grabowski et al. 2006). The Institute of Medicine 2001 report examining long term care quality summarized changes in the mix of individuals using nursing homes as part of a comprehensive effort to understand whether quality had improved since the passage

of OBRA 1987. Decker and colleagues, using data collected from the National Nursing Home surveys between 1977 and 1999, found that the number of discharges per bed rose from 86 per 100 to 134 per 100, (a 56% increase) between 1985 and 1999 (Decker 2005). In addition to the rising number of admissions, the composition of those residents changed to an older population more dependent in activities of daily living, with the proportion of residents able to walk independently declining from nearly 40% to under 20%. Using OSCAR data from the 1990's, Grabowski examined changes in resident acuity attributable to different state policies, and found that "management minutes", a measure of resident dependence translated into estimated care time, increased significantly during the same period and even more so in states with case mix reimbursement (Grabowski 2002). Feng and colleagues extended these analyses both in time and by examining changes in the acuity of residents as well as of all admissions to nursing homes between 1996 and 2002. They observed a strong secular trend in the rising rate of acuity for both admissions and residents, averaging nearly a 1% per year increase in case mix acuity (using the RUGS nursing case mix index) among admissions and somewhat less than that for residents (Feng, Grabowski et al. 2006).

The importance of taking increasing case mix into consideration is that case mix affects virtually all of our measures of quality, both those based upon person level measures like the MDS quality measures, and also many of the deficiencies levied by inspectors since these are predicated upon the likelihood that residents will experience a clinical problem, clearly a more likely outcome for the sicker residents.

#### **b. Changing Composition of Facilities**

Not only has the overall acuity of nursing home residents been increasing, there has been an increasing concentration of different types of residents in certain

facilities. That is, in most markets some facilities have ended up caring for a disproportionate share of certain types of residents, be they post-acute Medicare reimbursed residents or those with dementing disorders or psychiatric histories. There is considerable evidence that specialization in Medicare post-acute care patients has emerged as a result of a strategic focus. Zinn and colleagues found that following the introduction of the Balanced Budget Act (BBA) and the introduction of Medicare case mix reimbursement, there was a tremendous change in the industry resulting in the closure of many hospital based facilities and the bankruptcy of a number of nursing home systems (Zinn, Mor et al. 2003; Stevenson and Grabowski 2008; Zinn, Feng et al. 2008). Evidence suggests that those facilities able to anticipate and respond to policy changes and/or who adopted service innovations earlier than their local competition performed better viz. occupancy rate and payer mix (Zinn, Mor et al. 2009). The net result has been a growing segmentation of the market, with an increasing share of all post-acute patients served in a minority of facilities specializing in that type of care. In contrast, "lower tier" facilities in all markets end up with high concentrations of Medicaid patients or patients with long term psychiatric histories or minority patients. These facilities are much more likely to fail and to have chronic quality problems (Mor, Zinn et al. 2004; Smith, Feng et al. 2007; Zinn, Mor et al. 2009).

The substantial differences among these types of nursing facilities make it very difficult to compare their quality performance. Current quality measures are only minimally risk adjusted and even were there to be more complete risk adjustment (a significant challenge both technically and conceptually), the fact that the different types of facilities select their residents from very different patient populations means that there are likely to be many unmeasured confounders that undermine the validity of many comparisons (Mor, Berg et al. 2003).

### c. The Effect of State and Federal Policies on Quality

As noted, over the past decade there have been a number of policy changes associated with changes in the acuity of those using nursing homes. However, these policies have also had an impact on the level and type of staffing as well as on selected indicators of quality.

The policy that has been most extensively studied is the introduction of case-mix reimbursement, either at the federal or state level. Feng and his colleagues definitively demonstrated that the introduction of state based (as well as federal) case mix reimbursement was associated with a 1% (for long stay residents) or 2% (for admissions) increase in RUGS based nursing case mix index over the period from 1996 to 2002 (Feng, Grabowski et al. 2006). Since that time, additional states have adopted this form of Medicaid reimbursement and the evidence continues to support an immediate and sustained increase in acuity (Miller, Mor et al. 2009). One fear often voiced by opponents of case mix reimbursement is that patients will be treated so as to maximize reimbursement levels, through the use of feeding tubes or even intravenous therapy. Rapid increases in the proportion of nursing home residents with feeding tubes during the 1990's appeared to confirm this "common wisdom" (Teno, Mor et al. 2002). However, careful analysis of the impact of the introduction of state based case mix reimbursement clearly revealed that there was no policy effect after controlling for general secular trends present in all states, but which apparently began to slow around 2002 (Teno, Feng et al. 2008). Indeed, recent research clearly reveals that most feeding tubes are inserted during hospitalizations and that regional variation in medical practice is highly correlated with this phenomenon which is most prevalent (and of questionable benefit) among severely demented nursing home residents (Teno, Mitchell et al. 2009).

On the other hand, staffing levels have not been so positively affected by case mix reimbursement.

Konetzka and colleagues found that the introduction of Medicare case mix reimbursement under BBA was associated with significant reductions in professional staffing (Konetzka, Yi et al. 2004), while Feng reported that the level of professional staffing dropped with the introduction of state based case mix reimbursement, accompanied by large increases in lower skilled aides (Feng, Grabowski et al. 2008). Closer analyses of these data by Zinn and colleagues suggest that some of this drop in professional direct care staffing may have occurred by the hiring of additional administrative staff, presumably needed to document patients' clinical needs and care processes under most case mix reimbursement schemes, or by switching how nursing staff are classified (Zinn, Feng et al. 2008). Still not accounted for in the examination of the impact of case mix reimbursement on direct care staffing levels is the wide spread use of therapy staff needed to meet the needs of the increasing number of post-acute Skilled Nursing Facility (SNF) residents. Because most research to date hasn't included these individuals in the calculation of direct care staff, it is difficult to fully appreciate the impact of case mix reimbursement since this critical staffing resource has remained uncoun- ted.

