Appendix A

Development of Staffing Quality Measures-Phase I: Continuation

Task 2: Relationship Between Staffing Measures and Community Discharge, Rehospitalization, and Post-Acute Care Quality Measures for Short-Stay Residents

Final Subtask Report

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1. Introduction

Public reporting of validated nursing home staffing measures that are rigorously defined and based on accurate data has become a national priority. In the spring of 2003, the National Quality Forum Nursing Home Steering Committee recommended that a nurse staffing quality measure be included in the set of nursing home quality measures that are reported to the public (1). The Institute of Medicine (IOM) 2004 report entitled, "Keeping Patients Safe: Transforming the Work Environment of Nurses" cited evidence for a relationship between nurse staffing and quality of care (2). This report also included recommendations relating to the collection and reporting of staffing data.

The Development of Staffing Quality Measures – Phase I (SQM) project was designed to review a range of staffing measures and data sources for longer-term use in public reporting of staffing quality measures for nursing homes. Specifically, the SQM project was charged with investigating payroll based staffing measures that may be related to quality of care, including staffing levels (staff hours per resident day), staff turnover, staff tenure, and staff mix. During Phase I of the SQM project, payroll, personnel, and census data were obtained from eight national nursing home corporations and a range of staffing measures was calculated. This report includes an analysis in these eight corporations of the relationship between payroll-based staffing measures and skilled nursing facility (SNF) quality measures of community discharge, rehospitalization, and the three publicly reported post-acute care quality measures (QMs).

Community discharge is a SNF outcome that is gaining traction as a performance measure. With 78% of SNF residents receiving rehabilitation services (3) and 43% expected to be discharged within 90 days (4), discharge is clearly a major goal of SNF care. Community discharge has been widely used in studies of rehabilitation and has been shown to be related to process quality measures in SNFs (5-9). A limited number of studies have examined the relationship between community discharge and measures of nursing home staffing derived from Online Survey Certification and Reporting (OSCAR) data and self-report. Significant associations between discharge home and both higher staffing levels for RNs and licensed nursing staff were found in early small studies (10). In recent studies using OSCAR staffing data and a database of all Medicare SNFs, Kramer and colleagues found that RN, licensed staffing, and to a lesser extent CNA levels, were associated with higher rates of community discharge (11;12). However, for other staffing measures the relationship between staffing and community discharge is less clear. For example, Halbur and Fears found that higher RN turnover was positively related to discharge rates (13). This unexpected finding may suggest that some turnover may be beneficial, e.g., turnover for those RNs who are dissatisfied with their positions.

For many other SNF residents, the goal is to stabilize, monitor, and prevent complications following acute medical or surgical care, avoiding the need for rehospitalization. Hospitalization has been used to measure quality of ambulatory care using ambulatory care sensitive conditions (14-16), as a publicly reported measure for home health care (1;17;18), and will be used in the CMS nursing home value based purchasing demonstration (19). For rehospitalization, Kramer and Fish found that lower staffing levels for RNs, licensed staff, and CNAs based on Medicaid claims data were associated with increased risk of rehospitalization (20). In these studies, they found that for all types of nursing staff, there was a strong relationship between staffing levels and risk for rehospitalization up to a high maximum threshold above which no further reduction

in risk was found. More recently, Kramer et al. also found relationships between facility rates of rehospitalization and staffing levels for RNs, licensed staff, and to a lesser extent CNAs after risk adjustment, using the national file including all SNFs (11;12).

Additional analyses will examine the relationship between payroll-based staffing measures and the three publicly reported post-acute care quality measures (QMs) that were reported in 2003: delirium, pain, and pressure ulcers (21). Because only about 50% of SNF admissions have a 14-day MDS completed, half of SNF stays are not included in the post-acute care QMs (3;22). Community discharge and rehospitalization can be measured on about 99% of SNF stays (23) so these measures include different samples of stays. More importantly an inverse relationship has been reported between the post-acute care QMs and both rehospitalization and community discharge across all SNFs (11;12). That is, low values of the post-acute care QMs (better quality) were associated with high rates of rehospitalization (poor quality), and with low rates of community discharge (poor quality). The reason this is important to this analysis is that if better staffing is associated with good quality for rehospitalization and community discharge, then it is possible that it will be associated with worse quality for the post-acute care QMs and vice versa. It would be unlikely therefore that the staffing measures will be validated by all of these quality measures, since they do not cross-validate.

Although several studies have found relationships between staffing measures (using OSCAR data, Medicaid cost reports, surveys, etc.) and both community discharge and rehospitalization, the relationship between payroll-based staffing measures and quality measures has not been examined. In particular, payroll data allow for computation of a richer set of quality measures, including turnover and tenure, that are more precisely defined and presumably more accurate than other data sources. Therefore, one of the major objectives of this phase of the project is to examine the relationship of staffing measures to outcome measures for Medicare SNF residents. This information will inform recommendations to CMS on those staffing measures that are related to SNF quality of care and are therefore the most likely candidate measures for public reporting in this population.

2. Methods

2.1 Data sources and sample

During Phase I of the SQM project, eight national nursing home corporations representing 1,453 individual nursing home facilities provided payroll and/or personnel records for every employee who worked during calendar year 2003, as well as census records for 2003. The individual data elements 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 data elements, we constructed facility-level measures of staffing levels, staff mix, turnover, retention, and tenure.

Staffing data from Phase I of the project were linked to the national DataPRO SNF Stay File, containing information on Medicare-covered SNF stays linked with the preceding qualifying hospitalization and any rehospitalizations. This file contains selected information from Medicare claims, the Minimum Data Set (MDS), and the Online Survey Certification and Reporting

(OSCAR) system. The MDS Assessment Data File for 2002-2004 and OSCAR-reported staffing levels for 2003 were also utilized. The OSCAR staffing data were obtained to examine the OSCAR staffing levels of the facilities in our sample relative to all SNFs. The OSCAR staffing data editing rules proposed by Abt Associates (24) were applied to the OSCAR-reported staffing levels.

All data sources were combined at the stay level to create a single analytic file. Studies of the stability and variability of the risk-adjusted outcome measures (community discharge and rehospitalization) indicated that a minimum sample of 25 or more stays (excluding deaths) over one year was required for estimates to be sufficiently stable (23). The analytic file for this project was therefore restricted to those SNFs with all sources of data and having at least 25 stays (excluding deaths) for the outcome under consideration, resulting in 1,272 facilities and 194,993 stays (slight variation due to available data for specific outcome measures) for 2003 (Table 1).

A separate data file of all MDS assessments for residents of the study facilities in 2003 was used to calculate the delirium, pain, and pressure ulcer QMs. The code for computing these measures was the same as the code used to compute the QMs for public reporting. The QM stays with QM scores were then matched to the facilities where staffing data were available including the full set of case mix measures included in the previous file. This included 99,259 stays in 1,228 facilities in 2003 for any of the QMs. However, only 75,913 were available for the pressure ulcer QM because it required both the 5- and 14-day MDS. Thus, fewer facilities and about 50% of the stays were included in the delirium and pain QM analyses and less than 10% of stays were included in the pressure ulcer QM analyses because of attrition for these measures.

2.2 Measures

2.2.1 Short-stay outcome measures:

Community discharge was defined as direct discharge from the SNF to home or assisted living. However, if a resident was discharged to the community but then hospitalized within one day, the stay was reclassified as a rehospitalization and not a community discharge. This measure was assessed at 100 days after SNF admission, and excluded residents who died in the SNF before 100 days.

The rehospitalization measure was limited to hospitalizations for heart failure, electrolyte imbalance, respiratory infection, sepsis, or UTI — conditions for which rehospitalization may be potentially avoidable. (11;20;23) Rehospitalization was defined as an admission to an acute care or critical access hospital. Any such hospitalization that occurred within one day of SNF discharge (regardless of discharge location) was considered a rehospitalization. This measure was assessed at 100 days after SNF admission, and excluded residents who died in the SNF before 100 days.

The Quality Measures (QM), delirium, moderate to severe pain, and presence of pressure ulcers were defined according to the National Nursing Home Quality Measures prepared by Abt Associates. Delirium in a resident was defined as new onset or worsening of a resident being easily distracted, having periods of altered perception or awareness, episodes of disorganized

speech, or periods of restlessness, or whose mental function varied over the course of the day on the resident's 14-day MDS assessment. Moderate to severe pain was defined as having daily moderate to severe pain on the 14-day MDS assessment. Pressure sores were defined as new onset or worsening of pressure sores between the 5- and 14-day MDS assessments.

2.2.2 Stay level case mix measures:

Candidate measures for case mix adjustment included age, presence of advance directives, the Barthel Index (a measure of functional independence, ranging from 0 most dependent to 90 most independent), the Cognitive Performance Scale (a measure of cognitive impairment, ranging from 0 least impaired to 6 most impaired), selected MDS items (the bowel incontinence scale, presence of indwelling catheter, feeding tube, and parenteral/IV feeding tube, and presence of pressure ulcers) a weighted comorbidity index, selected comorbid conditions (cardiac arrhythmia, COPD, dementia, fluid/electrolyte disorder, fracture, genitourinary condition, hypertension, musculoskeletal disease, nervous system disorder, respiratory disease, skin disorder, and valvular disease), and length of stay of the qualifying hospitalization. These measures were selected based upon review of the literature, clinical considerations, and review of correlations.

2.2.3 Facility characteristic measures:

Measures of facility characteristics for descriptive analyses included hospital-based/freestanding, urban/rural, chain membership, ownership, size, state, and region. Additionally, urban/rural and region were considered as potential covariates for the analyses examining the relationship between outcome measures and staffing.

2.2.4 Payroll-based staffing measures:

The analyses presented in this report examined four categories of staffing measures: staff hours per resident day (i.e., staffing levels), position turnover, percent of staff classified as short-term, and staff tenure. Measures for each staffing category were examined for RN, RN+DON+ADON, LPN, CNA, and LPN+RN. All measures were calculated using payroll data for the first nine months of calendar year 2003 due to missing data for the last quarter. For the purposes of this report, we refer to this nine-month period as an annual period. A detailed description of staffing measure definitions is included in the SQM Phase I final report (25).

During Phase I, facilities were requested to provide daily census data; however two corporations provided annual census data. Due to a concern regarding the potential lack of variability in the denominator, a test of mean and variance differences for hours/resident day measures using daily versus annual census as the denominator was performed (Table 2). Analysis of variance, including Levene's test for homogeneity of variance, was conducted to determine if the two measures differed with regard to the mean and variance as a function of using daily versus average annual census and the difference was not significant. Therefore, to include all facilities, we used annual census.

One corporation, representing 244 facilities, was unable to provide productive hours but did provide total hours (productive and non-productive hours). Analyses conducted during Phase I

of the project demonstrated that productive hours represent 93% of total hours across all staff categories (25). Therefore, the total hours for these facilities, were multiplied by .93 to estimate productive hours and permit inclusion of these facilities in the analyses of staffing level measures.

The staffing level measures were calculated by dividing the total number of productive hours for any particular category of staff (RN, LPN, CNA, RN+DON+ADON, LPN+RN) in a given time interval by the annual census.

Position turnover was defined as the percent of staff by job category (RN, LPN, CNA, RN+DON+ADON, LPN+RN) that departed during the reporting period based on the average number of positions at the facility during the reporting period.

Percent of short-term employees was defined as the percent of employees who departed within 60 days from their start date during the reporting period.

Staff tenure was defined as the number of months of employment by job category for all staff that worked at least one day during calendar year 2003.

Table 1 presents the number of nursing homes by corporation for which data are available for the three categories of staffing measures (staff levels, turnover/short-term, and tenure). Unfortunately, only four corporations were able to submit personnel records, and therefore, tenure measures could only be calculated for facilities within these four corporations.

2.3 Analytic approach

2.3.1 Descriptive analyses:

Descriptive statistics for facility case mix (age, average Barthel) and characteristics (hospital based, for profit, urban) were examined for the SQM facilities and all SNF facilities with at least 25 resident stays for calendar year 2003. In addition, descriptive statistics, including measures of distribution, were examined for the two outcome measures and the staffing measures of interest. As facilities are nested within corporations, intraclass correlation coefficients (ICCs) for each staffing measure and the two outcome measures were examined to determine what portion of the variance in the measure is between corporation variance. Correlations among job categories within each staffing measure category were examined using Pearson's correlation coefficient.

2.3.2 Multivariate analyses – Relationship between payroll-based staffing measures and outcome measures:

Due to the clustered nature of the data (e.g., residents are nested within facilities and facilities are nested within corporations), multilevel analyses were performed at the resident stay level to determine the relationship between facility-level staffing measures and quality. The Generalized Linear Model (GLM) framework was applied with Generalized Estimation Equations (GEE) as these are methods of parameter estimation for correlated data. If correlation is not taken into account, the standard errors of the parameter estimates will not be valid and hypothesis testing results will not be replicable.

The analyses examined the relationship between the quality measures at the stay level for four categories of staffing measures: staff hours per resident day, position turnover, percent of staff classified as short-term, and staff tenure. Measures of facility characteristics including urban/rural, size, and region were used as covariates. Other covariates used in the analyses were at the resident stay level (e.g., age, gender, Barthel Index, etc.). All models accounted for corporation clustering effects.

We selected variables for risk adjustment from the list of candidate variables by conducting a series of ordinary least squares (OLS) regressions on the different samples because the sample was slightly different for the different types of staffing measures (i.e., hours per resident day, turnover, tenure, percent of short-term employees) and the different quality measures. Stepwise regression was conducted first to identify potential variables using the set of candidate resident characteristics to select case mix measures that were most strongly associated with the quality measures within each sample. These models were all reviewed for stability and the directionality of the associations. Measures that remained significant and made clinical sense in any of the samples were retained and constituted the set of case mix variables entered into the model for all subsequent steps.

