Development of Staffing Quality Measures - Phase I

Creation of the Nursing Home Staffing Database & Data Dictionary

July 25, 2005

Colorado Foundation for Medical Care

University of Colorado Health Sciences Center
- Division of Health Care Policy and Research

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& DATA DICTIONARY

1. Background and Pilot Data Collection

The Development of Staffing Quality Measures – Phase I project was designed to investigate a range of nursing home staffing quality measures for use in a public reporting system and to assess options for collection of the necessary data. The Centers for Medicare & Medicaid Services expressed an interest in staffing quality measures that go beyond simple staffing levels, and encouraged investigation of additional measures such as staff turnover, retention, and tenure. In March 2004, a stakeholders meeting was conducted in which representatives from nursing home corporations, national health care associations, and consumer advocacy groups identified which aspects of nursing home staffing were most important to them, and voiced their concerns regarding the accuracy of data currently being reported to the public. A technical expert panel (TEP) was convened immediately thereafter to review issues raised in the stakeholders meeting and to recommended specific quality measures and data sources for further study. TEP members expressed similar reservations about the quality of data currently used to report nursing home staffing levels, and recommended that an alternative source for these data be used for this project.

After considering the limited range of options currently available (the current Online Survey and Certification and Reporting System (OSCAR) data files, Medicaid cost reports, Medicare cost reports), the TEP concluded that each of these existing data sets involved significant limitations, and that the best source of staffing data would be the nursing homes' own payroll records. Although not stored in any central State or Federal data warehouse (adding to the complexity of obtaining these records), facility payroll records are already used by nursing home facilities, already in electronic format, and already subject to various regulatory audits. Thus, it was felt these records would provide the most accurate representation of nursing home staffing and would require the least effort for nursing home administrative staff to provide.

This report describes the data acquisition, receipt, and review processes. A data dictionary describing the variables created and used in various analyses is also provided. An earlier report entitled "Development of Staffing Quality Measures Phase I: Documentation of Nursing Home Staffing Database" and dated November 30, 2004 was prepared mid-way through the data collection process. (A brief Addendum was written July 25, 2005 that provided updated state, corporation, facility, and record counts.) Since that report was written, additional data were received and significant changes were made in methodology; this current report describes the process and results in their final form. Section 2 is reproduced from the Methods Section of the Final Report.

National nursing home corporations were contacted and invited to contribute data in support of the project. (It should be noted that corporations were not reimbursed for their participation.) An initial pilot data acquisition was conducted to get a sense of the feasibility of abstracting and using nursing home payroll data to calculate various types of staffing measures. Subsequent formal data acquisition activities were performed to obtain complete data from as many corporations as possible. Data use agreements outlining confidentiality and limitations on usage were completed with each corporation that provided data in either stage.

Twelve nursing home corporations were identified as potential participants and invited to participate in the pilot study. Ten corporations expressed interest in participating, and conference calls were held with seven corporations to discuss data systems, personnel practices, and the feasibility of providing detailed payroll and personnel records. Each corporation was asked to provide sample data files containing raw payroll records for one facility for one month, preferably at the shift-level and preferably distinguishing productive hours from non-productive hours, dates of hire, re-hire, and transfer for all employees reflected in those payroll records, daily resident census for the same month, and hours of contract labor for the same month. Pilot data was received from five corporations.

Most corporations were unable to provide payroll data at the shift-level. The ability to distinguish productive hours from non-productive hours was mixed, with some corporations able and some corporations unable to provide this detail. Corporate and facility practices regarding recording and retention of personnel action history (e.g., handling of hire and termination dates when an employee is re-hired or when an employee transfers from one facility to another, handling of employees with multiple job titles, responsibilities, or employment locations, etc.) varied greatly. Most, though not all, could provide daily census data; those that could not do so provided monthly or annual average daily census instead. All corporations reported that it would not be feasible to provide detailed information on contract staff.

Based on the results of the pilot data and discussions, a standardized formal request was developed (Appendix). Eleven corporations were asked to provide payroll, census, and employee status (personnel) data for all their nursing homes for calendar year 2003. Conference calls were conducted with the corporations to review the data specifications, discuss payroll system conventions and processes, and address any difficulties with the request. Eight corporations were able to provide the requested data. The eight nursing home corporations represent 1453 individual nursing homes, ranging from 31 to 360 facilities per corporation. Note that some corporations had to exclude certain facilities from the data abstraction due to various inconsistencies within their own data systems, and thus the individual nursing home data does not necessarily include all facilities owned by the corporation.

2. Methods (Reproduced from Methods Section of Final Report)
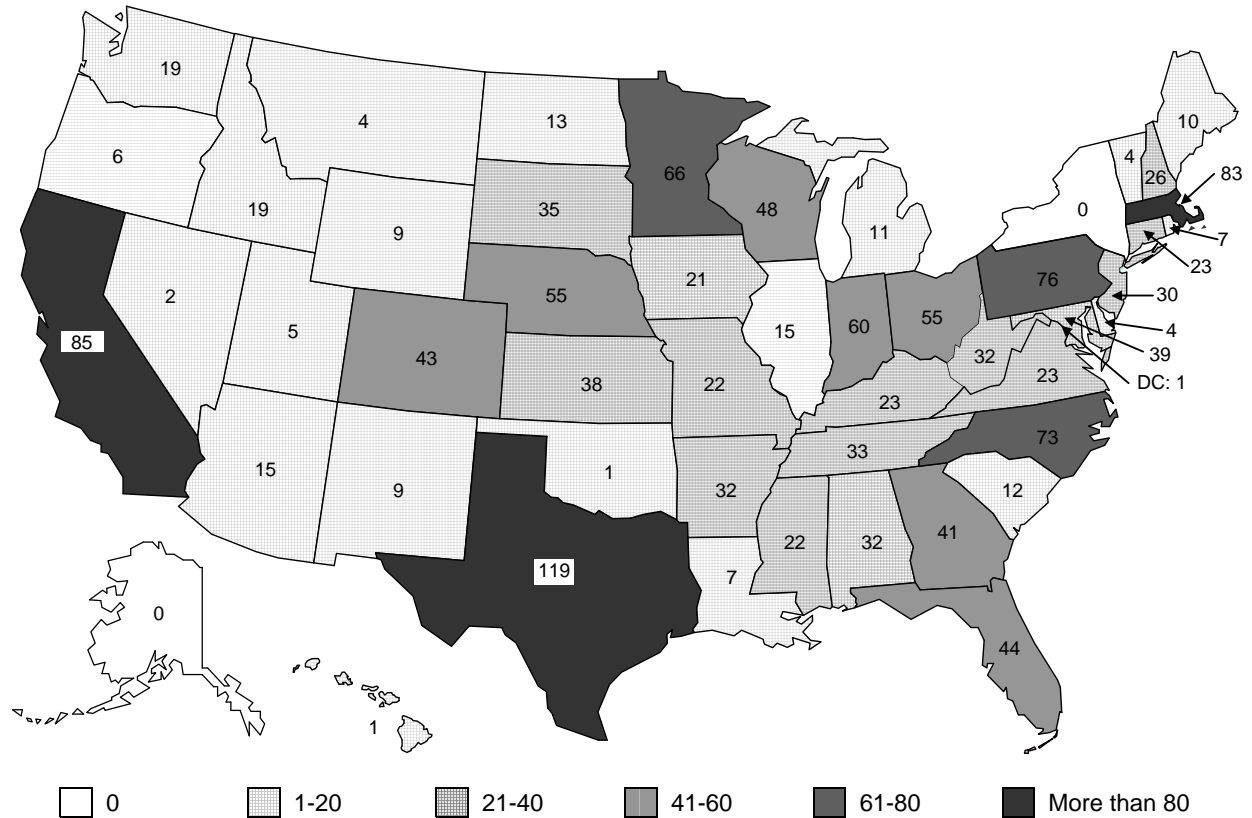
2.1 Data acquisition

National nursing home corporations were invited to provide staffing information for their constituent nursing facilities. We requested payroll and personnel records for every employee who worked during calendar year 2003, as well as daily census records for 2003. The individual data items requested included facility and employee identifiers, employee job title, employee productive and non-productive hours paid by date, employee hire and termination dates, reason for termination, and daily census. For corporations providing payroll data at the shift level, clock-in and clock-out dates and times were requested. Using these items, we constructed measures of staffing ratios, staff mix, RN shift coverage, turnover, retention, and tenure.

Eight corporations provided these data for 1453 individual nursing homes. As shown in Figure 1, the facilities are nationally distributed, with at least one nursing home in almost every state and the District of Columbia. We received no data for nursing homes in Alaska or in New York. The state of New York places regulatory limitations on the types of nursing facilities it allows to operate within the state, which was reflected in our database.

In order to maximize the number of corporations and facilities providing data, certain modifications to the data specifications were allowed, provided that data integrity was maintained. Even with modification, however, not all corporations were able to provide all data items as specified. Table 1 shows the data received from each corporation and the number of facilities for which the different measures can be calculated. The number of facilities per corporation ranges from 11 to 360, depending on the type of measure considered. In total, over 11.6 million individual payroll records and 172,563 individual personnel records were received.

Various data problems and inconsistencies were identified as the data were reviewed prior to creating the new staffing measures. Some of these problems were due to the lack of a standard extract while others are inherent to payroll data. These problems and their resolutions are listed by data source in Table 2. One issue relevant to all data sources is the type of facility included in the database. This project was specifically designed to assess staffing in Medicare-certified and/or Medicaid-certified nursing facilities (NFs) and skilled nursing facilities (SNFs). Some corporations submitted data from other types of facilities, such as long-term care hospitals or assisted living facilities; these data were deleted. A second issue common to all data sources was the need for facility identifiers. Because different types of data were submitted in different data files, some measures required merging the data files for a given facility. This required that a facility identifier be present on each file; records without such facility identifiers were necessarily deleted. The remaining items in Table 2 are specific to different measure types and will be discussed in the pertinent sections below.

Figure 1: **Distribution of nursing facilities that provided payroll, census or personnel data, by state (n=1453)**

	0		1-20		21-40		41-60		61-80		More than 80

Table 1: Number of facilities per corporation for which different measures can be created

Corporation	Level of census data	Staffing ratios*	Staffing levels and turnover using payroll records only	Tenure using personnel records
1	Daily	345	360[§]	--
2	Yearly	--	144	144
3	Yearly	--	195	191
4	Daily	52	52	--
5	Daily	245	245	245
6	Monthly	279	342	--
7	Daily	76	84	84
8	Daily	31	31	11
Total		1028	1453	675

* Requires payroll data, and census data provided at the daily or monthly level for each facility
[§] Due to the structure of these data, staffing ratios were calculable, but turnover measures were not

Table 2: Data problems and decisions made

Problem Description	Decision
All data files	
Records without any facility identifiers	If facility identifiers could not be obtained from the corporation or found by cross-referencing other data files, these records were deleted
Facilities with Medicare provider number that indicates something other than a SNF	Facilities with non-SNF Medicare provider numbers were deleted
Job titles	
Job descriptions vary for the same job code	Used job description only
Job descriptions vary by facility (even within the same corporation)	Created a crosswalk of job codes across facilities and corporations
Missing job codes and descriptions	Cross referenced other payroll records or employee status records for the employee's job code/description. For 80 records where a job code/description could not be found for an employee, the record was classified into the "general" category.
Job title indicates more than one job category (e.g., RN/DON)	Classified into "highest" job category (e.g., DON)
Job title indicates non-SNF position (e.g., RN - ICF)	Left record as is
Payroll data	
Payroll hours exceed the number of hours expected for a given pay period	Excessive hours for a pay period = 12 hrs x Number of days in pay period (e.g., 168 hrs for 14-day pay period). Excessive productive hours (or total hours for corps that reported only total hours) were set to zero.
Negative hours reported for a pay period	Negative payroll hours were set to zero
Records with inconsistent or illogical dates	Records with inconsistent or illogical dates that could not be resolved were deleted
Payroll records missing for a significant portion of year	Facilities with 120 or more days missing (all staff) during the first 50 weeks of the year were deleted
Records show zero productive or zero total hours for the all staff job category	For any day, if all staff hours = 0, hours for all staff type categories were set to missing

Table 2: Data problems and decisions made (continued)

Problem Description	Decision
Payroll data (continued)	
Individual employee does not have a record for a specific pay period	We assumed the employee worked zero hours for the pay period
Data appears incomplete - sudden severe drop in hours for a given day	If daily total hours for the all staff job category drops to ≤15% of facility annual mean, then all hours were set to missing for that day for all job categories
Census data	
Data provided for non-Medicare/non-Medicaid facilities	Non-Medicare/Non-Medicaid facilities were not included in any analyses. Facilities with zero Medicare days and zero Medicaid days for the year were deleted.
Annual average daily census was submitted instead of actual daily census	These facilities were not used to calculate staffing ratios
Census data was negative or excessively low	Test for low census data (≤15% of facility annual mean), and if negative or low used mean substitution using the annual mean census
Monthly average daily census was submitted instead of actual daily census	For each month, average census was used for each day of the month

It should be mentioned that other measures that might be of interest to policy-makers required data items that simply could not be provided by the corporations. These measures include: direct hands-on nursing care hours distinguished from indirect activities (e.g., documentation, reporting, phone calls, etc.), hours worked by contract agency staff, staffing ratios by shift or day of week, staffing levels by unit, and frequency of use of overtime for nursing staff. We are therefore unable to report these measures for the facilities in our database. However, we did receive limited data from one corporation that allowed us to investigate some shift-level measures, though we could not calculate staffing ratios by shift. We also received limited data from another corporation regarding the use of contract agency nursing staff; these data will be analyzed in a subsequent analytic phase following this report.

2.2 Job title categorization

Employees' job titles were requested so that staffing measures could be calculated by job category. The corporations provided 1551 individual job titles used by their facilities. These individual job titles were reviewed and collapsed into 11 common categories. Table 3 lists the categories and provides examples of the job titles they contain. Job titles that spanned more than one category were placed into the "higher level" category, under the assumption that an employee would spend the majority of his or her time at the higher level. For example, the job title "RN/DON" was placed in the Director of Nursing (DON) category because we assumed that most of the employee's time would be spent on DON-specific duties. Records with missing job titles were cross-referenced to other payroll or personnel records for that employee; 80 records remained with unknown job title and were classified into the "all others" category.

In some situations, an employee's job title suggested that he or she may work in a facility (or a unit within a facility) not referred to as a SNF or NF, e.g., "RN - ICF". We chose to retain these employee records in the database for several reasons. First, only a few certain facilities made this distinction in their employee job titles; most facilities' job titles simply indicated the employee's position, e.g., "RN". Employees at these latter facilities also may have worked in non-SNF/NF units, but the data do not make that distinction. Also, it may be that an employee with a title such as "RN - ICF" actually worked in several units within the building, but was given the ICF (intermediate care facility) unit title for other business concerns. The payroll records do not indicate how many hours the employee actually worked on the non-SNF/NF unit versus the SNF/NF itself. Furthermore, it is unclear if the facility census data included or excluded such units. Given that we can't make these distinctions uniformly across all facilities, we elected to include all staff titles and count as many staff as possible, though this may be a distortion of the true staffing picture. A standard set of job titles for reporting purposes would mitigate problems we encounter with allocating employees to specific job categories.

Table 3: Job title categories and examples

Job category	Examples of job titles
Administrator/Director	Administrator, Executive Director, Medical Director
DON	Director of Nursing
ADON	Assistant Director of Nursing
Other nursing administration	Case Manager, CNA Instructor, Infection Control Nurse, MDS Coordinator, Quality Improvement Coordinator, Wound Care Coordinator
Advance Practice Nurse	Clinical Nurse Specialist, Nurse Practitioner
RN	Registered Nurse
LPN	Licensed Practical Nurse, Licensed Vocational Nurse
CNA	Certified Nurse Aide, Certified Medication Aide, Restorative Aide
Non-certified nurses aide	Bath Aide, Caregiver, Nursing Assistant, Orderly, Personal Care Assistant
Other nursing	Nurse, Rehab Nurse, Restorative Nurse
All others	Bookkeeper, Cook, Customer Relations Director, IT Manager, Laundry Aide, Maintenance Technician, Physical Therapist, Social Worker, Unknown (missing) job titles

At the stakeholders meeting in March 2004, concerns were raised that traditional measures of nursing staff would not accurately reflect organizations with atypical or alternative staffing practices. Certain facilities may train clerical staff to perform non-nursing duties that often fall to nursing staff, such as responding to family complaints. This allows the facility to employ fewer nurses, but nursing staff are then able to devote more time to direct patient care. Other facilities operate under the philosophy that all employees are engaged in patient care, at least indirectly, and that these employees would be artificially excluded from counts of nursing staff. Other stakeholders argued that employees with advanced education or training should be counted separately from traditional nursing staff. On the other hand, several stakeholders maintained that nursing staff measures should be restricted to only nursing staff. The TEP members listened to these conflicting arguments and concluded that we should pursue the traditional measures of nursing staff such as registered nurse (RN), licensed practical nurse (LPN), and certified nurse assistant (CNA), but that we also include a measure of total staff that includes literally all employees. Recognizing that we can not report countless staffing measures for each possible different type of staff, including a measure for total staff seemed to be the best compromise. Alternative staffing model facilities are not currently well-represented in our database; we expect to obtain more data from such sites for future analysis.

The 11 job categories were further collapsed into three broader categories: 1) licensed nursing staff, which included DON, Assistant Director of Nursing (ADON), other nursing administration, advance practice nurse (APN), RN, and LPN; 2) all nursing staff, which included DON, ADON, other nursing administration, APN, RN, LPN, CNA, non-certified nurses aide, and other nursing; and 3) all staff, which included all job categories. Selected combinations of staff were also created, including RN+LPN, which simply combined the RN and LPN categories, and DON+ADON, which simply combined the DON and ADON categories.

2.3 Creation of staffing ratios, staff mix, and shift coverage measures

Payroll and census data were used to construct staffing ratios (hours per resident-day) by staff type and measures of staff mix (proportion of different types of staff, and percentage of hours worked by full-time employees). RN shift coverage (proportion of shift with at least one RN present) was constructed using raw time-clock payroll data from one corporation. All measures were calculated at monthly, quarterly, semi-annual, and annual time intervals. Payroll records that spanned two time intervals were prorated to appropriately distribute hours into each time interval. Missing, extraneous, and incomplete data were identified and modified or deleted as appropriate.

2.3.1 Cleaning pay period records and census data

Seven of the eight corporations provided payroll data by pay period and one corporation provided raw time-clock payroll data. It should be noted that much of the work devoted to cleaning up and standardizing the data could have been avoided or mitigated if data conforming to a standardized set of data elements could have been provided by each organization. For example if data elements such as pay period length, type of hours worked (e.g., productive versus non-productive), application of accounting adjustments to hours worked, etc. were the same for each corporation, cleaning and merging of the data would have been simplified.