There is a long history of research on the impact that Medicaid payment rates have on quality. The health economics literature on nursing home quality of care in the 1980s and 1990s was largely based on Scanlon's model in which nursing homes face two markets (Scanlon 1980); one for private residents with downward sloping demand, and the other for Medicaid residents who are insensitive to price. The existence of supply constraints in the form of Certificate of Need (CON) were consistent with the economists' perception that excess demand blunts any impact of payment increases on quality (Grabowski 2001). Some empirical research, largely based upon cross-sectional data from the 1980's were consistent with this theoretical perspective (Nyman 1988; Gertler 1989).

Perhaps because of the recent decline in nursing home occupancy rates, repeal of CON laws in certain states, and the emergence of improved data and methods, results from more recent studies, generally relying upon longitudinal data and more detailed outcome measurements, have by and large found a modest positive relationship between state Medicaid payment rates and nursing home quality. Higher payment rates have been found to be associated with fewer pressure ulcers (Grabowski and Angelelli 2004), more staffing (Cohen and Spector 1996; Grabowski 2001), fewer hospitalizations (Intrator and Mor 2004; Intrator, Grabowski et al. 2007), fewer physical restraints and feeding tubes (Grabowski 2004; Grabowski, Angelelli et al. 2004), and fewer government-cited deficiencies (Grabowski 2004). In terms of the size of the effect, these studies typically indicate a payment-quality elasticity in the range 0.1 to 0.7 (i.e., a 10% increase in payment improves quality by 1%-7%), depending upon the quality measure. For example, a 10% increase in Medicaid payment reduced pressure ulcers by roughly 2% (Grabowski 2004; Grabowski and Angelelli 2004). Importantly, across all recent studies, there is virtually no support for a negative relationship between the Medicaid payment level and quality.

#### **d. Impact of Public Reporting on Quality**

Public reporting of nursing home quality has been in place since 2002 with the advent of the CMS “Nursing Home Compare” website (Harris and Clauser 2002). In actuality, data on facilities’ staffing levels and inspection results had been publicly reported for some time prior to 2002, and this information was supposed to have been prominently displayed and available to any consumer on all Medicare/Medicaid certified facilities for decades before MDS based clinical quality measures were publicly reported on the CMS website. Public reporting may have an effect on quality because consumers (or their advocates) use the information to select facilities that appear superior viz.

quality performance and/or by inducing providers to institute quality improvement efforts to compensate for poor performance reports. While early research on the topic suggested that consumers weren’t using the sites, or at least providers didn’t believe they were, more recent research suggests that the publication of quality measures on Nursing Home Compare is associated with independent improvements in outcomes, both reported as well as unreported (Mor 2005; Mukamel, Weimer et al. 2008; Zinn, Spector et al. 2008; Werner, Konetzka et al. 2009; Werner, Konetzka et al. 2009).

More recently, Werner and her colleagues examined the effect of public reporting of post-acute measures on the patterns of admissions to skilled nursing facilities. They found significant reduction in pain, improvements in walking and in delirium associated with both nursing home specific improvements as well as changes in the market share of post-acute admissions entering higher quality facilities. Depending upon the post-acute measure, they estimate that as much as half of the improvement observed across all three quality measures is attributable to patients’ selecting higher quality facilities and the rest was associated with facility specific improvements (Werner 2009).

## **IV. Examining Changes in Nursing Home Quality**

The literature cited above, particularly that covering the period of the last decade strongly suggests a general pattern of improvement in quality, partly associated with increases in Medicaid payment rates but also associated with public reporting. In the section below, we present data on changes in staffing, in various MDS based quality measures and deficiencies emanating from the federal inspection process. In some instances the data are presented separately from the earlier to the later part of the current decade and although we find that the trends are not always consistent, these data directly reflect the three differ-

ent ways to think about quality structure (staffing); processes (deficiencies and selected aggregated MDS measures), and outcomes (measures like ADL decline or pain).