Next, for each staffing measure category (e.g., staff hours per resident day), the specific job category measure (e.g., RN hours per resident day) was individually entered into a GLM model while accounting for corporation clustering effects. After examining the independent contribution of each of the individual job category measures, combinations of significant staffing measure categories (e.g., RN, LPN, CNA) for each set of staffing measures were entered into the model simultaneously. A limited number of facility characteristics (urban, region, number of stays) were included in the models to determine whether staffing effects (if identified) could be explained by facility characteristics. We were unable to examine several facility characteristics that are likely of interest due to the relatively homogeneous nature of our sample (e.g., nearly all facilities are for profit, free standing, chains).

2.3.3 Multivariate analyses – Relationships between quintiles of payroll-based staffing measures and outcome measures:

To determine whether the relationships between staffing measures and quality were linear, two of the staffing measures (tenure and turnover) were broken down by quintiles for each staffing category. Relationships were analyzed using GLM applied with GEE, controlling for case mix differences, facility characteristics and accounting for corporation clustering effects. All models were adjusted for other continuous staffing categories (e.g., RN quintiles, LPN, CNA).

3. Results

3.1 Characteristics of SQM facilities and all SNF facilities

Table 3 presents facility-level case mix measures and facility characteristics for SQM facilities and all SNFs with at least 25 resident stays during 2003. Facility case mix measures for the SQM sample were very similar to the SNF population as a whole. However, several differences exist in facility characteristics. There was only one hospital-based facility in the SQM sample, and the SQM sample had a higher percentage of facilities that were for-profit, chain affiliated, or

located in rural areas. Therefore, findings from these analyses may not generalize to the entire population of SNFs, particularly those that are hospital-based and/or not affiliated with a chain.

3.2 Descriptive statistics for SQM outcome and staffing measures

Despite the selection of facilities within only eight corporations, substantial variation existed across facilities in all staffing measures (Table 4). Some of the low staffing levels result from the fact that these payroll data do not include contract staff, lowering the staff levels in facilities that use substantial contract staff. Staffing levels varied for all types of staff and measures of turnover and tenure were particularly variable across facilities. Some of this variability, however, was far greater across corporation than within corporation, leading to the high intraclass correlation coefficients for CNA staffing levels, and tenure measures. The staffing levels also show that on average facilities had 0.05 hours per resident day of DON and ADON time, which represented about 15% of total RN staffing. The outcome measures also varied substantially across facilities; however, rehospitalization rates were highly clustered within corporations as represented by the intraclass correlation coefficient. Hence, the use of GLM applied with GEE.

3.3 Correlations between staffing measures

Associations between staff types (RN, RN+DON+ADON, LPN, and CNA) for each of the staffing measure categories are shown in Table 5. For the turnover and tenure measures, moderate to strong associations were found across all three categories suggesting that measures of employee turnover and tenure may be determined by facility-wide factors that influence job satisfaction throughout the organization. The associations across the three categories for hours per resident day were generally modest except for the inverse correlation between RN and LPN, which reflects the substitution that can occur within facilities between RNs and LPNs. The high correlation between RN and RN+DON+DON reflects the fact that 85% of the latter group is the RN group and also there seem to be similarities between RN and the DON/ADON positions for most staffing measures.

3.4 Relationship between payroll-based staffing measures and quality

3.4.1 Hours per resident day and quality:

After controlling for case mix differences, each of the staffing level categories was entered into the model separately. As shown in Tables 6 and 7, more time per resident day in the RN, RN+DON+ADON, and LPN+RN categories were significantly related to higher odds of community discharge and lower odds of rehospitalization for RN and RN+DON+ADON categories. For every 15 more RN minutes per resident per day, there was a 19% greater chance for community discharge (AOR 1.19) (adjusted odds ratio) and an 8% lower chance of rehospitalization (AOR 0.92) without other staffing variables or facility characteristics in the model. Each 15 minutes per resident day of CNA time was associated with only a (6%) increased likelihood of community discharge rates, and a (1%) decreased likelihood of rehospitalization, which were not statistically significant in our sample. After controlling for facility characteristics, the RN, RN+DON+ADON, and LPN+RN categories were still positively and significantly related to community discharge and the CNA category was very modestly

associated with community discharge. RN and RN+DON+ADON categories also still had a significant inverse relationship with rehospitalization, after controlling for facility case mix. When the staffing categories were analyzed collectively, the RN, RN+DON+ADON, and LPN+RN categories all maintained significant relationships with community discharge and CNA maintained a more modest significant relationship, suggesting that both RN levels and licensed staff levels are strong predictors of community discharge, and CNA staffing is also significant but has a weaker association than licensed staff. Only the RN and RN+DON+ADON categories maintained a significant inverse relationship with rehospitalization, suggesting that RN staffing rather than LPN or CNA staff impact rehospitalization.

As shown in Table 8, higher (worse scores) on the delirium QM were associated with higher staffing levels for CNAs and licensed staff, even after adjusting for case mix and facility characteristics. Table 9 shows that higher scores (worse scores) on the pain QM were not associated with CNA staffing, but were associated with lower levels of LPN staffing and to a lesser extent licensed staffing after controlling for case mix and facility characteristics. Table 10 shows that higher scores (worse scores) for the pressure ulcer QM were associated with higher levels of LPN staffing and to a lesser extent total licensed staffing. Although the relationship between the pain QM and LPN and licensed staffing is in the same direction as the relationships between staffing levels and both hospitalization and community discharge, higher staffing levels were associated with worse quality on the delirium and pressure ulcer QMs.

3.4.2 Staff turnover and quality:

When entering turnover by individual staffing categories and adjusting for case mix, residents were less likely to be discharged with higher turnover rates in RNs, RN+DON+ADONs, and LPN+RNs (i.e., odds of community discharge decreased by 3% for every 25% more turnover among RNs) (Table 6). When also adjusting for facility characteristics, higher LPN turnover was significantly associated with lower odds of community discharge, but CNA turnover was not significantly associated with community discharge. As hypothesized, higher turnover for RNs and licensed staff increased the odds of rehospitalization (Table 7).

Lower turnover for CNAs, LPNs, and total licensed staff (better staffing) were all associated with higher rates of delirium, worse quality (Table 8). Turnover for any type of staff was not significantly related to either the pain QM or the pressure ulcer QM (Tables 9 and 10).

3.4.3 Percent of short-term employees by staff type and quality:

When entering percent of short-term employees by individual staffing categories into models and adjusting for case mix, residents were less likely to be discharged with higher percentages of short-term LPNs, RNs, RN+DON+ADONs, and LPN+RNs (i.e., odds of community discharge decreased by 7% for every 10% more short-term LPN+RNs). When also adjusting for facility characteristics, percent of short-term employees in these same categories were still significantly associated with lower odds of community discharge. As expected, higher percent of short-term employees among these same categories increased odds of rehospitalization.

Consistent with the turnover analysis, a lower percent of short-term employees (better staffing) was associated with higher rates of delirium (Table 8), and there was no association between short-term employees and both the pain and pressure ulcer QMs (Tables 9 and 10).

3.4.4 Average tenure by staff type and quality:

Greater tenure among CNAs (longer average employment) was associated with greater odds of rehospitalization and lower odds of community discharge (Tables 6 and 7). These results were the inverse of the relationships found among the other staffing categories, where longer tenure for RN and licensed staff was associated with significantly higher community discharge rates and lower rehospitalization rates. For every additional year of CNA tenure (on average), the odds of community discharge were at least 4% lower. Whereas, an additional year of tenure among licensed staff was associated with about a 4% increase in odds of community discharge, when controlling for CNA tenure and facility characteristics (Model 4b). The inverse was true for rehospitalization; longer licensed staff tenure was associated with reduced rehospitalization, but on average increased tenure for CNAs increased rehospitalization rates.

Longer tenure for CNAs and licensed staff to a lesser degree were associated with higher rates of delirium (Table 8), but there was no relationship between tenure and either the pain or the pressure ulcer QM (Tables 9 and 10).

3.5 Relationships between quintiles of payroll-based staffing measures and community discharge and rehospitalization

3.5.1 Quintiles of staff turnover and relationships to quality:

In order to further explore the nature of the relationships between quality and staff turnover, staff turnover for each staffing category was broken down into quintiles. Figure 1 shows that the relationship between staff turnover and community discharge for CNA, LPN, RN, and RN+DON+ADON staffing categories was generally linear. In particular, the LPN and LPN+RN categories showed steadily decreasing odds of community discharge as turnover increased.

Figure 2 shows the odds of rehospitalization remained roughly constant for RN and RN+DON+ADON until the highest quintile for turnover, at which point there was an increase in rehospitalization rates. For CNAs, LPNs, and RN+LPNs, the upside down U pattern was seen suggesting that turnover in these staffing categories increased the odds of rehospitalization up to a point (about the middle quintile), after which additional turnover was associated with declining rehospitalization rates. Thus, staff turnover does not have a linear relationship with rehospitalization for any category of staff.

3.5.2 Quintiles of staff tenure and relationships to quality:

Greater tenure among all staffing groups, except for CNAs, showed increasing odds of community discharge (Figure 3) and steadily declining odds of rehospitalization (Figure 4) in a roughly linear fashion with some leveling after tenure reached the third to fourth quintile. While the first four quintiles of CNA tenure were associated with a moderate decline in community discharge, CNAs in the highest quintile for tenure, who were employed around 5-10 years

(Table 4), were most strongly associated with lower community discharge rates. Rehospitalization increased in a steady, relatively linear fashion as CNA tenure increased, suggesting that shorter tenure for CNAs was generally associated with lower rehospitalization rates. Given that the 10th percentile in CNA tenure was 1.51 years (Table 4), this means that when CNAs stayed longer than 1.5-2 years, hospitalization rates were higher.

4. Discussion

This paper examines the relationships between staffing measures based on payroll data and measures of quality for short-stay residents including: community discharge, rehospitalization, and the post-acute care QMs. The most striking finding is that measures for RNs with and without the inclusion of DONs and ADONs were most strongly associated with improved quality for community discharge and rehospitalization. Staffing levels, staff turnover, and staff tenure for RNs had a persistent and powerful association with these two outcomes. Total licensed staffing levels (RN+LPN) were also very strongly associated with community discharge rates, and so were LPN and licensed staff turnover and tenure. The magnitude of the effects of licensed staff measures were similar to RN staff alone for community discharge, suggesting that licensed staff as a group impact whether residents are discharged to the community. However, the licensed staff associations with rehospitalization were small and not significant in all cases except for an association with tenure.

CNA staffing levels had a very modest association with community discharge and almost no association with rehospitalization. The more modest association between CNA hours and outcomes is consistent with prior work (11). CNA turnover had no effect on community discharge or rehospitalization rates in this study. Longer tenure among CNAs in excess of 1.5-2 years was associated with higher rehospitalization rates and lower community discharge rates suggesting burn out among the CNA staff or lack of continuing education.

Relationships between staffing measures and the post-acute care QMs show a very different picture. In particular, worse quality (higher scores) on the delirium QM were associated with higher staffing levels for CNAs and licensed staff, lower turnover for CNAs and LPNs, and shorter tenure for CNAs and licensed staff. Worse quality (higher scores) for the pressure ulcer QM were also associated with higher staffing levels for LPNs and licensed staff, and had no association with turnover or tenure for any types of staff. Worse quality on the pain QM was associated with lower LPN staffing levels and to a lesser extent licensed staff, but there were no associations between pain and turnover nor tenure. The sample for the QM data was about half the sample for the other two measures because residents discharged or hospitalized before the 14-day MDS are not included. Presumably, if a facility discharges their healthiest residents to the community and/or provides treatment in the facility rather than hospitalizing residents who have severe pain, delirium, or pressure sores, they will score worse on the post-acute care QMs. Thus the QM sample is biased against facilities that do well on the other two measures, and it is not surprising that quality according to the QMs is inversely related to quality according to the community discharge and rehospitalization measures (11;12).

The problem for the current study is that we have to decide which of the measures provide a more valid standard against which to compare the staffing measures. Given the sampling bias of the QMs and the definitional and empirical issues that have been raised about the delirium and

pressure ulcer measures in particular (12;26;27), we will use the hospitalization and community discharge quality measures as the standard against which to evaluate the staffing measures for short-stay residents.

These results suggest that staffing levels, turnover, and tenure for RN staff are the most critical issues with respect to quality for short-term residents, at least in terms of these two major outcomes. Licensed staff levels and turnover were strongly associated with community discharge, and LPN and licensed staff tenure were also strongly related to both outcomes. For the short-term residents, CNA levels, turnover, and tenure were not associated with improved quality, and longer CNA tenure was inversely related to quality. These findings suggest that for short-term residents, the emphasis on total staffing levels and CNA turnover and retention is misplaced. Given the skilled needs of Medicare residents, this is not counter-intuitive, but it goes against conventional wisdom. Perhaps findings will be different for the long-stay nursing home residents.

While the relative merits of these various staffing measures from payroll data are apparent from this analysis, generalizations from this analysis about relationships to quality should be made with caution. The data for this study were obtained from a self-selected group of eight corporations, so the sample is neither random nor representative of all facilities. Several of the measures were clustered within corporations limiting the statistical power of these comparisons even after accounting for clustering. Furthermore, these are quality measures for only the Medicare skilled population. Further research will examine additional measures that may be more related to CNA staffing and the long-stay population.

Based on this research, we recommend that for public reporting a high priority be placed on measures of RN staffing levels, turnover and tenure, and licensed staff turnover and tenure. We also recommend that the percent of short-term employees does not add sufficient new information about turnover to be included in measures for public reporting. This research also demonstrates that these staffing measures from payroll data provide the opportunity to investigate staffing issues in ways that are not possible from any other databases. The striking findings about RN staffing and turnover, and the nuanced tenure findings show the ways in which this rich array of staffing metrics enhance our understanding of nursing home staffing issues.