Only payroll records for calendar year 2003 were retained. Pay periods that began in 2002 and ended in 2003 or that began in 2003 and ended in 2004 were prorated to remove hours outside calendar year 2003. For example, if an employee's payroll record indicated 35 hours in the pay period beginning December

30, 2002 and ending January 5, 2003, the hours were adjusted downward to 25 hours (35 x 5/7) because two days in that pay period fell outside calendar year 2003.

The payroll data were analyzed for gaps between pay periods as well as for overlapping pay periods. All employees that had missing pay periods were assumed to have zero hours during those pay periods. Pay periods with zero hours were inserted into the database for employees with missing pay periods. To maximize data submission, as mentioned previously, corporations were permitted to modify the data specifications resulting in issues unique to each corporation that required various assumptions and adjustments to the data. For example, some corporations did not provide a pay period begin date but only an end date for the pay period. For this situation when pay periods were standard (e.g., always 14 days) a begin date was easily calculated. When pay periods varied, a begin date was calculated based on various factors such as facility or corporation norms (e.g., the pay period always begins on Wednesday). Sometimes the end date of the previous pay period was used to determine the next pay period start date. Some pay periods were eliminated entirely because they overlapped with other pay periods or because they did not conform to the normal pay period end date, indicating that these records were for an atypical purpose such as bonus payments or accounting adjustments.

Payroll records were analyzed for negative and very high hours, which appeared to be the result of accounting adjustments presumably for special situations such as bonuses or terminations. All pay period records with negative hours were set to zero hours. A high hours outlier test was applied to all pay period records as well. If the per-day hours for the pay period exceeded twelve hours then the pay period record hours were set to zero. In a small number of cases (236), all pay periods for an employee were either negative or very high. When this occurred, all records for that employee were deleted.

Some corporations provided multiple records per pay period for each employee. For example, one corporation provided payroll data where it appeared each record was a type of hours (regular, overtime, vacation, etc.). In these situations, the multiple pay period records were summed to obtain all hours for a given pay period for each employee.

Most corporations provided bed census data split by payer type (Medicare, Medicaid, private pay, or other) as requested. Examination of the bed census data revealed that some facilities had zero Medicare-covered residents and zero Medicaid-covered residents for the entire year. These facilities were removed from the database as we suspected they were not Medicare/Medicaid-certified facilities. Bed census data were provided for each facility at daily, monthly (i.e., the average daily census for each month), or annual (i.e., the average daily census for the year) levels depending on the corporation's ability to supply this information. One corporation provided monthly data that had very low and negative bed census data in the last quarter for some facilities. Two changes were made in the monthly census data in order to use this corporation's data. Mean substitution was applied to those months with negative or very low bed census values based on the remaining valid months using a 15% test of the mean. If the bed census for a particular month was less than 15% of the average bed census for all the other months, the low or negative bed census values were replaced with the mean bed census for that facility. Mean substitution was applied to 19 facilities for up to three months in the last quarter. In addition, the monthly bed census data was disaggregated to a daily time interval (the same monthly value was assigned to every day of the month). Yearly census data was not used to calculate any measures. Nearly all of the problems with bed census data would have been eliminated with an accurate, standardized daily bed census data element.

2.3.2 Prorating pay period data

Pay periods between corporations, within corporations, within facilities, and even for an individual employee varied in length. For maximum flexibility in creating subsequent measures, pay period hours were disaggregated to a daily level. For example, an employee with 35 hours for the pay period beginning on January 1, 2003 and ending on January 7, 2003 would be assigned five hours for each of the seven days in the pay period. If the pay period showed zero hours, then zero hours were assigned to each day in that pay period. Using daily hours, staffing measures for any time interval of interest could be constructed. Daily, weekly, monthly, quarterly, semi-annual, and annual time intervals were constructed for each measure, however only monthly, quarterly, semi-annual, and annual measures are provided in this report.

2.3.3 Aggregation of hours by job category to a facility level

Because some employees worked at multiple facilities or held multiple positions within a facility, identifiers were created that combined the facility ID, the employee ID, and the employee job category variables. Hours in a pay period for an employee with multiple responsibilities were then allocated to the proper facility and job categories. (Note that this is possible only for those facilities where employees with multiple job categories or employed by multiple facilities have separate payroll records for these situations. Some corporations track the hours such employees work in various locations, but other corporations do not.) Using these unique identifiers, pay period hours for each employee were classified into a job category and their hours were aggregated to the facility level (summed across employees at that facility) by job category for each calendar day. The hours could then be used to create staffing measures for various time intervals and job categories.

2.3.4 Missing data

Missing data problems would be mostly eliminated with a standard extract but were present at a number of levels in the data we received. At the corporation level, some corporations had days (almost always for an entire pay period) for which there were no hours for any facility. Many of the corporations did not include hours for roughly the last two weeks in December. Some corporations had missing data for all facilities for one or more weeks during the year (this was mostly for one corporation where a data transfer error resulted in the loss of a month of data).

At the facility level, data were missing for sporadic time periods, and sometimes for nearly the entire year for a few facilities. There were also pay periods in which a significant drop in hours occurred, usually, but not always, in December, possibly reflecting incomplete data abstraction. Missing data in December appear to have been the result of corporations not providing all of the pay period records for pay periods that began in December 2003 but ended in January 2004. To distinguish facilities with suspected incomplete data from facilities with legitimate very low hours, a test was applied to hours for the all staff job category at the facility level. If the number of aggregated hours for the all staff job category fell below 15% of the average hours over the entire year for any given day, then the hours for that day were set to missing for all job categories. Because the payroll data were generally supplied by pay period, blocks of days, most often for seven or fourteen days, were affected. For example, if a facility's average daily all staff hours for the year was 500, then any days with hours less than 75 (15% of the mean) were set to missing. Based on the evaluation of the all staff category, the hours in other job categories were also set to missing for those corresponding days under the assumption that if the all staff hours were inaccurate, all

other job categories were inaccurate as well. No adjustments to the data were made for high hour outliers at the job category level.

At the employee level, for days on which an employee had no payroll records, a missing value was generated for pay periods outside the first or last pay period record available for that employee. As discussed earlier, zero hours were assigned to any pay periods within the time frame of other payroll records. Missing pay period records could occur for several reasons. For example, an employee might begin working sometime after January 2003 or leave before the end of 2003 or there might be gaps in the employment history possibly reflecting a termination and re-hire. Payroll records could also be missing because they were not provided by the corporation.

2.3.5 Productive versus total hours, bed census interval and contributing facilities

Payroll and bed census data were provided in varying formats by each corporation which required substantial programming to insure quality measures were properly calculated. A standard extract would eliminate the work associated to tacking and calculating different types of hours and measures. Four corporations provided staff hours as separate variables for productive hours (hours actually worked) and non-productive hours (vacation, sick leave, etc). One corporation provided only total hours (the sum of productive and non-productive hours) and three corporations provided only productive hours. Bed census data were also provided for different time intervals with two corporations providing yearly data (a single value for each facility), one corporation providing monthly data (12 values for each facility), and four corporations provided daily census data (365 values for each facility).

In order to maximize the number of contributing facilities, staffing measures were calculated using the appropriate data that were available while minimizing interpolation of the data. For example, for those corporations that only provided productive hours, a multiplier could have been applied to convert the productive hours to total hours, however this was not done. Similarly, for those corporations that supplied yearly bed census data, the yearly data could have been used to calculate staffing ratios but this was not done. For the one corporation that supplied monthly bed census data, monthly bed census was used with modifications as previously described. Because staffing ratios require the use of bed census data, only those facilities with daily or monthly bed census data could be used. Staff mix measures do not use bed census data, therefore these measures were calculated for all facilities that provided either productive and/or total hours. Because corporations provided hours in different ways, the staff mix measures for productive hours versus total hours are created with different contributing facilities and corporations. For the set of staff mix measures that capture the proportion of hours worked by full-time employees, a conversation factor of .931 was used to determine full-time status for those corporations that only supplied productive hours. One corporation did not supply payroll data at the employee level, therefore it was not possible to use that corporation's data to calculate the percentage of full-time staff measures. A total of 1079 facilities provided productive hours and of these, 748 facilities also provided monthly or daily bed census data. A total of 764 facilities provided total hours and of these, 625 facilities also provided monthly or daily bed census data.

2.3.6 Staffing ratios

In order to calculate staffing ratios, payroll data (hours worked and/or paid for) must be combined with census data. The census variable counts the number of residents present in the facility on a given day, and ranges from zero to the total number of beds in the facility. Productive hours are employee hours worked during a given time interval. Total hours are productive hours plus hours that are not worked

but are part of the payroll system, such as sick leave, vacation, etc. The staffing ratios are calculated by dividing the total number of hours for any particular group of staff in a given time interval by the sum of the daily census figures during that same time interval.

Staffing ratios were calculated using both productive hours and total hours for each of seven job categories. The job categories were RN, LPN, CNA, RN+LPN, licensed nursing, all nursing, and all staff (See Table 3 for job category descriptions). Each of these 14 measures was calculated for monthly, quarterly, semi-annual and annual time intervals. The calculation of each of these measures is the same except that the contributing employee hours change (productive versus total hours for each of the seven staffing groups) depending on the desired measure. Therefore, only the method for calculating the RN staffing ratio (RNHRD) will be provided in detail. The same methodology was used to calculate the staffing ratios for the other staff groups.

To calculate RNHRD a seven-step process was applied to the payroll and bed census data. A number of these steps would be eliminated with a more standard data extract. The first six steps are exactly the same for calculating the staff mix measures (Section 2.3.7). In Step 1, all payroll records provided by each corporation were evaluated for integrity at whatever structure was supplied by each corporation. Transformations were applied to each corporation's data independently because each corporation had unique issues that needed to be addressed, such as extraneous payroll records, missing pay period start or end dates and records that fell entirely outside calendar year 2003. All payroll records were deleted or modified as appropriate. Of the original 210,588 unique employee IDs, all associated payroll records for 3334 employees were deleted, resulting in 207,254 employees being represented for all corporations after completing Step 1.

Step 2 brought all payroll records to a pay period level with valid pay periods and hours sorted by facility ID, employee ID, job category and pay period start date. Some corporations had multiple records for different types of hours, while other corporations had separate variables for different types of hours but only one record for each pay period. Using facility, employee and job category identifiers to sort the pay periods resulted in some employee's pay periods being split between different facilities and/or job categories. In effect, employees that worked at multiple facilities or multiple job categories were treated as if they were two or more separate employees, potentially affecting the full-time versus part-time designation of the employee. (See Section 2.3.8 for additional discussion). An employee's pay period begin and end dates were adjusted, if appropriate, and separate variables for productive, total, full-time productive and full-time total hours were created depending on the structure of the data provided by the corporation. Pay period start and end dates were evaluated to determine if there were overlapping pay periods or missing pay periods. If pay periods overlapped (a rare occurrence) the earlier pay period end date was adjusted so that the overlap was eliminated, consequently reducing the length of the pay period (hours were not adjusted). If there were missing pay periods between an employee's first and last pay period, a pay period record was created that had zero hours for this pay period. Four major adjustments relative to pay period hours were performed. Hours for pay periods that were partially outside calendar year 2003 were prorated (reduced) by dividing the pay period hours by the number of days in the pay period and multiplying by the number of days that were in calendar year 2003. Separate variables for all staff productive hours, full-time staff productive hours, all staff total hours and full-time staff total hours were created. Pay periods that had negative hours were set to zero hours. Excessively high hour pay periods were identified by dividing the pay period hours by the number of days in the pay period. If the result was greater than 12, hours for these records were set to zero. If employees had zero hours for all pay periods, all of their pay period records were deleted. Of the 207,254 unique employee IDs, 236

employees were deleted, resulting in 207,018 employees being represented for all corporations. No further deletion of payroll records was done.

Step 3 disaggregated hours for each pay period to daily time intervals and summed all hours for all employees into the same job category for each facility. Variables (365) for each calendar day for year 2003 were assigned a fraction of the hours for each type of hour. For example, if an employee worked 35 productive hours during a pay period that started on January 1st and ended on January 7th, then five hours were assigned to each of those seven days. All staff productive hours, full-time staff productive hours, all staff total hours, and full-time staff total hours were all kept in separate variables. (See Section 2.3.8 for details on full-time hours.) All records were then sorted by facility and job category. Hours were then summed across each job category resulting in the total number of hours for all employees in one of the seven job categories for each calendar day.

Step 4 created separate files for each of four types of hours (all staff productive hours, full-time staff productive hours, all staff total hours, and full-time staff total hours) and summed all hours for each job category to a facility level. Each of the resulting files contained 365 variables representing each day of the year for each of the seven job categories plus the facility identifier resulting in 2556 variables. Each corporation's data were processed in separate files because of different data structures. One corporation provided data that had already been aggregated to staff groups rather than at an employee level and therefore was included at this step after initial clean up of the payroll records.

Step 5 disaggregated bed census data to a daily time interval for one corporation, modified the bed census data (negative or very low values) using mean substitution and then merged the daily bed census data with the hours data at a facility level. Some facilities were lost during the merge process because some facilities had bed census data but no hours data, while other facilities had hours data but no bed census data. For all corporations there were 1374 facilities with valid bed census data (yearly, monthly, daily) and 1,436 with valid hours data. After merging there were 1357 facilities that could potentially be used for calculating the various staffing measures, however because yearly bed census data was not used, only 1022 facilities were available for calculating the staffing ratio measures.

Step 6 evaluated the hours for very low, zero, and missing hours for the all staff job category and then used this evaluation to set to missing hours for the remaining six staffing groups and the bed census data where appropriate. Data from each corporation were processed separately, as were the four types of hours and each of the seven staffing groups. Using the evaluation of low, zero and missing hours from the all staff group, a matrix of binary indicators was created for valid hours on any given day for each facility. The binary indicator determined if there were missing data for that facility on that day (0) or if there were valid data for that facility on that day (1). This matrix was then used to set to missing all hours for each job category and also for the bed census data for each day and each facility. For a given facility, selected days were set to missing for all job categories. All other days had valid hours or bed census data that were either zero or positive. For example, if seven days were missing in December for a particular facility, then any measures that were calculated for December would only use the valid 24 days, because hours and bed census for invalid days would be set to missing. Facilities with more than 120 days of missing data in the first 50 weeks of the year were then deleted. Four facilities were deleted at this point leaving 1353 facilities for calculating various staffing measures.

Step 7 calculated RNHRD for various time intervals by summing RN hours for every day for various time intervals and then dividing the summed RN hours by the sum of daily bed census for the same time interval. RNHRD can be created for any time interval, however because data were provided by pay

periods that were generally one to two weeks in length, time intervals of less than two weeks may not be reliable. The following staffing ratios were calculated for both productive and total hours:
- RN hours per resident day (monthly, quarterly, semi-annual, annual)
- LPN hours per resident day (monthly, quarterly, semi-annual, annual)
- CNA hours per resident day (monthly, quarterly, semi-annual, annual)
- RN+LPN hours per resident day (monthly, quarterly, semi-annual, annual)
- Licensed nursing hours per resident day (monthly, quarterly, semi-annual, annual)
- All nursing hours per resident day (monthly, quarterly, semi-annual, annual)
- All staff hours per resident day (monthly, quarterly, semi-annual, annual)

Because staffing ratios were calculated for both productive and total hours, an assessment of the relative differences between them was performed. Mean productive and mean total hours per resident-day were calculated (by job category), and the ratio between them was calculated as well. The ratio of the two forms of staffing ratios can be used to convert values from one form to the other.

2.3.7   Staff mix

In order to calculate staff mix, payroll hours by job category were needed. Productive hours (hours actually worked) and total hours (productive hours plus hours for sick leave, vacation and other accounting adjustments) were calculated for seven job categories and summed to a facility level for each corporation following the six steps previously described for staffing ratios (Section 2.3.6). To calculate staff mix, hours for different staff categories within the same time interval were divided which yielded a proportion.

Steps 1 through 6 (See Section 2.3.6)
Step 7 calculated the RN to LPN proportion by summing the RN hours for every day for a particular time interval and then dividing the summed RN hours by the sum of LPN hours for every day in the same time interval. The RN to LPN proportion can be created for any time interval one day or longer, however because hours data were provided for pay periods that were generally one to two weeks in length, time intervals of less than two weeks may not be reliable. The following staff mix measures were calculated for both productive and total hours:
- RN to LPN proportion (monthly, quarterly, semi-annual, annual)
- RN+LPN to CNA proportion (monthly, quarterly, semi-annual, annual)
- RN to all nursing proportion (monthly, quarterly, semi-annual, annual)
- RN+LPN to all nursing proportion (monthly, quarterly, semi-annual, annual)
- CNA to all nursing proportion (monthly, quarterly, semi-annual, annual)
- Licensed nursing to all nursing proportion (monthly, quarterly, semi-annual, annual)

2.3.8   Full-time versus part-time, and hours worked by full-time employees

In order to calculate the percentage of hours worked by full-time employees, each employee must be classified as full time or part-time. We chose to make all hours for an employee full-time or part-time rather than selected hours during different time periods. For example, an employee who worked part-time from January through March and then full-time from April through December would be considered a full-time employee for the entire year because more than half of the pay periods were worked at a full-time status. As discussed previously, a seven-step process was applied to the data to calculate various staffing measures. In Step 2, variables were created for each of the four types of hours (all staff productive hours, full-time staff productive hours, all staff total hours, and full-time staff total hours). An

evaluation of the full-time status for each employee was made at the pay period level. A unique employee was determined using facility, employee and job category identifiers, therefore it was possible for employees that worked at more than one facility and/or job category to be "split" into two or more unique employees, both of which would have a full-time status indicator that might be the same or different.

Full-time status was determined by evaluating the full-time status for each pay period for a unique employee. For those corporations that provided total hours, if the per day total hours were equal to or greater than five (35 hours per week), then full-time status was assigned for that pay period. For those corporations that only provided productive hours, a conversion factor of .931 (calculated as the median ratio of productive to total hours for those corporations that provided both types of hours) was used to reduce the per-day lower limit test to 4.655 hours (32.585 hours per week). If the total number of pay periods for a given employee had a status of full-time for 50% or more pay periods, then that employee was given a full-time status. The percentage of hours worked by full-time employees was calculated using a seven-step process.