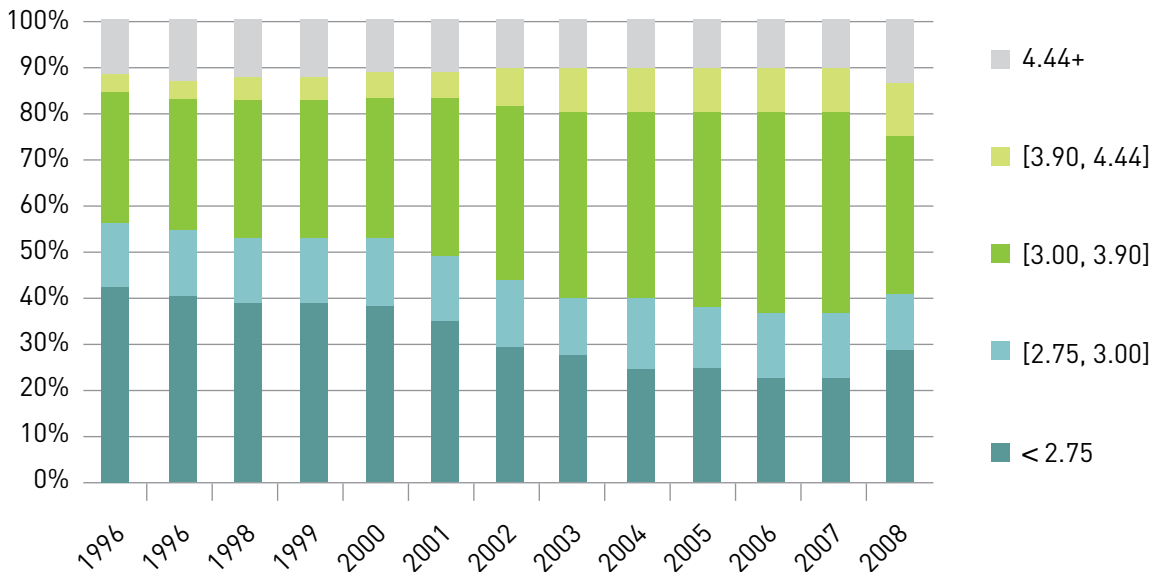
**a. Staffing Changes**

Staffing levels are often thought of as the sine quo non of nursing home quality since without adequate staff it is not possible to care for the frail population (Harrington, Kovner et al. 2000; Schnelle, Bates-Jensen et al. 2004). In keeping with the substantial heterogeneity of case mix acuity across US nursing homes, there is great heterogeneity in the level of staffing, in spite of the existence of state specific mandated staffing levels (Feng, Grabowski et al.

2008). While there have been numerous complaints about the inadequacy of the OSCAR staffing data since they are self-reported by administrators around the time of their certification inspection, these data are the only consistent national source of information regarding staffing levels and composition. Feng and colleagues documented changes in direct care staffing levels between 1996 and 2004 in terms of the proportion of facilities that met selected minimum and recommended staffing levels and recently updated these data (see Figure 1). They found increases in total direct care staffing as an increasingly high proportion of facilities achieved the benchmark of 3.0 or more FTEs per resident (Feng, Grabowski et al. 2008). In more recent years,

**FIGURE 1**

Total Direct Care Staff (RN+LPN+CNA) HPRD, 1996-2008



there appears to have been a simultaneous increase in number of highly staffed and poorly staffed facilities, presumably reflecting continuing specialization in certain types of residents.

Figure 2 presents summary data on the number of hours of staff time per resident day by type of staff person from the period 2005 through 2009, looking at all facilities whose most recent inspection occurred in Quarter 1 of each of those years. As is evident, when all facilities are averaged, we see growth in the number of aides per resident day, the number of licensed practical nurses per day and stability in the number of RNs per resident day. As noted above, missing in these figures were therapy staff, particularly important for facilities concentrating in

post-acute care; nor were “administrative” nurses, a group that has grown substantially in the last decade, included in the figures summarized here.

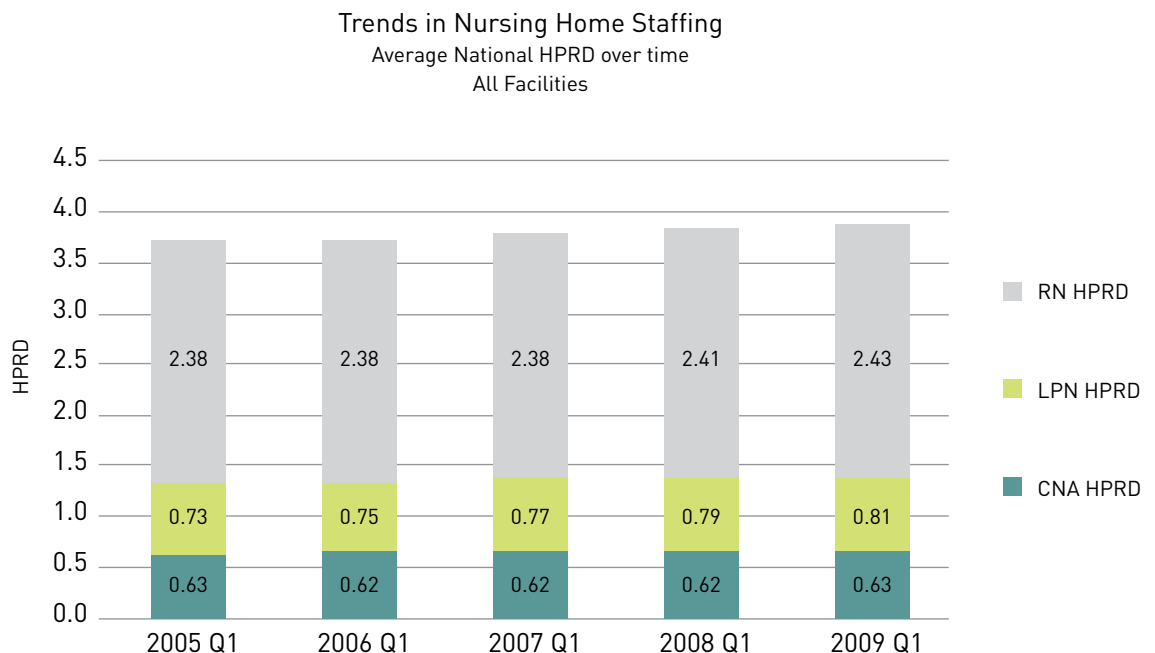
## b. Quality Measures

### i. Process indicators

As noted above, the literature is consistent in documenting reduced rates of physical restraints since OBRA '87. Using MDS data from all certified US nursing homes aggregated to the level of the facility, Brown investigators documented the continuing rate of decline in restraint use between 1999 and 2005.