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6. Tables and Figures

Table 1: Number of Facilities per Corporation for Which Different Measures Can Be Created

Corporation	# of Stays	Staffing Level Measures (Annual Census)	Turnover and Short-stay Measures	Tenure Measures
1	43,782	334	-	-
2	30,800	133	133	133
3	14,049	165	167	167
4	10,207	51	51	-
5	40,296	242	242	242
6	39,642	244	244	-
7	11,342	72	81	81
8	4,875	31	31	-
Total	194,993	1272	949	623

Table 2: Test of Mean and Variance Differences for Hours/Resident Day Measures Using Daily Versus Annual Census as the Denominator (N=748)

	Daily Census		**Annual Census**			
	Mean	**SD**	**Mean**	**SD**	**P-value[1] Means**	**P-value Variance**
CNA	1.9686	0.4074	1.9675	0.4070	0.959	0.990
LPN	0.6487	0.2209	0.6484	0.2211	0.981	0.985
RN	0.2934	0.1613	0.2932	0.1610	0.976	0.967

[1] A p-value close to 1.0 indicates no differences between the two measures. A p-value below .05 would indicate that the measures differ as a function of using annual versus daily census.

Table 3: Comparison of Stay Measures Between SQM and SNF Populations (2003)

	SQM (n=190,983)[1]		SNF (n=2,032,200)[2]	
	Mean[3]	Stdev	Mean	Stdev
Case Mix Indicators				
Age (years)	79.32	10.44	79.77	10.13
DNR orders	40.30%	49.05%	35.12%	47.74%
Barthel Index (0-90)[5]	35.02	24.09	37.15	23.72
Cognitive Performance Scale (0-6)[6]	2.04	1.82	1.82	1.83
Bowel incontinence scale (1-4) (MDS item H1a)[6]	1.48	1.77	1.29	1.71
Indwelling catheter (MDS item H3d)	23.80%	42.58%	25.19%	43.41%
Feeding tube (MDS item K5b)	7.40%	26.17%	7.53%	26.39%
Parenteral/IV feeding (MDS item K5a)	12.53%	33.11%	11.46%	31.86%
Pressure ulcer (MDS item M2a)	24.82%	43.20%	25.21%	43.42%
Rehabilitation RUG	75.33%	43.11%	77.56%	41.72%
Rehospitalization comorbidity index (-3.3 to 3.1)	0.41	0.40	0.41	0.40
Cardiac arrhythmia	27.57%	44.69%	28.20%	45.00%
COPD	24.33%	42.91%	24.10%	42.77%
Dementia	25.43%	43.55%	22.14%	41.52%
Fluid/Electrolyte disorder	32.10%	46.69%	31.37%	46.40%
Fracture	13.83%	34.52%	14.50%	35.21%
Genitourinary condition	37.45%	48.40%	36.21%	42.06%
Uncomplicated hypertension	41.17%	49.21%	42.32%	49.41%
Musculoskeletal disease	29.16%	45.45%	31.14%	46.31%
Nervous system disorder	25.99%	43.86%	24.22%	42.84%
Respiratory disease	26.94%	44.37%	26.87%	44.33%
Skin disorder	13.67%	34.35%	13.40%	34.06%
Valvular disease	8.98%	28.59%	9.39%	29.17%
LOS of qualifying hospital stay	31.80	24.04	26.11	24.04
OSCAR staffing levels[7]				
CNA hours per resident day	2.07	0.63	2.34	0.86
LPN hours per resident day	0.73	0.37	0.82	0.50
RN hours per resident day	0.32	0.21	0.46	0.61
Facility Characteristics				
Northeast	19.49	------	19.42	------
Midwest	31.10	------	31.44	------
South	34.92	------	34.21	------
West	14.50	------	14.93	------
Hospital-based	0.08	------	9.40	------
Freestanding	96.88	------	90.60	------
Urban	65.16	------	69.20	------
Rural	34.84	------	30.80	------
For-profit	87.14	------	68.25	------
Non-profit	12.78	------	27.29	------
Chain	96.88	------	57.22	------
Not chain	3.12	------	42.78	------

Table 3: Comparison of Stay Measures Between SQM and SNF Populations (2003) (Cont'd)

	SQM (n=190,983)[1]		SNF (n=2,032,200)[2]	
	Mean[3]	Stdev	Mean	Stdev
Number of stays per facility:				
25-50	9.82	------	13.71	------
51-100	27.51	------	27.98	------
101-200	39.67	------	33.29	------
201 or more	22.99	------	25.02	------

[1] Sample for SQM 2003 facilities with a minimum of 25 resident stays for the rehospitalization in 100 days measure.

[2] Sample for 2003 SNFs with a minimum of 25 resident stays for the rehospitalization in 100 days measure.

[3] Values are percentages unless otherwise noted.

[5] Higher values indicate better status.

[6] Lower values indicate better status.

[7] Oscar staffing measures used in this analysis exclude contract staff hours.

Table 4: Distributional Statistics of Staffing and Quality Measures

	n	Mean	Standard deviation	Corp ICC[1]	Minimum	10th Percentile	Median	90th Percentile	99th Percentile	Maximum
Staffing Measures										
Hours per resident day										
CNA	1272	1.97	.40	.37	0.005	1.58	1.95	2.39	3.30	4.50
LPN	1272	.64	.22	.10	0.04	0.36	0.63	0.90	1.18	2.48
RN	1272	.29	.17	.05	0.00	0.10	0.27	0.52	0.74	2.34
LPN+RN	1271	.93	.21	.07	0.09	0.67	0.92	1.17	1.51	2.07
RN/DON/ADON	1272	.34	.17	.06	0.00	0.14	0.31	0.56	0.78	2.65
Staff turnover										
CNA	948	77.7%	38.1%	.11	13.3%	36.7%	70.4%	125.7%	199.4%	277.6%
LPN	949	45.8%	28.8%	.10	0.0%	14.5%	40.3%	81.8%	138.5%	214.3%
RN	945	87.6%	68.2%	.11	0.0%	23.7%	71.4%	171.4%	313.0%	533.3%
LPN+RN	949	54.4%	29.1%	.12	5.2%	23.4%	48.9%	93.6%	146.3%	212.3%
RN/DON/ADON	949	61.6%	34.5%	.10	0.0%	24.7%	54.4%	107.4%	177.2%	236.4%
Percent of short-term employees										
CNA	949	21.6%	9.5%	.12	2.8%	10.9%	20.4%	33.9%	48.0%	92.1%
LPN	949	16.8%	10.8%	.09	0.0%	0.0%	16.0%	30.8%	44.8%	57.1%
RN	948	21.3%	15.6%	.07	0.0%	0.0%	20.0%	42.9%	66.7%	81.8%
LPN+RN	949	18.6%	9.5%	.11	0.0%	4.8%	17.6%	31.7%	44.4%	52.6%
RN/DON/ADON	949	16.6%	9.5%	.09	0.0%	5.3%	15.9%	29.2%	41.2%	52.6%
Average tenure										
CNA	623	3.22	1.61	.19	0.23	1.51	2.83	5.29	8.62	9.52
LPN	623	4.24	2.80	.19	0.46	1.55	3.65	7.67	14.28	17.85
RN	622	3.49	2.40	.21	0.24	1.07	2.92	6.55	11.39	13.84
LPN+RN	623	3.87	2.31	.25	0.47	1.57	3.30	7.01	11.87	13.16
RN/DON/ADON	623	3.41	2.02	.18	0.10	1.31	2.94	6.01	9.92	14.99
Quality Measures										
Community discharge (observed)	1283	27.5%	14.0%	.07	0.0%	11.2%	25.7%	46.6%	64.2%	82.1%
Rehospitalization (observed)	1283	18.1%	7.3%	.23	0.0%	8.5%	18.2%	27.9%	35.0%	40.3%
Delirium	1228	3.7%	6.4%	.003	0.0%	0.0%	1.3%	10.6%	26.3%	100.00%
Moderate/Severe Pain	1228	22.8%	14.9%	.02	0.0%	4.8%	20.6%	42.9%	68.2%	83.8%
Pressure Ulcers	1228	19.9%	11.7%	.005	0.0%	5.6%	18.4%	36.0%	51.2%	62.5%

[1] Intraclass correlations for corporation effects were calculated based on Howell (2007).

Table 5: Pearson's Correlation Statistics by Job Category Within Staffing Measure

Staffing Measure	CNA	LPN	RN
Hours Per Resident Day			
CNA			
LPN	.01		
RN	.13	-.31	
RN+DON+ADON	.10	-.15	1.00
Staff Turnover			
CNA			
LPN	.44		
RN	.35	.42	
RN+DON+ADON	.32	.39	.97
Percent of Short-Term Employees			
CNA			
LPN	.34		
RN	.24	.26	
RN+DON+ADON	.27	.27	.95
Average Tenure			
CNA			
LPN	.59		
RN	.51	.57	
RN+DON+ADON	.51	.62	.94

Table 6: Community Discharge Within 100 Days Regression Model Series – Stay Level

Staffing Measure	Model	Variables in model	n	CNA AOR (p)	LPN AOR (p)	RN AOR (p)	RN/DN AOR (p)	LPN+RN AOR (p)
Hours per resident day (per 15 min more)	1a	Case mix, each staffing measure individually	182,314	1.06 (.07)	1.04 (.32)	1.19 (<,.0001)	1.18 (<.0001)	1.18 (.002)
	1b	Model 1a, Facility Characteristics		1.01 (.01)	1.00 (.95)	1.10 (.005)	1.10 (.01)	1.07 (.03)
	2a	Case mix, CNA, LPN, RN staffing measures		1.05 (.21)	1.07 (.10)	1.19 (<.0001)		
	2b	Model 2a, Facility Characteristics		1.04 (.05)	1.01 (.62)	1.10 (.003)		
	3a	Case mix, CNA, LPN, RN/DN staffing measures		1.05 (.21)	1.07 (.11)		1.18 (.0008)	
	3b	Model 3a, Facility Characteristics		1.04 (.05)	1.01 (.68)		1.09 (.007)	
	4a	Case mix, CNA, LPN+RN staffing measures		1.05 (.19)				1.17 (.002)
	4b	Model 4a, Facility Characteristics		1.04 (.02)				1.06 (.06)
Staff turnover (per 25% more)	1a	Case mix, each staffing measure individually	143,190	.97 (.34)	.97 (.14)	.97 (.008)	.98 (.03)	.96 (.03)
	1b	Model 1a, Facility Characteristics		.98 (.38)	.94 (.001)	.98 (.0001)	.97 (.0001)	.94 (.006)
	2a	Case mix, CNA, LPN, RN staffing measures		.99 (.25)	.97 (<.0001)	1.00 (.72)		
	2b	Model 2a, Facility Characteristics		.99 (.24)	.97 (.0009)	1.00 (.22)		
	3a	Case mix, CNA, LPN, RN/DN staffing measures		.99 (.25)	.98 (<.0001)		1.00 (.88)	
	3b	Model 3a, Facility Characteristics		.99 (.26)	.97 (.002)		.99 (.11)	
	4a	Case mix, CNA, LPN+RN staffing measures		.98 (.14)				.98 (.03)
	4b	Model 4a, Facility Characteristics		.99 (.07)				.97 (.006)
Percent of short-term employees (per 10% more)	1a	Case mix, each staffing measure individually	143,300	.94 (.20)	.96 (.03)	.96 (.005)	.95 (.03)	.93 (.01)
	1b	Model1a, Facility Characteristics		.97 (.31)	.94 (<.0001)	.96 (<.0001)	.97 (<.0001)	.93 (<.0001)
Average tenure (per 1 year more)	1a	Case mix, each staffing measure individually	91,437	.96 (.07)	1.01 (.47)	1.01 (.31)	1.01 (.21)	1.01 (.37)
	1b	Model 1a, Facility Characteristics		.99 (.49)	1.02 (<.0001)	1.02 (.0004)	1.02 (<.0001)	1.03 (<.0001)
	2a	Case mix, CNA, LPN, RN staffing measures		.92 (<.0001)	1.02 (<.0001)	1.03 (.02)		
	2b	Model 2a, Facility Characteristics		.96 (<.0001)	1.02 (.0002)	1.03 (.005)		
	3a	Case mix, CNA, LPN, RN/DN staffing measures		.92 (.0002)	1.02 (<.0001)		1.03 (.0009)	
	3b	Model 3a, Facility Characteristics		.96 (<.0001)	1.02 (.002)		1.02 (.0001)	
	4a	Case mix, CNA, LPN+RN staffing measures		.96 (<.0001)				1.05 (<.0001)
	4b	Model 4a, Facility Characteristics		.96 (<.0001)				1.04 (<.0001)

Table 7: Odds of Rehospitalization for Five Conditions Within 100 Days Regression Model Series