Steps 1 through 6 (Same as Steps 1 through 6 previously described in Section 2.3.6 for staffing ratios). Step 7 calculated the licensed nursing full-time percentage by summing the all licensed nursing full-time hours for every day for a particular time interval and then divided those summed all licensed nursing full-time hours by the sum of all licensed nursing all hours (includes both full-time and part-time hours for the all licensed nursing job category) for every day in the same time interval. The licensed nursing full-time percentage can be created for any time interval one day or longer, however because hours data were provided for pay periods that were generally one to two weeks in length, time intervals of less than two weeks may not be reliable. The following measures were calculated for both productive and total hours:
- Licensed nursing percent of hours worked by full-time employees (monthly, quarterly, semi-annual, annual)
- All nursing percent of hours worked by full-time employees (monthly, quarterly, semi-annual, annual)
- All staff percent of hours worked by full-time employees (monthly, quarterly, semi-annual, annual)

2.3.9   Shift coverage using raw time-clock payroll data

Unfortunately, the one corporation (representing 194 facilities) that provided raw time-clock payroll data was only able to provide annual census data, therefore it was not possible to calculate shift-level staffing ratios. However other measures that do not require census information were created at the shift level for these facilities. We calculated the proportion of the shift for which at least one RN was present separately for day, evening, night, 24-hour, weekday, weekend, holiday and non-holiday shifts. The day shift was defined as 7:00AM to 3:00PM, evening shift was defined as 3:00PM to 11:00PM, night shift was defined as 11:00PM to 7:00AM, and a 24-hour shift was defined as 11:00PM to 11:00PM. The night and 24-hour shifts span two contiguous days. For the holiday shift, the following 2003 holidays were used: New Years Day (1/1), Easter (4/20), Memorial Day (5/26), July 4th (7/4), Labor Day (9/1), Thanksgiving Day (11/27), Christmas Eve (12/24), Christmas Day (12/25) and New Year's Eve (12/31). This measure can take on any value from zero to one and could also be thought of as the percent of coverage during a shift. For example, if an RN comes on duty at 6:00AM on May 1st and remains on duty until 4:00PM, then the RN day shift coverage would be one or 100% for the facility on May 1st. If two RNs come on duty and leave at the same time the RN day shift coverage would still be one; multiple RN coverage does not change the

measure. If an RN comes on duty at 4:00AM on May 2nd and goes off duty at 10:00AM, and a new RN comes on duty at 11:00AM that same day and then goes off duty at 5:00PM, the RN day shift coverage would be 0.875 or 87.5% because out of the eight possible hours of coverage there was one hour (between 10:00AM and 11:00AM) during which no RN was present.

To calculate shift coverage, the raw time-clock payroll data were used to determine the time frames at least one RN worked during a given shift. In Step 1, time-clock punch-in and punch-out times were validated. Records with missing punch times or days outside of calendar year 2003 were deleted. Only those punch times for the RN job category were retained.

Step 2 adjusted punch times to eliminate overlaps (a rare occurrence) and then allocated coverage for a unique employee into a given shift based on the punch times. Because raw punch times were provided, a unique employee could - and most often did - have two or more punch time records for one or more shifts. The punch time data reflected breaks in work such as a half hour lunch break. On the rare occasion that an employee punched back in before they punched out, the earlier punch end time was modified to eliminate any overlap. Once multiple punch times for each employee were combined, coverage was then allocated to day, evening and night shifts as appropriate. The night shift runs across two calendar days with one hour in the previous day and the remaining seven hours in the next day. The coverage allocated to the night shift was for contiguous hours. This required that the coverage worked on the previous day be added to the coverage worked on the next day to get the coverage for that one night shift.

Step 3 evaluated RN coverage at a facility level to determine the continuous coverage for that facility by all RN staff. Punch times for all RN staff on duty at the same facility were evaluated for gaps in coverage. For example, beginning at 11:00PM on May 1st through May 2nd at 11:00PM for facility X, four RNs worked at various times through these three shifts. RN-A came on duty prior to 11:00PM on May 1st and then worked until 6:00AM the next morning providing coverage for all but one hour of the night shift. RN-B came on duty at 5:00AM on May 2nd and therefore overlapped RN-A by one hour. RN-B worked until 5:00PM covering the entire day shift, the last hour of the night shift, and two hours of the evening shift for May 2nd. RN-C came on duty at 2:00PM and worked until 7:00PM and therefore provided coverage for two hours of the evening shift. RN-D came on duty 6:00PM and worked until midnight providing coverage for the remaining four hours of the evening shift. For this example, all shifts had 100% coverage. If RN punch-in and punch-out times for multiple staff did not fully overlap (or end and start at the same time), then gaps of coverage would occur and the coverage would be less than 100%.

Step 4 calculated the RN coverage proportion by calculating the total hours covered for a particular shift on a particular day for all RN staff and then dividing by eight. The maximum possible coverage is 100%, but this was rarely achieved because the raw time-clock data included breaks. Because multiple coverage by more than one RN at any given time was more the exception than the rule, lunch and other breaks were usually not covered. This resulted in a loss of coverage even if there was overlap of RN staff at the beginning or end of the RN staff work periods.

Step 5 used the daily day, evening and night shift coverage proportions to calculate the coverage for the 24-hour, weekday, weekend, holiday and non-holiday shifts for various time intervals. Day, evening, and night shift coverage proportion was calculated for each day. To calculate shift coverage for different time intervals, the coverage proportions for a given time interval were summed and then divided by the number of days in that time interval. The 24-hour shift was calculated by summing the coverage proportions for the three shifts on that day and dividing by three. The 24-hour shift coverage proportions

were then used to calculate weekends, weekdays, holidays, and non-holidays for various time intervals. The holiday, non-holiday coverage was only calculated for an annual time interval. The following shift coverage measures were calculated for productive hours:

- Day shift RN coverage (monthly, quarterly, semi-annual, annual)
- Evening shift RN coverage (monthly, quarterly, semi-annual, annual)
- Night shift RN coverage (monthly, quarterly, semi-annual, annual)
- 24-hour period RN coverage (monthly, quarterly, semi-annual, annual)
- Weekday shift RN coverage (monthly, quarterly, semi-annual, annual)
- Weekend shift RN coverage (monthly, quarterly, semi-annual, annual)
- Holiday shift RN coverage (annual)
- Non-holiday shift RN coverage (annual)

2.4 Creation of turnover, retention, and tenure measures

2.4.1 Identification of data source for computing turnover, retention, and turnover measures

Two potential data sources were considered for computing staff turnover, retention, and tenure measures: personnel data and payroll data. As described previously, corporations were asked to provide personnel data (hire dates, termination dates, rehire dates, etc.) in addition to payroll and census data. Personnel data were received from five corporations and due to limitations with acquiring historical data from corporate data systems, the personnel data that were submitted contained records with inaccurate job descriptions; missing or inaccurate hire, termination, and rehire dates; and little if any information to identify transfers between facilities within a corporation. For example, several corporations were able to provide only the most recent termination date for an employee. Therefore, if an employee departed from a facility more than once during 2003, only the most recent departure would be included in turnover calculations based on personnel data. These issues impacted the utility of the personnel data for computing staffing turnover, retention, and tenure measures. As many of these issues are inherent in the human resources software applications, a more standardized data extract would not correct many of these problems. Therefore, given that personnel data were difficult to obtain and contained incomplete or inaccurate information, a preliminary examination of the feasibility of using payroll data to compute these measures was undertaken. Furthermore, the ability to use the same data source (i.e., payroll data) to compute all measures of nursing home staffing will decrease data collection/submission burden for nursing home facilities.

2.4.2 Creating employee status records based on payroll data

To examine the feasibility of using payroll data for computing turnover, retention, and tenure, employee departures based on payroll data and personnel data were compared for one corporation (245 facilities). In order to conduct this analysis, employee personnel records were created using payroll data. Records were created for each employee within a facility; therefore, if an employee worked at multiple facilities, a unique record (reflecting an employment episode) was created for each facility. In Step 1, each corporation's payroll data were examined for issues related to data quality and integrity based on the unique characteristics of the corporation's data structure. Payroll records with missing Medicare provider numbers, missing employee IDs, missing job categories, and invalid or missing pay period start and end dates were deleted. In addition, payroll records for pay periods that occurred prior to or after calendar year 2003 were removed. In Step 2, for corporations that provided multiple records per pay period for each employee, one record per employee pay period was retained. It is important to note that individual payroll records, not employees, were deleted in Steps 1 and 2. As mentioned previously,

many of these problems would be eliminated or substantially mitigated with a standardized extract. In the third step the number of days elapsed (referred to as a "gap") between employee pay periods was calculated. For example, if an employee has two payroll records, the first with a pay period start date of 1/1/2003 and a pay period end date of 1/6/2003 and the second record with a pay period start date of 1/13/2003, then the gap between pay period 1 and pay period 2 would be seven days.

In Step 4, employee personnel records were created from the payroll data using the employee's first and last payroll records for calendar year (CY) 2003, unless a gap of at least 60 days occurred in the payroll history. When a gap of 60 days or more appeared in the payroll data, a new personnel record was created using the first pay period following the payroll gap and the last pay period in CY 2003 or the last pay period preceding the next payroll gap. For example, a CNA with contiguous payroll data from January 1, 2003 through March 1, 2003 and contiguous payroll data from June 1, 2003 through December 15, 2003 would have two personnel records for CY 2003. The first record would show an employment start date of January 1, 2003 and an employment end date of March 1, 2003 and the second employee record would have an employment start date of June 1, 2003, since the gap between March 1, 2003 and June 1, 2003 is greater than 60 days. For the purposes of computing retention and turnover measures this employee would be considered a departed and rehired employee.

The decision to use 60 days as the cutoff for a departure was based on a review of the distributions for the pay period gap variable created in Step 3. Ninety percent of the gaps in payroll records were 15 days or less. Of those records that had a gap greater than 15 days, the average number of days elapsed between pay periods was 57 days, with a minimum value of 16 days and a maximum value of 337 days.

In Step 5, employees that were deleted from the personnel file when they had only one payroll record and the total hours worked for that record was zero or missing. For the test corporation no employees were deleted at this step. Across all facilities 381 employees were deleted as a result of this exclusion. In the final step, pay period start dates prior to calendar year (CY) 2003 were set to 1/1/2003 and pay period end dates after CY 2003 were set to 12/31/2003. This step was necessary to account for those pay periods (and therefore corresponding pay period start and end dates) that spanned years.

Each personnel record created from the payroll data contained the employee ID, facility Medicare provider number, job category, calendar year start date (equal to the pay period start date of the first pay period the employee worked during CY 2003 or the first pay period after a gap) and calendar year end date (equal to the pay period end date of the last pay period worked during CY 2003 or the pay period end date for the last record preceding a gap). When using payroll data for computing retention and turnover measures, CY start dates are analogous with employee hire dates. However, CY end dates are considered equivalent to termination dates only when a gap of at least 60 days in the payroll data can be established. As a result, to identify a departure, a minimum of 60 days of payroll data beyond the end date of the reporting period is required for the computation of turnover measures.

Personnel records based on payroll data were created independently for each specific job category (e.g., CNA, RN, LPN) and for each combined staffing group (licensed nursing, all nursing, all staff). For example, if an employee worked as an RN from January 1, 2003 through February 15, 2003 and worked as a DON from February 16, 2003 through December 31, 2003, the following personnel records would be created:
- a record as an RN with a CY start date of 1/1/2003 and a CY end date 2/15/2003,
- a record as a DON with a CY start date of 2/16/2003 and a CY end date 12/31/2003,
- a record as licensed staff with a CY start date of 1/1/2003 and a CY end date 12/31/2003,

- a record as nursing staff with a CY start date of 1/1/2003 and a CY end date 12/31/2003, and
- a record as all staff with a CY start date of 1/1/2003 and a CY end date 12/31/2003.

When examining retention and turnover for the RN position, this employee would be counted as an RN departure, even though the employee was promoted within the facility to a DON position. However, this method allows for recognition of facilities that promote internally, as this individual would not be considered a departure in the all licensed, all nursing, or all staff categories. Therefore this approach allows for an examination of both position level and employee level turnover and retention.

2.4.3   Comparison of departures and departure dates between personnel and payroll data

A comparison of employee end dates was conducted to examine the comparability of personnel data and payroll data for computing retention, turnover, and tenure measures. Employee end date was selected because it is a necessary component for all three measures. For payroll data, employees with end dates prior to 10/1/2003 were considered a departure, and for personnel data, termination dates in calendar year 2003 were considered a departure.

In this comparison, 42.8% of the employees in the payroll data had an end date prior to the end of the year compared to 40.1% of the employees in the personnel data who had a termination data in 2003. In addition to examining turnover rates, an employee level comparison of departures was conducted between the two data sources. Sixteen percent of the employees with departure (termination) dates in the personnel file did not have matching departure dates (CY end date) based on payroll data. Departure dates within 15 days of each other were considered a match. Furthermore, 14.6% of the employees with departures in 2003 based on payroll data did not have a departure (termination) date based on personnel data. Missing or mismatched departure dates were the result of:
- missing termination dates in the personnel data when employees had several terminations in CY 2003 (as described previously personnel data for most of the corporations only reports the most recent termination date),
- employees that departed and were rehired within a 60-day period (and therefore the employee did not have a gap in the payroll data that qualified as a departure), and
- a gap of more than 15 days between the last payroll record for the employee and the termination date in the employee status file suggesting that termination dates reported in the personnel file may not be related to the actual last day worked.

Overall departure dates are fairly similar between the two data sources, suggesting that payroll data can be used to construct departure dates that represent the overall rate of departures across all employees. Furthermore, use of payroll data will permit measures of retention, turnover, and tenure to be computed with greater specificity and precision. For example, using payroll data turnover within positions can be more precisely measured (e.g., when an RN is promoted to a DON) as well as turnover, retention, and tenure across facilities when employees work at multiple facilities concurrently (most of the corporations that provided data for this project did not provide information on transfers or concurrent work episodes in the personnel data). Retention and turnover measures based on payroll data are biased toward under-representing very brief departures from a facility but are a more reliable source than personnel data for detecting multiple terminations (provided the termination is 60 days or more) within a report period. As payroll data were easier to acquire than personnel data and were determined to be a feasible source for creating personnel records, measures of turnover, retention, and tenure will be calculated based on payroll data.

2.4.4   Measures of employee turnover and retention

Based on a review of the literature and communication with the corporations participating in this project, multiple definitions for turnover, retention, and tenure measures were considered. Three approaches to measuring turnover were explored including cohort turnover, position turnover, and short-term employees. Cohort turnover was defined as the percent of staff employed at the beginning of the reporting period that departed prior to the end of the reporting period. Position turnover was defined as the percent of staff that departed during the reporting period based on the average number of positions at the facility during the reporting period. Although it is anticipated that these two measures of staff turnover will be highly correlated, they are distinct measures. The cohort measure is an indication of employee (versus position) turnover and is not sensitive to multiple individuals filling the same position over and over ("churn"). The position turnover measure reflects both turnover across positions and repeated turnover within a given position but provides an overall turnover rate that does not differentiate these two types of turnover. The final turnover measure, short-term employees, was defined as the percent of employees who departed within 60 days from their start date. In addition to measures examining turnover, a cohort retention measure was computed and is defined as the percent of staff employed at the beginning of the report period that were still employed at the end of the report period. The cohort retention measure is the inverse of the cohort turnover measure.

Each of the tenure and retention measures was calculated separately for CNAs, LPNs, RNs, RNs+LPNs, DONs+ADONs, all licensed staff, all nursing staff, and all staff. As the number of employees categorized into the DON and administrator groups was small (one DON/facility), proportional measures were not computed. Therefore, two additional turnover measures were generated: the number of DONs who departed during the report period and the number of nursing home administrators who departed during the report period. The short-term measures were computed for all staff groups including DONs and administrators.

2.4.5   Measures of employee tenure

Albeit the payroll data were determined to be a feasible and preferable data source for calculating measures of retention and turnover, these data did not contain employee hire dates necessary for computing tenure measures. Therefore employee hire/rehire dates from the five corporations that provided personnel data were matched to the payroll records created in Section 2.4.2 above to compute the tenure measures. During the process, personnel data from one corporation were excluded due to problems with mismatched employee IDs between the two files. Therefore the tenure measures are based on data from four corporations (663 facilities).

Five tenure measures were created for each facility including, tenure to date (TTD), percent of departed employees whose tenure was greater than 1 year, percent of departed employees whose tenure was greater than 5 years, percent of employed staff whose TTD was greater than 1 year, and percent of employed staff whose TTD was greater than 5 years. The term tenure is used for departed employees because their tenure is a known quantity. For current employees, the term tenure to date is used to denote the fact that the true tenure for these employees is unknown at this time. Tenure is defined as CY end date - hire (or rehire) date, and tenure to date is defined as the report period end date (i.e., 9/30/2003) - hire (or rehire) date.

2.4.6 Full-time versus part-time

As described in Section 2.3.8 employees were classified as full-time or part-time based on the average number of hours worked for each pay period for the entire calendar year 2003. Full-time designations were used to create measures of the proportion of staff in each job category that were classified as full-time. In addition, turnover, retention, and tenure measures were calculated separately for full-time and part-time employees.

2.4.7 Exclusions for turnover, retention, and tenure measures

One corporation was unable to provide Medicare provider numbers and therefore exclusions based on Medicare provider number as described in Table 2 of Section 2.1 could not be conducted, which would not have been a problem with a standard data extract. However, an examination of the staff composition within these facilities revealed that 19 facilities did not have CNAs (with the exception of CNAs for medication administration) or RNs, and LPNs were employed on an intermittent basis, if at all. Some of these facilities were staffed entirely by corporate positions (e.g., CEOs, vice-presidents) or by other staff groups (e.g., resident assistants, housekeeping, cooks). It was determined that these facilities did not appear to be Medicare/Medicaid nursing facilities and were excluded from all measures. Twenty-two facilities were excluded from the turnover, retention, and tenure measures because these facilities had less than five months of data or the average number of employees across all job categories was less than 10 employees.

Facilities were excluded on a measure-by-measure basis for the retention and turnover measures when the number of months with active employees for the staff group in question was less than 5 months. For example, if a facility employed RNs for only two months during the nine-month reporting period, this facility would be excluded from the RN turnover and retention measures. Therefore sample sizes vary across all measures based on staff composition within facilities.

2.5 Assessment of appropriate measurement intervals

2.5.1 Staffing ratios

To thoroughly investigate the properties of the staffing ratio measures (hours per resident-day), the measures were calculated over multiple time periods, ranging from weekly to annually. For each facility, the mean hours per resident-day was calculated for each of the different periods; for example, each facility had 12 monthly mean values for January through December. Next, for each facility, the standard deviation (SD) and the coefficient of variation (CV) expressed as a percentage (CV=SD/mean x 100%) were calculated; for example, the SD and the CV of the facility's 12 individual mean monthly values was determined. Last, the individual facility SDs and CVs were averaged to assess the overall variability of the measure across all facilities; for example, the means of the 748 individual facility monthly SDs and CVs were calculated. These steps were repeated for the weekly, quarterly, semi-annual and annual staffing ratio measures. By comparing the variation of the measure when calculated over different time periods, one can assess whether staffing ratios measured over shorter time periods are too variable relative to longer periods, or whether staffing ratios measured over a shorter time period provide sufficient additional precision to be worth the expense of calculating them more frequently.

2.5.2   Turnover and retention

Each measure of employee turnover and retention was calculated at five time intervals: three quarterly intervals (Q1-Q3, 2003), semi-annually (January - June 2003) and at a nine-month (January - September 2003) interval. As described in Section 2.4.2., when using payroll data to compute retention and turnover measures two months of data beyond the end date of the reporting period are necessary to identify employee departures (i.e., gaps in the payroll data of 60 days or more). The data requested for this project were for calendar year 2003 only, and therefore CY end dates after October 31, 2003 could not be definitively counted as departures or retentions. Therefore, for this developmental work nine-month measures were created in lieu of annual measures; however, it is recommended that adequate data be obtained in the future to compute turnover and retention measures based on annual data.

