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United States General Accounting Office
Washington, DC 20548

June 13, 2002

The Honorable John B. Breaux
Chairman
The Honorable Larry E. Craig
Ranking Minority Member
Special Committee on Aging
United States Senate

The Honorable Charles E. Grassley
Ranking Minority Member
Committee on Finance
United States Senate

Subject: *Nursing Homes: Quality of Care More Related to Staffing than Spending*

Since 1990, national expenditures for nursing home care have almost doubled, climbing from $53 billion to $92 billion in 2000. An increasing amount of that spending has been financed with public monies. Under the Medicare and Medicaid programs, the federal government financed 39 percent of the nation's nursing home spending in 2000, up from 28 percent in 1990. As federal outlays have grown, the Congress has focused attention on the quality of care delivered and the level of staffing in nursing homes. Questions have arisen about how federal dollars are being spent and the relationship between nursing homes' spending and quality of care. To better understand what public monies are purchasing, whether nursing homes with high total expenditures spend more on nursing care, and how individual nursing homes' expenditures relate to the quality of care they furnish, you asked us to examine (1) nursing home expenditures, particularly those devoted to resident care, and (2) whether there is any relationship among nurse staffing levels, quality of care, and expenditures.

We examined the spending and staffing for freestanding[1] nursing homes in three states—Mississippi, Ohio, and Washington—that are geographically diverse and that collect the necessary information to adjust homes' spending for differences in residents' care needs. We analyzed 1999 cost data included in Medicaid cost reports, which include nursing homes' spending for all residents. We adjusted these spending data to account for differences in the resource needs of residents across homes and

[1]Freestanding nursing homes are not part of another facility such as an acute care or rehabilitation hospital.

for differences in wages across geographic areas. We also analyzed federal data on the results of state surveys of nursing home quality in those states. In addition, we discussed cost reporting requirements and payment methods with Medicaid officials from each state. Although our findings cannot be generalized to the country as a whole, they provide insights into nursing home spending patterns. We conducted our work from December 2000 through April 2002 in accordance with generally accepted government auditing standards. (For a detailed discussion of our scope and methodology, see encl. I.)

In summary, we found that nursing homes' expenditures per resident day varied considerably across the three states.[2] After controlling for differences in the care needs of residents and in area wages, average total nursing home expenditures were $133 per resident day in Ohio and $132 per resident day in Washington and were about 23 percent less in Mississippi. Although the total level of spending varied, the average share devoted to resident-care activities such as nursing care[3] and medical supplies was relatively stable across the states, averaging slightly more than 50 percent of total expenditures in all three states. The share of spending devoted to buildings and equipment, by comparison, was more variable. For nursing homes within each of the states, spending also varied widely. Nursing homes with high total expenditures tended to have high nursing care expenditures, but as spending per resident day increased, the proportion of spending devoted to nursing care tended to decline. Some of the variation in spending within the states may be due to Medicaid payment policies, which attempt to influence the resources nursing homes use, generally by encouraging spending on nursing services and limiting payments for other services. For two of the states we examined, homes with a high proportion of Medicaid residents had lower daily expenditures per resident than homes with a low share of Medicaid residents.

Homes in Ohio and Washington that provided more nursing hours per resident day, especially nurses' aide hours, were less likely than homes providing fewer nursing hours to have had repeated serious or potentially life-threatening quality problems, as measured by deficiencies detected during state surveys. But we found no clear relationship between a nursing home's spending per resident day and the number of serious quality problems. Higher spending on nursing was associated with fewer deficiencies only in Washington; Mississippi homes with higher nursing expenditures had slightly more deficiencies, while in Ohio we found no relationship between nursing expenditures and deficiencies. We received comments from state officials from Mississippi, Ohio, and Washington, and from two experts in nursing home costs and quality, and we have incorporated into these into the report as appropriate.

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[2]Due to differences in the state reporting requirements for spending on ancillary services (such as physical, occupational, and speech therapy, and drugs and laboratory services), these services were excluded from this analysis.

[3]Throughout this letter, "nursing" refers to services provided by registered nurses, licensed practical nurses, and nurses' aides.

BACKGROUND

Nursing homes in the United States play an essential role in our health care system, caring for 1.6 million elderly and disabled persons who are temporarily or permanently unable to care for themselves but who do not require the level of care furnished in an acute care hospital. They provide a variety of services to residents, including nursing and personal care; physical, occupational, respiratory, and speech therapy; and medical social services. On average, 67 percent of nursing home residents have their care paid for through the Medicaid program, while 9 percent are covered by Medicare, and 24 percent are covered by other payers or pay for the care themselves.