Figure 3 presents the “box and whisker plots” of these data by quarter, indicating the median facility restraint rate as well as the 10th and 90th percentile. Of note

**FIGURE 2**



is that both the median and the 90th percentile have been dropping over the same time period.

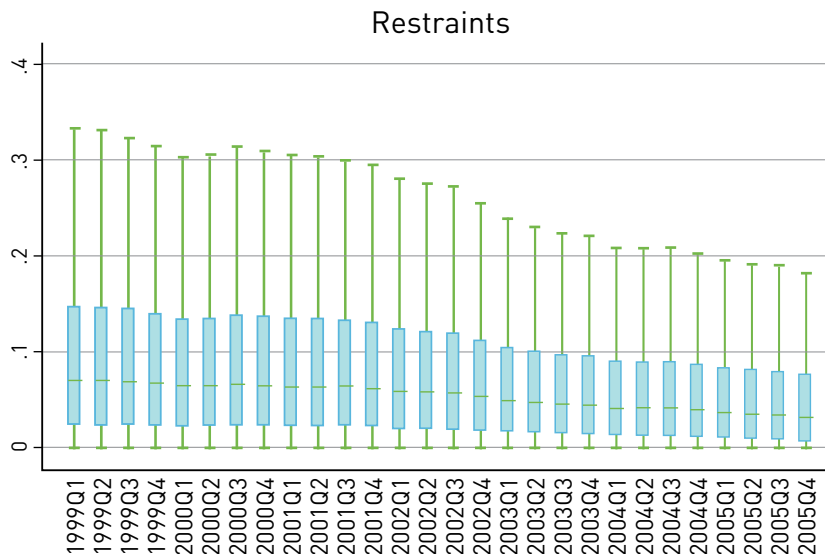
More recent national data (2005-09) from the OSCAR which is based upon annual inspections is presented below in **Table 1** standardized by the quarter in which the inspection occurred. As can be seen, the downward trend in the proportion of residents restrained has continued to the point that by the first quarter of 2009, in the average US nursing home, only 3.5% of residents were restrained. While there was a slight increase in the proportion of residents receiving any psychoactive drugs, this was largely attributable to an increase in the proportion of residents taking antidepressants and anti-anxiety agents so that the proportion of residents taking antipsychotics dropped

from 26.1% to 24.6% between 2005 and 2009. Other process quality measures have also improved substantially over the last five years including improvements in immunization rates for both influenza and pneumonia. Small improvements were also noted for process measures such as providing pain management programs for residents in pain or providing bladder training programs for those who are incontinent.

*ii. Outcome indicators*

The availability of the MDS provides numerous opportunities to measure changes in patients' condition which, if properly constructed, risk adjusted, and averaged, while accounting for patient selection, can provide insight into the variation in the outcomes of

**FIGURE 3**



care that short stay and long stay residents experience due to differences in the providers caring for them. Most existing measures in common use fall short of the ideal either because of inadequate risk adjustment, selection or sample size (Wu, Miller et al. 2005; Mor 2007). Nonetheless, as long as one doesn't attempt to explicitly compare the performance of facilities, it is very useful to track MDS based outcome measures over time to get a sense of the trends in the industry altogether. Using a risk adjusted measure of ADL decline among long stay residents, Brown investigators examined changes in the rates of ADL change across all non-hospital based facilities in the country having a minimum of 30 observations per quarter. As can be seen in **Figure 4**, the likelihood that long stay residents decline at least 4 points on the MDS

based ADL scale dropped between 1999 and 2005. These declines might appear small, but it is clear that both the median and the 90th percentile homes are experiencing lower rates of ADL decline. Using the CMS publicly reported measure of ADL decline among the long stay residents, we find that between 2005 and 2008 the pattern of improvements in ADL decline continued with the average facility reducing the rate of decline by about one half of a percentage point. Consistent with the ADL decline measure, as can be seen in **Table 2**, worsening mobility declined as well over the last five years, suggesting a more generalized improvement in nursing facilities' ability to maintain their residents' functional status. Again, as can be seen in **Table 2**, even larger declines are observed for pain, a finding consistent with Brown

**TABLE 1 Process Measures and Outcomes**

↑ Statistically Significant Improvement	Process Measures and Outcomes	2005 Q1	2006 Q1	2007 Q1	2008 Q1	2009 Q1
↓ Statistically Significant Decline						
— No Significant Change						
↑	Percent of Residents with Facility-Acquired Pressure Ulcers	3.5%	3.3%	3.2%	3.1%	3.1%
↑	Percent of Residents with Facility-Acquired Restraints	5.7%	5.3%	4.8%	4.2%	3.5%
↑	Percent of Residents with Facility-Acquired Catheters	1.9%	1.8%	1.8%	1.7%	1.7%
↑	Percent of Residents with Pneumonia Immunization	32.2%	39.1%	53.0%	58.9%	61.8%
↑	Percent of Residents with Influenza Immunization	60.5%	64.0%	68.5%	70.4%	70.7%
—	Percent of Residents with Advanced Directives	62.2%	62.5%	62.5%	62.6%	62.3%
↑	Percent of Residents with Pain Management	24.6%	25.5%	26.6%	27.0%	27.6%
↑	Percent of Residents with Bladder Training	5.7%	6.0%	6.6%	6.7%	6.4%
↑	Percent of Residents Receiving any Psychoactive Medications	63.4%	64.1%	65.1%	65.4%	65.4%
↑	Percent of Residents Receiving any Antipsychotic Medications	26.1%	25.8%	25.5%	25.0%	24.6%
↓	Percent of Residents Receiving Anti-anxiety Medications	17.3%	17.9%	18.6%	19.3%	20.1%
*	Percent of Residents Receiving Antidepressant Medications	45.0%	46.0%	47.0%	48.0%	48.2%