For cohort measures, quarterly measures included all employees with a calendar year start date on or before the seventh day of the respective quarter. For measures based on average number of positions, the average number of employees for each quarter was defined as the number of employees with calendar year start dates equal to or prior to the last day of each month in the quarter and calendar year end dates greater than the end of each month of the quarter divided by the number of months with valid data in the quarter. For example, if data were not available for the first month of the quarter (e.g., no staff were employed), the average would be based on two months of data. For both types of measures (cohort and position average), the numerator (departures) was defined as the number of employees with a calendar year end date in the respective quarter. Retention, for quarterly measures, was defined as the number of employees with calendar year end dates greater than the respective quarter.

Semi-annual and nine-month cohort measures derived from payroll data included all employees with a calendar year start date prior to 2/1/2003. For measures based on monthly averages, the number of employees was defined as the number of employees for each month with calendar year start dates equal to or prior to the last day of each month and calendar year end dates greater than the end of each month divided by the number of months with valid data. For the semi-annual cohort and position turnover measures, the numerator (departures) was defined as the number of employees with calendar year end dates prior to 7/1/2003 and retention was defined as the number of employees with calendar year end dates after 6/30/2003. For the nine-month cohort and position turnover measures, the numerator (departures) was defined as the number of employees with calendar year end dates prior to 10/1/2003 and retention was defined as the number of employees with calendar year end dates after 9/30/2003.

2.6 Simple statistics

The distributions of all measures (and the component variables used to create them) outlined above were examined to understand the measure behavior. The distributional statistics included mean, median, standard deviation, minimum and maximum values, and 10th, 90th, and 99th percentiles. To assess relationships between the many measures, Pearson's correlations were calculated between all measures.

3. Data Dictionary

This section presents the primary analytic variables created for analysis of nursing home staffing ratios, staff mix, shift coverage, turnover, retention, and tenure. The original data files provided by the nursing home corporations were significantly different in both structure and content, and customized programming was required for each corporation to create a set of measures that was consistent and accurate for all corporations. A number of interim variables were therefore created in order to calculate these primary measures; most of these interim variables are not presented here. Select interim variables, however, are included in the data dictionary because they are critical components of the primary measure calculation and are therefore key to a thorough understanding of the measure definition.

Variable Name	Label	Type	Data Source(s)	Definition and Comment
JOBCAT	Employee job category	Char	Payroll	**Definition:** The category of the employee's job title. Job titles were collapsed into the following 12 categories: A=All other staff B=Administrator/Medical Director C=DON D=ADON E=Other nursing administration F=APN G=RN H=LPN I=CNA J=Non-certified nurses aide K=Other nursing L=Therapy **Data Structure:** Employee level, interim variable. **Comment:** Employees with multiple job titles were classified into the "highest" job category (e.g., "RN, D.O.N." was classified into C-DON).
LICENSED	Licensed staff category	Num	Payroll	**Definition:** The licensed staff category includes the following employee job categories (JOBCAT): C=DON, D=ADON, E=Other nursing administration, F=APN, G=RN, and H=LPN **Data Structure:** Employee level, interim variable.
NURSING	Nursing staff category	Num	Payroll	**Definition:** The nursing staff category includes the following employee job categories (JOBCAT): C=DON, D=ADON, E=Other nursing administration, F=APN, G=RN, H=LPN, I=CNA, J=Non-certified nurses aide, and K=Other nursing **Data Structure:** Employee level, interim variable.
CYSTDATE	Calendar year start date	Date	Payroll	**Definition:** The date of an employee's first occurrence in the payroll records for a given facility or the employee's first payroll date following a 60 day gap in the employee's payroll records. For facilities with payroll records at the pay period level, this is the start date of the employee's first pay period or the start date of the first pay period following a 60 day gap in the employee's payroll records. **Data Structure:** Employee level, interim variable.

Interim Variables (Defined here for reference, but not included on data file)

Variable Name	Label	Type	Data Source(s)	Definition and Comment
CYENDDATE	Calendar year end date	Date	Payroll	**Definition:** The date of an employee's last occurrence in the payroll records for a given facility or employee's last occurrence in the payroll records for a given facility preceding a 60 day gap. For facilities with payroll records at the pay period level, this is the end date of the employee's last pay period or the end date of the last pay period preceding a 60 day gap in the employee's payroll records.

Data Structure: Employee level, interim variable. |
| FULLTIME_INDICATOR | Full-time employee indicator | Binary Num | Payroll | **Definition:** An binary variable (1=Yes, 0=No) indicating full-time employee status. An employee was considered full-time if the number of hours in 50% or more of the weeks he or she worked in 2003 was equal to or greater than 32.6 productive hours or 35 total hours.

Data Structure: Employee level, interim variable. |
| DF_BC1-365 | Daily bed census | Num | Census | **Definition:** The number of occupied beds for a given day (24 hours).

Data Structure: Facility level, interim variable. The first character indicates a daily time interval. The second character (F) indicates facility level data.

Comment: Bed census data was provided in daily, monthly, and yearly categories at a facility level. Monthly census data was converted to daily by assigning the same monthly value to each day of that month. Mean substitution was used to correct negative and excessively low monthly values. Yearly census data was not used. |

Total Hours Staffing Ratios and Staff Mix Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
T_MF_CN_QM1-12 T_QF_CN_QM1-4 T_SF_CN_QM1-2 T_YF_CN_QM	CNA total hours per resident day	Num	Payroll & Census	**Definition:** The sum of all payroll total hours for all Certified Nursing Assistants for a particular time interval divided by the sum of the daily bed census for the same time interval. **Variable Name:** Variables for this measure are provided for monthly, quarterly, semi-annual, and annual time intervals with the first letter in the variable name indicating productive or total hours (P or T) and the second letter indicating the time interval (M, Q, S, Y respectively). The third character is an F indicating the data are at a facility level. The fourth and fifth characters indicate the staffing group or groups. The sixth and seventh characters are QM standing for quality measure. The number at the end of the variable name indicates the respective month (1 to 12), quarter (1 to 4) or half year (1 or 2) for a particular time interval. **Data Structure:** Both the total hours for CNAs and the bed census data are created for each calendar day in order to calculate the measure for different time intervals. Most of the data for total hours worked were provided in summary form at a pay period level by individual employees. Some of the census data were provided at a monthly level. Daily total hours and bed census data were calculated by pro-rating the total hours or bed census evenly across the time interval (typically one week, two weeks or a month).
T_MF_LP_QM1-12 T_QF_LP_QM1-4 T_SF_LP_QM1-2 T_YF_LP_QM	LPN total hours per resident day	Num	Payroll & Census	**Definition:** The sum of all payroll total hours for all Licensed Practical Nurses for a particular time interval divided by the sum of the daily bed census for the same time interval. **Variable Name:** Same as CNA total hours per resident day. **Data Structure:** Same as CNA total hours per resident day.
T_MF_RN_QM1-12 T_QF_RN_QM1-4 T_SF_RN_QM1-2 T_YF_RN_QM	RN total hours per resident day	Num	Payroll & Census	**Definition:** The sum of all payroll total hours for all Registered Nurses for a particular time interval divided by the sum of the daily bed census for the same time interval. **Variable Name:** Same as CNA total hours per resident day. **Data Structure:** Same as CNA total hours per resident day.

Total Hours Staffing Ratios and Staff Mix Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
T_MF_RL_QM1-12 T_QF_RL_QM1-4 T_SF_RL_QM1-2 T_YF_RL_QM	RN plus LPN total hours per resident day	Num	Payroll & Census	**Definition:** The sum of all payroll total hours for all Registered Nurses and Licensed Practical Nurses for a particular time interval divided by the sum of the daily bed census for the same time interval. **Variable Name:** Same as CNA total hours per resident day. **Data Structure:** Same as CNA total hours per resident day.
T_MF_TL_QM1-12 T_QF_TL_QM1-4 T_SF_TL_QM1-2 T_YF_TL_QM	All Licensed Nursing total hours per resident day	Num	Payroll & Census	**Definition:** The sum of all payroll total hours for all Licensed Nursing staff for a particular time interval divided by the sum of the daily bed census for the same time interval. **Variable Name:** Same as CNA total hours per resident day. **Data Structure:** Same as CNA total hours per resident day.
T_MF_TN_QM1-12 T_QF_TN_QM1-4 T_SF_TN_QM1-2 T_YF_TN_QM	All Nursing total hours per resident day	Num	Payroll & Census	**Definition:** The sum of all payroll total hours for all Nursing staff for a particular time interval divided by the sum of the daily bed census for the same time interval. **Variable Name:** Same as CNA total hours per resident day. **Data Structure:** Same as CNA total hours per resident day.
T_MF_TE_QM1-12 T_QF_TE_QM1-4 T_SF_TE_QM1-2 T_YF_TE_QM	All Employees total hours per resident day	Num	Payroll & Census	**Definition:** The sum of all payroll total hours for all employees for a particular time interval divided by the sum of the daily bed census for the same time interval. **Variable Name:** Same as CNA total hours per resident day. **Data Structure:** Same as CNA total hours per resident day.

Total Hours Staffing Ratios and Staff Mix Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
T_MF_R1_QM1-12 T_QF_R1_QM1-4 T_SF_R1_QM1-2 T_YF_R1_QM	Ratio of RN to LPN total hours	Num	Payroll	**Definition:** The sum of all payroll total hours for Registered Nurses for a particular time interval divided by the sum of all payroll total hours for Licensed Practical Nurses for the same time interval. **Variable Name:** Variables for this measure are provided for monthly, quarterly, semi-annual, and annual time intervals with the first letter in the variable name indicating productive or total hours (P or T) and the second letter indicating the time interval (M, Q, S, Y respectively). The third character is an F indicating the data are at a facility level. The fourth character is R indicating a ratio measure. The fifth character is a number from 1 to 9 that is an arbitrary numbering for different ratios. The sixth and seventh characters are QM standing for quality measure. The number at the end of the variable name indicates the respective month (1 to 12), quarter (1 to 4) or half year (1 or 2) for a particular time interval. **Data Structure:** Total hours for RNs and LPNs are created for each calendar day in order to calculate the measure for different time intervals. Most of the data for total hours worked were provided in summary form at a pay period level by individual employees. Daily total hours were calculated by pro-rating the total hours evenly across the time interval (typically seven to fourteen days).
T_MF_R2_QM1-12 T_QF_R2_QM1-4 T_SF_R2_QM1-2 T_YF_R2_QM	Ratio of RN+LPN to CNA total hours	Num	Payroll	**Definition:** The sum of all payroll total hours for Registered and Licensed Practical Nurses for a particular time interval divided by the sum of all payroll total hours for Certified Nursing Assistants for the same time interval. **Variable Name:** Same as Ratio of RN to LPN total hours. **Data Structure:** Same as Ratio of RN to LPN total hours.
T_MF_R3_QM1-12 T_QF_R3_QM1-4 T_SF_R3_QM1-2 T_YF_R3_QM	Ratio of RN to All Nursing total hours	Num	Payroll	**Definition:** The sum of all payroll total hours for Registered Nurses for a particular time interval divided by the sum of all payroll total hours for All Nursing staff for the same time interval. **Variable Name:** Same as Ratio of RN to LPN total hours. **Data Structure:** Same as Ratio of RN to LPN total hours.

Total Hours Staffing Ratios and Staff Mix Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
T_MF_R4_QM1-12 T_QF_R4_QM1-4 T_SF_R4_QM1-2 T_YF_R4_QM	Ratio of RN+LPN to All Nursing total hours	Num	Payroll	**Definition:** The sum of all payroll total hours for Registered and Licensed Practical Nurses for a particular time interval divided by the sum of all payroll total hours for All Nursing staff for the same time interval. **Variable Name:** Same as Ratio of RN to LPN total hours. **Data Structure:** Same as Ratio of RN to LPN total hours.
T_MF_R5_QM1-12 T_QF_R5_QM1-4 T_SF_R5_QM1-2 T_YF_R5_QM	Ratio of CNA to All Nursing total hours	Num	Payroll	**Definition:** The sum of all payroll total hours for Certified Nursing Assistants for a particular time interval divided by the sum of all payroll total hours for All Nursing staff for the same time interval. **Variable Name:** Same as Ratio of RN to LPN total hours. **Data Structure:** Same as Ratio of RN to LPN total hours.
T_MF_R6_QM1-12 T_QF_R6_QM1-4 T_SF_R6_QM1-2 T_YF_R6_QM	Ratio of All Licensed Nursing to All Nursing total hours	Num	Payroll	**Definition:** The sum of all payroll total hours for All Licensed Nursing staff for a particular time interval divided by the sum of all payroll total hours for All Nursing staff for the same time interval. Measure Values: Continuous with a range from 0 to 0.9 **Variable Name:** Same as Ratio of RN to LPN total hours. **Data Structure:** Same as Ratio of RN to LPN total hours.
T_MF_R7_QM1-12 T_QF_R7_QM1-4 T_SF_R7_QM1-2 T_YF_R7_QM	Ratio of All Licensed Nursing full-time to full-time + part-time total hours	Num	Payroll	**Definition:** The sum of all payroll total hours for full-time All Licensed Nursing staff for a particular time interval divided by the sum of all payroll total hours for both full-time and part-time All Licensed Nursing staff for the same time interval. This provides a measure of the percentage of All Licensed Nursing total hours that were worked by full-time staff. **Variable Name:** Same as Ratio of RN to LPN total hours. **Data Structure:** Same as Ratio of RN to LPN total hours.

Total Hours Staffing Ratios and Staff Mix Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
T_MF_R8_QM1-12 T_QF_R8_QM1-4 T_SF_R8_QM1-2 T_YF_R8_QM	Ratio of All Nursing full-time to full-time + part-time total hours	Num	Payroll	**Definition:** The sum of all payroll total hours for full-time All Nursing staff for a particular time interval divided by the sum of all payroll total hours for both full-time and part-time All Nursing staff for the same time interval. This provides a measure of the percentage of All Nursing total hours that were worked by full-time staff. **Variable Name:** Same as Ratio of RN to LPN total hours. **Data Structure:** Same as Ratio of RN to LPN total hours.
T_MF_R9_QM1-12 T_QF_R9_QM1-4 T_SF_R9_QM1-2 T_YF_R9_QM	Ratio of All Employees full-time to full-time + part-time total hours	Num	Payroll	**Definition:** The sum of all payroll total hours for full-time employees for a particular time interval divided by the sum of all payroll total hours for both full-time and part-time employees for the same time interval. This provides a measure of the percentage of all employees total hours that were worked by full-time staff. **Variable Name:** Same as Ratio of RN to LPN total hours. **Data Structure:** Same as Ratio of RN to LPN total hours.

Productive Hours Staffing Ratios, Staff Mix, and RN Shift Coverage Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
P_MF_CN_QM1-12 P_QF_CN_QM1-4 P_SF_CN_QM1-2 P_YF_CN_QM	CNA productive hours per resident day	Num	Payroll & Census	**Definition:** The sum of all payroll productive hours for all Certified Nursing Assistants for a particular time interval divided by the sum of the daily bed census for the same time interval. **Variable Name:** Variables for this measure are provided for monthly, quarterly, semi-annual, and annual time intervals with the first letter in the variable name indicating productive or total hours (P or T) and the second letter indicating the time interval (M, Q, S, Y respectively). The third character is an F indicating the data are at a facility level. The fourth and fifth characters indicate the staffing group or groups. The sixth and seventh characters are QM standing for quality measure. The number at the end of the variable name indicates the respective month (1 to 12), quarter (1 to 4) or half year (1 or 2) for a particular time interval. **Data Structure:** Both the productive hours for CNAs and the bed census data are created for each calendar day in order to calculate the measure for different time intervals. Most of the data for productive hours worked were provided in summary form at a pay period level by individual employees. Some of the census data were provided at a monthly level. Daily productive hours and bed census data were calculated by pro-rating the productive hours or bed census evenly across the time interval (typically one week, two weeks or a month).
P_MF_LP_QM1-12 P_QF_LP_QM1-4 P_SF_LP_QM1-2 P_YF_LP_QM	LPN productive hours per resident day	Num	Payroll & Census	**Definition:** The sum of all payroll productive hours for all Licensed Practical Nurses for a particular time interval divided by the sum of the daily bed census for the same time interval. **Variable Name:** Same as CNA productive hours per resident day. **Data Structure:** Same as CNA productive hours per resident day.
P_MF_RN_QM1-12 P_QF_RN_QM1-4 P_SF_RN_QM1-2 P_YF_RN_QM	RN productive hours per resident day	Num	Payroll & Census	**Definition:** The sum of all payroll productive hours for all Registered Nurses for a particular time interval divided by the sum of the daily bed census for the same time interval. **Variable Name:** Same as CNA productive hours per resident day. **Data Structure:** Same as CNA productive hours per resident day.

Productive Hours Staffing Ratios, Staff Mix, and RN Shift Coverage Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
P_MF_RL_QM1-12 P_QF_RL_QM1-4 P_SF_RL_QM1-2 P_YF_RL_QM	RN plus LPN productive hours per resident day	Num	Payroll & Census	**Definition:** The sum of all payroll productive hours for all Registered Nurses and Licensed Practical Nurses for a particular time interval divided by the sum of the daily bed census for the same time interval. **Variable Name:** Same as CNA productive hours per resident day. **Data Structure:** Same as CNA productive hours per resident day.
P_MF_TL_QM1-12 P_QF_TL_QM1-4 P_SF_TL_QM1-2 P_YF_TL_QM	All Licensed Nursing productive hours per resident day	Num	Payroll & Census	**Definition:** The sum of all payroll productive hours for all Licensed Nursing staff for a particular time interval divided by the sum of the daily bed census for the same time interval. **Variable Name:** Same as CNA productive hours per resident day. **Data Structure:** Same as CNA productive hours per resident day.
P_MF_TN_QM1-12 P_QF_TN_QM1-4 P_SF_TN_QM1-2 P_YF_TN_QM	All Nursing productive hours per resident day	Num	Payroll & Census	**Definition:** The sum of all payroll productive hours for all Nursing staff for a particular time interval divided by the sum of the daily bed census for the same time interval. **Variable Name:** Same as CNA productive hours per resident day. **Data Structure:** Same as CNA productive hours per resident day.
P_MF_TE_QM1-12 P_QF_TE_QM1-4 P_SF_TE_QM1-2 P_YF_TE_QM	All Employees productive hours per resident day	Num	Payroll & Census	**Definition:** The sum of all payroll productive hours for all employees for a particular time interval divided by the sum of the daily bed census for the same time interval. **Variable Name:** Same as CNA productive hours per resident day. **Data Structure:** Same as CNA productive hours per resident day.