Nursing homes treat people with a wide range of clinical conditions. Most facilities historically have served residents whose primary need is custodial care. Nursing homes also treat residents with more complex needs, furnishing higher intensity rehabilitative therapies and nursing services—such as ventilator care—that previously were provided only in hospital settings. The mix and amount of resources nursing homes use determine the cost of the care they provide. These resources include nurses and nurses' aides (referred to in this letter as "nursing"); medical supplies; other resident care resources such as dieticians, social workers, directors of nursing, and staff and supplies needed for medical recordskeeping; home operations such as staff and supplies needed for housekeeping, food services, laundry, and maintenance; capital such as depreciation on buildings, equipment, and furnishings; and administration such as administrator and clerical salaries and office supplies.

The states and the federal government share responsibility for oversight of the quality of care provided in nursing homes. The federal government, through the Centers for Medicare and Medicaid Services (CMS),[4] establishes the requirements that nursing homes must meet to participate in the Medicare and Medicaid programs. CMS contracts with state agencies to check compliance with these standards through on-site surveys conducted at every home at least once every 15 months. During these surveys, state surveyors spend several days on site, conducting a broad review of care and services to ensure that homes are meeting the needs of residents.[5] Deficiencies identified during the survey process are placed in 1 of 12 categories depending on the extent of resident harm (severity) and the number of residents adversely affected (scope). The most serious category is for a widespread deficiency that causes actual or potential for death or serious injury to residents; the least

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[4]On July 1, 2001, the Health Care Financing Administration (HCFA) was renamed the Centers for Medicare and Medicaid Services (CMS). This letter refers to the agency as HCFA when referring to actions taken before the name change and as CMS when referring to actions taken since the name change.

[5]Surveyors assess the provision of services in residents' plans of care, the use of physical restraints, the incidence of pressure sores, the treatment of incontinence, the use of antipsychotic drugs, the rate of medical errors, the adequacy of the nursing staff, the maintenance of residents' quality of life and personal dignity, the facility's cleanliness, and the thoroughness of employee background checks, among many other areas.

serious category is for an isolated deficiency that poses no actual harm and has potential only for minimal harm.

Under their shared responsibility for nursing home oversight, state agencies identify and categorize deficiencies and make referrals for proposed sanctions to CMS.[6] Most homes are given a grace period, usually 30 to 60 days, to correct deficiencies. Usually, states do not refer homes to CMS for sanctions unless the homes fail to correct their deficiencies within that grace period. CMS policies call for states to refer immediately for sanction those facilities found to have repeated severe deficiencies.

The survey process has revealed many homes to be deficient in guaranteeing the safety and welfare of their residents. Each year more than 25 percent of nursing homes are found to have deficiencies that cause actual harm to residents or place them at risk of death or serious injury.[7] Even so, in previous work, we concluded that state surveys of nursing home quality likely understate the extent of serious care problems, for several reasons.[8] First, homes may be able to mask some problems because they can predict the timing of annual reviews and therefore can prepare for them. Surveyors can also miss problems that affect the health and safety of nursing home residents because of the sampling methods used to select the residents whose care will be reviewed and because the reviews rely heavily on medical records, which are not always accurate.

In addition, the subjective nature of the survey process means that surveyors may apply standards unevenly. Indeed, we previously have reported that during attempts to validate the findings of state surveyors, federal surveyors have found more than three times the number of serious care problems recorded by state surveyors.[9] Further, we have found considerable variation nationwide in the reporting of deficiencies: there was more than a five-fold difference across states in the percentage of homes found by state surveyors to have actual harm and immediate jeopardy deficiencies.[10] Such differences in reporting make comparisons across states difficult since it cannot be determined whether observed differences are due to real variations in quality or to inconsistent application of standards. In spite of these shortcomings, the deficiency data are the best available national source of information about the quality of care provided in the nation's nursing homes.

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[6]States are responsible for enforcing standards in homes with only Medicaid certification.

[7]U.S. General Accounting Office, *Nursing Homes: Additional Steps Needed to Strengthen Enforcement of Federal Quality Standards*, GAO/HEHS-99-46 (Washington, DC: March 1999).

[8]U.S. General Accounting Office, *California Nursing Homes: Care Problems Persist Despite Federal and State Oversight*, GAO/HEHS-98-202 (Washington, DC: July 1998).

[9]U.S. General Accounting Office, *Nursing Homes: Sustained Efforts Are Essential to Realize the Potential of the Quality Initiatives*, GAO/HEHS-00-197 (Washington, DC: Sept. 2000).

[10]Immediate jeopardy deficiencies are those that have caused or have the potential to cause serious injury or death.