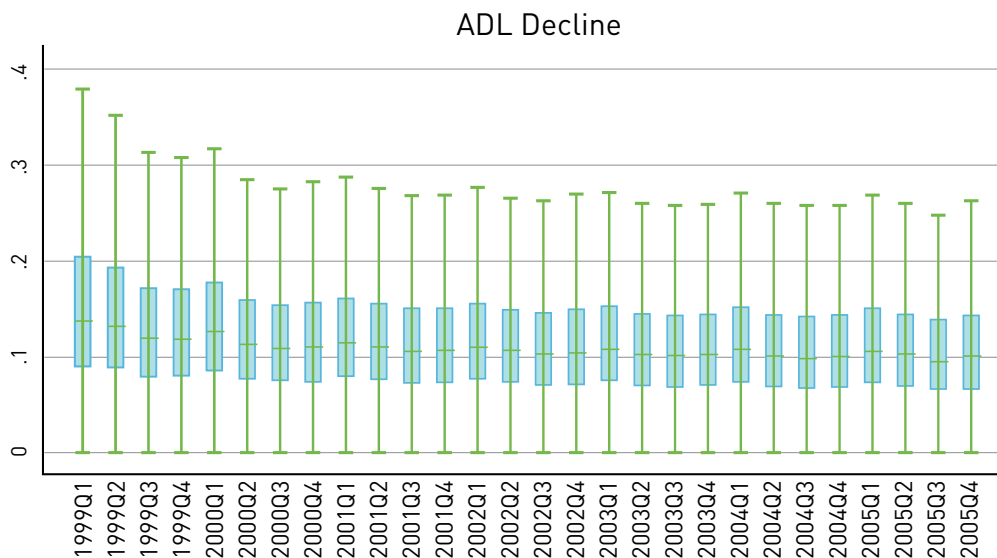
investigators' for the period 1999-2004, using a measure based upon more extensive case mix adjustment and which appeared responsive to public reporting in a recently published paper (Werner, Konetzka et al. 2009). **Table 2** also reveals almost a 2 percentage point reduction in the prevalence of pressure ulcers among high risk nursing home residents between 2004 and 2005. Since even the measures Brown investigators have been using are not optimally risk adjusted, these reductions must be interpreted in light of the substantial year to year increase in case mix acuity in the resident nursing home population.

*iii. Hospitalization and Re-hospitalization*

Hospitalization of those in nursing homes is another marker of nursing home care quality that is increas-

ingly being examined due to the high cost as well as the implications for continuity of care. High rates of hospitalization and re-hospitalization from SNFs have been documented, calling into question the practice of rapidly discharging Medicare patients from the hospital to be cared for in nursing homes (Coleman, Min et al. 2004; Ma, Coleman et al. 2004; Gruneir, Miller et al. 2008). Researchers at Brown, PointRight, and elsewhere have been studying the determinants of hospitalization of long stay residents and the re-hospitalization of those admitted to SNF for short stays (Mor, Intrator et al. 1997; Intrator, Castle et al. 1999; Miller, Gozalo et al. 2001; Gruneir, Miller et al. 2007). As many have noted, a significant, but imprecise, number of these hospitalizations are avoidable. First, a failure of advanced care planning, either in the

**FIGURE 4**



hospital or in the SNF, often leads to hospitalizations that are of no benefit to patients who are terminal (Teno, Mitchell et al. 2009). Secondly, inadequate communication and transfer of clinically important information between the discharging hospital and the receiving nursing home facility has been shown to increase “bounce back” re-hospitalizations (Coleman, Min et al. 2004). Thirdly, the availability of a cohesive medical staff and physician extenders such as nurse practitioners and physician assistants is consistently associated with reduced likelihood of hospitalization (Intrator, Castle et al. 1999; Intrator, Grabowski et al. 2007; Konetzka, Spector et al. 2008). Finally, there are substantial regional differences in the rates of hospitalization of nursing home residents and re-hospitalization of post-acute patients in the same way that Wennberg and his colleagues have observed large regional variation in all manner of health care

utilization (Fisher, Wennberg et al. 2000).

Brown investigators have prepared data on state variations in the rates of hospitalization and rehospitalization of persons in nursing homes for use in the Commonwealth Fund Chartbook on High Performing Health Care systems which compares the performance of states’ “health care systems” on a variety of different parameters.<sup>3</sup> Using Medicare claims matched to MDS records of all ‘fee for service’ Medicare beneficiaries ever using a nursing home between 1999 and 2006, Brown investigators identified two cohorts of Medicare nursing home users: 1) those who’d been in a facility continuously for at least 6 months; and, 2) those who had, based upon the available data,

3 <http://www.commonwealthfund.org/Content/Publications/Fund-Reports/2009/Feb/The-Path-to-a-High-Performance-US-Health-System.aspx>

