# Appropriateness of Minimum Nurse Staffing Ratios in Nursing Homes

**Report to Congress:**

**Phase II Final**

**Volume I**

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## Executive Summary: Phase II Report[1]

### Background

#### Purpose

This purpose of this report is to complete the Report to Congress that was mandated by Public Law 101-508 which required the Secretary to report to the Congress on the appropriateness of establishing minimum caregiver ratios for Medicare and Medicaid certified nursing homes. In addition we secured expert review from a Technical Expert Panel as well as input from consumer advocates, unions, and the nursing home industry.

A Phase I report of preliminary findings was delivered to Congress in July, 2000. Although the investigators of this Phase II report make no recommendations, the report provides an important empirical foundation for any policy initiatives with respect to nursing home staffing. In light of this new information, the Department of Health and Human Services recommends some legislative changes and initiatives to provide improved nurse staffing, information for consumers and to improve the management and training of nurse aides. These recommendations and initiatives are found in a separate section at the end of this Executive Summary. The following is a summary of Phase II.

#### CMS's Current Authority/Role in Nurse Staffing Requirements

Currently, the Centers for Medicare & Medicaid Services (CMS), formerly the Health Care Financing Administration, mandates certain nurse staffing, requirements under the statutory authority of The Omnibus Budget Reconciliation Act of 1987 (OBRA '87). The general requirement is that nursing homes must provide "…sufficient nursing staff to attain or maintain the highest practicable ... well-being of each resident..." Many professionals view this central requirement, when implemented in practice, as too vague to serve as an adequate Federal standard. There are also specific minimum requirements of 8-hours of registered nurse and 24-hours of licensed nurse coverage per day. However, since this minimum is the same for all facilities (e.g., the same for a 60 bed facility or a 600 bed facility), many professionals also view this requirement as inadequate; they argue for a required minimum nurse staffing to resident *ratio*. The Congressional requirement for this study essentially asks the Secretary to determine if there is some appropriate ratio of nurses to residents.

[1] Author: Marvin Feuerberg, Centers for Medicare and Medicaid Services (CMS).

## Evaluation Contractors, Study Investigators, And Technical Expert Panel

Abt Associates is the prime evaluation contractor for this study. Abt's Alan White, Ph.D., and Donna Hurd, RN, MSN served as Principal Investigator and Project Manager, respectively. Important subcontractors and/or consultants to Abt or CMS on this project include: University of Colorado Health Sciences Center, Andrew Kramer, MD, Principal Investigator; University of California, Los Angeles and Los Angeles Jewish Home, Anna & Harry Borun Center for Gerontological Research, John F. Schnelle, Ph.D., Principal Investigator; Survey Solutions, Inc., Beth A. Klitch, President; Barbara B. Manard, Ph.D., Principal, the Manard Company, Chevy Chase, Maryland; Susan C. Eaton, Ph.D., John F. Kennedy School of Government at Harvard University; and Mary Ann Wilner, Ph.D., Director of Health Policy, Paraprofessional Healthcare Institute. In addition, CMS' co-project officers for the study, Susan Joslin, Ph.D. and Marvin Feuerberg, Ph.D., have been responsible for much of the study design, implementation, and analyses employed throughout the project.

## Technical Expert Panel (TEP)

Abt Associates convened a TEP to review and comment on key project deliverables, such as design plans for and results of technical analyses. The TEP was comprised of nationally recognized experts in long-term care, nursing, economics, and research and analysis.

## Stakeholders Input

In addition to the formal TEP, Abt Associates and CMS sought and obtained input on the planned study design from different stakeholders in the long-term care staffing debate through other mechanisms, such as official meetings with representatives from consumer advocate groups, unions, and the nursing home industry. In addition, informal conversations were held with policy experts not included on the Abt TEP.

## Attribution

A footnote on the first page of each of the 11 chapters details the appropriate attribution and acknowledgments for all of the analyses contained in the chapter. Although this is a CMS report for which it alone is responsible, each of the reports received from contractors and subcontractors has not been changed or altered in any way, other than minor editing.

# Study Approach

## Study Objectives

The primary objectives of the Phase I and Phase II studies are to determine 1) if minimum nurse staffing ratios are appropriate and, if appropriate, 2) the potential cost and feasibility implications of minimum ratio requirements. Assessment of appropriateness was conceptualized to require, first, an analysis of the relationship between staffing ratios and quality. If no such relationship exists, then all other considerations related to appropriateness become moot. Conversely, if the staffing quality relationship is real and substantial, then appropriateness of establishing minimum nurse staffing ratio requirements also entails the specification of the actual nurse staffing ratios, assessment of the costs, feasibility of implementation, and other considerations which are the subject of this Phase II report.