Variable Name	Label	Type	Data Source(s)	Definition and Comment
P_MF_R1_QM1-12 P_QF_R1_QM1-4 P_SF_R1_QM1-2 P_YF_R1_QM	Ratio of RN to LPN productive hours	Num	Payroll	**Definition:** The sum of all payroll productive hours for Registered Nurses for a particular time interval divided by the sum of all payroll productive hours for Licensed Practical Nurses for the same time interval. **Variable Name:** Variables for this measure are provided for monthly, quarterly, semi-annual, and annual time intervals with the first letter in the variable name indicating productive or total hours (P or T) and the second letter indicating the time interval (M, Q, S, Y respectively). The third character is an F indicating the data are at a facility level. The fourth character is R indicating a ratio measure. The fifth character is a number from 1 to 9 that is an arbitrary numbering for different ratios. The sixth and seventh characters are QM standing for quality measure. The number at the end of the variable name indicates the respective month (1 to 12), quarter (1 to 4) or half year (1 or 2) for a particular time interval. **Data Structure:** Total productive hours for RNs and LPNs are created for each calendar day in order to calculate the measure for different time intervals. Most of the data for productive hours worked were provided in summary form at a pay period level by individual employees. Daily productive hours were calculated by pro-rating the productive hours evenly across the time interval (typically seven to fourteen days).
P_MF_R2_QM1-12 P_QF_R2_QM1-4 P_SF_R2_QM1-2 P_YF_R2_QM	Ratio of RN+LPN to CNA productive hours	Num	Payroll	**Definition:** The sum of all payroll productive hours for Registered and Licensed Practical Nurses for a particular time interval divided by the sum of all payroll productive hours for Certified Nursing Assistants for the same time interval. **Variable Name:** Same as Ratio of RN to LPN productive hours. **Data Structure:** Same as Ratio of RN to LPN productive hours.
P_MF_R3_QM1-12 P_QF_R3_QM1-4 P_SF_R3_QM1-2 P_YF_R3_QM	Ratio of RN to All Nursing productive hours	Num	Payroll	**Definition:** The sum of all payroll productive hours for Registered Nurses for a particular time interval divided by the sum of all payroll productive hours for All Nursing staff for the same time interval. **Variable Name:** Same as Ratio of RN to LPN productive hours. **Data Structure:** Same as Ratio of RN to LPN productive hours.

Productive Hours Staffing Ratios, Staff Mix, and RN Shift Coverage Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
P_MF_R4_QM1-12 P_QF_R4_QM1-4 P_SF_R4_QM1-2 P_YF_R4_QM	Ratio of RN+LPN to All Nursing productive hours	Num	Payroll	**Definition:** The sum of all payroll productive hours for Registered and Licensed Practical Nurses for a particular time interval divided by the sum of all payroll productive hours for All Nursing staff for the same time interval. **Variable Name:** Same as Ratio of RN to LPN productive hours. **Data Structure:** Same as Ratio of RN to LPN productive hours.
P_MF_R5_QM1-12 P_QF_R5_QM1-4 P_SF_R5_QM1-2 P_YF_R5_QM	Ratio of CNA to All Nursing productive hours	Num	Payroll	**Definition:** The sum of all payroll productive hours for Certified Nursing Assistants for a particular time interval divided by the sum of all payroll productive hours for All Nursing staff for the same time interval. **Variable Name:** Same as Ratio of RN to LPN productive hours. **Data Structure:** Same as Ratio of RN to LPN productive hours.
P_MF_R6_QM1-12 P_QF_R6_QM1-4 P_SF_R6_QM1-2 P_YF_R6_QM	Ratio of All Licensed Nursing to All Nursing productive hours	Num	Payroll	**Definition:** The sum of all payroll productive hours for All Licensed Nursing staff for a particular time interval divided by the sum of all payroll productive hours for All Nursing staff for the same time interval. Measure Values: Continuous with a range from 0 to 0.9 **Variable Name:** Same as Ratio of RN to LPN productive hours. **Data Structure:** Same as Ratio of RN to LPN productive hours.
P_MF_R7_QM1-12 P_QF_R7_QM1-4 P_SF_R7_QM1-2 P_YF_R7_QM	Ratio of All Licensed Nursing full-time to full-time + part-time productive hours	Num	Payroll	**Definition:** The sum of all payroll productive hours for full-time All Licensed Nursing staff for a particular time interval divided by the sum of all payroll productive hours for both full-time and part-time All Licensed Nursing staff for the same time interval. This provides a measure of the percentage of All Licensed Nursing productive hours that were worked by full-time staff. **Variable Name:** Same as Ratio of RN to LPN productive hours. **Data Structure:** Same as Ratio of RN to LPN productive hours.

Variable Name	Label	Type	Data Source(s)	Definition and Comment
P_MF_R8_QM1-12 P_QF_R8_QM1-4 P_SF_R8_QM1-2 P_YF_R8_QM	Ratio of All Nursing full-time to full-time + part-time productive hours	Num	Payroll	**Definition:** The sum of all payroll productive hours for full-time All Nursing staff for a particular time interval divided by the sum of all payroll productive hours for both full-time and part-time Nursing staff for the same time interval. This provides a measure of the percentage of All Nursing productive hours that were worked by full-time staff. **Variable Name:** Same as Ratio of RN to LPN productive hours. **Data Structure:** Same as Ratio of RN to LPN productive hours.
P_MF_R9_QM1-12 P_QF_R9_QM1-4 P_SF_R9_QM1-2 P_YF_R9_QM	Ratio of All Employees full-time to full-time + part-time productive hours	Num	Payroll	**Definition:** The sum of all payroll productive hours for full-time employees for a particular time interval divided by the sum of all payroll productive hours for both full-time and part-time employees for the same time interval. This provides a measure of the percentage of all employees productive hours that were worked by full-time staff. **Variable Name:** Same as Ratio of RN to LPN productive hours. **Data Structure:** Same as Ratio of RN to LPN productive hours.
P_MF_RN_SD1-12 P_QF_RN_SD1-4 P_SF_RN_SD1-2 P_YF_RN_SD	Day shift RN percent coverage	Num	Payroll	**Definition:** The number of productive hours between 7:00AM and 3:00PM when at least one Registered Nurse was punched in (officially working) divided by eight. **Variable Name:** Variables for this measure are provided for monthly, quarterly, semi-annual, and annual time intervals with the first letter in the variable name indicating productive or total hours (P or T) and the second letter indicating the time interval (M, Q, S, Y respectively). The third character is an F indicating the data are at a facility level. The fourth and fifth characters indicate the staffing group or groups. The sixth and seventh characters indicate the punch time interval category. Punch time categories include day shift (SD), evening shift (SE), night shift (SN), 24-hour shift (SA), weekends (WE), weekdays (WD), holiday (HY) and non-holiday (HN). The number at the end of the variable name indicates the respective month (1 to 12), quarter (1 to 4) or half year (1 or 2) for a particular time interval. **Data Structure:** Punch time productive hours for RNs were provided as time-in and time-out time values with multiple time-in/time-out pairs for an individual employee possible on any given date. The punch time data reflected break times and therefore hours derived from the punch time data reflected only hours actually worked. Shift coverage was calculated by summing all appropriate productive hours for any given shift where at least one RN was present. Coverage by more than one RN does not affect (i.e., does not increase the value of) this measure.

Productive Hours Staffing Ratios, Staff Mix, and RN Shift Coverage Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
P_MF_RN_SE1-12 P_QF_RN_SE1-4 P_SF_RN_SE1-2 P_YF_RN_SE	Evening shift RN percent coverage	Num	Payroll	**Definition:** The number of productive hours between 3:00PM and 11:00PM when at least one Registered Nurse was punched in (officially working) divided by eight. **Variable Name:** Same as Day shift RN percent coverage. **Data Structure:** Same as Day shift RN percent coverage.
P_MF_RN_SN1-12 P_QF_RN_SN1-4 P_SF_RN_SN1-2 P_YF_RN_SN	Night shift RN percent coverage	Num	Payroll	**Definition:** The number of productive hours between 11:00PM and 7:00AM (the following day) when at least one Registered Nurse was punched in (officially working) divided by eight. **Variable Name:** Same as Day shift RN percent coverage. **Data Structure:** Same as Day shift RN percent coverage.
P_MF_RN_SA1-12 P_QF_RN_SA1-4 P_SF_RN_SA1-2 P_YF_RN_SA	24 hour RN percent coverage	Num	Payroll	**Definition:** The number of productive hours between 11:00PM and 11:00PM (the following day) when at least one Registered Nurse was punched in (officially working) divided by eight. **Variable Name:** Same as Day shift RN percent coverage. **Data Structure:** Same as Day shift RN percent coverage.
P_MF_RN_WE1-12 P_QF_RN_WE1-4 P_SF_RN_WE1-2 P_YF_RN_WE	Weekend RN percent coverage	Num	Payroll	**Definition:** The number of productive hours for all weekends (Sat & Sun) in a given time interval when at least one Registered Nurse was punched in (officially working) divided by the total number of productive hours for all weekends (Sat & Sun) in the same time interval. **Variable Name:** Same as Day shift RN percent coverage. **Data Structure:** Same as Day shift RN percent coverage.
P_MF_RN_WD1-12 P_QF_RN_WD1-4 P_SF_RN_WD1-2 P_YF_RN_WD	Weekdays RN percent coverage	Num	Payroll	**Definition:** The number of productive hours for all weekdays (Mon-Fri) in a given time interval when at least one Registered Nurse was punched in (officially working) divided by the total number of productive hours for all weekdays (Mon-Fri) in the same time interval. **Variable Name:** Same as Day shift RN percent coverage. **Data Structure:** Same as Day shift RN percent coverage.

Productive Hours Staffing Ratios, Staff Mix, and RN Shift Coverage Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
P_YF_RN_HY	Holiday RN percent coverage	Num	Payroll	**Definition:** The number of productive hours for all holiday days in 2003 when at least one Registered Nurse was punched in (officially working) divided by the total number of productive hours for all holiday days in 2003. **Variable Name:** Same as Day shift RN percent coverage. **Data Structure:** Same as Day shift RN percent coverage. The following 2003 holidays were used: New Years Day (1/1), Easter (4/20), Memorial Day (5/26), July 4th (7/4), Labor Day (9/1), Thanksgiving Day (11/27), Christmas Eve (12/24), Christmas Day (12/25) and New Year's Eve (12/31).
P_YF_RN_HN	Non-Holiday RN percent coverage	Num	Payroll	**Definition:** The number of productive hours for all non-holiday days in 2003 when at least one Registered Nurse was punched in (officially working) divided by the total number of productive hours for all non-holiday days in 2003. **Variable Name:** Same as Day shift RN percent coverage. **Data Structure:** Same as Day shift RN percent coverage.

Staff Composition Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_CN_PER YFFT_CN_PER YFPT_CN_PER	Percent of staff employed as CNAs	Num	Payroll	**Definition:** The average number of CNAs employed during the reporting period divided by the average number of all staff employed during the reporting period. **Variable Name:** In the first segment of the variable name, the first character of the variable (Y) indicates that the measure is an annual measure (due to limitations of the data file measures could not be computed annually so nine month measures were calculated in place of annual measures). The second character is an F indicating the data are at a facility level. The third and forth characters (when present) indicate whether the measure is based on all employees (no third and fourth characters), full-time employees (FT) or part-time employees (PT). The second segment indicates the staffing group or groups (as described in the JobCat, Licensed, and Nursing measure definitions). And the third segment indicates that this is a percent ("PER") measure (i.e., percent of total staff). **Data Structure:** The average number of employees by job category and across all staff were calculated based on the total number of employees with CY start dates on or before the last day of each month and CY end dates after the last day of each month divided by the total number of months. This measure is calculated across the entire reporting period (January-September, 2003).
YF_LP_PER YFFT_LP_PER YFPT_LP_PER	Percent of staff employed as LPNs	Num	Payroll	**Definition:** The average number of LPNs employed during the reporting period divided by the average number of all staff employed during the reporting period. **Variable Name:** Same as Percent of staff employed as CNAs **Data Structure:** Same as Percent of staff employed as CNAs
YF_RN_PER YFFT_RN_PER YFPT_RN_PER	Percent of staff employed as RNs	Num	Payroll	**Definition:** The average number of RNs employed during the reporting period divided by the average number of all staff employed during the reporting period. **Variable Name:** Same as Percent of staff employed as CNAs **Data Structure:** Same as Percent of staff employed as CNAs
YF_RL_PER YFFT_RL_PER YFPT_RL_PER	Percent of staff employed as RNs or LPNs	Num	Payroll	**Definition:** The average number of RNs and LPNs employed during the reporting period divided by the average number of all staff employed during the reporting period. **Variable Name:** Same as Percent of staff employed as CNAs **Data Structure:** Same as Percent of staff employed as CNAs

Staff Composition Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_DN_PER YFFT_DN_PER YFPT_DN_PER	Percent of staff employed as DONs	Num	Payroll	**Definition:** The average number of DONs employed during the reporting period divided by the average number of all staff employed during the reporting period. **Variable Name:** Same as Percent of staff employed as CNAs **Data Structure:** Same as Percent of staff employed as CNAs
YF_TD_PER YFFT_TD_PER YFPT_TD_PER	Percent of staff employed as DONs or ADONs	Num	Payroll	**Definition:** The average number of DON and ADONs employed during the reporting period divided by the average number of all staff employed during the reporting period. **Variable Name:** Same as Percent of staff employed as CNAs **Data Structure:** Same as Percent of staff employed as CNAs
YF_TL_PER YFFT_TL_PER YFPT_TL_PER	Percent of staff employed as licensed staff	Num	Payroll	**Definition:** The average number of licensed staff employed during the reporting period divided by the average number of all staff employed during the reporting period. **Variable Name:** Same as Percent of staff employed as CNAs **Data Structure:** Same as Percent of staff employed as CNAs
YF_TN_PER YFFT_TN_PER YFPT_TN_PER	Percent of staff employed as nursing staff	Num	Payroll	**Definition:** The average number of nursing staff employed during the reporting period divided by the average number of all staff employed during the reporting period. **Variable Name:** Same as Percent of staff employed as CNAs **Data Structure:** Same as Percent of staff employed as CNAs
YF_AD_PER YFFT_AD_PER YFPT_AD_PER	Percent of staff employed as administrators	Num	Payroll	**Definition:** The average number of administrators employed during the reporting period divided by the average number of all staff employed during the reporting period. **Variable Name:** Same as Percent of staff employed as CNAs **Data Structure:** Same as Percent of staff employed as CNAs

Staff Composition Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_CN_PER_FT	Percent of CNAs working full-time	Num	Payroll	**Definition:** The average number of CNAs working full-time during the reporting period divided by the average number of all CNAs (full-time + part-time) working during the reporting period. **Variable Name:** In the first segment of the variable name, the first character (Y) indicates that the measure is an annual measure (due to limitations of the data file measures could not be computed annually so nine month measures were calculated in place of annual measures). The second character is an F indicating the data are at a facility level. The second segment indicates the staffing group or groups (as described in the JobCat, Licensed, and Nursing measure definitions). The third segment indicates that this is a percent ("PER") measure and the fourth segment indicates that it is a measure of full-time staff (i.e., percent of staff by job category who work full-time as defined by the full-time variable described in the measure definition). **Data Structure:** The average number of full-time workers by job category and across all staff were calculated based on the total number of full-time employees each month with CY start dates on or before the last day of each month and CY end dates after the last day of each month divided by the total number of months. The average number of all workers (full-time and part-time by job category and across all staff were calculated based on the total number of employees (full-time and part-time) each month with CY start dates on or before the last day of the month and CY end dates after the last day of each month divided by the total number of months. This measure is calculated across the entire reporting period (January-September, 2003).
YF_LP_PER_FT	Percent of LPNs working full-time	Num	Payroll	**Definition:** The average number of LPNs working full-time during the reporting period divided by the average number of all LPNs (full-time + part-time) working during the reporting period. **Variable Name:** Same as Percent of CNAs working full-time **Data Structure:** Same as Percent of CNAs working full-time
YF_RN_PER_FT	Percent of RNs working full-time	Num	Payroll	**Definition:** The average number of RNs working full-time during the reporting period divided by the average number of all RNs (full-time + part-time) working during the reporting period. **Variable Name:** Same as Percent of CNAs working full-time **Data Structure:** Same as Percent of CNAs working full-time

Staff Composition Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_RL_PER_FT	Percent of RNs and LPNs working full-time	Num	Payroll	**Definition:** The average number of RNs and LPNs working full-time during the reporting period divided by the average number of all RNs and LPNs (full-time + part-time) working during the reporting period. **Variable Name:** Same as Percent of CNAs working full-time **Data Structure:** Same as Percent of CNAs working full-time
YF_TL_PER_FT	Percent of all licensed staff working full-time	Num	Payroll	**Definition:** The average number of licensed staff working full-time during the reporting period divided by the average number of all licensed staff (full-time + part-time) working during the reporting period. **Variable Name:** Same as Percent of CNAs working full-time **Data Structure:** Same as Percent of CNAs working full-time
YF_TN_PER_FT	Percent of all nursing staff working full-time	Num	Payroll	**Definition:** The average number of licensed staff working full-time during the reporting period divided by the average number of all licensed staff (full-time + part-time) working during the reporting period. **Variable Name:** Same as Percent of CNAs working full-time **Data Structure:** Same as Percent of CNAs working full-time
YF_DN_PER_FT	Percent of DONs working full-time	Num	Payroll	**Definition:** The average number of DONs working full-time during the reporting period divided by the average number of all DONs (full-time + part-time) working during the reporting period. **Variable Name:** Same as Percent of CNAs working full-time **Data Structure:** Same as Percent of CNAs working full-time
YF_TD_PER_FT	Percent of DONs and ADONs working full-time	Num	Payroll	**Definition:** The average number of DONs and ADONs working full-time during the reporting period divided by the average number of all DONs and ADONs (full-time + part-time) working during the reporting period. **Variable Name:** Same as Percent of CNAs working full-time **Data Structure:** Same as Percent of CNAs working full-time

Staff Composition Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_AD_PER_FT	Percent of administrators working full-time	Num	Payroll	**Definition:** The average number of administrators working full-time during the reporting period divided by the average number of all administrators (full-time + part-time) working during the reporting period.
				Variable Name: Same as Percent of CNAs working full-time
				Data Structure: Same as Percent of CNAs working full-time
YF_TE_PER_FT	Percent of all staff working full-time	Num	Payroll	**Definition:** The average number of full-time staff during the reporting period divided by the average number of all staff (full-time + part-time) during the reporting period.
				Variable Name: Same as Percent of CNAs working full-time
				Data Structure: Same as Percent of CNAs working full-time