Staffing Measure	Model	Variables in model	n	CNA AOR (p)	LPN AOR (p)	RN AOR (p)	RN/DN AOR (p)	LPN+RN AOR (p)
Hours per resident day (per 15 min more)	1a	Case mix, each staffing measure individually	182,340	.99 (.29)	1.02 (.50)	.92 (.002)	.92 (.002)	.98 (.13)
	1b	Model 1a, Facility Characteristics		1.00 (.87)	1.01 (.69)	.95 (.002)	.95 (.001)	.99 (.13)
	2a	Case mix, CNA, LPN, RN staffing measures		1.00 (.66)	1.00 (.77)	.93 (.0009)		
	2b	Model 2a, Facility Characteristics		1.00 (.71)	1.00 (.91	.98 (.001)		
	3a	Case mix, CNA, LPN, RN/DN staffing measures		1.00 (.65)	1.00 (.73)		.93 (.0009)	
	3b	Model 3a, Facility Characteristics		1.00 (.72)	1.00 (.82)		.95 (.001)	
	4a	Case mix, CNA, LPN+RN staffing measures		.99 (.45)				.98 (.21)
	4b	Model 4a, Facility Characteristics		1.00 (.91)				.99 (.65)
Staff turnover (per 25% more)	1a	Case mix, each staffing measure individually	141,486	.99 (.41)	1.01 (.23)	1.02 (.0001)	1.02 (<.0001)	1.01 (.10)
	1b	Model 1a, Facility Characteristics		.98 (.41)	1.02 (.17)	1.01 (<.0001)	1.02 (<.0001)	1.02 (.11)
	2a	Case mix, CNA, LPN, RN staffing measures		1.01 (.27)	1.00 (.77)	1.00 (.67)		
	2b	Model 2a, Facility Characteristics		1.00 (.53)	1.00 (.67)	1.01 (.21)		
	3a	Case mix, CNA, LPN, RN/DN staffing measures		1.01 (.19)	1.00 (.80)		1.00 (.66)	
	3b	Model 3a, Facility Characteristics		1.00 (.54)	1.00 (.69)		1.01 (.11)	
Percent of short-term employees (per 10% more)	1a	Case mix, each staffing measure individually	141,486	1.00 (.53)	1.01 (.13)	1.02 (.006)	1.02 (.0003)	1.02 (.02)
	1b	Model1a, Facility Characteristics		1.00 (.81)	1.00 (.09)	1.02 (.0004)	1.02 (<.0001)	1.02 (.005)
Average tenure (per 1 year more)	1a	Case mix, each staffing measure individually	89,623	1.01 (.39)	.98 (.008)	.97 (<.0001)	.97 (<.0001)	.97 (<.0001)
	1b	Model 1a, Facility Characteristics		1.00 (.91)	.98 (.0004)	.97 (<.0001)	.97 (<.0001)	.97 (<.0001)
	2a	Case mix, CNA, LPN, RN staffing measures		1.04 (<.0001)	.98 (.005)	.97 (<.0001)		
	2b	Model 2a, Facility Characteristics		1.03 (.05)	.98 (.0002)	.97 (.0002)		
	3a	Case mix, CNA, LPN, RN/DN staffing measures		1.04 (<.0001)	.98 (.0002)		.97 (<.0001)	
	3b	Model 3a, Facility Characteristics		1.03 (.04)	.98 (<.0001)		.97 (<.0001)	
	4a	Case mix, CNA, LPN+RN staffing measures		1.04 (<.0001)				.95 (.0001)
	4b	Model 4a, Facility Characteristics		1.03 (.05)				.96 (<.0001)

RN/DN=RN+DON+ADON, AOR=Adjusted odds ratio; Facility characteristics=Urban, Region, and # of facility stays; Models accounted for corporation clustering effects

Table 8: Odds of Delirium - 100 Days Regression Model Series – Stay level

Staffing Measure	Model	Variables in model	n	CNA AOR (p)	LPN AOR (p)	RN AOR (p)	RN/DN AOR (p)	LPN+RN AOR (p)
Hours per resident day (per 15 min more)	1a	Case mix, each staffing measure individually	94,183	1.05 (.0004)	1.01 (.35)	1.01 (.71)	1.00 (.83)	1.03 (.05)
	1b	Step 1a, Facility Characteristics		1.05 (.003)	1.05 (.02)	.99 (.69)	.98 (.51)	1.06 (.02)
	2a	Case mix, CNA, LPN, RN staffing measures		1.05 (.0004)	1.01 (.27)	1.00 (.90)		
	2b	Step 2a, Facility Characteristics		1.06 (.004)	1.05 (.01)	.98 (.55)		
	3a	Case mix, CNA, LPN, RN/DN staffing measures		1.05 (.0003)	1.01 (.27)		1.00 (.78)	
	3b	Step 3a, Facility Characteristics		1.06 (.004)	1.05 (.01)		.98 (.31)	
	4a	Case mix, CNA, LPN+RN staffing measures		1.05 (.0007)				1.02 (.13)
	4b	Step 4a, Facility Characteristics		1.05 (.01)				1.05 (.01)
Staff turnover (per 25% more)	1a	Case mix, each staffing measure individually	75,262	.98 (.006)	.97 (<.0001)	.99 (.06)	1.00 (.19)	.98 (<.0001)
	1b	Step 1a, Facility Characteristics		.97 (.0009)	.95 (<.0001)	.99 (.12)	.99 (.40)	.96 (<.0001)
	2a	Case mix, CNA, LPN, RN staffing measures		.99 (.09)	.97 (<.0001)	1.00 (.70)		
	2b	Step 2a, Facility Characteristics		.98 (.03)	.96 (<.0001)	1.00 (.80)		
	3a	Case mix, CNA, LPN, RN/DN staffing measures		.99 (.08)	.97 (<.0001)		1.00 (.72)	
	3b	Step 3a, Facility Characteristics		.98 (.03)	.96 (<.0001)		1.01 (.30)	
	4a	Case mix, CNA, LPN+RN staffing measures		.99 (.03)				.98 (<.0001)
	4b	Step 4a, Facility Characteristics		.98 (.01)				.96 (<.0001)
Percent of short-term employees (per 10% more)	1a	Case mix, each staffing measure individually	75,262	.96 (.001)	.97 (.005)	.99 (.48)	1.00 (.89)	.97 (.01)
	1b	Step1a, Facility Characteristics (Urban, Region)		.98 (.003)	.96 (.004)	.99 (.62)	1.00 (.76)	.95 (<.0001)
Average tenure (per 1 year more)	1a	Case mix, each staffing measure individually	48,231	1.07 (<.0001)	1.04 (<.0001)	1.02 (.02)	1.02 (.08)	1.03 (<.0001)
	1b	Step 1a, Facility Characteristics		1.17 (<.0001)	1.07 (.001)	1.04 (.002)	1.04 (.04)	1.07 (<.0001)
	2a	Case mix, CNA, LPN, RN staffing measures		1.07 (<.0001)	1.01 (.05)	.98 (.27)		
	2b	Step 2a, Facility Characteristics		1.18 (<.0001)	1.03 (.16)	.96 (.28)		
	3a	Case mix, CNA, LPN, RN/DN staffing measures		1.07 (<.0001)	1.01 (.03)		.99 (.25)	
	3b	Step 3a, Facility Characteristics		1.17 (<.0001)	1.03 (.14)		.96 (.32)	
	4a	Case mix, CNA, LPN+RN staffing measures		1.07 (<.0001)				1.00 (.93)
	4b	Step 4a, Facility Characteristics		1.18 (<.0001)				.99 (.65)

Table 9: Odds of Moderate/Severe Pain - 100 Days Regression Model Series – Stay level

Staffing Measure	Model	Variables in model	N	CNA AOR (p)	LPN AOR (p)	RN AOR (p)	RN/DN AOR (p)	LPN+RN AOR (p)
Hours per resident day (per 15 min more)	1a	Case mix, each staffing measure individually	95,763	1.01 (.21)	.95 (.04)	1.01 (.62)	1.01 (.73)	.97 (.20)
	1b	Step 1a, Facility Characteristics		1.00 (.66)	.95 (.01)	.99 (.69)	.99 (.66)	.95 (.02)
	2a	Case mix, CNA, LPN, RN staffing measures		1.01 (.23)	.95 (.04)	1.00 (.43)		
	2b	Step 2a, Facility Characteristics		1.00 (.69)	.94 (.01)	.98 (.09)		
	3a	Case mix, CNA, LPN, RN/DN staffing measures		1.01 (.23)	.95 (.04)		1.00 (.86)	
	3b	Step 3a, Facility Characteristics		1.01 (.69)	.94 (.01)		.98 (.13)	
	4a	Case mix, CNA, LPN+RN staffing measures		1.01 (.20)				.97 (.15)
	4b	Step 4a, Facility Characteristics		1.01 (.58)				.95 (.01)
Staff turnover (per 25% more)	1a	Case mix, each staffing measure individually	76,009	1.01 (.36)	.99 (.29)	1.00 (.98)	1.00 (.97)	.99 (.09)
	1b	Step 1a, Facility Characteristics		1.01 (.29)	.99 (.30)	1.00 (.95)	1.00 (.96)	1.00 (.32)
	2a	Case mix, CNA, LPN, RN staffing measures		1.01 (.10)	.99 (.41)	1.00 (.99)		
	2b	Step 2a, Facility Characteristics		1.01 (.04)	.99 (.40)	1.00 (.99)		
	3a	Case mix, CNA, LPN, RN/DN staffing measures		1.01 (.10)	.99 (.41)		1.00 (.98)	
	3b	Step 3a, Facility Characteristics		1.01 (.03)	.99 (.40)		1.00 (.96)	
	4a	Case mix, CNA, LPN+RN staffing measures		1.01 (.16)				.99 (.05)
	4b	Step 4a, Facility Characteristics		1.01 (.09)				.98 (.14)
Percent of short-term employees (per 10% more)	1a	Case mix, each staffing measure individually	76,009	1.01 (.53)	1.02 (.23)	.99 (.33)	.99 (.45)	1.01 (.34)
	1b	Step1a, Facility Characteristics		1.01 (.41)	1.02 (.23)	.99 (.43)	.99 (.57)	1.01 (.48)
Average tenure (per 1 year more)	1a	Case mix, each staffing measure individually	48,276	1.00 (.57)	1.00 (.63)	.99 (.31)	.99 (.23)	.99 (.46)
	1b	Step 1a, Facility Characteristics		1.01 (.69)	1.00 (.85)	.99 (.50)	.99 (.42)	.99 (.66)
	2a	Case mix, CNA, LPN, RN staffing measures		1.00 (.79)	1.00 (.92)	.99 (.32)		
	2b	Step 2a, Facility Characteristics		1.02 (.27)	1.00 (.95)	.99 (.47)		
	3a	Case mix, CNA, LPN, RN/DN staffing measures		1.00 (.57)	1.00 (.84)		.98 (.30)	
	3b	Step 3a, Facility Characteristics		1.02 (.05)	1.00 (.85)		.96 (.24)	
	4a	Case mix, CNA, LPN+RN staffing measures		1.00 (.76)				.99 (.50)
	4b	Step 4a, Facility Characteristics		1.02 (.08)				.99 (.43)

Table 10: Odds of Failure to Prevent Pressure Ulcers - 100 Days Regression Model Series – Stay level

Staffing Measure	Model	Variables in model	N	CNA AOR (p)	LPN AOR (p)	RN AOR (p)	RN/DN AOR (p)	LPN+RN AOR (p)
Hours per resident day (per 15 min more)	1a	Case mix, each staffing measure individually	73,598	1.01 (.39)	1.04 (<.0001)	1.00 (.83)	1.00 (.99)	1.03 (.02)
	1b	Step 1a, Facility Characteristics		1.01 (.29)	1.03 (.02)	1.00 (.82)	1.01 (.53)	1.02 (.08)
	2a	Case mix, CNA, LPN, RN staffing measures		1.01 (.35)	1.04 (<.0001)	1.00 (.88)		
	2b	Step 2a, Facility Characteristics		1.01 (.28)	1.03 (.01)	1.00 (.78)		
	3a	Case mix, CNA, LPN, RN/DN staffing measures		1.01 (.36)	1.04 (<.0001)		1.00 (.68)	
	3b	Step 3a, Facility Characteristics		1.01 (.28)	1.03 (.01)		1.01 (.53)	
	4a	Case mix, CNA, LPN+RN staffing measures		1.01 (.46)				1.03 (.02)
	4b	Step 4a, Facility Characteristics		1.01 (.29)				1.02 (.09)
Staff turnover (per 25% more)	1a	Case mix, each staffing measure individually	58,858	.99 (.45)	1.00 (.86)	1.00 (.54)	1.00 (.71)	1.00 (.93)
	1b	Step 1a, Facility Characteristics		1.00 (.25)	1.00 (.66)	1.00 (.96)	1.00 (.80)	1.00 (.67)
	2a	Case mix, CNA, LPN, RN staffing measures		.99 (.44)	.99 (.27)	1.01 (.17)		
	2b	Step 2a, Facility Characteristics		.99 (.30)	.99 (.26)	1.00 (.44)		
	3a	Case mix, CNA, LPN, RN/DN staffing measures		.99 (.46)	.99 (.29)		1.00 (.27)	
	3b	Step 3a, Facility Characteristics		.99 (.32)	.99 (.27)		1.01 (.77)	
	4a	Case mix, CNA, LPN+RN staffing measures		.99 (.29)				1.00 (.75)
	4b	Step 4a, Facility Characteristics		.99 (.16)				1.00 (.87)
Percent of short-term employees (per 10% more)	1a	Case mix, each staffing measure individually	58,858	.99 (.64)	1.00 (.77)	1.00 (.61)	1.00 (.71)	1.00 (.96)
	1b	Step1a, Facility Characteristics		.99 (.38)	.99 (.59)	1.00 (.94)	1.00 (.84)	1.00 (.59)
Average tenure (per 1 year more)	1a	Case mix, each staffing measure individually	37,625	.99 (.37)	.98 (.0001)	1.00 (.99)	1.00 (.84)	.99 (.25)
	1b	Step 1a, Facility Characteristics		.99 (.07)	.98 (<.0001)	1.00 (.92)	1.00 (.79)	.99(.30)
	2a	Case mix, CNA, LPN, RN staffing measures		1.01 (.61)	.97 (<.0001)	1.02 (.53)		
	2b	Step 2a, Facility Characteristics		1.00 (.63)	.98 (.002)	1.02 (.65)		
	3a	Case mix, CNA, LPN, RN/DN staffing measures		1.00 (.53)	.97 (<.0001)		1.01 (.53)	
	3b	Step 3a, Facility Characteristics		1.00 (.87)	.98 (.01)		1.01 (.65)	
	4a	Case mix, CNA, LPN+RN staffing measures		1.01 (.80)				.98 (.31)
	4b	Step 4a, Facility Characteristics		1.00 (.58)				.99 (.58)

RN/DN=RN+DON+ADON, AOR=Adjusted odds ratio; Facility characteristics= # of stays, Urban (yes/no), and region; Models accounted for corporation clustering effec**odds ratio; Facility characteristics= # of stays, Urban (yes/no), and region; Models accounted for corporation clustering effects**