In addition, the Phase II report more fully assessed the appropriateness of minimum staffing ratio requirements by incorporating an assessment of the importance of staffing relevant factors other than staffing numbers/ratios. Specifically, there is the question of whether nursing homes that fall below the thresholds identified in the statistical analysis could substantially mitigate quality problems with better nursing and management practices. The study addressed this concern with three different analyses, described below, which identified the importance of the involvement of non-nursing staff; facility practices with respect to absenteeism; effective supervision including clear guidelines and procedures; clear expectations regarding standards of care; the importance of retention of existing staff; and improved management and training of nurse aides.

To address the link between staffing and quality - two core analyses were conducted. One analysis focused on nurse staffing levels necessary to avoid bad outcomes. The key study questions for this analysis were: *Is there some ratio of nurses to residents below which nursing home residents are at substantially increased risk of quality problems? Conversely, is there some ratio of nurses to residents above which no additional improvements in quality are observed?*

The other core analysis focused on nurse aide staffing thresholds minimally necessary to provide *care processes* consistent with the OBRA '87 *optimal* standards and related regulations and guidelines.

In both Phase I and Phase II reports, the phrase "nurse staffing" refers to all three categories of nurses: Registered Nurses (RNs), Licensed Practical Nurses (LPNs), and Nurse Aides/Nursing Assistants (NAs).

# Findings

In addition to a more detailed chapter 1 overview of findings, the following ten chapters present empirical findings and analysis directed toward three general areas: 1) empirical determination of the relationship between staffing and quality; 2) other considerations relevant to the "appropriateness" of minimum nurse staffing ratios; and 3) the importance of staffing-relevant factors other than staffing numbers/ratios.

## 1. Empirical Determination Of The Relationship Between Staffing And Quality

- Using data from a representative sample of 10 states including over 5,000 facilities, the objective of the empirical analysis was to identify staffing thresholds below which quality of care was compromised and above which there was no further benefit of additional staffing with respect to quality. Quality measures consisted of hospital transfer for potentially avoidable causes (e.g. urinary tract infections, sepsis, electrolyte imbalance) for a short-stay sample of Medicare SNF admissions, and selected quality of care issues for the treatment of long-stay nursing home residents who were in the facility for at least 90 days (i.e. functional improvement, incidence of pressure sores, incidence of skin trauma, resisting care improvement, and weight loss).

To identify staffing thresholds, logistic regression was used to examine associations between incremental increases in staffing and whether facilities were in the worst 10 percent of facilities with respect to each quality measure, controlling for the unique resident characteristics that were predictive of each quality measure.

For each measure, there was a pattern of incremental benefits of increased nurse staffing until a threshold was reached at which point there were no further benefits with respect to quality when additional staff were utilized. Depending on the nursing home population, these thresholds range between 2.4 - 2.8, 1.15 - 1.30, and 0.55 - 0.75 hrs/resident day for nurse aides, licensed staff (RNs and LPNs combined), and Registered Nurses, respectively. **Although no quality improvements are observed for staffing levels above these thresholds, quality is improved with incremental increases in staffing up to these thresholds.**

Implementation of these thresholds as requirements would find 97 percent of all nursing homes failing to meet one or more of these standards. The analysis also indicated that implementation of thresholds lower than those above which maximize quality, would still result in substantial improvements in a smaller, yet substantial portion of all nursing homes.

While staffing levels up to these thresholds represent possible minimum staffing ratios in order to reduce the likelihood of quality of care problems, casemix may influence levels for specific nursing homes. The case mix analyses suggested that these staffing thresholds to prevent inclusion in the worst 10 percent of facilities were relatively similar, regardless of facility casemix. Fewer facilities in the lowest risk category were in the worst 10 percent of facilities with respect to quality, but it appeared that quality improvements occurred until about the same thresholds in each casemix category.

However, with more facilities in the worst 10 percent of facilities in the higher risk case mix categories, it makes sense for staffing requirements to be higher (i.e. closer to the threshold) in higher risk facilities. To date no feasible approach to casemix stratification has been developed. If no feasible way to adjust the thresholds by casemix is ultimately identified, this would in no way invalidate the thresholds that were identified. This is because the multivariate models used to identify the thresholds adjusted for facility casemix and other facility characteristics that were predictive of the quality measures.