DEVELOPMENT OF STAFFING QUALITY MEASURES PHASE I - DATA DICTIONARY

Staff Turnover, Retention, and Tenure Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_CN_C_PTP YFFT_CN_C_PTP YFPT_CN_C_PTP	Percent cohort turnover for CNAs	Num	Payroll	**Definition:** Number of CNAs with a CY start date in January 2003 and a CY end date prior to 10/1/2003 divided by the number of CNAs with a CY start date in January 2003. **Variable Name:** In the first segment of the variable name, the first character of the variable (Y) indicates that the measure is an annual measure (due to limitations of the data file measures could not be computed annually so nine month measures were calculated in place of annual measures). The second character is an F indicating the data are at a facility level. The third and forth characters (when present) indicate whether the measure is based on all employees (no third and fourth characters), full-time employees (FT) or part-time employees (PT). The second segment indicates the staffing group or groups (as described in the JobCat, Licensed, and Nursing measure definitions). The third segment indicates the type of measure (cohort or average) and the fourth segment indicates the data source (P=payroll), Turnover (T) or Retention (R), and finally that the measure is a percentage (P). **Data Structure:** The measure was calculated across the entire reporting period (January-September, 2003). All CNAs with at least one payroll record in January 2003 based on CY start date were included in the measure. CNAs whose last payroll record (CY end date) occurred on or before 9/30/2003 were considered terminated.
YF_LP_C_PTP YFFT_LP_C_PTP YFPT_LP_C_PTP	Percent cohort turnover for LPNs	Num	Payroll	**Definition:** Number of LPNs with a CY start date in January 2003 and CY end date prior to 10/1/2003 divided by the number of LPNs with a CY start date in January 2003. **Variable Name:** Same as Percent cohort turnover for CNAs **Data Structure:** Same as Percent cohort turnover for CNAs
YF_RN_C_PTP YFFT_RN_C_PTP YFPT_RN_C_PTP	Percent cohort turnover for RNs	Num	Payroll	**Definition:** Number of RNs with a CY start date in January 2003 and CY end date prior to 10/1/2003 divided by the number of RNs with a CY start date in January 2003. **Variable Name:** Same as Percent cohort turnover for CNAs **Data Structure:** Same as Percent cohort turnover for CNAs

Staff Turnover, Retention, and Tenure Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_RL_C_PTP YFFT_RL_C_PTP YFPT_RL_C_PTP	Percent cohort turnover for RNs and LPNs	Num	Payroll	**Definition:** Number of RNs and LPNs with a CY start date in January 2003 and CY end date prior to 10/1/2003 divided by the number of RNs and LPNs with a CY start date in January 2003. **Variable Name:** Same as Percent cohort turnover for CNAs **Data Structure:** Same as Percent cohort turnover for CNAs
YF_TD_C_PTP YFFT_TD_C_PTP YFPT_TD_C_PTP	Percent cohort turnover for DONs and ADONs	Num	Payroll	**Definition:** Number of DONs and ADONs with a CY start date in January 2003 and CY end date prior to 10/1/2003 divided by the number of DONs and ADONs with a CY start date in January 2003. **Variable Name:** Same as Percent cohort turnover for CNAs **Data Structure:** Same as Percent cohort turnover for CNAs
YF_TL_C_PTP YFFT_TL_C_PTP YFPT_TL_C_PTP	Percent cohort turnover for all licensed staff	Num	Payroll	**Definition:** Number of licensed staff with a CY start date in January 2003 and CY end date prior to 10/1/2003 divided by the number of licensed staff with a CY start date in January 2003. **Variable Name:** Same as Percent cohort turnover for CNAs **Data Structure:** Same as Percent cohort turnover for CNAs
YF_TN_C_PTP YFFT_TN_C_PTP YFPT_TN_C_PTP	Percent cohort turnover for all nursing staff	Num	Payroll	**Definition:** Number of nursing staff with a CY start date in January 2003 and CY end date prior to 10/1/2003 divided by the number of nursing staff with a CY start date in January 2003. **Variable Name:** Same as Percent cohort turnover for CNAs **Data Structure:** Same as Percent cohort turnover for CNAs
YF_TE_C_PTP YFFT_TE_C_PTP YFPT_TE_C_PTP	Percent cohort turnover for all staff	Num	Payroll	**Definition:** Number of staff with a CY start date in January 2003 and CY end date prior to 10/1/2003 divided by the number of staff with a CY start date in January 2003. **Variable Name:** Same as Percent cohort turnover for CNAs **Data Structure:** Same as Percent cohort turnover for CNAs

DEVELOPMENT OF STAFFING QUALITY MEASURES PHASE I - DATA DICTIONARY
Staff Turnover, Retention, and Tenure Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_CN_C_PRP YFFT_CN_C_PRP YFPT_CN_C_PRP	Percent cohort retention for CNAs	Num	Payroll	**Definition:** Number of CNAs with a CY start date in January 2003 and CY end date after 09/30/2003 divided by the number of CNAs with a CY start date in January 2003. **Variable Name:** In the first segment of the variable name, the first character of the variable (Y) indicates that the measure is an annual measure (due to limitations of the data file measures could not be computed annually so nine month measures were calculated in place of annual measures). The second character is an F indicating the data are at a facility level. The third and forth characters (when present) indicate whether the measure is based on all employees (no third and fourth characters), full-time employees (FT) or part-time employees (PT). The second segment indicates the staffing group or groups (as described in the JobCat, Licensed, and Nursing measure definitions). And the third segment indicates the type of measure (cohort or average) and the fourth segment indicates the data source (P=payroll), whether the measure reflects Turnover (T) or Retention (R) and finally an indication that the measure is a percentage (P). **Data Structure:** The measure was calculated across the entire reporting period (January-September, 2003). All CNAs with at least one payroll record in January 2003 based on CY start date were included in the denominator for the measure. CNAs whose last payroll record (CY end date) occurred after 9/30/2003 were considered actively employed (i.e., retained) for the reporting period and were included in the numerator. This measure is the inverse of the percent cohort turnover measure for CNAs.
YF_LP_C_PRP YFFT_LP_C_PRP YFPT_LP_C_PRP	Percent cohort retention for LPNs	Num	Payroll	**Definition:** Number of LPNs with a CY start date in January 2003 and CY end date after 09/30/2003 divided by the number of LPNs with a CY start date in January 2003. **Variable Name:** Same as Percent cohort retention for CNAs **Data Structure:** Same as Percent cohort retention for CNAs
YF_RN_C_PRP YFFT_RN_C_PRP YFPT_RN_C_PRP	Percent cohort retention for RNs	Num	Payroll	**Definition:** Number of RNs with a CY start date in January 2003 and CY end date after 09/30/2003 divided by the number of RNs with a CY start date in January 2003. **Variable Name:** Same as Percent cohort retention for CNAs **Data Structure:** Same as Percent cohort retention for CNAs

Staff Turnover, Retention, and Tenure Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_RL_C_PRP YFFT_RL_C_PRP YFPT_RL_C_PRP	Percent cohort retention for RNs and LPNs	Num	Payroll	**Definition:** Number of RNs and LPNs with a CY start date in January 2003 and CY end date after 09/30/2003 divided by the number of RNs and LPNs with a CY start date in January 2003. **Variable Name:** Same as Percent cohort retention for CNAs **Data Structure:** Same as Percent cohort retention for CNAs
YF_TD_C_PRP YFFT_TD_C_PRP YFPT_TD_C_PRP	Percent cohort retention for DONs and ADONs	Num	Payroll	**Definition:** Number of DONs and ADONs with a CY start date in January 2003 and CY end date after 09/30/2003 divided by the number of DONs and ADONs with a CY start date in January 2003. **Variable Name:** Same as Percent cohort retention for CNAs **Data Structure:** Same as Percent cohort retention for CNAs
YF_TL_C_PRP YFFT_TL_C_PRP YFPT_TL_C_PRP	Percent cohort retention for all licensed staff	Num	Payroll	**Definition:** Number of licensed staff with a CY start date in January 2003 and CY end date after 09/30/2003 divided by the number of licensed staff with a CY start date in January 2003. **Variable Name:** Same as Percent cohort retention for CNAs **Data Structure:** Same as Percent cohort retention for CNAs
YF_TN_C_PRP YFFT_TN_C_PRP YFPT_TN_C_PRP	Percent cohort retention for all nursing staff	Num	Payroll	**Definition:** Number of nursing staff with a CY start date in January 2003 and CY end date after 09/30/2003 divided by the number of nursing staff with a CY start date in January 2003. **Variable Name:** Same as Percent cohort retention for CNAs **Data Structure:** Same as Percent cohort retention for CNAs
YF_TE_C_PRP YFFT_TE_C_PRP YFPT_TE_C_PRP	Percent cohort retention for all staff	Num	Payroll	**Definition:** Number of staff with a CY start date in January 2003 and a CY end date after 09/30/2003 divided by the number of staff with a CY start date in January 2003. **Variable Name:** Same as Percent cohort retention for CNAs **Data Structure:** Same as Percent cohort retention for CNAs

Staff Turnover, Retention, and Tenure Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_CN_A_PTP YFFT_CN_A_PTP YFPT_CN_A_PTP	Average CNA turnover	Num	Payroll	**Definition:** Number of CNAs with a CY end date prior to 10/1/2003 divided by the average number of CNAs employed during the reporting period.

Variable Name: In the first segment of the variable name, the first character of the variable (Y) indicates that the measure is an annual measure (due to limitations of the data file measures could not be computed annually so nine month measures were calculated in place of annual measures). The second character is an F indicating the data are at a facility level. The third and forth characters (when present) indicate whether the measure is based on all employees (no third and fourth characters), full-time employees (FT) or part-time employees (PT). The second segment indicates the staffing group or groups (as described in the JobCat, Licensed, and Nursing measure definitions). And the third segment indicates the type of measure (cohort or average) and the fourth segment indicates the data source (P=payroll), whether the measure reflects Turnover (T) or Retention (R) and finally an indication that the measure is a percentage (P).

Data Structure: The average number of employees by job category (e.g., CNAs) was calculated based on the total number of CNAs with a CY start date on or before the last day of each month and CY end date after the last day of each month divided by the total number of months. The measure was calculated across the entire reporting period (January-September, 2003). CNAs whose last payroll record (CY end date) occurred prior to 10/01/2003 were considered terminated. |
| YF_LP_A_PTP YFFT_LP_A_PTP YFPT_LP_A_PTP | Average LPN turnover | Num | Payroll | **Definition:** Number of LPNs with a CY end date prior to 10/1/2003 divided by the average number of LPNs employed during the reporting period.

Variable Name: Same as Average CNA turnover

Data Structure: Same as Average CNA turnover |
| YF_RN_A_PTP YFFT_RN_A_PTP YFPT_RN_A_PTP | Average RN turnover | Num | Payroll | **Definition:** Number of RNs with a CY end date prior to 10/1/2003 divided by the average number of RNs employed during the reporting period.

Variable Name: Same as Average CNA turnover

Data Structure: Same as Average CNA turnover |

Staff Turnover, Retention, and Tenure Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_RL_A_PTP YFFT_RL_A_PTP YFPT_RL_A_PTP	Average combined RN and LPN turnover	Num	Payroll	**Definition:** Number of RNs and LPNs with a CY end date prior to 10/1/2003 divided by the average number of RNs and LPNs employed during the reporting period. **Variable Name:** Same as Average CNA turnover **Data Structure:** Same as Average CNA turnover
YF_TD_A_PTP YFFT_TD_A_PTP YFPT_TD_A_PTP	Average combined DON and ADON turnover	Num	Payroll	**Definition:** Number of DONs and ADONs with a CY end date prior to 10/1/2003 divided by the average number of DONs and ADONs employed during the reporting period. **Variable Name:** Same as Average CNA turnover **Data Structure:** Same as Average CNA turnover
YF_TL_A_PTP YFFT_TL_A_PTP YFPT_TL_A_PTP	Average licensed staff turnover	Num	Payroll	**Definition:** Number of licensed staff with a CY end date prior to 10/1/2003 divided by the average number of licensed staff employed during the reporting period. **Variable Name:** Same as Average CNA turnover **Data Structure:** Same as Average CNA turnover
YF_TN_A_PTP YFFT_TN_A_PTP YFPT_TN_A_PTP	Average nursing staff turnover	Num	Payroll	**Definition:** Number of nursing staff with a CY end date prior to 10/1/2003 divided by the average number of nursing staff employed during the reporting period. **Variable Name:** Same as Average CNA turnover **Data Structure:** Same as Average CNA turnover
YF_TE_A_PTP YFFT_TE_A_PTP YFPT_TE_A_PTP	Average all staff turnover	Num	Payroll	**Definition:** Number of staff with a CY end date prior to 10/1/2003 divided by the average number of staff employed during the reporting period. **Variable Name:** Same as Average CNA turnover **Data Structure:** Same as Average CNA turnover

Staff Turnover, Retention, and Tenure Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_CN_PSTP YFFT_CN_PSTP YFPT_CN_PSTP	Percent of short term CNAs	Num	Payroll	**Definition:** Number of CNAs whose tenure was less than 60 days during the reporting period divided by the total number of CNAs employed during the reporting period. **Variable Name:** In the first segment of the variable name, the first character of the variable (Y) indicates that the measure is an annual measure (due to limitations of the data file measures could not be computed annually so nine month measures were calculated in place of annual measures). The second character is an F indicating the data are at a facility level. The third and forth characters (when present) indicate whether the measure is based on all employees (no third and fourth characters), full-time employees (FT) or part-time employees (PT). The second segment indicates the staffing group or groups (as described in the JobCat, Licensed, and Nursing measure definitions). And the third segment indicates the data source (P=payroll), type of measure (ST=short term), and finally an indication that the measure is a percentage (P). **Data Structure:** Short term was defined as employment less than 60 days based on CY start and end dates. Total number of CNAs during reporting period was calculated based on the total number of CNAs with a CY start date prior to 10/1/2003 (if a CNA was hired, terminated, and rehired they would be counted twice in the denominator). The measure was calculated across the entire reporting period (January-September, 2003).
YF_LP_PSTP YFFT_LP_PSTP YFPT_LP_PSTP	Percent of short term LPNs	Num	Payroll	**Definition:** Number of LPNs whose tenure was less than 60 days during the reporting period divided by the total number of LPNs employed during the reporting period. **Variable Name:** Same as Percent of short term CNAs **Data Structure:** Same as Percent of short term CNAs
YF_RN_PSTP YFFT_RN_PSTP YFPT_RN_PSTP	Percent of short term RNs	Num	Payroll	**Definition:** Number of RNs whose tenure was less than 60 days during the reporting period divided by the total number of RNs employed during the reporting period. **Variable Name:** Same as Percent of short term CNAs **Data Structure:** Same as Percent of short term CNAs

Staff Turnover, Retention, and Tenure Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_RL_PSTP YFFT_RL_PSTP YFPT_RL_PSTP	Percent of short term RNs and LPNs	Num	Payroll	**Definition:** Number of RNs and LPNs whose tenure was less than 60 days during the reporting period divided by the total number of RNs and LPNs employed during the reporting period. **Variable Name:** Same as Percent of short term CNAs **Data Structure:** Same as Percent of short term CNAs
YF_DN_PSTP YFFT_DN_PSTP YFPT_DN_PSTP	Percent of short term DONs	Num	Payroll	**Definition:** Number of DONs whose tenure was less than 60 days during the reporting period divided by the total number of DONs employed during the reporting period. **Variable Name:** Same as Percent of short term CNAs **Data Structure:** Same as Percent of short term CNAs
YF_TD_PSTP YFFT_TD_PSTP YFPT_TD_PSTP	Percent of short term DONs and ADONs	Num	Payroll	**Definition:** Number of DONs and ADONs whose tenure was less than 60 days during the reporting period divided by the total number of DONs and ADONs employed during the reporting period. **Variable Name:** Same as Percent of short term CNAs **Data Structure:** Same as Percent of short term CNAs
YF_TL_PSTP YFFT_TL_PSTP YFPT_TL_PSTP	Percent of short term licensed staff	Num	Payroll	**Definition:** Number of licensed staff whose tenure was less than 60 days during the reporting period divided by the total number of licensed staff employed during the reporting period. **Variable Name:** Same as Percent of short term CNAs **Data Structure:** Same as Percent of short term CNAs
YF_TN_PSTP YFFT_TN_PSTP YFPT_TN_PSTP	Percent of short term nursing staff	Num	Payroll	**Definition:** Number of nursing staff whose tenure was less than 60 days during the reporting period divided by the total number of nursing staff employed during the reporting period. **Variable Name:** Same as Percent of short term CNAs **Data Structure:** Same as Percent of short term CNAs

Staff Turnover, Retention, and Tenure Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_AD_PSTP YFFT_AD_PSTP YFPT_AD_PSTP	Percent of short term administrators	Num	Payroll	**Definition:** Number of administrators whose tenure was less than 60 days during the reporting period divided by the total number of administrators employed during the reporting period. **Variable Name:** Same as Percent of short term CNAs **Data Structure:** Same as Percent of short term CNAs
YF_TE_PSTP YFFT_TE_PSTP YFPT_TE_PSTP	Percent of short term staff	Num	Payroll	**Definition:** Number of staff whose tenure was less than 60 days during the reporting period divided by the total number of staff employed during the reporting period. **Variable Name:** Same as Percent of short term CNAs **Data Structure:** Same as Percent of short term CNAs
YF_CN_TTDA YFFT_CN_TTDA YFPT_CN_TTDA	Average CNA tenure to date	Num	Payroll & Personnel	**Definition:** The sum of tenure to date (TTD) for all CNAs working during the report period divided by the total number of CNAs working during the reporting period. **Variable Name:** In the first segment of the variable name, the first character of the variable (Y) indicates that the measure is an annual measure (due to limitations of the data file measures could not be computed annually so nine month measures were calculated in place of annual measures). The second character is an F indicating the data are at a facility level. The third and forth characters (when present) indicate whether the measure is based on all employees (no third and fourth characters), full-time employees (FT) or part-time employees (PT). The second segment indicates the staffing group or groups (as described in the JobCat, Licensed, and Nursing measure definitions). And the third segment indicates the type of measure (TTD=tenure to date) and finally an indication that the measure is an average (A). **Data Structure:** Length of employment is referred to as tenure for departed employees and tenure to date (TTD) for employed staff. Calculation of tenure measures requires a valid Hire/Start Date and therefore only those employees with both payroll and personnel data were included in this measure. TTD is defined as the number of days lapsed between the most recent hire/start date (obtained from the personnel data) and CY end date (obtained from payroll data). The measure was calculated across the entire reporting period (January-September, 2003).