Figure 1: Odds of Community Discharge by Quintiles of Staff Turnover

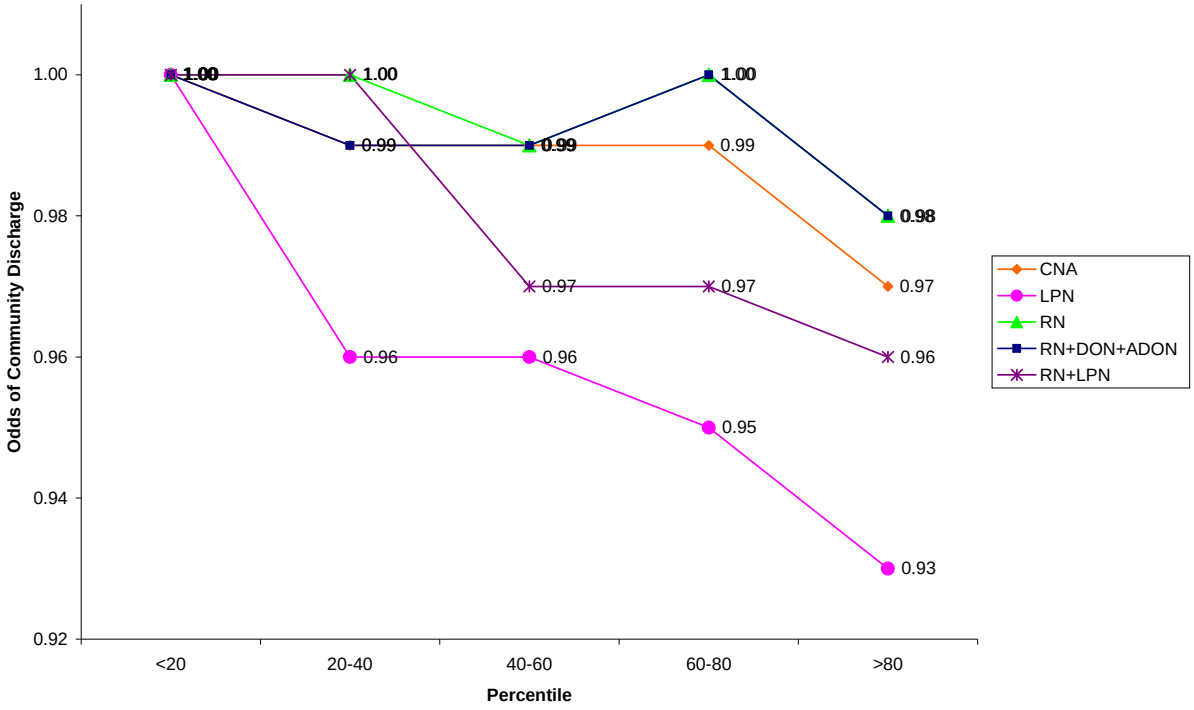


Figure 2: Odds of Rehospitalization by Quintiles of Staff Turnover

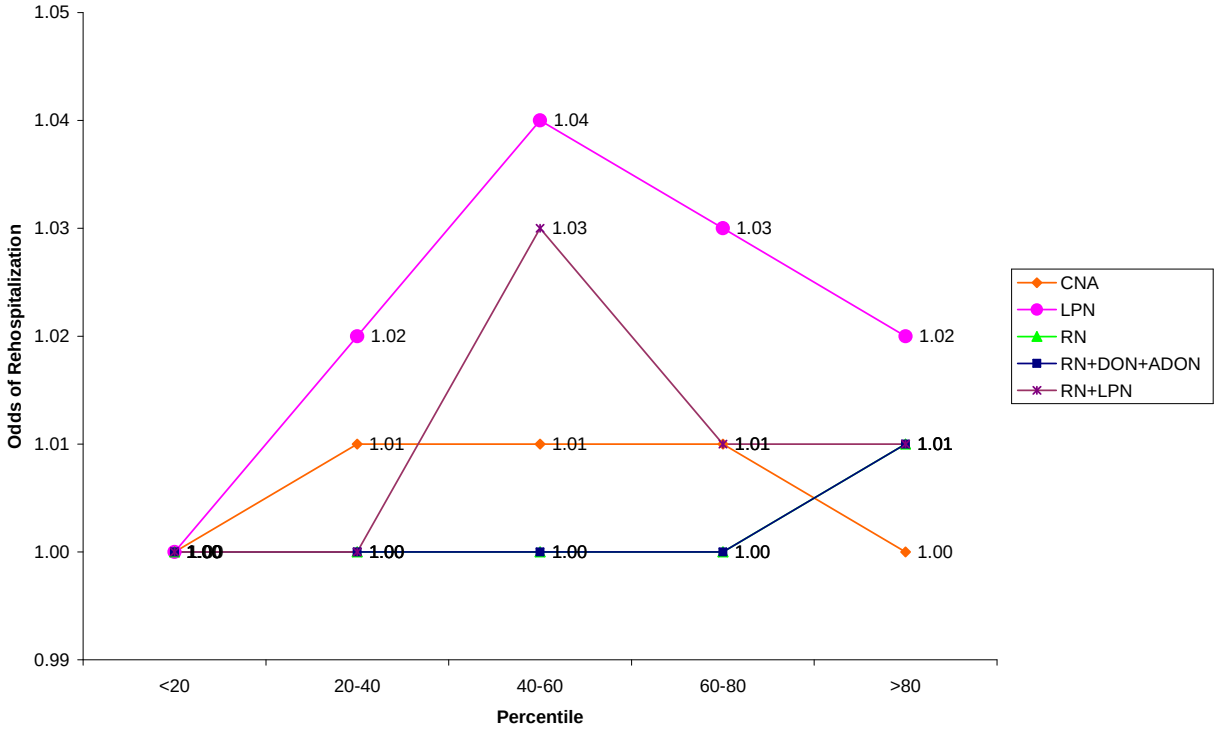


Figure 3: Odds of Community Discharge by Quintiles of Staff Tenure

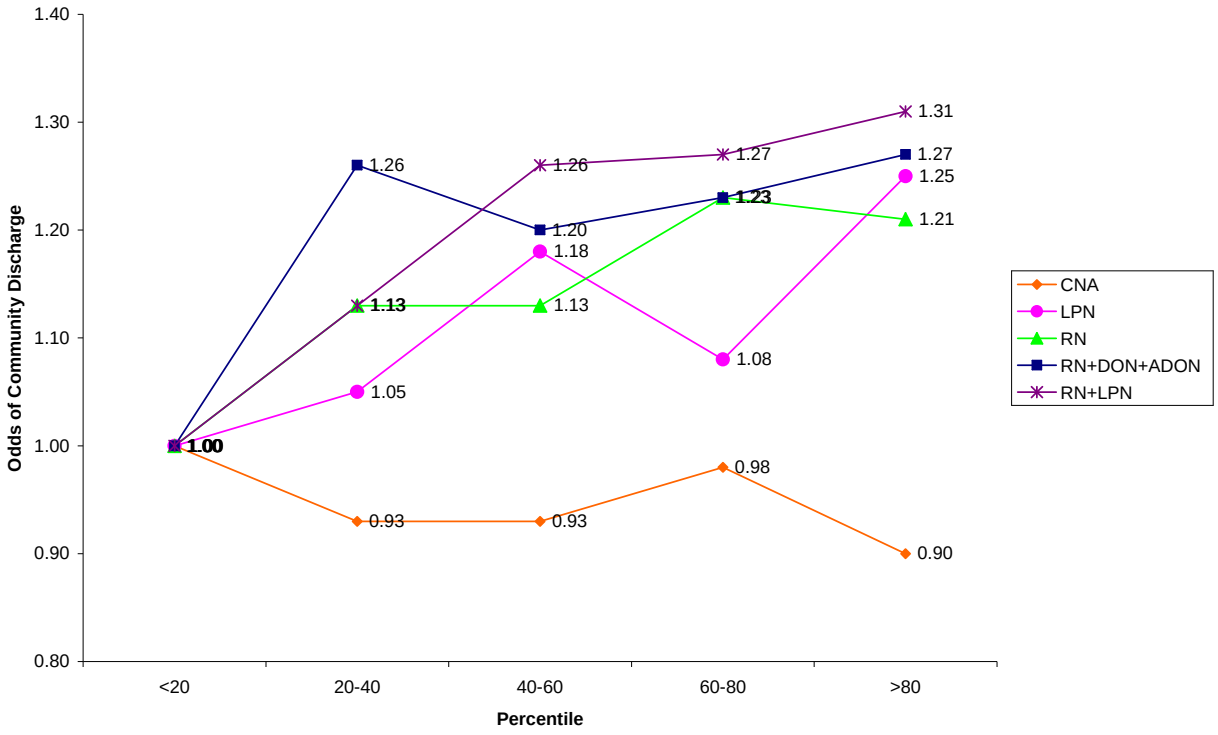
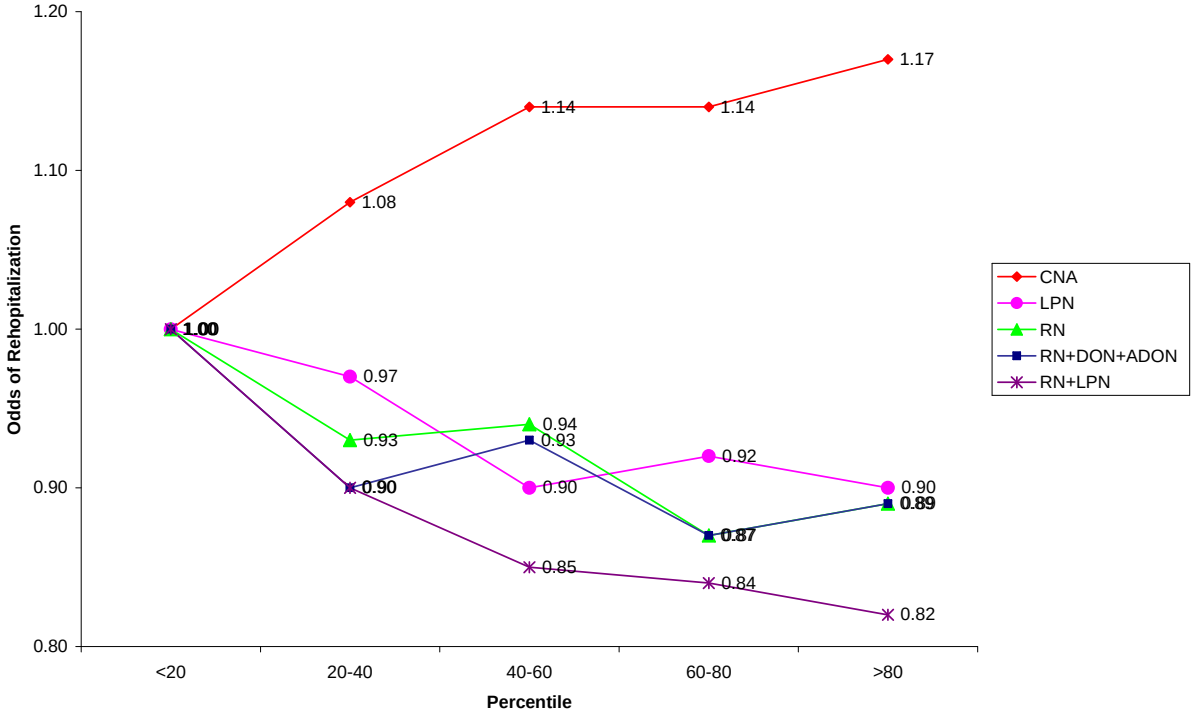


Figure 4: Odds of Rehospitalization by Quintiles of Staff Tenure



Development of Staffing Quality Measures- Phase I: Continuation

Task 2: Relationship Between Staffing Measures and Community Discharge, Rehospitalization, and Post-Acute Care Quality Measures for Short-Stay Residents

Final Subtask Report Addendum

May 2, 2008

Submitted on May 2, 2008 to:
Mr. Martin Rice, CMS, Government Task Leader
Dr. Jean Scott, CMS, Government Task Leader
Mr. Randy Poulsen, CMS, Project Officer

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Relationship Between Staffing Measures and Community Discharge, Rehospitalization, and Post-Acute Care Quality Measures for Short-Stay Residents

This update to Table 4 of the Task 2 report is provided so that the values of the different staffing measures are available for quintiles. The quintile values are provided because Figures 1 to 4 (located on pages 26 and 27 of the Task 2 Final Report) show outcomes for different staffing measure quintiles. The values in Table 4 now correspond to these quintiles.