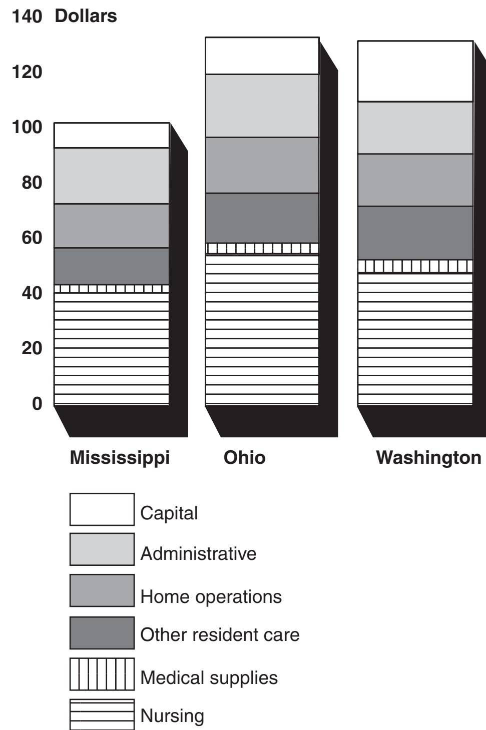
NURSING HOMES' EXPENDITURES VARY CONSIDERABLY, BUT SHARE DEVOTED TO RESIDENT CARE COMPARATIVELY UNIFORM

We found significant variation in nursing home spending across Mississippi, Ohio, and Washington. Spending on capital was particularly variable. By comparison, the proportion of spending devoted to resident-care activities, such as nursing care and medical supplies, was relatively stable across the states, averaging more than 50 percent of total expenditures for all three states. Within each state, nursing home spending varied considerably. We found that nursing homes with high total expenditures tended to have high levels of spending in all expenditure categories, including nursing, but those homes devoted a smaller share of their total expenditures to nursing compared to homes with low levels of spending. The variation in spending within states may be explained in part by differences across homes in their reliance on Medicaid reimbursement. Homes with large shares of Medicaid residents had lower daily expenditures than homes with low Medicaid shares. Further, Medicaid policies appeared to influence the resources used by nursing homes. Within each state, spending varied less for expenditure categories for which Medicaid payments were more restricted.

We found that average total nursing home expenditures—excluding spending on therapies, drugs, and laboratory services—were $133 per resident day in Ohio and $132 in Washington, compared to $102 in Mississippi, even after controlling for differences in the mix of residents and in area wages (see fig. 1). Although total spending per resident day in Ohio and Washington was similar, spending across expenditure categories differed somewhat. Capital spending per resident day averaged $22 in Washington, while in Ohio it was $13. On average, spending on nursing was $55 per resident day in Ohio, compared with $48 in Washington.[11] But the amount spent on medical supplies, other resident care, and home operations combined was almost the same in Ohio and Washington, averaging $42 and $43 per resident day, respectively.

[11]Due to data limitations, we were unable to separate nursing-related administrative expenditures from nursing expenditures in Ohio, which may explain in part that state's higher nursing costs per resident day.

Figure 1: Average Total Nursing Home Expenditures per Resident Day, by Expenditure Category, 1999



Note: Expenditures were adjusted to account for differences in the resource needs of residents across homes and for differences in wages across geographic areas. Due to data limitations, ancillary services, including therapies, were excluded from this analysis.

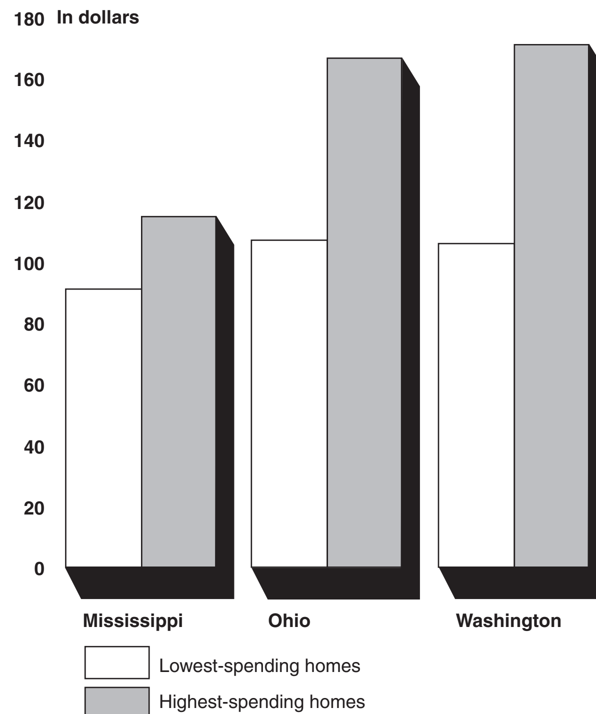
Source: GAO analysis of fiscal year 1999 Medicaid nursing home cost report data from Mississippi, Ohio, and Washington.