Staff Turnover, Retention, and Tenure Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_LP_TTDA YFFT_LP_TTDA YFPT_LP_TTDA	Average LPN tenure to date	Num	Payroll & Personnel	**Definition:** The sum of tenure to date (TTD) for all LPNs working during the report period divided by the total number of LPNs working during the reporting period. **Variable Name:** Same as Average CNA tenure to date **Data Structure:** Same as Average CNA tenure to date
YF_RN_TTDA YFFT_RN_TTDA YFPT_RN_TTDA	Average RN tenure to date	Num	Payroll & Personnel	**Definition:** The sum of tenure to date (TTD) for all RNs working during the report period divided by the total number of RNs working during the reporting period. **Variable Name:** Same as Average CNA tenure to date **Data Structure:** Same as Average CNA tenure to date
YF_RL_TTDA YFFT_RL_TTDA YFPT_RL_TTDA	Average combined RN and LPN tenure to date	Num	Payroll & Personnel	**Definition:** The sum of tenure to date (TTD) for all RNs and LPNs working during the report period divided by the total number of RNs and LPNs working during the reporting period. **Variable Name:** Same as Average CNA tenure to date **Data Structure:** Same as Average CNA tenure to date
YF_DN_TTDA YFFT_DN_TTDA YFPT_DN_TTDA	Average DON tenure to date	Num	Payroll & Personnel	**Definition:** The sum of tenure to date (TTD) for all DONs working during the report period divided by the total number of DONs working during the reporting period. **Variable Name:** Same as Average CNA tenure to date **Data Structure:** Same as Average CNA tenure to date
YF_TD_TTDA YFFT_TD_TTDA YFPT_TD_TTDA	Average combined DON and ADON tenure to date	Num	Payroll & Personnel	**Definition:** The sum of tenure to date (TTD) for all DONs and ADONs working during the report period divided by the total number of DONs and ADONs working during the reporting period. **Variable Name:** Same as Average CNA tenure to date **Data Structure:** Same as Average CNA tenure to date

Staff Turnover, Retention, and Tenure Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_TL_TTDA YFFT_TL_TTDA YFPT_TL_TTDA	Average licensed staff tenure to date	Num	Payroll & Personnel	**Definition:** The sum of tenure to date (TTD) for all licensed staff working during the report period divided by the total number of licensed staff working during the reporting period. **Variable Name:** Same as Average CNA tenure to date **Data Structure:** Same as Average CNA tenure to date
YF_TN_TTDA YFFT_TN_TTDA YFPT_TN_TTDA	Average nursing staff tenure to date	Num	Payroll & Personnel	**Definition:** The sum of tenure to date (TTD) for all nursing staff working during the report period divided by the total number of nursing staff working during the reporting period. **Variable Name:** Same as Average CNA tenure to date **Data Structure:** Same as Average CNA tenure to date
YF_AD_TTDA YFFT_AD_TTDA YFPT_AD_TTDA	Average administrator staff tenure to date	Num	Payroll & Personnel	**Definition:** The sum of tenure to date (TTD) for all administrators working during the report period divided by the total number of administrators working during the reporting period. **Variable Name:** Same as Average CNA tenure to date **Data Structure:** Same as Average CNA tenure to date
YF_TE_TTDA YFFT_CN_TTDA YFPT_CN_TTDA	Average staff tenure to date	Num	Payroll & Personnel	**Definition:** The sum of tenure to date (TTD) for all staff working during the report period divided by the total number of staff working during the reporting period. **Variable Name:** Same as Average CNA tenure to date **Data Structure:** Same as Average CNA tenure to date

Staff Turnover, Retention, and Tenure Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_CN_TTD_T1 YFFT_CN_TTD_T1 YFPT_CN_TTD_T1	Percent of departed CNAs with tenure greater than 1 year	Num	Payroll & Personnel	**Definition:** Number of CNAs that departed during the reporting period whose tenure was greater than one year divided by the number of CNAs who departed during the reporting period. **Variable Name:** In the first segment of the variable name, the first character of the variable (Y) indicates that the measure is an annual measure (due to limitations of the data file measures could not be computed annually so nine month measures were calculated in place of annual measures). The second character is an F indicating the data are at a facility level. The third and forth characters (when present) indicate whether the measure is based on all employees (no third and fourth characters), full-time employees (FT) or part-time employees (PT). The second segment indicates the staffing group or groups (as described in the JobCat, Licensed, and Nursing measure definitions). The third segment indicates the type of measure (TTD=tenure to date). Finally the first character of the fourth segment indicates whether the measure includes departed/terminated (T) employees or employees currently employed (E) and the second character indicates the tenure length of interest (1=tenure greater than 1 year; 5=tenure greater than 5 years). **Data Structure:** Length of employment is referred to as tenure for departed employees and tenure to date (TTD) for employed staff. Calculation of tenure measures requires a valid Hire/Start Date and therefore only those employees with both payroll and personnel data were included in this measure. Tenure is defined as the number of days lapsed between the most recent hire/start date (obtained from the personnel data) and CY end date (obtained from payroll data). This measure includes only those individuals who departed/were terminated from the facility during the reporting period (i.e., CY end date prior to 10/1/2003). The measure was calculated across the entire reporting period (January-September, 2003).
YF_LP_TTD_T1 YFFT_LP_TTD_T1 YFPT_LP_TTD_T1	Percent of departed LPNs with tenure greater than 1 year	Num	Payroll & Personnel	**Definition:** Number of LPNs that departed during the reporting period whose tenure was greater than one year divided by the number of LPNs who departed during the reporting period. **Variable Name:** Same as Percent of departed CNAs with tenure greater than 1 year. **Data Structure:** Same as Percent of departed CNAs with tenure greater than 1 year.

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Staff Turnover, Retention, and Tenure Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_RN_TTD_T1 YFFT_RN_TTD_T1 YFPT_RN_TTD_T1	Percent of departed RNs with tenure greater than 1 year	Num	Payroll & Personnel	**Definition:** Number of RNs that departed during the reporting period whose tenure was greater than one year divided by the number of RNs that departed during the reporting period. **Variable Name:** Same as Percent of departed CNAs with tenure greater than 1 year. **Data Structure:** Same as Percent of departed CNAs with tenure greater than 1 year.
YF_RL_TTD_T1 YFFT_RL_TTD_T1 YFPT_RL_TTD_T1	Percent of departed RNs and LPNs with tenure greater than 1 year	Num	Payroll & Personnel	**Definition:** Number of RNs and LPNs that departed during the reporting period whose tenure was greater than one year divided by the number of RNs and LPNs who departed during the reporting period. **Variable Name:** Same as Percent of departed CNAs with tenure greater than 1 year. **Data Structure:** Same as Percent of departed CNAs with tenure greater than 1 year.
YF_DN_TTD_T1 YFFT_DN_TTD_T1 YFPT_DN_TTD_T1	Percent of departed DONs with tenure greater than 1 year	Num	Payroll & Personnel	**Definition:** Number of DONs that departed during the reporting period whose tenure was greater than one year divided by the number of DONs that departed during the reporting period. **Variable Name:** Same as Percent of departed CNAs with tenure greater than 1 year. **Data Structure:** Same as Percent of departed CNAs with tenure greater than 1 year.
YF_TD_TTD_T1 YFFT_TD_TTD_T1 YFPT_TD_TTD_T1	Percent of departed DONs and ADONs with tenure greater than 1 year	Num	Payroll & Personnel	**Definition:** Number of DONs and ADONs that departed during the reporting period whose tenure was greater than one year divided by the number of DONs and ADONs who departed during the reporting period. **Variable Name:** Same as Percent of departed CNAs with tenure greater than 1 year. **Data Structure:** Same as Percent of departed CNAs with tenure greater than 1 year.

Staff Turnover, Retention, and Tenure Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_TL_TTD_T1 YFFT_TL_TTD_T1 YFPT_TL_TTD_T1	Percent of departed licensed staff with tenure greater than 1 year	Num	Payroll & Personnel	**Definition:** Number of licensed staff that departed during the reporting period whose tenure was greater than one year divided by the number of licensed staff that departed during the reporting period. **Variable Name:** Same as Percent of departed CNAs with tenure greater than 1 year. **Data Structure:** Same as Percent of departed CNAs with tenure greater than 1 year.
YF_TN_TTD_T1 YFFT_TN_TTD_T1 YFPT_TN_TTD_T1	Percent of departed nursing staff with tenure greater than 1 year	Num	Payroll & Personnel	**Definition:** Number of nursing staff that departed during the reporting period whose tenure was greater than one year divided by the number of nursing staff who departed during the reporting period. **Variable Name:** Same as Percent of departed CNAs with tenure greater than 1 year. **Data Structure:** Same as Percent of departed CNAs with tenure greater than 1 year.
YF_AD_TTD_T1 YFFT_AD_TTD_T1 YFPT_AD_TTD_T1	Percent of departed administrators with tenure greater than 1 year	Num	Payroll & Personnel	**Definition:** Number of administrators that departed during the reporting period whose tenure was greater than one year divided by the number of administrators that departed during the reporting period. **Variable Name:** Same as Percent of departed CNAs with tenure greater than 1 year. **Data Structure:** Same as Percent of departed CNAs with tenure greater than 1 year.
YF_TE_TTD_T1 YFFT_TE_TTD_T1 YFPT_TE_TTD_T1	Percent of departed staff with tenure greater than 1 year	Num	Payroll & Personnel	**Definition:** Number of staff that departed during the reporting period whose tenure was greater than one year divided by the number of staff who departed during the reporting period. **Variable Name:** Same as Percent of departed CNAs with tenure greater than 1 year. **Data Structure:** Same as Percent of departed CNAs with tenure greater than 1 year.

Staff Turnover, Retention, and Tenure Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_CN_TTD_T5 YFFT_CN_TTD_T5 YFPT_CN_TTD_T5	Percent of departed CNAs with tenure greater than 5 years	Num	Payroll & Personnel	**Definition:** Number of CNAs that departed during the reporting period whose tenure was greater than five years divided by the number of CNAs who departed during the reporting period. **Variable Name:** In the first segment of the variable name, the first character of the variable (Y) indicates that the measure is an annual measure (due to limitations of the data file measures could not be computed annually so nine month measures were calculated in place of annual measures). The second character is an F indicating the data are at a facility level. The third and forth characters (when present) indicate whether the measure is based on all employees (no third and fourth characters), full-time employees (FT) or part-time employees (PT). The second segment indicates the staffing group or groups (as described in the JobCat, Licensed, and Nursing measure definitions). The third segment indicates the type of measure (TTD=tenure to date). Finally the first character of the fourth segment indicates whether the measure includes departed/terminated (T) employees or employees currently employed (E) and the second character indicates the tenure length of interest (1=tenure greater than 1 year; 5=tenure greater than 5 years). **Data Structure:** Length of employment is referred to as tenure for departed employees and tenure to date (TTD) for employed staff. Calculation of tenure measures requires a valid Hire/Start Date and therefore only those employees with both payroll and personnel data were included in this measure. Tenure is defined as the number of days lapsed between the most recent hire/start date (obtained from the personnel data) and CY end date (obtained from payroll data). This measure includes only those individuals who departed/were terminated from the facility during the reporting period (i.e., CY end date prior to 10/1/2003). The measure was calculated across the entire reporting period (January-September, 2003).
YF_LP_TTD_T5 YFFT_LP_TTD_T5 YFPT_LP_TTD_T5	Percent of departed LPNs with tenure greater than 5 years	Num	Payroll & Personnel	**Definition:** Number of LPNs that departed during the reporting period whose tenure was greater than five years divided by the number of LPNs who departed during the reporting period. **Variable Name:** Same as Percent of departed CNAs with tenure greater than 5 years. **Data Structure:** Same as Percent of departed CNAs with tenure greater than 5 years.

Staff Turnover, Retention, and Tenure Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_RN_TTD_T5 YFFT_RN_TTD_T5 YFPT_RN_TTD_T5	Percent of departed RNs with tenure greater than 5 years	Num	Payroll & Personnel	**Definition:** Number of RNs that departed during the reporting period whose tenure was greater than five years divided by the number of RNs that departed during the reporting period. **Variable Name:** Same as Percent of departed CNAs with tenure greater than 5 years. **Data Structure:** Same as Percent of departed CNAs with tenure greater than 5 years.
YF_RL_TTD_T5 YFFT_RL_TTD_T5 YFPT_RL_TTD_T5	Percent of departed RNs and LPNs with tenure greater than 5 years	Num	Payroll & Personnel	**Definition:** Number of RNs and LPNs that departed during the reporting period whose tenure was greater than five years divided by the number of RNs and LPNs who departed during the reporting period. **Variable Name:** Same as Percent of departed CNAs with tenure greater than 5 years. **Data Structure:** Same as Percent of departed CNAs with tenure greater than 5 years.
YF_DN_TTD_T5 YFFT_DN_TTD_T5 YFPT_DN_TTD_T5	Percent of departed DONs with tenure greater than 5 years	Num	Payroll & Personnel	**Definition:** Number of DONs that departed during the reporting period whose tenure was greater than five years divided by the number of DONs that departed during the reporting period. **Variable Name:** Same as Percent of departed CNAs with tenure greater than 5 years. **Data Structure:** Same as Percent of departed CNAs with tenure greater than 5 years.
YF_TD_TTD_T5 YFFT_TD_TTD_T5 YFPT_TD_TTD_T5	Percent of departed DONs and ADONs with tenure greater than 5 years	Num	Payroll & Personnel	**Definition:** Number of DONs and ADONs that departed during the reporting period whose tenure was greater than five years divided by the number of DONs and ADONs who departed during the reporting period. **Variable Name:** Same as Percent of departed CNAs with tenure greater than 5 years. **Data Structure:** Same as Percent of departed CNAs with tenure greater than 5 years.

Staff Turnover, Retention, and Tenure Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_TL_TTD_T5 YFFT_TL_TTD_T5 YFPT_TL_TTD_T5	Percent of departed licensed staff with tenure greater than 5 years	Num	Payroll & Personnel	**Definition:** Number of licensed staff that departed during the reporting period whose tenure was greater than five years divided by the number of licensed staff that departed during the reporting period. **Variable Name:** Same as Percent of departed CNAs with tenure greater than 5 years. **Data Structure:** Same as Percent of departed CNAs with tenure greater than 5 years.
YF_TN_TTD_T5 YFFT_TN_TTD_T5 YFPT_TN_TTD_T5	Percent of departed nursing staff with tenure greater than 5 years	Num	Payroll & Personnel	**Definition:** Number of nursing staff that departed during the reporting period whose tenure was greater than five years divided by the number of nursing staff who departed during the reporting period. **Variable Name:** Same as Percent of departed CNAs with tenure greater than 5 years. **Data Structure:** Same as Percent of departed CNAs with tenure greater than 5 years.
YF_AD_TTD_T5 YFFT_AD_TTD_T5 YFPT_AD_TTD_T5	Percent of departed administrators with tenure greater than 5 years	Num	Payroll & Personnel	**Definition:** Number of administrators that departed during the reporting period whose tenure was greater than five years divided by the number of administrators that departed during the reporting period. **Variable Name:** Same as Percent of departed CNAs with tenure greater than 5 years. **Data Structure:** Same as Percent of departed CNAs with tenure greater than 5 years.
YF_TE_TTD_T5 YFFT_TE_TTD_T5 YFPT_TE_TTD_T5	Percent of departed staff with tenure greater than 5 years	Num	Payroll & Personnel	**Definition:** Number of staff that departed during the reporting period whose tenure was greater than five years divided by the number of staff who departed during the reporting period. **Variable Name:** Same as Percent of departed CNAs with tenure greater than 5 years. **Data Structure:** Same as Percent of departed CNAs with tenure greater than 5 years.

Staff Turnover, Retention, and Tenure Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_CN_TTD_E1 YFFT_CN_TTD_E1 YFPT_CN_TTD_E1	Percent of employed CNAs with TTD greater than 1 year	Num	Payroll & Personnel	**Definition:** Number of CNAs employed at the end of the reporting period whose TTD was greater than one year divided by the number of CNAs employed at the end of the reporting period. **Variable Name:** In the first segment of the variable name, the first character of the variable (Y) indicates that the measure is an annual measure (due to limitations of the data file measures could not be computed annually so nine month measures were calculated in place of annual measures). The second character is an F indicating the data are at a facility level. The third and forth characters (when present) indicate whether the measure is based on all employees (no third and fourth characters), full-time employees (FT) or part-time employees (PT). The second segment indicates the staffing group or groups (as described in the JobCat, Licensed, and Nursing measure definitions). The third segment indicates the type of measure (TTD=tenure to date). Finally the first character of the fourth segment indicates whether the measure includes departed/terminated (T) employees or employees currently employed (E) and the second character indicates the tenure length of interest (1=tenure greater than 1 year; 5=tenure greater than 5 years). **Data Structure:** Length of employment is referred to as tenure for departed employees and tenure to date (TTD) for employed staff. Calculation of tenure measures requires a valid Hire/Start Date and therefore only those employees with both payroll and personnel data were included in this measure. TTD is defined as the number of days lapsed between the most recent hire/start date (obtained from the personnel data) and CY end date (obtained from payroll data). This measure includes only those individuals who were still employed at the end of the reporting period (i.e., CY end date after 09/30/2003). The measure was calculated across the entire reporting period (January-September, 2003).
YF_LP_TTD_E1 YFFT_LP_TTD_E1 YFPT_LP_TTD_E1	Percent of employed LPNs with TTD greater than 1 year	Num	Payroll & Personnel	**Definition:** Number of LPNs employed at the end of the reporting period whose TTD was greater than one year divided by the number of LPNs employed at the end of the reporting period. **Variable Name:** Same as Percent of employed CNAs with TTD greater than 1 year. **Data Structure:** Same as Percent of employed CNAs with TTD greater than 1 year.

Staff Turnover, Retention, and Tenure Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_RN_TTD_E1 YFFT_RN_TTD_E1 YFPT_RN_TTD_E1	Percent of employed RNs with TTD greater than 1 year	Num	Payroll & Personnel	**Definition:** Number of RNs employed at the end of the reporting period whose TTD was greater than one year divided by the number of RNs employed at the end of the reporting period. **Variable Name:** Same as Percent of employed CNAs with TTD greater than 1 year. **Data Structure:** Same as Percent of employed CNAs with TTD greater than 1 year.
YF_RL_TTD_E1 YFFT_RL_TTD_E1 YFPT_RL_TTD_E1	Percent of employed RNs and LPNs with TTD greater than 1 year	Num	Payroll & Personnel	**Definition:** Number of RNs and LPNs employed at the end of the reporting period whose TTD was greater than one year divided by the number of RNs and LPNs employed at the end of the reporting period. **Variable Name:** Same as Percent of employed CNAs with TTD greater than 1 year. **Data Structure:** Same as Percent of employed CNAs with TTD greater than 1 year.
YF_DN_TTD_E1 YFFT_DN_TTD_E1 YFPT_DN_TTD_E1	Percent of employed DONs with TTD greater than 1 year	Num	Payroll & Personnel	**Definition:** Number of DONs employed at the end of the reporting period whose TTD was greater than one year divided by the number of DONs employed at then end of the reporting period. **Variable Name:** Same as Percent of employed CNAs with TTD greater than 1 year. **Data Structure:** Same as Percent of employed CNAs with TTD greater than 1 year.
YF_TD_TTD_E1 YFFT_TD_TTD_E1 YFPT_TD_TTD_E1	Percent of employed DONs and ADONs with TTD greater than 1 year	Num	Payroll & Personnel	**Definition:** Number of DONs and ADONs employed at the end of the reporting period whose TTD was greater than one year divided by the number of DONs and ADONs employed at the end of the reporting period. **Variable Name:** Same as Percent of employed CNAs with TTD greater than 1 year. **Data Structure:** Same as Percent of employed CNAs with TTD greater than 1 year.