- In a separate study, a simulation analysis utilized prior data on the nurse aide time expended in providing five key care processes in addition to routine care: 1) dressing/grooming independence enhancement, 2) exercise, 3) feeding- assistance, 4) changing wet clothes and repositioning residents, 5) providing toileting assistance and repositioning residents. The simulation analysis conservatively estimated that in 2000 over 91 percent of nursing homes have nurse aide staffing levels below that identified as minimally necessary to provide all the needed care processes that could benefit their specific resident population.

These nurse aide staffing levels depended on the nurse aide workload requirements of a nursing home's specific resident population and ranged between 2.8 and 3.2 hrs/per resident day. The simulation staffing estimates should be viewed as a necessary condition for optimal care by nurse aides, not a sufficient condition. The estimates *assume* a very highly motivated and productive nurse aide staff.

## 2. "Appropriateness" of Minimum Nurse Staffing Ratios: Other Considerations

The "appropriateness" of establishing minimum nurse staffing ratios, the central policy issue of this Congressionally mandated report, cannot be inferred solely from empirical studies demonstrating a strong relationship between critical staffing ratio thresholds and resident outcomes. Of course, if no such relationship is found or if the evidence is ambiguous, then the policy issue becomes moot. As noted above, the evidence supporting the existence of these critical thresholds is strong and compelling. But, as we have also noted, there are other issues relevant to a consideration of "appropriateness." These other considerations and the results of the Phase II analyses are outlined below.

- **Does The Current Nursing Workforce Shortage Preclude Higher Minimum Staffing Requirements? Study Answer:**

No, but it is estimated that the increased demand for nurses that would result from implementation of the identified staffing thresholds would increase RN wage rates by between 2.5 and 7 percent; nurse aide compensation would need to be increased by between 10 and 22 percent.

- **Is There A Policy Alternative To Minimum Nurse Staffing Requirements Which Could Result In Enhanced Nurse Staffing Resources? Study Answer:**

Yes, a requirement for minimum expenditures for nurse staffing might achieve the same objectives of improving quality through enhanced resources for staffing. Total wages in dollars

per resident day were associated with quality, suggesting that quality keeps improving as staffing expenditures increase.

- **Does The Current Nursing Workforce Shortage Contribute To High Turnover And Retention Problems Which Adversely Affect Quality? If So, Can Turnover Be Reduced Within The Current Environment? Study Answer:**

Study results were inconclusive with respect to the impact of the nurse staffing levels on turnover and retention problems. However, a qualitative study conducted for this report indicate that there are a number of effective management practices resulting in reduced turnover that can and are implemented in many nursing homes- nursing homes operating within the current nursing shortage and without any additional resources that were identified.

- **Is The Cost Of Implementing Nurse Staffing Ratio Requirements So High As To Preclude Its Feasibility? Study Answer:**

Analysis of cost implications is continuing. However, an analysis of Medicare expenditures under PPS related to nursing care indicates that these expenditures are very close to what costs would be to facilities to staff at the minimum thresholds identified in the Phase II report. In addition, a preliminary analysis by CMSs Office of the Actuary indicated that the total national incremental nursing home cost of implementing the "preferred" minimum nurse staffing ratios identified in the Phase I analysis is on the order of $7.6 billion for CY 2001, about an 8 percent increase over current expenditures.

- **Are Existing Nurse Staffing Data Sufficiently Accurate For Determining Compliance With Any Nurse Staffing Requirements That Might Be Implemented - Or For Consumer Information? Study Answer:**

No. As was shown in the Phase I report, the only ongoing source of uniform data on nursing home staffing throughout the U.S. is CMS' On-Line Survey Certification and Reporting System (OSCAR) data. Unfortunately, the evidence presented in Chapter 7 of that report indicates that these self-reported data are highly inaccurate. A Phase II analysis conducted site visits to a small number of nursing homes to determine the feasibility of collecting more accurate staffing data based on payroll records and invoices from contract agencies. Collecting accurate total staffing hours by licensure type (RN, LPN, NA) and turnover/retention data appear feasible, but tedious given the variability in payroll records.

Nevertheless, from the limited number of site visits it appears quite feasible to replace the current reporting requirement with electronic submission of a limited set of staffing variables derived from payroll records and invoices from contract agencies. The increased reporting burden to providers would be minimal or nonexistent.

- **Apart From Total Costs, What Are The Policy Issues For Public Payers That Need To Be Considered? Study Answer:**

The fundamental policy issue is how these costs are distributed among providers, public payers (Medicare and Medicaid), and private payers. In addition, there are questions about how policy-makers strike an appropriate balance among competing objectives: spending sufficient money (both in rates and administrative costs) to achieve staffing objectives; reasonable cost containment; administrative feasibility; accountability; and equity.