**TABLE 2 National Trends – CMS Quality Measures**

↑ Statistically Significant Improvement ↓ Statistically Significant Decline — No Significant Change	Quality Measures	2004	2005	2006	2007	2008
↑	ADL Decline	15.7%	15.8%	15.9%	15.3%	15.2%
↑	Pain in Long Stay Residents	6.3%	6.2%	5.1%	4.4%	4.0%
↑	Pressure Ulcers in High Risk Residents	13.7%	13.4%	12.8%	12.3%	12.0%
↓	Incontinence in Low Risk Residents	46.9%	47.6%	48.1%	49%	49.8%
↑	Adjusted Prevalence of Indwelling Catheter Use	5.9%	6.0%	5.8%	5.7%	5.5%
—	Worsening Mobility	12.5%	12.7%	12.8%	12.2%	11.9%
↓	Urinary Tract Infection	8.5%	8.7%	8.8%	9.0%	9.1%
↑	Delirium in Short Stay Patients	3.2%	2.8%	2.4%	2.0%	1.8%
↑	Pain in Short Stay Residents	22.7%	22.5%	21.4%	20.7%	20.0%

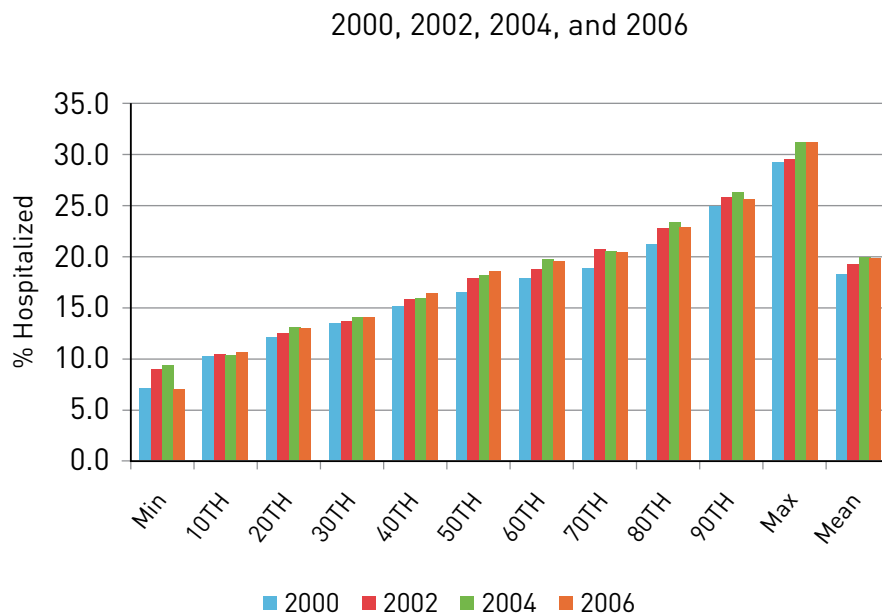
never been in a nursing home before. For the first group, we calculated the probability of hospitalization during the subsequent 6 months whereas for the second group, we calculated the likelihood that the patient was rehospitalized at least once within 30 days of hospital discharge. For both groups we aggregated the person level hospitalization rates to the state in which the nursing home was located and examined how these rates changed between 2000 and 2006.

Figure 5 below presents the 6 month hospitalization rates of long stay residents by year, based upon the inter-state distribution. The median state's rate of hospitalization increased from 16% to 20% between 2000 and 2006, while the state with the highest rate of hospitalization increased to over 30%. Consistent with our observation about the importance of regional variations in patterns of medical care use, in examining changes in the rates of hospitalization of long stay

residents, we observed consistency among those states which were 'high users' and those states classified as 'low users'. The lowest using states, Oregon, Utah and Arizona remained under 10% over the seven year period, while the highest using states, Mississippi and Louisiana, ended up exceeding a 30% hospitalization rate over the 6 month period. It is important to note, that this definition of hospitalization excludes those individuals who experience multiple hospitalizations within a 6 month period, a proportion that also appears to vary substantially by state.

Findings for the newly admitted residents are remarkably similar even though all the individuals are very different and tend to be concentrated in facilities that specialize in providing post-acute care. Rehospitalization has increased each year and the inter-state differences are large, ranging from around 13% to 28% in 2006. As noted, we calculate the percentage of

FIGURE 5

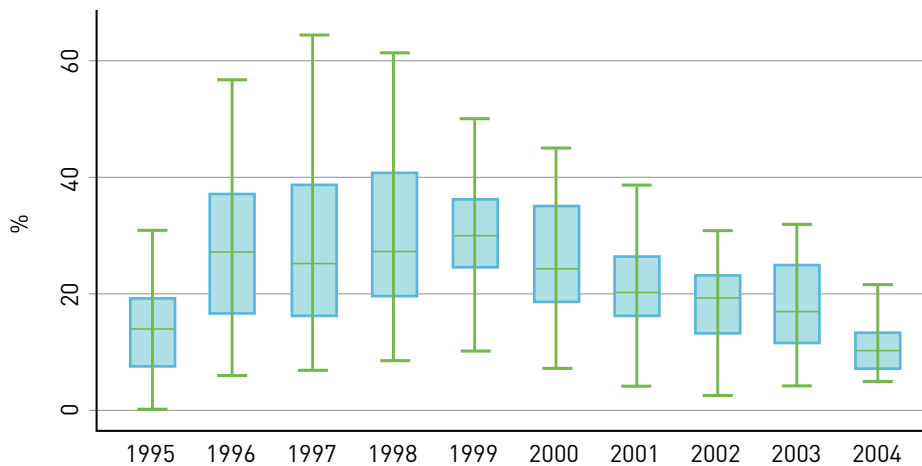


residents re-hospitalized within 30 days of admission to a SNF. It should be noted that in terms of calculating the “true” rate of rehospitalization, the proportion re-hospitalized is an underestimate since some of these individuals were re-hospitalized on more than one occasion during the 30 day period following their originating hospitalization. Obviously, those individuals who have never before used a SNF for post-acute care are less likely to be among the “frequent flyers” so often noted in the literature (Coleman 2007). What is most surprising about these data is that in spite of the presumably “healthier” selected residents included in these analyses, the median state re-hospitalizes about one fifth (and growing) of Medicare beneficiaries’ first time ‘fee for service’ SNF post-acute users. The highest using state is the same as for the long stay population, Louisiana. However, New Jersey has a rate of about 25% as well, suggesting another dynamic is operating here. The lowest use rate states again include Utah and Oregon, states that, according to the Dartmouth Atlas of Health Care, have low aggregate Medicare expenditures per capita.