Although spending in Mississippi was lower than in the other two states, the shares of spending devoted to the different expenditure categories were similar to those in Ohio. Nursing expenditures in both states averaged about two-fifths of total spending. Other resident care expenditures (such as salaries and benefits for social workers and medical recordkeeping) were 13 percent in Mississippi and 14 percent in Ohio. The share of spending devoted to capital was also similar, averaging 9 percent of total expenditures in Mississippi and 10 percent in Ohio.

Within each of the three states, we found wide variation in spending across nursing homes that was not explained by differences in area wages or the care needs of residents. Washington nursing homes with the highest spending levels had total expenditures per resident day that were, on average, 63 percent higher than the

state's lowest-spending nursing homes (see fig. 2).[12] There was a similar difference between the highest-spending and lowest-spending nursing homes in Ohio. In contrast, the difference between the highest- and lowest-spending nursing homes was much smaller in Mississippi (26 percent).

Figure 2: Average Total Nursing Home Expenditures per Resident Day for the Lowest- and Highest-Spending Homes, 1999



Notes: Nursing homes with total expenditures per resident day that were in the top 25 percent for a state were considered to be the highest-spending homes. Homes with total expenditures per resident day that were in the bottom 25 percent for a state were considered to be the lowest-spending homes.

Expenditures were adjusted to account for differences in the resource needs of residents across homes and for differences in wages across geographic areas. Due to data limitations, ancillary services, including therapies, were excluded from this analysis.

Source: GAO analysis of fiscal year 1999 Medicaid nursing home cost report data from Mississippi, Ohio, and Washington.

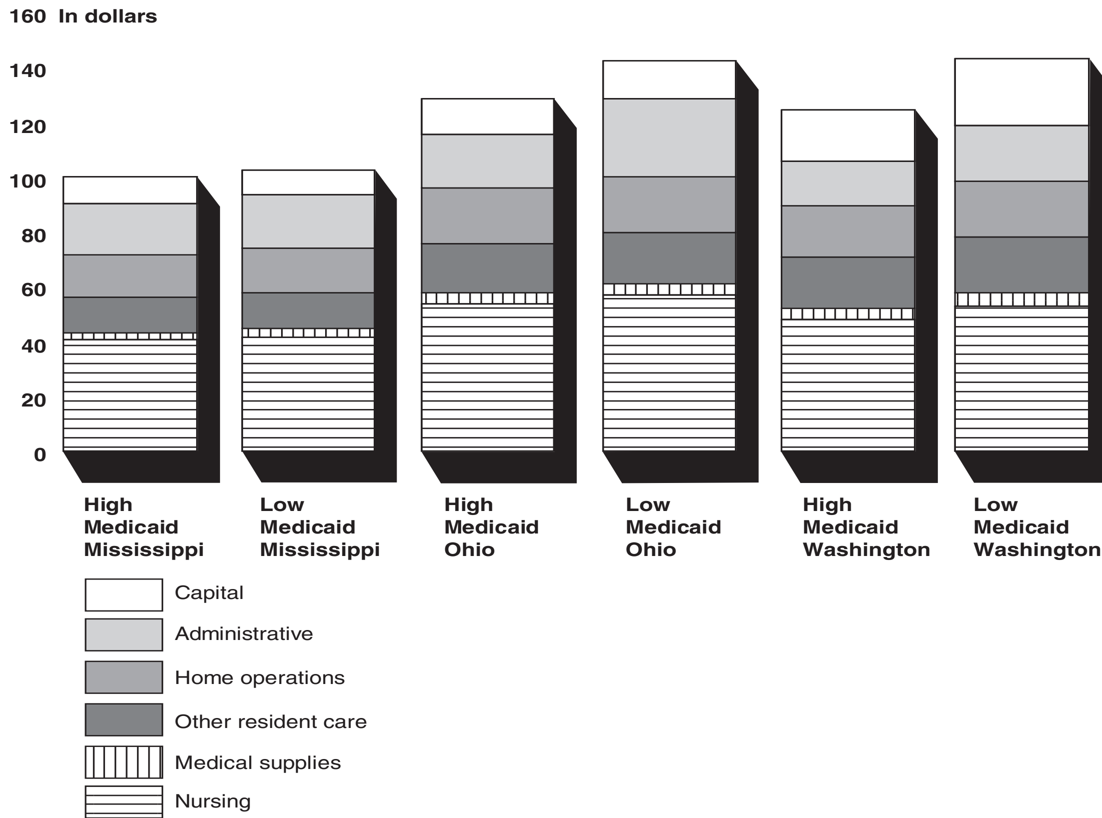
We also found that as total nursing home expenditures per resident day increased, the amount spent in almost every expenditure category also increased, but not proportionally. Although the level of their spending on nursing was higher, the highest-spending homes in Ohio and Washington devoted a smaller share of their total spending to nursing compared with the lowest-spending homes in each state. In both those states, the share of total expenditures devoted to capital increased as total