Table 4: Distributional Statistics of Staffing and Quality Measures (updated 2/28/08)

	n	Mean	Standard deviation	Corp ICC[1]	Minimum	20th Percentile	40th Percentile	Median	60th Percentile	80th Percentile	Maximum
Staffing Measures											
Hours per resident day											
CNA	1272	1.97	.40	.37	0.005	1.68	1.87	1.95	2.01	2.19	4.50
LPN	1272	.64	.22	.10	0.04	0.48	.62	0.63	0.73	0.84	2.48
RN	1272	.29	.17	.05	0.00	0.15	.24	0.27	0.32	0.44	2.34
LPN+RN	1271	.93	.21	.07	0.09	0.81	.91	0.92	1.02	1.13	2.08
RN/DON/ADON	1272	.34	.17	.06	0.00	0.20	.28	0.31	0.37	0.49	2.65
Staff turnover											
CNA	948	77.7%	38.1%	.11	13.3%	45.8%	62.1%	70.4%	80.6%	107.0%	277.6%
LPN	949	45.8%	28.8%	.10	0.0%	22.6%	34.3%	40.3%	46.4%	67.7%	214.3%
RN	945	87.6%	68.2%	.11	0.0%	36.2%	59.0%	71.4%	87.1%	128.6%	533.3%
LPN+RN	949	54.4%	29.1%	.12	5.3%	31.0%	42.8%	48.9%	55.4%	76.9%	212.3%
RN/DON/ADON	949	59.9%	34.5%	.10	0.0%	30.0%	45.0%	51.2%	61.1%	87.3%	236.4%
Percent of short-term employees											
CNA	949	21.6%	9.5%	.12	2.8%	13.2%	18.0%	20.4%	22.9%	29.1%	92.1%
LPN	949	16.8%	10.8%	.09	0.0%	7.1%	13.3%	16.0%	18.8%	25.7%	57.1%
RN	948	21.3%	15.6%	.07	0.0%	7.7%	16.7%	20.0%	24.3%	33.3%	81.8%
LPN+RN	949	18.6%	9.5%	.11	0.0%	10.3%	15.4%	17.6%	20.0%	26.3%	52.6%
RN/DON/ADON	949	16.1%	9.5%	.09	0.0%	7.7%	12.9%	15.2%	15.2%	24.3%	52.6%
Average tenure											
CNA	623	3.22	1.61	.19	0.23	1.84	2.54	2.83	3.21	4.56	9.52
LPN	623	4.24	2.80	.19	0.46	1.98	3.03	3.65	4.27	5.84	17.85
RN	622	3.49	2.40	.21	0.24	1.57	2.43	2.92	3.39	5.01	13.84
LPN+RN	623	3.87	2.31	.25	0.47	1.95	2.88	3.30	3.82	5.41	13.16
RN/DON/ADON	623	3.70	2.30	.18	0.10	1.82	2.72	3.16	3.65	5.37	15.00
Quality Measures											
Community discharge (observed)	1282	27.7%	14.1%	.07	0.0%	15.5%	22.3%	25.9%	29.6%	39.4%	82.1%
Rehospitalization (observed)	1283	18.1%	7.4%	.23	0.0%	11.5%	16.0%	18.1%	20.0%	24.5%	40.3%
Delirium	1238	3.7%	6.4%	.003	0.0%	0.0%	0.0%	1.2%	2.5%	6.3%	100.0%
Moderate/Severe Pain	1238	22.9%	14.9%	.02	0.0%	9.7%	16.7%	20.6%	24.6%	34.3%	83.3%
Pressure Ulcers	1238	20.0%	11.7%	.005	0.0%	10.0%	16.2%	18.4%	21.7%	29.6%	62.5%

[1] Intraclass correlations for corporation effects were calculated based on Howell (2007).

Appendix B

Development of Staffing Quality Measures-Phase I: Continuation

Task 3: Relationship Between Staffing Measures and Outcome Quality Measures for Long-Stay Residents

Final Subtask Report

March 31, 2008

Submitted on March 31, 2008 to:
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Table of Contents

1. Introduction

Public reporting of validated nursing home staffing measures that are rigorously defined and based on accurate data has become a national priority. In the spring of 2003, the National Quality Forum Nursing Home Steering Committee recommended that a nurse staffing quality measure be included in the set of nursing home quality measures that are reported to the public (1). The Institute of Medicine (IOM) 2004 report entitled, "Keeping Patients Safe: Transforming the Work Environment of Nurses" cited evidence for a relationship between nurse staffing and quality of care (2). This report also included recommendations relating to the collection and reporting of staffing data.

The Development of Staffing Quality Measures – Phase I (SQM) project was designed to review a range of staffing measures and data sources for longer-term use in public reporting of staffing quality measures for nursing homes. Specifically, the SQM project was charged with investigating payroll based staffing measures that may be related to quality of care, including staffing levels (staff hours per resident day), staff turnover, staff tenure, and staff mix. During Phase I of the SQM project, payroll, personnel, and census data were obtained from eight national nursing home corporations and a range of staffing measures was calculated. In a subsequent report, an analysis was conducted of the relationship between payroll-based staffing measures and skilled nursing facility (SNF) quality measures of community discharge, rehospitalization, and the three publicly reported post acute care quality measures (QMs) (3). This study found a relationship between staffing measures and both the outcomes of community discharge and rehospitalization, particularly for RN staff and to lesser extent LPN staff. No relationships were found between staffing and the post acute care QMs and no associations were found with CNA staffing measures for the most part.

Although several studies have found relationships between staffing measures and both community discharge and rehospitalization for SNF residents (4-6), the relationship between staffing measures and quality measures has not been studied to such an extent for long-term care residents. This is the first study to use payroll-based staffing measures, including staffing levels, turnover, and tenure, which are more precisely defined and presumably more accurate than staffing measures from other data sources. Therefore, the major objective of this report was to examine the relationship of staffing measures to outcome measures for long-stay residents. This information will inform recommendations to CMS on those staffing measures that are related to quality of long-term care and, therefore, are the most likely candidate measures for public reporting in this population.

The outcome measures evaluated in this study consisted of 12 chronic care QMs developed for the Nursing Home Quality Initiative (NHQI) and hospitalizations per 100 resident days. The NHQI chronic care QMs included the percent of residents who have worsening late loss ADLs, moderate to severe pain, physical restraints, indwelling catheter, urinary tract infection (UTI), decline in locomotion, as well as high risk residents who have pressure sores, low risk residents who have pressure sores, low risk residents who lose control of their bowels or bladder, are bedfast, depressed or anxious, or residents who experience weight loss.

2. Methods

2.1 Data Sources and Sample

During Phase I of the SQM project, eight national nursing home corporations representing 1453 individual nursing home facilities provided payroll and/or personnel records for every employee who worked during calendar year 2003, as well as census records for 2003. The individual data elements requested included facility and employee identifiers, employee job titles, employee productive and non-productive hours paid by date, employee hire and termination dates, reasons 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 data elements, the project team constructed facility-level measures of staffing levels, staff mix, turnover, retention, and tenure. Staffing data from Phase I of the project were linked to the Linked Corporate Nursing Home (LCNH) stay file. The LCNH stay file was constructed by linking source files to all NH stays for eight corporations from the Minimum Data Set Nursing Home (MDSNH) stay file.

The file building process for defining the stays based on MDS data and then merging in claims data was described in a previous report to CMS (7). The final file building steps included determining which stays were long-stays, and then linking the stays for an individual resident to the resident level. We defined long-stays by residents with nursing home stays totaling at least 90 days, even if all 90 days were not in 2003. Once a resident stayed 90 days, he/she was considered a long-stay resident, regardless of whether these were Medicare or non-Medicare days. This definition allows for stays that included a hospitalization occurring within the stay. Community discharge for more than 30 days, however, ended the stay. These stays were then linked by resident. When aggregating to the facility level, only nursing home days occurring in a study facility were included, and if a resident resided in two study facilities during 2003, only the days for the facility where he/she spent the most time were included.

The study team built two files to accommodate the different types of outcome measures and construct appropriate covariates. The first file was built to model the 12 QMs and is referred to as the QM analysis file. The QMs are calculated once in each quarter for a facility, so if a resident's stay covered multiple quarters, then each QM had more than one value for the resident. If more than one value for the QMs was available, the most recent value was used. This is the same decision rule that is used for public reporting of the QMs when more than one QM value is present per quarter. MDS covariates for the QM analysis file were derived from either a full assessment just previous to the QM, or if there was an intervening quarterly assessment available, the quarterly assessment values were used. Additionally, for MDS variables not available on a quarterly assessment, the most recently available full assessment was used. The multi-level regression models used in this study for risk adjustment used more covariates and were more robust than the risk adjustment models used for the QMs that are publicly reported (8). Exclusions were applied to the QM analysis file, including excluding residents who were less than 18 years of age and excluding residents with nursing home length of stay in 2003 of <30 days. The final QM analysis file included 151,829 residents from 1,341 facilities during 2003.

The second file, the hospitalization analysis file, was slightly different. All hospitalizations occurring after a resident was admitted to the nursing home in 2003 were combined at the resident level into the hospitalization measure (see below for definition). MDS covariates were

created by using a weighted average of each covariate throughout the entire stay, using any MDS assessments available during the stay. Weighting was performed by using the number of days between assessments looking forward, including at the beginning of the year 2003 when the last MDS from 2002 was used. However, for a new admission, the first MDS was applied to the days prior to the MDS, when the assessment was being completed, as well as the days preceding the next MDS. For the MDS items not available on the quarterly MDS, the most recent full MDS was used. In order to measure comorbidity, three indices were created: one used the MDS items only (available on all residents with an MDS history), one used the hospital/SNF claims items only (available only for residents with a hospital claim in the prior year), and the other used a combination of the two sources (available if either index was present). The exclusions applied to the hospitalization analysis file included the exclusions applied to the QM analysis file plus excluding residents who lacked Medicare Part A data because they participated in a Managed Care Organization (MCO) or were not Medicare eligible. The final hospitalization analysis file represented 133,168 residents from 1,324 facilities during 2003.

2.2 Measures

2.2.1 Long-stay Outcome Measures:

The hospitalization measure was the number of hospitalizations per 100 resident days. This was derived from summing the number of hospitalizations and dividing by the number of nursing home days, and multiplying by 100. The hospitalization measure included only hospitalizations for heart failure, electrolyte imbalance, respiratory infection, sepsis, or UTI - conditions for which hospitalization may be potentially avoidable. Hospitalization was defined as an admission to an acute care or critical access hospital. Any such hospitalization that occurred within one day of nursing facility discharge (regardless of discharge location) is considered a hospitalization.

The QMs (decline in ability to perform late-loss activities of daily living [ADL], moderate to severe pain, high and low risk residents with pressure ulcers, use of physical restraints, more depressed or anxious, low risk residents who lose control of their bowels or bladder, presence of indwelling catheter, bedfast, decline in locomotion, urinary tract infection [UTI], weight loss) were defined according to the National Nursing Home Quality Measures prepared by Abt Associates (9).

The decline in the ability to perform late-loss ADLs was defined as the worsening of any one of four ADLs (bed mobility, transfer, eating, or toileting) from one MDS to the next (~3 months). Moderate to severe pain was defined as having moderate to severe pain at least once during an assessment period. A resident with at least one Stage 1-4 pressure ulcer during an assessment period was determined to be high risk by being impaired in transfer or bed mobility, comatose, or suffering from malnutrition. A low risk resident with pressure sores was a non-high risk resident with at least one Stage 1-4 pressure ulcer during an assessment period.

Physical restraints included any resident with a trunk or limb restraint, or in a chair that prevented rising used anytime in the seven days preceding the latest MDS assessment. To be considered a resident who became more depressed or anxious, the resident had to have a score on the mood scale that increased from one quarterly assessment to the next. A low risk resident who lost control of their bowels or bladder was defined as a resident who did not have severe dementia, who did not have limited ability to move on their own, who did not have an indwelling

catheter, ostomy, or was not comatose, and who was frequently or fully incontinent within the prior three months. Residents who had a catheter inserted and left in their bladder were defined as residents who had a catheter inserted and left in their bladder for a period of time during the 14-days prior to completing the MDS assessment.

A bedfast resident was defined as any non-comatose resident who spent 22 hours or more per day in bed or in a recliner in their own room for at least four of the last seven days prior to the completion of the assessment. A decline in locomotion was defined as a resident whose ability to move about, either walking or using a wheelchair, in their room and the hallway near their room declined since their prior assessment. This does not include residents who were comatose, had an end stage disease, or were receiving hospice care. To be considered a resident with a UTI, the resident had to have the UTI within 30 days prior to the most recent assessment. A loss of too much weight was defined as a weight loss of 5 percent or more in the 30 days prior to the most recent assessment or 10 percent or more in the 6 months prior to the most recent assessment in a resident who was not receiving hospice care.

2.2.2 Resident Characteristics/covariates:

Resident characteristics were used as covariates in the risk adjustment procedure. Candidate risk factors included demographics (age, race, gender, marital status), presence of advance directives, the modified Barthel Index (a measure of functional independence, ranging from 0 for most dependent to 90 for most independent), the Cognitive Performance Scale (a measure of cognitive impairment, ranging from 0 for least impaired to 6 for most impaired), selected MDS items, and selected comorbid conditions (arterioslerotic heart disease, cardiac dysrhythmia, congestive heart failure, deep vein thrombosis, hypertension, peripheral vascular disease, arthritis, osteoporosis, hip fracture, pathological bone fracture, Alzheimer's disease, dementia, stroke, hemiplegia/hemiparesis, COPD, comatose, diabetes, diabetic retinopathy, anemia, cancer, renal failure, antibiotic resistant infection, pneumonia, respiratory infection, septicemia, urinary tract infection, and viral hepatitis). For the hospitalization measure risk adjustment, these comorbidities were combined into a comorbidity index using the method and categories described by Ramano, et al. (10). This index, referred to as the Dartmouth/Mantibo Index, was used in earlier studies for SNF outcome analyses (3;11). In this study, however, three indices were constructed as described above using the MDS conditions from the full MDS, claims data, and both of these data sources in order to include a comorbidity index for every resident.

2.2.3 Facility Characteristic Measures:

Measures of facility characteristics for descriptive analyses included urban/rural, type of ownership, facility size, and four broad geographical regions (Northeast, Midwest, South, West).

2.2.4 Payroll Based Staffing Measures:

The analyses presented in this report examined the relationship between quality measures and three categories of staffing measures: staff hours per resident day (i.e., staffing levels), position turnover, and staff tenure. Measures for each staffing category were examined for RNs+DONs+ADONs, LPNs, CNAs, and licensed staff (LPNs+RNs). All measures were calculated using payroll data for the first nine months of calendar year 2003 due to missing data

for the last quarter. For the purposes of this report, we refer to this nine-month period as an annual period.

One corporation, representing 244 facilities, was unable to provide productive hours but did provide total hours (productive and non-productive hours). Analyses conducted during Phase I of the project demonstrated that productive hours represent 93% of total hours across all staff categories (12). Therefore, the total hours, for these facilities, were multiplied by 0.93 to estimate productive hours and permit inclusion of these facilities in the analyses of staffing level measures.

The staffing level measures were calculated by dividing the total number of productive hours for any particular group of staff (RN+DON+ADON, LPN, CNA, LPN+RN,) in a given time interval by the annual average daily census. Position turnover was defined as the percent of staff by job category (RN+DON+ADON, LPN, CNA, LPN+RN,) that departed during the reporting period based on the average number of positions at the facility during the reporting period. Staff tenure was defined as the number of months of employment by job category for all staff that worked at least one day during calendar year 2003. A detailed description of staffing measure calculations is included in the SQM Phase I final report (12).