### 3. Importance Of Factors Other Than Staffing Numbers/Ratios

- The relationship between quality and critical minimum staffing levels was supported by case studies of individual facilities, units, and residents. Below minimum staffing levels on particular units and shifts, there appears to be little facilities can do to mitigate quality problems. But these staffing minimums, to the degree that they can be translated into facility-wide averages, are well below the thresholds discussed above which result in the maximum quality observed. Above these minimum levels identified in the case studies, addressing a number of nursing and management practices can optimize care. These include the involvement of non-nursing staff (e.g., single task workers, management) during peak hours (e.g., mealtimes); facility practices with respect to absenteeism; and good management and supervision including clear guidelines and procedures, clear expectations regarding standards of care, use of tools and materials to guide practice, and consistent enforcement of standards.

Another set of case studies that focused on management practices with respect to turnover also underscored the importance of high quality leadership and management with a strong mission, setting standards and holding others accountable.

- Additional qualitative analyses in the report emphasize the importance of improved nurse aide training including additional clinical training during, a nursing assistant's first few months on the job to facilitate the transition from training to work, and formal supervision and continuing education throughout a nursing assistant's career.

- A strong relationship was found between nursing assistant retention and several quality measures. Although in a free society and market economy high turnover and staff retention could never be subject to regulation, the two sets of case studies on management practices, the qualitative study on nurse aide training, and the retention study, all demonstrate the importance of other staffing factors besides staffing levels in quality of nursing home care.

While stopping short of making specific policy recommendations, the investigators of this Phase II report have provided an empirical basis for any policy debate and initiatives related to nursing home staffing. In light of this new information, the Department of Health and Human Services recommends some legislative changes and initiatives to provide improved nurse staffing information for consumers and to improve the management and training of nurse aides. These recommendations are found in the next section.

# HHS RECOMMENDATIONS AND INITIATIVES

## Importance and Policy Limitations of Nurse Staffing Study

The 6-volume Phase I and Phase II reports on the appropriateness of minimum nurse staffing ratios in nursing homes have provided the most comprehensive data and analysis to date on this issue. The reports have produced strong and compelling evidence of the relationship between staffing ratios and quality of nursing home care and have identified staffing thresholds that maximize quality outcomes. Further, the reports have identified a number of staffing relevant factors other than staffing numbers/ratios that importantly impact quality. In addition, the report has arrayed a wealth of information with respect to the nursing shortage, turnover and retention, costs, and other considerations in assessing the appropriateness of minimum staffing requirements. Any policy recommendations and initiatives must take into account this vast array of empirical data and analysis. [2]

Although many states will look to the report for standards upon which to base minimum staffing requirements under their state licensure authority, we do not think there is currently sufficient information upon which to base a Federal requirement for all certified nursing homes. First, any requirement would have to be balanced against cost, and a cost analysis by CMS' Office of the Actuary and Abt Associates is ongoing. Second, the scope of that analysis is limited to determining the resource requirements of implementing the Phase II thresholds. Yet, incremental increases in staffing up to these thresholds yield quality improvements. An analysis is needed of the quality improvement/cost tradeoff as staffing increases up to the thresholds. In considering any staffing requirement, it is fundamentally important to know how much quality we are purchasing with cost increases.

**Initiative #1: The Department will conduct a study to identify the quality improvements and costs associated with incremental increases in staffing up to the thresholds identified in the Phase II study.**

Third, apart from the empirical determination of the quality/cost tradeoff, there remains the important public payment policy issues identified *but not resolved* in the report:

> The fundamental policy issue is how these costs are distributed among providers, public payers (Medicare and Medicaid), and private payers. In addition, there are questions about how policy- makers strike an appropriate balance among competing objectives: spending sufficient money (both in rates and administrative costs) to achieve staffing objectives; reasonable cost containment; administrative feasibility; accountability; and equity.

[2] This section of the Executive Summary lists some items as recommendations to Congress requiring new legislative authority, others as initiatives that can be conducted under normal regulatory rule making, and others as simple as administrative actions not requiring rule making. Although we are confident about what is needed, at this time the categorization of needed actions as requiring legislation, rule making, or neither is tentative.