[12]Nursing homes with total expenditures per resident day that were in the top 25 percent for a state were considered to be the highest-spending homes. Homes with total expenditures per resident day that were in the bottom 25 percent for a state were considered to be the lowest-spending homes.

expenditures increased. In Mississippi, the share of total expenditures devoted to nursing was the same in the highest-spending homes and lowest-spending homes, although the highest-spending homes provided 25 percent more nursing hours per resident day than did the lowest-spending homes.

Some of the variation in spending within states may be attributable to Medicaid payment policies and their effects on homes with different proportions of Medicaid residents. We found an inverse relationship between spending and Medicaid share in Ohio and Washington, where average total expenditures per resident day were lower in homes that had a high proportion of Medicaid residents and higher in homes that had a low proportion of Medicaid residents. In Ohio, homes with a high Medicaid share had total expenditures per resident day that were 10 percent lower than low-Medicaid-share homes, and in Washington, high-Medicaid-share homes had total expenditures per resident day that were 13 percent lower (see fig. 3). In Ohio, the total expenditure difference between high-Medicaid-share and low-Medicaid-share homes was driven mostly by a difference in expenditures for administration, while in Washington, the difference between the two types of homes was due to differences in expenditures for capital, administration, and nursing. No relationship between spending and Medicaid share was found in Mississippi. Since the proportion of residents covered by Medicaid was greater than 65 percent for almost all Mississippi nursing homes, those homes may be uniformly influenced by Medicaid payment policies.

Figure 3: Average Total Nursing Home Expenditures per Resident Day for Homes with the Highest and Lowest Medicaid Shares, 1999



Notes: Homes in which the proportion of resident days paid by Medicaid was in the top 25 percent for a state were considered to be high-Medicaid-share homes. Homes in which the proportion of resident days paid by Medicaid was in the bottom 25 percent for a state were considered to be low-Medicaid-share homes.

Expenditures were adjusted to account for differences in the resource needs of residents across homes and for differences in wages across geographic areas. Due to data limitations, ancillary services, including therapies, were excluded from this analysis.

Source: GAO analysis of fiscal year 1999 Medicaid nursing home cost report data from Mississippi, Ohio, and Washington.

Medicaid payment policies influence spending by creating incentives for homes to contain overall expenditures while encouraging spending on resources that most directly affect resident care and well-being, like nursing services (see table 1). Generally, the states we examined established Medicaid payment rates prospectively based on a previous year's spending, so that homes were at risk for any spending that exceeded the rate. For most spending categories, nursing homes were paid their costs up to a certain limit. States encouraged nursing home spending on nursing care and other resident care by applying higher limits or ceilings compared with those applied to other spending categories. In addition, Mississippi and Washington

encouraged a minimum level of spending on nursing care. Mississippi made additional payments to homes with nursing expenditures above a certain level. In Washington, payments to homes with low nursing expenses were established based on a minimum level of nursing spending. At the end of the year, homes that had not spent the minimum amount had to give back any unspent funds. The Mississippi and Ohio Medicaid programs encouraged nursing homes to limit their spending in certain areas by offering efficiency incentives, by which homes received additional payments if they kept their home operations and administrative expenditures below the daily maximum allowable Medicaid payment amounts. Mississippi and Ohio also employed mechanisms to limit capital payments, either by not tying payment directly to a home's spending or by setting maximum payment rates and offering incentives to homes with lower expenditures. Washington's reimbursement method for capital was comparatively generous, which may help to explain higher average capital expenditures in that state.