*iv. Quality reflected in the Nursing Home Survey Process* Medicare/Medicaid certified nursing homes are inspected at least once every 15 months by state officials following centrally established guidelines. The surveyor guidelines provide detailed review processes for inspectors to follow as they review patient care processes based upon a sample of residents’ records, observation of residents, and the interaction between residents and care staff. Emerging from the inspection are findings regarding the number and severity of deficiencies which are violations of the clinical care guidelines. In spite of the detailed guidelines, the literature clearly documents large inter-state variation in the number and severity of deficiencies (Angelelli, Mor et al. 2003; Mor 2007; Kelly, Liebig et al. 2008). Kelly and colleagues found that state funding levels, the “professionalism” of the state’s bureaucracy and even the character of the state’s legislature is related to the regulatory stringency applied to nursing homes by state inspectors. Indeed, these authors and Brown investigators note that some states are prone to levy a higher average number of deficiencies while other

**FIGURE 6**

Trends and Inter-State Variations in the Percentage of Facilities Cited for Actual Harm or Immediate Jeopardy to Residents, 1995-2004



Source: OSCAR.

states are much more likely to identify deficiencies that are viewed as more severe, placing residents' lives at risk. In addition to interstate variation, historically there has also been substantial variation in the propensity of state officials to levy deficiencies.

**Figure 6** reveals changes over time as well as inter-state variation in the percentage of facilities cited for actual harm or immediate jeopardy to residents of US nursing homes. As can be seen, in 1997 and 98, there was considerable inter-state variation around a national median of 30% whereas by 2004 there was much less variation around a much lower proportion.

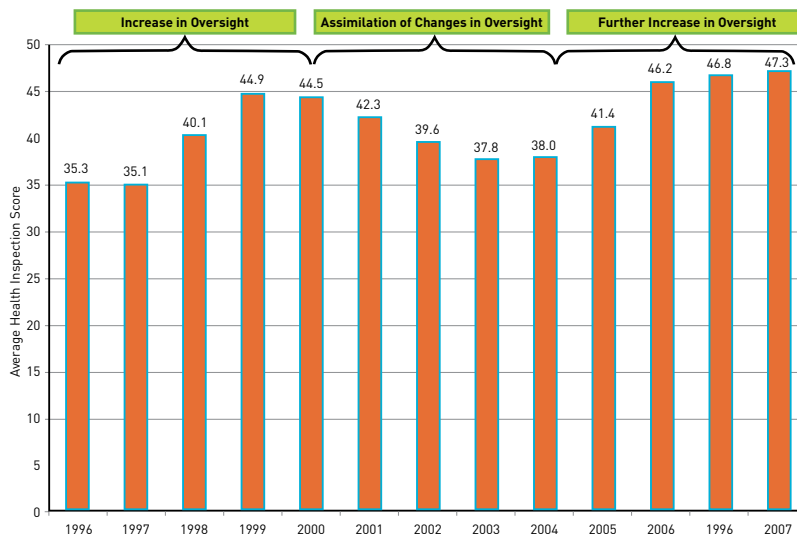
A more recent analysis performed for CMS as part of an examination of how the Five-Star rating system might be revised, reveals continued increases in the number of severity weighted deficiencies. As can be seen in **Figure 7**, these increases were apparently occurring in response to policy initiatives emanating from CMS, which is one reason we can see periodic shifts in the volume and severity of deficiencies.

According to CMS staff, the period of the late 1990's coincided with directives requiring less predict-

able survey scheduling and greater focus on complaint investigations. No new quality review initiatives were instituted outside of the introduction of public reporting and providing quality measures to the survey teams until 2004 when additional surveyor guidance directives were released and the trend toward more deficiency citations resumed.

During the period 2003 through 2008, the proportion of nursing facilities in the US that were cited for pressure ulcer clinical care problems increased from around 15% to around 18% during a period of time when, as we've just seen, the prevalence of pressure ulcers among high risk patients was actually declining. This is quite consistent with the national finding that there is relatively little correlation between the measures of nursing home quality that emanate from the survey and inspection process and those which pertain to the reported and unreported measures of clinical quality created from the MDS. While this is not to say that there is no validity to the survey results, it does mean that these two sources of information are capturing very different aspects of quality.

**FIGURE 7**



## V. Future Directions and Recommendations for Additional Research

There are numerous unanswered questions about the changing nature and role of nursing homes in the US context and how to improve the measurements of the outcomes that patients experience. In the next few paragraphs we discuss some of the challenges that need to be addressed in order to better understand the determinants of nursing home quality and how to best measure and think about nursing home quality for the increasingly heterogeneous groups of nursing home residents.