Because one corporation did not provide all the necessary data for the turnover measures and four corporations did not provide the data for the tenure measures, the sample sizes are reduced for the analyses of these two measures. Table 1 provides the resident and facility sample sizes for the corporations and for the different staffing measures.

2.3 Analytic Approach

2.3.1 Descriptive Analyses:

Descriptive statistics for resident case mix (i.e., age, average Barthel) and facility characteristics (region, urban/rural) were examined for the SQM facilities with at least 25 residents for calendar year 2003. In addition, descriptive statistics, including measures of distribution, were examined for all outcome measures and the staffing measures of interest. As facilities are nested within corporations, intraclass correlations (ICCs) for each staffing measure and the outcome measures were examined to determine the portion of the variance in the measure that is accounted for by corporation.

2.3.2 Multivariate Analyses – Relationship Between Payroll-Based Staffing Measures and Outcome Measures:

Due to the clustered nature of the data (e.g., residents are nested within facilities and facilities are nested within corporations), multilevel analyses were performed at the resident level to determine the relationship between facility-level staffing measures and quality. For analyses concerning the 12 QMs, the Generalized Linear Model (GLM) framework was applied with Generalized Estimation Equations (GEE) assuming a compound symmetry working covariance structure, as these are methods of parameter estimation for correlated data. If correlation is not taken into account, the standard errors of the parameter estimates will not be valid and hypothesis testing results will not be replicable. For the hospitalization analyses PROC MIXED,

a form of linear regression from SAS, was employed to account for the hierarchical nature of the models. All analyses were performed using SAS version 9.1 (SAS Institute, Cary, NC).

The analyses presented in this report examined the relationship between the 12 quality measures at the resident level for three categories of staffing measures: staff hours per resident day, position turnover, and staff tenure, as well as the relationship between hospitalizations per 100 resident days and the three categories of staffing measures. Measures of facility characteristics including urban/rural, size, and region were used as covariates. Other covariates used in the analyses were at the resident level (e.g., age, gender, Barthel Index, etc.). All models accounted for corporation clustering effects.

We selected variables for risk adjustment from the list of candidate variables (Table 2) by conducting a series of ordinary least squares (OLS) regressions on the different samples because the sample was slightly different for the different types of staffing measures (i.e., hours per resident day, turnover, tenure) and for the 12 different quality measures. Stepwise regression was conducted first to identify potential variables using the candidate set of resident characteristics to select case mix measures that were most strongly associated with the quality measures within each sample. These models were all reviewed for stability and the directionality of the associations. Measures that remained significant and made clinical sense in any of the samples were retained and constituted the set of case mix variables entered into the model for all subsequent steps.

Next, for the staffing measure of staff hours per resident day, two different combinations of staffing categories were entered into the model. One model included CNAs, LPNs, and RNs+DONs+ADONs entered simultaneously; the other model included CNAs, and LPNs+RNs entered simultaneously. For the staffing measures of turnover and tenure, one combination of staffing categories (CNAs, LPNs, RNs+DONs+ADONs) was entered into the model simultaneously. A limited number of facility characteristics (urban, region, number of stays) were included in the models to determine whether staffing effects (if identified) could be explained by facility characteristics. We were unable to examine several facility characteristics that are likely of interest due to the relatively homogeneous nature of our sample (e.g., nearly all facilities are part of for-profit, free standing, chains).

3. Results

3.1 Resident and Facility Characteristics

Table 2 presents resident and facility characteristics for residents in facilities with at least 25 long-stay residents during 2003. This sample of residents stayed an average of 284 days in the nursing home during the year, and were almost 82 years of age on average. Over half of them had do not resuscitate (DNR) orders, and they were functionally impaired with a high prevalence of incontinence and cognitive impairment. Do not hospitalize orders, however, were still rare in this group. Only one of the chains was a non-profit organization so the sample over-represents for-profit facilities.

3.2 Descriptive Statistics For Staffing Measures and Quality Measures

Despite the selection of facilities within only eight corporations, substantial variation existed across facilities in all staffing measures (Table 3). Some of the low staffing levels resulted from the fact that these payroll data did not include contract staff, which has the effect of lowering staff levels in facilities that used substantial contract staff. Staffing levels varied for all types of staff, and measures of turnover and tenure were particularly variable across facilities. This variability, however, was greater across corporation than within corporation for some measures, leading to the high intraclass correlation coefficients for CNA staffing levels, turnover, and tenure measures.

The rehospitalization and QM measures also varied substantially across facilities (Table 4). The facility mean for hospitalizations was 0.23 hospitalizations per 100 resident days, which averages less than one hospitalization per year for residents who stayed in the facility all year. The mean facility QM scores ranged from 3.0 for low risk residents with pressure sores to 48.7 for low risk residents with incontinence. The QM measures did not cluster within corporation (except for moderate to severe pain), as indicated by the intraclass correlations that were generally less than 0.1.

3.3 Relationship Between Payroll-Based Staffing Measures and the Quality Measures

3.3.1 Hours Per Resident Day and Quality (Table 5):

Because high rates on the QMs represent greater prevalence, or worse quality, adjusted odds ratios (AORs) below 1.0 represent situations where higher staffing was associated with better quality. AORs above 1.0 represent situations where higher staffing was associated with worse QM scores, or worse quality. The odds ratios are based on increments of 15 minutes of staff time for the staffing measures; a time increment that is reasonable for all staff types based on distributions in Table 3.

For CNAs, lower QM scores, representing better quality, were significantly associated with higher staffing levels (AORs less than 1.0) for the following three QMs: high risk residents with pressure sores ($p<.0001$), indwelling catheter ($p = .009$), and weight loss ($p = .005$). For one QM, physical restraints, worse quality was associated with higher CNA staffing levels (AOR 1.03; $p = .03$). For licensed staff (RN+LPN), higher QM scores (worse quality) were significantly associated with higher staffing for 6 of the 12 QMs (AORs greater than 1.0; $p<.01$, except weight loss which was $p = .04$). For RN/DON, higher QM scores (worse quality) were significantly associated with higher staffing for three of the QMs (AORs greater than 1.0; $p = .02$). No significant relationships for any staff type were found between staffing hours per resident day and the QMs for moderate to severe pain and depressed or anxiousness, whereas the associations went one direction for RNs and the other for LPNs for low risk residents who lose control of their bladder or bowels.

3.3.2 Staff Turnover and Quality (Table 6)

When entering turnover by individual staffing categories and adjusting for case mix, AORs greater than 1.0 indicate that higher turnover was associated with higher QM scores (worse

quality). The odds ratios are based on increments of 25% in turnover; turnover increments that are reasonable for all types of staff based on distributions in Table 3.

Higher CNA turnover was associated with higher rates of functional decline (late loss ADLs and locomotion), greater levels of moderate to severe pain, indwelling catheter use, and bedfast residents ($p<.0001$ except for late loss ADLs which was $p<.02$). Lower CNA turnover was associated with higher rates of pressure sores in low risk residents, worse quality ($p = .01$). Higher turnover for LPNs and/or RNs was associated with higher rates of pressure sores in high risk residents ($p = .03$), pain ($p<.0001$), physical restraints ($p = .02$), urinary tract infection ($p<.04$), indwelling catheter ($p = .04$), and significant weight loss ($p = .008$). For the other QMs, there were no significant associations with staff turnover except that in low risk residents with pressure sores, higher CNA turnover was associated with lower QM scores (better quality).

3.3.3 Tenure by Staff Type and Quality (Table 7):

Greater tenure among CNAs (longer average employment) was associated with lower QM scores, better quality, for four of the QMs: worsening ADLs ($p<.0001$), pain ($p<.0001$), pressure sores in low risk residents ($p<.0001$), and urinary tract infections ($p = .05$). For physical restraints, longer CNA tenure was associated with a higher prevalence of restraints. Greater tenure among LPNs (longer average employment) was associated with lower QM scores, better quality, for four of the QMs: worsening ADLs ($p = .004$), pressure sores in high risk residents ($p = .007$), bedfast residents ($p<.0001$), and decline in locomotion ($p = .0001$). Greater tenure among RNs (longer average employment) was associated with lower quality measure scores, better quality, for three of the QMs: pressure sores in high risk residents ($p = .03$), urinary tract infections ($p = .001$), and weight loss ($p = .0002$).

3.4 Staffing Levels, Turnover, and Tenure Relationships With Hospitalization

In the regression model relating staffing levels to hospitalizations per 100 resident days, a negative coefficient would indicate that higher staffing levels are associated with lower hospitalization rates (good quality). These associations (negative coefficients) were significant for both CNAs ($p = .006$) and RN/DONs ($p = .0007$), after adjusting for case mix (Table 8). Positive coefficients for staff turnover measures would indicate that higher turnover is associated with higher hospitalization rates (and lower turnover was associated with lower hospitalization rates). These associations (positive coefficients) were significant for both LPNs and RNs ($p = .0004$). Negative coefficients for staff tenure measures would indicate that longer tenure is associated with lower hospitalization rates (good quality), which was found for LPNs and RN/DONs ($p<.001$ and $p<.0001$, respectively). Longer CNA tenure was associated with higher hospitalization rates ($p<.0001$).

4. Discussion

Long-stay residents in the study were an average of 2.5 years older, were more likely to be DNR, and had greater cognitive and functional impairments than their short-stay counterparts in these same facilities (3). They stayed an average of about 285 days during 2003.

Higher CNA staffing levels were associated with better QM scores for three of the chronic care QMs, suggesting that more CNAs may help to reduce pressure sores in high risk residents,

indwelling catheter use, and significant weight loss. Higher CNA staffing levels were also associated with reduced hospitalization for long-stay residents. In our related report that evaluated short-stay staffing quality measures and outcomes, CNA levels were modestly associated with community discharge and not associated with rehospitalization (3). We might expect that CNA staffing levels would be more strongly associated with reducing pressure sores, indwelling catheter use, preventing weight loss, and even hospitalization among long-stay residents than with rehospitalization and community discharge of short-stay skilled residents.

The large number of QMs where higher scores (worse quality) were associated with higher levels of RN or licensed staffing suggest that the QMs may also reflect something other than quality, such as case mix. One could infer that more licensed staff were bad for quality in long-stay residents, but this is highly unlikely, especially since higher RN staffing was associated with lower hospitalization in long-stay residents. In addition, higher RN and licensed staffing were associated with lower hospitalization and higher community discharge rates in the short-stay population (3). Thus, it is more likely that the QMs are not capturing only quality, but are also measuring case mix, such that more RN and LPN time is required in facilities that have more residents who are declining in function, bedfast, or losing weight, or who have pressure sores, restraints, catheters, or urinary tract infections. These facilities may admit sicker residents and therefore have a higher prevalence of these conditions. Although we adjusted for risk factors, to the extent that these are case mix measures, one cannot adjust for the effect.

The turnover results can be interpreted in one of two ways as well. Either higher turnover was associated with worse quality, or worse case mix was associated with higher turnover. Either explanation is plausible. To the extent that the QMs measure quality, the association between higher turnover and higher QM scores suggests that worse quality may be attributable to higher turnover in some instances. Alternatively, to the extent that the QMs measure case mix, worse case mix could lead to higher turnover because the residents require more intense care and were harder for CNAs and licensed staff to care for. Turnover of LPNs and RNs/DONs were also associated with higher hospitalization rates for long-stay residents in this analysis. In our previous analysis of the relationships of the short-stay staffing measures and outcomes, higher turnover for RNs and LPNs, and to a lesser extent CNAs, was associated with lower community discharge rates (3).

The tenure results can also be interpreted one of two ways: lower QM scores (better quality) could be attributable to longer tenure for CNAs, LPNs and RNs for some of the measures; or nurses are likely to stay longer in facilities where the residents are easier to care for (i.e., case mix).

These findings in combination with the report on short-stay measures (3) suggest the importance of using an array of staffing measures for public reporting. Staffing level measures seem to be appropriate to report for CNA staff and for RN/DON staff because of the relationship to outcomes. Turnover measures seem to be important to report for CNAs, LPNs, and RN/DONs, all of which were associated some type of outcomes. Tenure for RN/DON and LPN staff seem to be strongly associated with quality as well.

This would result in a profile of seven measures. However, the RN/DON and LPN tenure measures were highly correlated (R=.62) (3), so one might consider reporting just RN/DON tenure. The turnover measures were somewhat correlated (R=.24-.34) (3) suggesting that perhaps

a composite of turnover measures would be appropriate to give an overall turnover measure. The CNA and RN/DON staffing level measures were not highly correlated (R=.10) suggesting they both should be reported. Thus, a staffing measure performance profile could include measures of: 1) RN/DON staffing levels; 2) CNA staffing levels; 3) a composite turnover measure (RN/DON, LPN, and CNA); and 4) RN/DON tenure. These four measures would be less complicated for consumers than the seven measures above, capture the different dimensions of staffing performance, and represent staffing issues relevant to both short-stay and long-stay residents.