Table 1: Medicaid Payment Rules for Nursing Homes in Mississippi, Ohio, and Washington, 1999

State	Homes paid their incurred costs up to
Mississippi	
Nursing	120% of median costs for all homes[a]
Other resident care	120% of median costs for all homes[a]
Medical supplies	120% of median costs for all homes[a]
Home operations	109% of median costs for similar homes[b]
Administrative	109% of median costs for similar homes[b]
Ohio	
Nursing	124% of median costs for similar homes[a,c]
Other resident care	124% of median costs for similar homes[a,c]
Medical supplies	No cap
Home operations	112.5% of median costs for similar homes[d]
Administrative	112.5% of median costs for similar homes[d,e] Certain home office costs not capped

Washington	
Nursing	115% of median costs for similar homes[a,f]
Other resident care	115% of median costs for similar homes[a,f]
Medical supplies	115% of median costs for similar homes[a,f]
Home operations	Costs associated with food services, housekeeping, and laundry capped at 110% of median for similar homes; other costs capped at median costs for similar homes[f]
Administrative	Median costs for similar homes[f]

Note: Payment rules for capital-related expenditures are omitted from this table.

[a]Costs are adjusted to reflect differences in the resource needs of residents across homes.

[b]Median costs are calculated separately for large and small homes.

[c]Median costs are calculated separately for four geographic areas.

[d]Median costs are calculated separately for eight groups of homes that are similar in number of beds and geographic location.

[e]Nursing-related administrative costs paid as nursing costs.

[f]Median costs calculated separately for urban and rural homes.

Source: GAO analysis of Medicaid payment rules for Mississippi, Ohio, and Washington.

Across states, spending per resident day varied more and was higher for expenditure categories that were less constrained by Medicaid policies. Though Ohio and Washington have similar total expenditures per resident day, spending on nursing was higher and varied more widely in Ohio. This higher variation is consistent with that state's policy of establishing separate limits for more subgroups of homes, thereby accounting for more differences in spending across homes compared with Washington's system.

NURSING HOURS—MORE THAN EXPENDITURES—RELATED TO QUALITY OF CARE DEFICIENCIES

In the states we examined, nursing hours per resident day—especially nurses' aide hours—were related to quality of care deficiencies, with homes providing more nursing hours being less likely to have identified quality problems than homes providing fewer nursing hours. We found no clear relationship between a nursing home's total spending and the frequency of quality of care deficiencies identified on

state surveys, or between spending on nursing and quality of care deficiencies. In Washington, homes with higher nursing expenditures per resident day had fewer quality of care deficiencies. In Mississippi, the opposite was true, while we found no relationship between them in Ohio.

We found in Washington and Ohio that nursing homes providing more nursing hours per resident day were less likely than homes with fewer nursing hours to be cited by state surveyors for having repeated deficiencies involving actual harm or immediate jeopardy to residents. This was especially true for nurses' aide hours. In Washington, 16 percent of homes with the lowest number of nurses' aide hours per resident day were found to have serious deficiencies in successive surveys, compared with 3 percent of homes with the highest number of nurses' aide hours per resident day.[13] In Ohio, among homes with the lowest number of nurses' aide hours per resident day, almost 6 percent were found to have repeated serious deficiencies, compared to about half that many among homes with the highest number of nurses' aide hours per resident day. In Mississippi, however, homes with higher nursing hours per resident day were more likely to have deficiencies. The findings in Washington and Ohio echo those of some other studies, which have shown that staffing is positively correlated with quality of care, although stronger associations were found between registered nurses' hours and quality than between nurses' aide hours and quality.[14] A HCFA study on nursing home staffing found that, for each type of nursing staff, there is a minimum threshold of staff hours to residents below which homes are at substantial risk of increased quality problems.[15]

Studies of nursing home spending have not found a clear association between spending and quality.[16] One study, using defined outcomes as measures of quality, found that higher quality can be associated with lower costs.[17] We found no consistent relationship between spending and quality deficiencies in the three states we examined. This may be indicative of the complex factors influencing quality in

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[13]Nursing homes with nurses' aide hours per resident day that were in the top 25 percent for a state were considered to be the highest-aide-hour homes. Homes with nurses' aide hours per resident day that were in the bottom 25 percent for a state were considered to be the lowest-aide-hour homes.

[14]Joel W. Cohen and William D. Spector, "The Effect of Medicaid Reimbursement on Quality of Care in Nursing Homes," *Journal of Health Economics* 1996;15:23-48; John A. Nyman, "Improving the Quality of Nursing Home Outcomes: Are Adequacy- or Incentive-Oriented Policies More Effective?" *Medical Care* 1988:26(12):1158-1171.

[15]Health Care Financing Administration, *Report to Congress: Appropriateness of Minimum Nurse Staffing Ratios in Nursing Homes*, Summer 2000.

[16]See for example Mark A. Davis, "On Nursing Home Quality: A Review and Analysis," *Medical Care Review* 1991; 48(2):129-166; John A. Nyman, "The Effect of Competition on Nursing Home Expenditures Under Prospective Reimbursement," *Health Services Research* 1988; 23(4):555-574; Donald F. Vitaliano and Mark Toren, "Cost and Efficiency in Nursing Homes: A Stochastic Frontier Approach," *Journal of Health Economics* 1994;13:281-300.