Staff Turnover, Retention, and Tenure Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_TL_TTD_E1 YFFT_TL_TTD_E1 YFPT_TL_TTD_E1	Percent of employed licensed staff with TTD greater than 1 year	Num	Payroll & Personnel	**Definition:** Number of licensed staff employed at the end of the reporting period whose TTD was greater than one year divided by the number of licensed staff employed at the end of the reporting period. **Variable Name:** Same as Percent of employed CNAs with TTD greater than 1 year. **Data Structure:** Same as Percent of employed CNAs with TTD greater than 1 year.
YF_TN_TTD_E1 YFFT_TN_TTD_E1 YFPT_TN_TTD_E1	Percent of employed nursing staff with TTD greater than 1 year	Num	Payroll & Personnel	**Definition:** Number of nursing staff employed at the end of the reporting period whose TTD was greater than one year divided by the number of nursing staff employed at the end of the reporting period. **Variable Name:** Same as Percent of employed CNAs with TTD greater than 1 year. **Data Structure:** Same as Percent of employed CNAs with TTD greater than 1 year.
YF_AD_TTD_E1 YFFT_AD_TTD_E1 YFPT_AD_TTD_E1	Percent of employed administrators with TTD greater than 1 year	Num	Payroll & Personnel	**Definition:** Number of administrators employed at the end of the reporting period whose TTD was greater than one year divided by the number of administrators employed at the end of the reporting period. **Variable Name:** Same as Percent of employed CNAs with TTD greater than 1 year. **Data Structure:** Same as Percent of employed CNAs with TTD greater than 1 year.
YF_TE_TTD_E1 YFFT_TE_TTD_E1 YFPT_TE_TTD_E1	Percent of employed staff with TTD greater than 1 year	Num	Payroll & Personnel	**Definition:** Number of staff employed at the end of the reporting period whose TTD was greater than one year divided by the number of staff employed at the end of the reporting period. **Variable Name:** Same as Percent of employed CNAs with TTD greater than 1 year. **Data Structure:** Same as Percent of employed CNAs with TTD greater than 1 year.

Staff Turnover, Retention, and Tenure Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_CN_TTD_E5 YFFT_CN_TTD_E5 YFPT_CN_TTD_E5	Percent of employed CNAs with TTD greater than 5 years	Num	Payroll & Personnel	**Definition:** Number of CNAs employed at the end of the reporting period whose TTD was greater than five years divided by the number of CNAs employed at the end of the reporting period. **Variable Name:** In the first segment of the variable name, the first character of the variable (Y) indicates that the measure is an annual measure (due to limitations of the data file measures could not be computed annually so nine month measures were calculated in place of annual measures). The second character is an F indicating the data are at a facility level. The third and forth characters (when present) indicate whether the measure is based on all employees (no third and fourth characters), full-time employees (FT) or part-time employees (PT). The second segment indicates the staffing group or groups (as described in the JobCat, Licensed, and Nursing measure definitions). The third segment indicates the type of measure (TTD=tenure to date). Finally the first character of the fourth segment indicates whether the measure includes departed/terminated (T) employees or employees currently employed (E) and the second character indicates the tenure length of interest (1=tenure greater than 1 year; 5=tenure greater than 5 years). **Data Structure:** Calculation of the tenure to date variable requires a valid Hire/Start Date and therefore only those employees with both payroll and personnel data were included in this measure. TTD is defined as the number of days lapsed between the most recent hire/start date (obtained from the personnel data) and CY end date (obtained from payroll data). This measure includes only those individuals who were still employed at the end of the reporting period (i.e., CY end date after 09/30/2003). The measure was calculated across the entire reporting period (January-September, 2003).
YF_LP_TTD_T5 YFFT_LP_TTD_T5 YFPT_LP_TTD_T5	Percent of employed LPNs with TTD greater than 5 years	Num	Payroll & Personnel	**Definition:** Number of LPNs employed at the end of the reporting period whose TTD was greater than five years divided by the number of LPNs employed at the end of the reporting period. **Variable Name:** Same as Percent of employed CNAs with TTD greater than 5 years. **Data Structure:** Same as Percent of employed CNAs with TTD greater than 5 years.

Staff Turnover, Retention, and Tenure Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_RN_TTD_E5 YFFT_RN_TTD_E5 YFPT_RN_TTD_E5	Percent of employed RNs with TTD greater than 5 years	Num	Payroll & Personnel	**Definition:** Number of RNs employed at the end of the reporting period whose TTD was greater than five years divided by the number of RNs employed at the end of the reporting period. **Variable Name:** Same as Percent of employed CNAs with TTD greater than 5 years. **Data Structure:** Same as Percent of employed CNAs with TTD greater than 5 years.
YF_RL_TTD_E5 YFFT_RL_TTD_E5 YFPT_RL_TTD_E5	Percent of employed RNs and LPNs with TTD greater than 5 years	Num	Payroll & Personnel	**Definition:** Number of RNs and LPNs employed at the end of the reporting period whose TTD was greater than five years divided by the number of RNs and LPNs employed at the end of the reporting period. **Variable Name:** Same as Percent of employed CNAs with TTD greater than 5 years. **Data Structure:** Same as Percent of employed CNAs with TTD greater than 5 years.
YF_DN_TTD_E5 YFFT_DN_TTD_E5 YFPT_DN_TTD_E5	Percent of employed DONs with TTD greater than 5 years	Num	Payroll & Personnel	**Definition:** Number of DONs employed at the end of the reporting period whose TTD was greater than five years divided by the number of DONs employed at then end of the reporting period. **Variable Name:** Same as Percent of employed CNAs with TTD greater than 5 years. **Data Structure:** Same as Percent of employed CNAs with TTD greater than 5 years.
YF_TD_TTD_E5 YFFT_TD_TTD_E5 YFPT_TD_TTD_E5	Percent of employed DONs and ADONs with TTD greater than 5 years	Num	Payroll & Personnel	**Definition:** Number of DONs and ADONs employed at the end of the reporting period whose TTD was greater than five years divided by the number of DONs and ADONs employed at the end of the reporting period. **Variable Name:** Same as Percent of employed CNAs with TTD greater than 5 years. **Data Structure:** Same as Percent of employed CNAs with TTD greater than 5 years.

Staff Turnover, Retention, and Tenure Variables

Variable Name	Label	Type	Data Source(s)	Definition and Comment
YF_TL_TTD_E5 YFFT_TL_TTD_E5 YFPT_TL_TTD_E5	Percent of employed licensed staff with TTD greater than 5 years	Num	Payroll & Personnel	**Definition:** Number of licensed staff employed at the end of the reporting period whose TTD was greater than five years divided by the number of licensed staff employed at the end of the reporting period. **Variable Name:** Same as Percent of employed CNAs with TTD greater than 5 years. **Data Structure:** Same as Percent of employed CNAs with TTD greater than 5 years.
YF_TN_TTD_E5 YFFT_TN_TTD_E5 YFPT_TN_TTD_E5	Percent of employed nursing staff with TTD greater than 5 years	Num	Payroll & Personnel	**Definition:** Number of nursing staff employed at the end of the reporting period whose TTD was greater than five years divided by the number of nursing staff employed at the end of the reporting period. **Variable Name:** Same as Percent of employed CNAs with TTD greater than 5 years. **Data Structure:** Same as Percent of employed CNAs with TTD greater than 5 years.
YF_AD_TTD_E5 YFFT_AD_TTD_E5 YFPT_AD_TTD_E5	Percent of employed administrators with TTD greater than 5 years	Num	Payroll & Personnel	**Definition:** Number of administrators employed at the end of the reporting period whose TTD was greater than five years divided by the number of administrators employed at the end of the reporting period. **Variable Name:** Same as Percent of employed CNAs with TTD greater than 5 years. **Data Structure:** Same as Percent of employed CNAs with TTD greater than 5 years.
YF_TE_TTD_E5 YFFT_TE_TTD_E5 YFPT_TE_TTD_E5	Percent of employed staff with TTD greater than 5 years	Num	Payroll & Personnel	**Definition:** Number of staff employed at the end of the reporting period whose TTD was greater than five years divided by the number of staff employed at the end of the reporting period. **Variable Name:** Same as Percent of employed CNAs with TTD greater than 5 years. **Data Structure:** Same as Percent of employed CNAs with TTD greater than 5 years.

4. Appendix - Data Request Specifications

Date

Name
Address
Address

Dear ,

The Colorado Foundation for Medical Care has been awarded a contract from the Centers for Medicare & Medicaid Services to develop a nursing home staffing measure(s) that can be appropriately used as a quality measure for public reporting. Note that it is not the intent of the project to address the issue of minimum staffing levels. The University of Colorado Health Sciences Center, Abt Associates, and the University of Missouri join CFMC in this effort.

Specifically the project is addressing:
- Review of relevant studies to gain an understanding of the "state of the art" in measurement of staffing.
- Consultation of experts through the use of a panel of recognized leaders in this field.
- Determination of the aspects of staffing that matter most to our stakeholders.
- Investigation of options for collection of the relevant staffing data.
- Construction of a draft measure or measures.
- Analysis of the relationship of draft measures with quality outcomes using existing data.

Toward this goal, CFMC has been working with several nursing home corporations on obtaining pilot payroll, census, and employment status data for a one-month period of time for a single nursing home. Five nursing home corporations provided data during this initial phase of the project. We anticipate approximately ten nursing home

organizations will contribute data for our second data request. Based on a review of the initial data we have gained a better understanding of what is feasible to request from nursing homes with regard to payroll, census, and employment data and are now ready to proceed with a larger data request to support the project goals specified above.

By providing data for the project your organization is contributing to:
- Development of what is feasible for facilities to submit
- Development of a large data set so that variation and consistencies can be tested as well as a viable data set to develop the best QM for public reporting in the industry
- Testing of an accurate staffing quality measure
- Testing of a variety of staffing quality measures that will best meet stakeholder and industry needs

We are requesting payroll, census, and employment status data for calendar year (CY) 2003 for all facilities within your organization. Following is a summary of the data being requested.

Payroll Data
- *Shift Data (Preferred)* - In order to compute several of the staffing measures of interest, we are requesting payroll data in its most unaggregated form -- raw time-clock data recording clock-in and clock-out times.

- *Pay Period Data* - If a facility is **unable** to report employee hours by shift, we are requesting the number of hours worked by each employee for each pay period in CY 2003. For example, if employees are paid every two weeks and an employee worked the entire year, 26 payroll records would be provided for that employee.

Census Data
- We are requesting daily census data by payer source for CY 2003.

Employment Status Data
- In order to test turnover and retention measures, we are requesting dates of hire and termination for all staff that worked at least one day at a facility during CY 2003.

Although we are requesting data from all facilities within your organization, we recognize that some facilities may not be able to submit some or all of the requested data. The project team is sensitive to your concerns. To aide in future requests and recommendations, we would like to obtain information on the number of facilities

within your organization that will be able to submit data and the number that will not be able to submit data. Additionally, information on barriers encountered for those facilities that will not be able to provide data is requested.

We are asking that all data files be submitted to CFMC no later than July 19, 2004. Files may be sent to CFMC via UPS and paid for through third party billing to CMFC. Additional enclosures with this letter describe the formats for data submission and packaging.

We would like to contact you the week of June 28, 2004 to discuss the progression of this data request and review any questions or concerns you have regarding the requested data, timeline, and/or data submission format. If you have questions prior to that call, please do not hesitate to contact either of the data team members indicated below. We are available to help you in any way possible.

We appreciate your interest and involvement in this project and look forward to working with you on this data request.

Sincerely,

Kris Mattivi   Terry Eilertsen
Colorado Foundation for Medical Care   University of Colorado Health Sciences
                                                   Center
Phone: (303) 306-4510   Phone: (303) 724-2436
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Enclosures

Data Specifications

Data specifications are provided below for each file, including variable name (data item), variable description, format (size), and comments. The four file types are:

1. Payroll data by shift (Preferred)
2. Payroll data by pay period (alternate format when shift level data cannot be obtained)
3. Census data
4. Employment status data

Data can be submitted in comma delimited ASCII format or in Microsoft Excel spreadsheet format (please note that MS Excel has a limit of 65,532 rows per workbook). Data submitted in Microsoft Excel spreadsheet format should use the variable names provided in the specifications for the corresponding column labels.

ASCII Comma Delimited File Conventions

1. Data items should appear in the order presented in the data specification tables below.
2. All data items should be delimited by a comma
3. When an item is missing, leave it blank. No other fill characters should be used (e.g., -_).

    Incorrect: 3,-, 4
    Correct: 3,,4

4. When submitting Text (strings) fields do not include text qualifiers (e.g., " ")

    Incorrect: "text","text1","text2"
    Correct: text,text1,text2

Time Frame for Data Request

We are requesting data for calendar year 2003 -- chains and/or facilities can determine how to parse out the data for submission. For example, a file could contain shift data for a single pay period, a month, a quarter, or for the full year.

Submission Information

Data can be submitted on CD or DVD. Files may be sent to CFMC via UPS as described previously. The CFMC billing number is X99280. We recommend that you use "three day select" for the UPS mailing. Please place the CD/DVD in a double envelope marked confidential in order to comply with HIPAA requirements.

Payroll Data by Shift File Specifications (Preferred Payroll Data Submission)
A file contains one or more employee records for one or more facilities. An employee record contains information for a single employee for a single shift at a specific facility.

Variable	Description	Format (Size)	Comments
Medicare Provider Number	The Medicare Provider Number is a six-digit number where the first two digits identify the state (e.g., Colorado is 06) and the 3rd-6th digits uniquely identify the facility and range from 5000 to 6399 (the 3rd digit can be a U, Y, or Z, if the facility is a swing-bed unit in a hospital).	Text (6)	
State Assigned Unique Facility ID Code (FAC_ID)	This facility ID code is assigned by the state to each facility for submission of MDS data to the state system	Text (16)	
Facility State Code	Valid 2 character state code (e.g., AL - Alabama, AK - Alaska)	Text (2)	
Employee ID	The unique identifier for an employee	Text	
Actual Date In	Start date for a specific shift	Date (MM/DD/YYYY)	

Variable	Description	Format (Size)	Comments
Actual Time In	Start time for a specific shift	Date (HH:MM:DD)	
Actual Date Out	End date for a specific shift	Date (MM/DD/YYYY)	
Actual Time Out	End time for a specific shift	Date (HH:MM:DD)	
Job Code		Text	If job codes are not retained with the historical shift or payroll record, please provide documentation on how this information was obtained to create this file (e.g., job code was obtained from current employee file and reflects current job code).
Job Category (Description)		Text	Descriptions can be provided in this file or a list of all job codes and corresponding job categories can be provided separately.

Payroll Data Reported by Pay Period File Specifications

If a facility cannot generate payroll data by shift, employee data by pay period can be submitted. A file contains one or more employee records for one or more facilities. An employee record contains information for a single employee for a single pay period for a specific facility.

Variable	Description	Format	Comments
Medicare Provider Number	The Medicare Provider Number is a six-digit number where the first two digits identify the state (e.g., Colorado is 06) and the 3rd-6th digits uniquely identify the facility and range from 5000 to 6399 (the 3rd digit can be a U, Y, or Z, if the facility is a swing-bed unit in a hospital).	Text (6)	
State Assigned Unique Facility ID Code (FAC_ID)	This facility ID code is assigned by the state to each facility for submission of MDS data to the state system	Text (16)	
Facility State Code	Valid 2 character state code (e.g., AL - Alabama, AK - Alaska)	Text (2)	
Employee ID	The unique identifier for an employee.	Text	

Variable	Description	Format	Comments
Total productive hours	Total number of hours worked at the facility during the pay period. This number should not include hours for vacation leave, sick leave, etc.	Number (Single)	
Total nonproductive hours	Total number of leave (sick, vacation, administrative) hours paid during the pay period	Number (Single)	
Pay Period Start Date	First day for the pay period	Date (MM/DD/YYYY)	
Pay Period End Date	Last day for the pay period	Date (MM/DD/YYYY)	
Job Code		Text	If job codes are not retained with the historical shift or payroll record, please provide documentation on how this information was obtained to create this file (e.g., job code was obtained from current employee file and reflects current job code).
Job Category (Description)		Text	Descriptions can be provided in this file or a list of all job codes and corresponding job categories can be provided separately.
Special Shift Designation	Number of hours paid at a premium if the employee worked an evening, weekend, or holiday shift	Number (single)	If shift premiums can not be reported separately from other premiums (e.g., premium for excessive work hours) do not include

Census Data File Specifications

A file contains one or more census records for one or more facilities. A census record contains census information for a single day by payer source for a specific facility.

Variable	Description	Format	Comments
Medicare Provider Number	The Medicare Provider Number is a six-digit number where the first two digits identify the state (e.g., Colorado is 06) and the 3rd-6th digits uniquely identify the facility and range from 5000 to 6399 (the 3rd digit can be a U, Y, or Z, if the facility is a swing-bed unit in a hospital).	Text (6)	
State Assigned Unique Facility ID Code (FAC_ID)	This facility ID code is assigned by the state to each facility for submission of MDS data to the state system	Text (16)	
Facility State Code	Valid 2 character state code (e.g., AL - Alabama, AK - Alaska)	Text (2)	
Day		Date (MM/DD/YYYY)	
Payer Source: Private Pay	Number of residents paid by private pay	Number (Integer)	

Variable	Description	Format	Comments
Payer Source: Medicare	Number of residents paid by Medicare	Number (Integer)	
Payer Source: Medicaid	Number of residents paid by Medicaid	Number (Integer)	
Payer Source: Other	Number of residents paid by other payer sources	Number (Integer)	All residents must be classified into one of the payer source categories

Employment Status Data File Specifications

We are requesting employment status information for all staff that worked at least one day at a facility during CY 2003. A file contains one or more employee records for one or more facilities. An employee record contains employee information for a single employee for a specific facility.

Variable	Description	Format	Comments
Medicare Provider Number	The Medicare Provider Number is a six-digit number where the first two digits identify the state (e.g., Colorado is 06) and the 3rd-6th digits uniquely identify the facility and range from 5000 to 6399 (the 3rd digit can be a U, Y, or Z, if the facility is a swing-bed unit in a hospital).	Text (6)	
State Assigned Unique Facility ID Code (FAC_ID)	This facility ID code is assigned by the state to each facility for submission of MDS data to the state system	Text (16)	
Facility State Code	Valid 2 character state code (e.g., AL - Alabama, AK - Alaska)	Text (2)	
Employee ID	The unique identifier for an employee	Text (50)	
Employment Start Date		Date (MM/DD/YYYY)	

Variable	Description	Format	Comments
Employment Termination Date		Date (MM/DD/YYYY)	
Employment Rehire Date		Date (MM/DD/YYYY)	How are employee records managed for rehired personnel (e.g., a person who is rehired is considered a new employee and a new employee ID is assigned; a rehired employee retains his/her old employee ID but receives a rehire date)
Job Code		Number (Integer)	
Job Category/Description		Text (100)	
Reason for Termination (Optional)		Text (100)	A few staffing measures examine voluntary versus involuntary terminations.