Ultimately, these issues are resolved, either explicitly or implicitly, in our public payment systems. With respect to Medicare payment to nursing homes, these issues will be addressed in a current ongoing project under contract to the Urban Institute, "Assessment, Refinement, and Analysis of the Existing Prospective Payment System (PPS) for Skilled Nursing Facilities." A report to Congress is expected in the summer of 2004. Two of the investigators who contributed to the Phase I and Phase II reports are also among the contract's investigators on the PPS report. Although the nurse staffing reports have provided valuable empirical data and analysis, it will be some time before there can be a full assessment of all the relevant policy issues inherent in a potential staffing requirement.

Notwithstanding all these unresolved issues related to the appropriateness of minimum nurse staffing ratios, the Phase II report has identified two areas, discussed below, that can lead to enhanced nursing staffing resources: the reliable public reporting of nurse staffing information and efforts to improve management and training of nurse aides.

**Reliable Public Reporting of Nurse Staffing Information**

It is not currently feasible to implement a minimum nurse staffing ratio requirement. As noted above, the currently available nurse staffing data are highly inaccurate. The data on staff turnover and retention are even more doubtful and not nationally collected in any data system. Although currently available data were sufficient for conducting the Phase II analyses with statistical adjustments on large numbers of facilities, the data are not sufficiently accurate for determining the compliance of *individual* facilities with any staffing requirement which might be implemented.

Yet these data are important, apart from whatever merits future research may find with respect to the appropriateness of establishing minimum nurse staffing ratio requirements. Consistent with the CMS' November 19, 2001 initiative to disseminate and publish reliable information on nursing home quality for Medicare and Medicaid beneficiaries, staffing information should be made available to the general public to make informed decisions when choosing health care providers. With reliable information, nurse staffing levels may simply increase due to the market demand created by an informed public. Although the staffing thresholds identified in the report as maximizing quality may not ultimately become the basis for Federal or State minimum requirements, consumers arguably have the right to select homes with this standard in mind.

To make reliable information available to the public, a more accurate reporting form for providers, an audit mechanism for what is reported, and the most efficient method of transmission need to be further developed and tested. Some assessment of the feasibility of collecting accurate data on the contributions of volunteers is also warranted. The Phase II study conducted some preliminary field work which can be the starting point for developing a reliable public reporting system for nurse staffing.

Accurate staffing information is a necessary, but not a sufficient condition for informing the public. It is also necessary to provide additional information so that the public can make some kind of informed judgment about reported staffing levels in a given facility relevant to the casemix of the nursing home. Although the Phase II analysis did not identify different staffing

levels that maximized quality for different casemix groupings, it did find that adverse outcomes were significantly higher at the same staffing levels for facilities of higher casemix. The investigators concluded that higher staffing levels are warranted for facilities with residents of higher acuity and functional limitations. Hence, consumers need to have not only accurate staffing information about a nursing home they may be considering, but also need to know how the reported staffing levels compare to facilities of comparable casemix.

To meet these objectives, we have two initiatives and one recommendation:

**Initiative # 2: The Department will conduct a study leading to recommendations for an improved reporting, auditing, and transmission of nurse staffing data to CMS for a reliable system of public reporting.**

**Initiative # 3: The Department will conduct a study leading to recommendations for the public reporting of staffing data arrayed against the casemix of the nursing home.**

**Recommendation # 1: The Department recommends a new provider requirement of electronic submission of staffing data based on payroll data and invoices from contract agencies.**

**Improved Management and Training of Nurse Aides**

The Phase II qualitative case studies identified a number of management practices related to staffing that appeared to mitigate quality problems, even under conditions of relatively low staffing. While the case studies offered important evidence on general areas of concern, there is a need to develop specific protocols which could operationalize these practices so they could be of practical use to providers. Hence, the following initiative:

**Initiative # 4: The Department will develop and test specific protocols on how to organize and manage nurse aides to achieve the high productivity that would make any level of staffing more effective.**

In addition, a qualitative study on the current requirements, content, and typical implementation of nurse aide training requirements led to the following recommendations to CMS by one of the projects consultants:

- Require more than 75 hours of certification training to give students more time to absorb all the material covered in the classroom and to include sufficient clinical training;

- Add "soft skills" training, such as communication, problem solving and cultural sensitivity, to the curriculum requirements; and

- Develop a multi-agency task force at the federal and state levels across DOL, HHS, and DOE to address training issues such as curricula, certification, payment for training and access to public supports.

We think these recommendations have merit. However, at this time we are not able to recommend a specific increase in the number of hours that should be required of certification training, nor the specific content of such training. Hence, we think these issues need to be addressed in the recommended task force:

**The Department will establish a multi-agency task force to address nurse aide training issues with respect to the required number of hours, curricula, certification, payment for training and access to public supports.**