[17]Dana B. Mukamel and William D. Spector, "Nursing Home Costs and Risk-Adjusted Outcome Measures of Quality," *Medical Care* 2000; 38(1):78-89.

nursing homes or because increased spending does not necessarily purchase more hours of care.[18] In Ohio, the presence of repeated serious deficiencies appeared unrelated to homes' spending on nursing.[19] However, in Mississippi, homes with lower spending on nursing were less likely to have been found deficient in state surveys. This is consistent with our finding that homes in Mississippi with lower staffing levels had fewer deficiencies. By contrast, in Washington, we found that homes with the lowest expenditures per resident day on nursing were more likely to have repeated serious deficiencies than were homes with highest nursing expenditures per resident day. Of the lowest-spending homes, 17 percent had repeated serious deficiencies, compared with 7 percent of the highest-spending homes. Further, a larger share of the highest-spending homes had no serious deficiencies compared with lowest-spending homes. Homes with serious deficiencies in successive surveys had lower average nursing expenditures (9 percent less) than did homes with no serious deficiencies in successive surveys. But these homes with repeated serious deficiencies also had higher capital and administrative expenditures, and as a result, had total spending that was 9 percent higher than homes with no such deficiencies.

COMMENTS FROM EXTERNAL REVIEWERS

We received comments on a draft of this report from Medicaid officials in Mississippi, Ohio, and Washington. They provided technical comments, which we incorporated as appropriate. The representative from Ohio reported that our findings of no relationship between nursing home spending and quality of care were consistent with analyses conducted by the state.

We also received comments from two researchers who have done extensive analyses in the area of nursing home quality. We incorporated their technical comments as appropriate. One researcher commented on the complexity of the relationship between quality and staffing, noting that factors such as management, tenure and training, staff mix, retention, and turnover of staff may affect both the quality and the cost of care. We do not disagree with this observation. The other researcher was concerned about the possible interpretations of our results and noted that increased spending does not necessarily increase hours of nursing care, but that increased hours would increase homes' costs, which homes might afford by decreasing their non-nursing costs or by lowering their profits. We point out that nursing homes could increase nursing hours, and not necessarily costs, and that the homes with higher spending had disproportionately higher spending on capital, home operations, and administrative expenses—not nursing care.

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[18]For example, a home may pay higher wages or it may hire a different (and more skilled) mix of personnel, which would increase a home's costs without raising care hours.

[19]Reviews of 1999 Ohio nursing home cost report data by that state's Bureau of Long Term Facilities also found no clear relationship between nursing home spending and the frequency of quality of care deficiencies.

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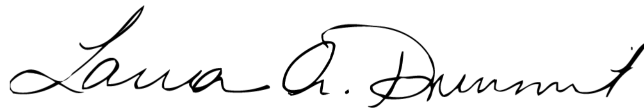
As agreed with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies of this report to Medicaid officials in Mississippi, Ohio, and Washington and to interested congressional committees. In addition, the letter will be available at no charge on the GAO Web site at **http://www.gao.gov**. If you or your staff have any questions, please call me at (202) 512-7114 or Carol Carter, Assistant Director, at (312) 220-7711. Staff who made major contributions to this letter include Christine DeMars, Dana Kelley, and Daniel Lee.



Laura A. Dummit
Director, Health Care—Medicare Payment Issues

Enclosure

Scope and Methodology

To determine levels of spending in nursing homes and the factors influencing that spending, we analyzed the 1999 Medicaid cost reports of nursing homes in three states, Mississippi, Ohio, and Washington. The cost reports capture nursing home expenditures associated with the care of all residents living in Medicaid-certified nursing homes in the states. Because we wanted to uniformly adjust nursing home spending for differences in the care needs of residents, we selected 3 of the 18 states that use the Resource Utilization Group (RUG) case-mix classification system in their Medicaid payment systems, were geographically diverse, and could provide us with electronic data in a timely fashion.[20] We examined the expenditures of freestanding nursing homes only; homes that were part of another facility, such as an acute care or rehabilitation hospital, were excluded from the analysis.[21] Medicaid nursing home reimbursement practices vary considerably across states and, therefore, the results of our analyses cannot be generalized to the rest of the country.