First, we need to better understand the current process of nursing home specialization that is underway since it is crucial to our understanding of whether quality is improving and in which sector(s) it is and is not improving. This is particularly important in light of the recent study suggesting that consumers and their advocates appear to be selectively “choosing” post-acute nursing homes with superior quality measures (Werner 2009). If one consequence of public reporting is, as was originally hypothesized, to “steer” patients to superior facilities, given the heterogeneous long term care needs nursing homes meet, it is incumbent upon us to better understand which types of homes appear to best meet the needs of which types of residents. The increasing use of the nursing home as a post-acute care setting following hospitalization for serious surgeries, medical infections and complications means that a subset of nursing homes will increasingly resemble the general medical hospital wards of yesterday. Hospital based facilities have traditionally served this population but now nearly 20% of free-standing nursing homes have 20% of their patient days covered by Medicare, a number that has been growing almost annually. Another area of specialization that has arisen is care of the seriously demented, long stay resident; and nearly 30% of nursing homes now care for over 50% of residents with dementia, whether within or outside of dementia

special care units (Gruneir, Lapane et al. 2008). An emerging trend, perhaps arising by default, is one of serving the growing number of young old, relatively recent Medicare beneficiaries with a long standing serious psychiatric disorder who are entering nursing homes and staying there. (Fullerton, McGuire et al. 2009; Grabowski, Aschbrenner et al. 2009) While there is still much to be learned, there are indications that facilities with a disproportionate share of residents with serious mental illness diagnoses have more serious quality problems, have lower staffing levels and very high proportions of Medicaid residents. (Mor, Zinn et al. 2004) In light of the different types of individuals being served, it is difficult to imagine that the same set of quality measures are appropriate for these different types of homes. Since specialization is obviously occurring, we need to consider the implications for measuring quality and publicly reporting those results so that they are useful to consumers and their advocates.

Nursing home quality is currently being measured using a multiplicity of different “instruments” and approaches. Survey and certification results along with complaints vary between states (and even within states as a function of inspection team districts) and seem quite responsive to political and policy initiatives. As importantly, they are not correlated with quality measures purportedly measuring a similar concept. Quality measures focus on clinical outcomes but have been shown to be strongly correlated with facility acuity and so are inadequately case mix adjusted (Mukamel, Glance et al. 2008). Structural measures such as staffing levels are widely acknowledged to be important, but the level of staffing should clearly be related to the mix of patients being served and the specific types of needs that they have. While the new CMS Five-Star rating system takes resident acuity into account, there are some types of clinical staff like therapists and nurse practitioners that aren’t counted and there appears to be great variation in how the staffing data

are reported. Finally, other measures like rehospitalization, satisfaction, patients' experience and a host of other possible process quality measures have not been examined in relation to the existing set of measures nor in terms of which types of patients and homes they matter for the most. It is clear that nursing home quality is multi-dimensional; what is also becoming clear is that it is no more appropriate to compare all nursing homes with one another than it would be appropriate to compare an Obstetrics hospital with an Oncology hospital.

One corollary to both the heterogeneity of facilities and the different types of quality measures is the need to greatly enhance our measures of quality for the post acute patients using nursing homes. Presently, there are only three measures and these are only possible for that group of SNF residents who are in the facility long enough to have at least two measures—generally the 5 day Medicare assessment and the 14 day admission assessment. One of the main goals of post-acute care, whether it is for residents undergoing rehabilitation or those recovering from a serious medical problem, is recovery to pre-morbid functioning, or at least improvement from their level of functioning at the time of admission. The alternatives to post-acute nursing home care, home health and rehabilitation hospitals, both have outcome measurements that are clearly calculated as the difference between patients' condition upon entry and upon discharge. It is imperative that nursing homes adopt a discharge assessment that can be used to calculate improvement in functioning, as well. As it is, too many post-acute patients are being treated and returned to their pre-hospital living situations without an opportunity to contribute to the performance evaluation of the nursing home. Furthermore, the array of possible quality measures for post-acute nursing home residents is greatly restricted without the benefit of having a discharge assessment with which to calculate a change score.

Finally, implementation of the MDS 3.0 is rapidly

approaching. It will introduce even more complex conceptual and empirical measurement problems than currently face us for interpreting outcome measures based upon staff input and assessment (Mor, Berg et al. 2003). Currently, small facilities or facilities with very short lengths of stay may not have enough observations to be able to generate a quality measure. Under MDS 3.0, efforts to appropriately hear the residents' voice by asking staff to determine which residents can be interviewed will greatly complicate any quality of life measures, since it will require an understanding of the fact that the proportion of residents that may actually be interviewed will vary by type of resident. For example, a higher proportion of those who have experienced declines in locomotion or in other areas of physical functioning will be interviewed compared with those who have experienced cognition loss, aphasia or other disorders that may prevent them from providing coherent responses. Furthermore, measures relying upon the residents' voice cannot reasonably be combined with measures of the same concept that are based upon staff observation. Beyond the obvious advantages and complications that interviewing the resident brings to the situation, almost all of the existing quality measures have to be revised, making comparisons over time unlikely, if not utterly impossible. Thus, the pending changes will be of sufficient magnitude to require a complete reconstruction of much of the measurement research that has developed around the MDS 2.0 over the last decade.

If this review has done anything it is to underscore the heterogeneity of US nursing homes and the need to explicitly take that heterogeneity into account in describing their performance and staffing, in comparing the manner in which they serve their distinct populations and in comparing the outcomes experienced by their residents. It is perhaps time to begin thinking explicitly about this heterogeneity in considering how CMS sets policy governing nursing homes in the US. ■

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