The three states' cost reports included slightly different categorizations of costs. We aggregated the more detailed spending available in some of the cost reports into six uniformly defined categories: nursing (salaries and benefits for registered nurses, licensed practical nurses, and nurses' aides), medical supplies, other resident care (such as salaries and benefits for dieticians, social workers, and directors of nursing; and staff and supplies for medical recordkeeping), home operations (such as staff and supplies needed for housekeeping, food service, laundry, and maintenance), administrative (such as administrative and clerical salaries and office supplies), and capital (such as depreciation on buildings, equipment, and furnishings; interest; leases; and rentals). Ancillary services, including therapies, were not included in our analysis because spending for these services was not uniformly reported on the state cost reports that we examined.

We excluded nursing homes that had cost-reporting periods of less than 10 months or greater than 14 months. We also excluded homes that had aberrant values for total expenditures per resident day and nursing hours. Finally, we excluded homes with missing data. In total, we excluded 5 percent of free-standing nursing homes in Washington and 5 percent of free-standing homes in Ohio. In Mississippi, we excluded 31 percent of free-standing nursing homes, largely because of missing data.[22] Our final sample sizes were 105 homes for Mississippi, 826 homes for Ohio, and 232 homes for Washington. In Washington and Ohio, our final sample of homes did not

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[20]This classification system sorts nursing home residents into groups based on their clinical condition, functional status, and expected use of certain services. Payments for each group are adjusted up or down to reflect the level of resources needed to care for the average resident in the group, relative to the overall average cost.

[21]Because of their affiliations with hospitals and other health systems, the cost structures of facility-based nursing homes can differ substantially from those of freestanding homes. For this reason, we excluded those homes from our analysis.

[22]The most common missing information was the staffing data. The voluntary nature of the special staffing survey may have contributed to the number of homes with missing data.

differ from the population of free-standing homes in terms of number of beds, ownership, and rural and urban location. In Mississippi, our final sample of homes included a slightly higher share of proprietary homes and more large homes and fewer small homes, compared to the population of free-standing homes.

To compare spending across facilities, we adjusted nursing expenditures for differences in resident complexity, as calculated by the states for each nursing home using the RUG classification system. Nursing, other resident care, and administrative expenditures were also adjusted for differences in wages across geographic areas using the Medicare hospital wage index.

Our staffing analysis assessed the total number of registered nurse, licensed practical nurse, and nurses' aide hours per resident day, as reported on Ohio and Washington cost reports.[23] Staffing hours were not reported on Mississippi cost reports. For that state, we used data from a voluntary 1-month study (December 1999) of total staffing hours (all nursing hours and nurses' aide hours combined). We extrapolated these data to a 12-month period.[24]

We measured quality using deficiency data reported in CMS's On-line Survey Certification and Reporting system.[25] We examined deficiencies recorded in the following areas: physical restraints, abuse, quality of life, dignity, pressure sores, indwelling catheters, treatment of incontinence, nutrition, dehydration, unnecessary drugs, antipsychotic drugs, and nursing staff. Good quality homes were determined to be those that CMS considers to be "in substantial compliance" in the areas we examined. In Ohio, 56 percent of homes fell into this category, compared with 43 percent and 24 percent of homes in Mississippi and Washington, respectively.

Because of differences in the frequency of deficiencies across the states, we used a relative measure to identify poor quality homes. We defined as poor quality those homes that had G-level deficiencies or worse in successive surveys. These are homes that were found in two consecutive surveys to have deficiencies in the same area that caused actual harm, potential for death or serious injury, or actual death or serious injury. Five percent of Ohio homes met this definition of poor quality and 10 percent

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[23]Due to data limitations, we were unable to separate out spending on rehabilitation aides from spending on nurses' aides in Washington nursing homes.

[24]We also examined Mississippi nursing home staffing data from another point in time and determined that the December 1999 data were a reasonable representation of the year.

[25]These data record the findings of routine and follow-up state surveys to assess compliance with federal standards. We used results from the most recent survey for each home; generally, homes' most recent surveys were in 1999 or 1998. Deficiencies identified in the survey process are placed in 1 of 12 categories, labeled "A" through "L" depending on the extent of resident harm (severity) and the number of residents adversely affected (scope). The most dangerous category (L) is for a widespread deficiency that causes actual or potential for death or serious injury to residents; the least dangerous category (A) is for an isolated deficiency that poses no actual harm and has potential only for minimal harm. Homes with deficiencies that do not exceed the C level are considered in "substantial compliance," and as such, providing an acceptable level of care.

of Washington homes did. No homes in Mississippi met this definition, so we chose a less stringent definition for that state: Poor quality was defined as homes that had four or more D-level deficiencies (deficiencies that have the potential for more than minimal harm) or two or more G-level deficiencies in a single survey. Fourteen percent of Mississippi nursing homes fell into this category.

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