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6. Tables

Table 1: Sample Sizes for Different Staffing Measure Analyses

Corporation	# of Residents*	# of Facilities with: Staffing Level Measures	Staff Turnover Measures	Staff Tenure Measures
1	36,909	346	-	-
2	18,501	140	140	140
3	15,683	192	192	192
4	6,680	53	53	-
5	31,790	246	246	246
6	29,255	248	248	-
7	9,128	85	85	85
8	3,866	31	31	-
Total	151,812	1341	995	663

*****In facilities with at least 25 residents during 2003

Table 2: Characteristics of Long-Stay Residents in Study Facilities (n=151,812)

	Mean (Std Dev)
Resident Characteristics	
Demographics/Advance Directives:	
Age (years)	81.8 (12.2)
DNR orders	52.3%
Do not hospitalize orders	2.3%
Length of NH stay in 2003 (days)	284.3 (103.4)
Cognition:	
Cognitive Performance Scale (0-6) [1]	2.81 (1.79)
Function:	
Barthel Index (0-90) [2]	33.9 (28.3)
Bowel incontinence scale (1-4) (MDS item H1a) [1]	1.93 (1.82)
Bladder incontinence scale (1-4) (MDS item H1b) [1]	2.17 (1.77)
Service Needs:	
Indwelling catheter (MDS item H3d)	8.4%
Feeding tube (MDS item K5b)	7.3%
Comorbidity:	
Parenteral/IV feeding (MDS item K5a)	3.0%
Pressure ulcer (MDS item M2a)	23.0%
Abrasions (MDS item M4a)	25.0%
Burns (MDS item M4b)	0.2%
Skin tears or cuts (MDS item M4f)	6.4%
Arterioslerotic heart disease (MDS item I1d)	11.2%
Cardiac dysrhythmia (MDS item I1e)	14.6%
Congestive heart failure (MDS item I1f)	22.2%
Deep vein thrombosis (MDS item I1g)	2.2%
Hypertension (MDS item I1h)	58.2%
Peripheral vascular disease (MDS item I1j)	11.2%
Arthritis (MDS item I1l)	29.0%
Osteoporosis (MDS item I1o)	17.2%
Hip fracture (MDS item I1m)	5.2%
Pathological bone fracture (MDS item I1p)	0.7%
Alzheimer's disease (MDS item I1q)	17.4%
Dementia (MDS item I1u)	36.4%
Stroke (MDS item I1t)	23.2%
Comatose (MDS item B1)	0.2%
Hemiplegia/hemiparesis (MDS item I1v)	10.5%
COPD (MDS item I1ii)	16.2%
Diabetes (MDS item I1a)	27.3%
Diabetic retinopathy (MDS item I1kk)	1.0%
Anemia (MDS item I1oo)	23.7%
Cancer (MDS item I1pp)	7.8%
Renal Failure (MDS item I1qq)	6.6%

	Mean (Std Dev)
Antibiotic resistant infection (MDS item I2a)	2.0%
Pneumonia (MDS item I2e)	5.2%
Respiratory infection (MDS item I2f)	2.7%
Septicemia (MDS item I2g)	0.9%
Urinary tract infection (MDS item I2j)	12.8%
Viral hepatitis (MDS item I2k)	0.2%
Wound infection (MDS item I2l)	2.1%
Facility Characteristics	
Geographic:	
Northeast	20.5%
Midwest	27.6%
South	38.5%
West	13.4%
Urban (vs. rural)	71.0%
Ownership:	
For-profit	89.4%
Number of certified beds:	
<50	2.0%
51-100	29.8%
101-150	41.3%
>150	26.9%
Average	129.3

[1] Lower values indicate better status
[2] Higher values indicate better status

Table 3: Distributional Statistics of Staffing

Staffing Measures	n	Mean	Std Dev	Corp ICC[1]	Minimum	20th Percentile	40th Percentile	Median	60th Percentile	80th Percentile	Maximum
Hours per resident day											
CNA	1324	1.98	0.40	0.36	0.005	1.73	1.89	1.95	2.02	2.22	4.50
LPN	1324	0.63	0.22	0.10	0.04	0.45	0.58	0.63	0.70	0.81	2.48
RN	1324	0.29	0.17	0.05	0.00	0.14	0.23	0.27	0.31	0.43	2.34
LPN+RN	1323	0.92	0.21	0.07	0.09	0.76	0.87	0.92	0.96	1.07	2.08
RN/DON/ADON	1324	0.33	0.17	0.07	0.00	0.19	0.27	0.31	0.35	0.47	2.65
Staff turnover											
CNA	990	137.6%	80.0%	0.22	15.7%	72.7%	102.1%	117.4%	138.7%	192.2%	528.0%
LPN	961	87.2%	68.8%	0.18	0.0%	33.6%	56.8%	69.2%	85.7%	132.8%	466.7%
RN/DON/ADON	928	106.1%	86.2%	0.18	0.0%	39.1%	70.8%	87.8%	103.8%	165.8%	675.0%
Average tenure (years)											
CNA	660	3.24	1.61	0.18	0.23	1.84	2.55	2.87	3.29	4.56	9.52
LPN	660	4.27	2.78	0.19	0.46	2.01	3.04	3.66	4.32	5.86	17.85
RN/DON/ADON	660	3.82	2.39	0.22	0.10	1.83	2.79	3.27	3.77	5.57	15.00

[1] Intraclass correlations for corporation effects were calculated based on Howell (2007).

Table 4: Distributional Statistics of Quality Measures

Quality Measure	n	Mean	Standard deviation	Corp ICC[1]	Minimum	20th Percentile	40th Percentile	Median	60th Percentile	80th Percentile	Maximum
Hospitalizations per 100 days	1324	0.23	0.12	0.08	0.005	0.12	0.18	0.21	0.24	0.31	0.78
Worsening late loss ADL	1320	21.8	7.9	0.09	1.9	15.1	19.3	21.3	23.1	28.6	54.1
Moderate/severe pain	1321	10.0	7.8	0.18	0.0	3.8	6.7	8.2	10.1	15.0	54.2
High risk residents with pressure sores	1275	15.8	7.1	0.07	0.0	9.9	13.6	15.3	17.2	21.6	41.2
Low risk residents with pressure sores	1069	3.0	3.2	0.04	0.0	0.0	1.7	2.4	3.0	5.1	17.9
Physical restraints	1321	6.1	5.9	0.006	0.0	1.0	3.0	4.4	6.1	10.9	32.3
Depressed or anxious	1323	17.9	8.0	0.04	1.5	11.1	15.0	17.0	18.8	24.0	56.8
Low risk residents who lose control of their bowels/bladder	1287	48.7	12.5	0.03	4.9	38.1	45.2	48.8	51.7	59.5	88.9
Indwelling catheter	1321	8.3	4.3	0.02	0.0	4.7	6.9	8.0	9.0	11.5	29.0
Bedfast	1321	5.9	5.7	0.10	0.0	1.5	3.2	4.1	5.4	9.6	41.9
Decline in locomotion	1299	20.4	8.3	0.05	1.5	13.3	18.0	19.6	21.5	26.8	68.6
Urinary tract infection	1321	9.6	4.9	0.03	0.0	5.3	7.8	9.0	10.2	13.3	32.9
Weight loss	1321	11.6	4.8	0.006	0.0	7.5	10.0	11.3	12.5	15.4	36.4

[1] Intraclass correlations for corporation effects were calculated based on Howell (2007)

Table 5: Relationship between Quality Measures and Hours per Resident Day (per 15 minutes more)

Quality Measure Outcome	n	CNA AOR (p)	LPN AOR (p)	RN/DON AOR (p)	LPN+RN AOR (p)
Worsening Late Loss ADL (CNA, LPN, RN+DON+ADON)	122,480	1.00 (.89)	1.08 (.0002)	.97 (.09)	
CNA, LPN+RN	122,389	.99 (.54)			1.07 (.002)
Moderate to Severe Pain (CNA, LPN, RN+DON+ADON)	145,181	.98 (.14)	1.00 (.89)	.96 (.11)	
CNA, LPN+RN	145,060	.97 (.11)			1.00 (.99)
High risk residents with pressure sores (CNA, LPN, RN+DON+ADON)	88,072	.96 (<.0001)	1.04 (.14)	1.03 (.02)	
CNA, LPN+RN	87,994	.96 (<.0001)			1.04 (.17)
Low risk residents with pressure sores (CNA, LPN, RN+DON+ADON)	51,743	1.00 (.85)	1.08 (.11)	1.11 (.02)	
CNA, LPN+RN	51,699	.99 (.96)			1.15 (.01)
Physical restraints (CNA, LPN, RN+DON+ADON)	144,056	1.03 (.03)	1.06 (.04)	1.01 (.87)	
CNA, LPN+RN	143,935	1.03 (.04)			1.05 (.14)
Depressed or anxious (CNA, LPN, RN+DON+ADON)	144,500	.98 (.40)	.99 (.50)	1.04 (.23)	
CNA, LPN+RN	144,384	.98 (.42)			1.01 (.70)
Low risk residents who lose control of their bladder or bowels (CNA, LPN, RN+DON+ADON)	43,952	.99 (.66)	.97 (.02)	1.05 (.02)	
CNA, LPN+RN	43,527	.99 (.81)			.96 (.03)
Indwelling catheter (CNA, LPN, RN+DON+ADON)	144,944	.97 (.009)	1.07 (.04)	1.02 (.46)	
CNA, LPN+RN	144,821	.96 (.01)			1.09 (.01)
Bedfast (CNA, LPN, RN+DON+ADON)	144,019	.97 (.25)	1.08 (.03)	1.01 (.57)	
CNA, LPN+RN	143,898	.97 (.19)			1.07 (.20)
Decline in locomotion (CNA, LPN, RN+DON+ADON)	94,102	.99 (.65)	1.05 (.0002)	1.02 (.15)	
CNA, LPN+RN	94,036	.99 (.50)			1.04 (.02)
Urinary tract infection (CNA, LPN, RN+DON+ADON)	145,857	.99 (.14)	1.07 (<.0001)	1.01 (.53)	
CNA, LPN+RN	145,734	.98 (.08)			1.07 (.003)
Weight loss (CNA, LPN, RN+DON+ADON)	139,896	.99 (.005)	1.02 (.07)	1.01 (.19)	
CNA, LPN+RN	139,781	.99 (.0002)			1.03 (.04)

RN/DN=RN+DON+ADON, AOR=Adjusted odds ratio; Models were adjusted for case-mix, facility characteristics (Urban, Region, ownership, and # of residents), and accounted for corporation clustering effects

Table 6: Relationship between Quality Measures and Staff Turnover (per 25% more)

Quality Measure Outcome	n	CNA AOR (p)	LPN AOR (p)	RN/DON AOR (p)
Worsening Late Loss ADL	86,380	1.01 (.02)	1.00 (.79)	1.00 (.44)
Moderate to Severe Pain	101,964	1.04 (<.0001)	1.00 (.78)	1.01 (<.0001)
High risk residents with pressure sores	61,849	1.00 (.61)	1.02 (.03)	1.01 (.03)
Low risk residents with pressure sores	36,710	.99 (.01)	1.01 (.64)	1.01 (.44)
Physical restraints	101,041	1.00 (.86)	1.02 (.02)	1.01 (.21)
Depressed or anxious	102,058	1.01 (.06)	1.00 (.55)	1.00 (.49)
Low risk residents who lose control of their bladder or bowels	33,060	1.00 (.84)	1.00 (.58)	1.00 (.68)
Indwelling catheter	101,811	1.02 (<.0001)	1.00 (.71)	1.01 (.04)
Bedfast	101,028	1.02 (<.0001)	.99 (.48)	1.01 (.07)
Decline in locomotion	65,764	1.02 (<.0001)	1.00 (.68)	1.00 (.59)
Urinary tract infection	102,513	1.00 (.23)	1.01 (.04)	1.01 (.32)
Weight loss	98,340	1.01 (.53)	.98 (.41)	1.03 (.008)

RN/DN=RN+DON+ADON, AOR=Adjusted odds ratio; Models were adjusted for case-mix, facility characteristics (Urban, Region, ownership, and # of residents), and accounted for corporation clustering effects

Table 7: Relationship between Quality Measures and Tenure (per 1 year more)

Quality Measure Outcome	n	CNA AOR (p)	LPN AOR (p)	RN/DON AOR (p)
Worsening Late Loss ADL	62,108	.98 (<.0001)	.98 (.004)	.99 (.07)
Moderate to Severe Pain	72,031	.98 (<.0001)	0.99 (.61)	.98 (.17)
High risk residents with pressure sores	42,728	1.00 (.26)	.97 (.007)	.97 (.03)
Low risk residents with pressure sores	26,248	.91 (<.0001)	.99 (.73)	1.03 (.24)
Physical restraints	71,483	1.03 (.05)	.98 (.21)	.98 (.40)
Depressed or anxious	71,950	.97 (.19)	1.01 (.18)	1.00 (.46)
Low risk residents who lose control of their bladder or bowels	17,208	1.00 (.89)	1.01 (.59)	1.02 (.26)
Indwelling catheter	71,838	.99 (.06)	1.00 (.49)	1.00 (.07)
Bedfast	71,451	1.00 (.87)	.96 (<.0001)	1.01 (.008)
Decline in locomotion	47,597	.98 (.26)	.99 (.0001)	1.01 (.27)
Urinary tract infection	71,824	.97 (.05)	1.00 (.91)	.98 (.001)
Weight loss	69,781	1.00 (.88)	1.00 (.92)	.98 (.0002)

RN/DN=RN+DON+ADON, AOR=Adjusted odds ratio; Models were adjusted for case-mix, facility characteristics (Urban, Region, ownership, and # of residents), and accounted for corporation clustering effects

Table 8: Staffing Measure Associated with Hospitalizations per 100 Resident Days

Staffing Measure	n	CNA	LPN	RN/DN	LPN+RN
Hours/ resident day (per 15 min more)					
CNA, LPN, RN+DON+ADON	131,804	-.00312 (.006)	.00392 (.04)	-.00818(.0007)	
CNA, LPN+RN	131,678	-.00352 (.002)			.00062 (.75)
Staff turnover (per 25% higher)	91,937	.00044 (.51)	.00305 (.0004)	.00210 (.0004)	
Tenure	65,021	.00976 (<.0001)	-.00366 (.001)	-.00596 (<.0001)	

RN/DN=RN+DON+ADON, AOR=Adjusted odds ratio; Models were adjusted for case-mix, facility characteristics (urban/rural, region, ownership, and # of residents), and accounted for corporation clustering effects

Appendix C

Development of Staffing Quality Measures- Phase I: Continuation

Documentation of the Payroll Data Specifications

Final Report
January 16, 2007

Submitted on January 16, 2007 to:
Ms. Mary Weakland, CMS, Government Task Leader
Dr. Jean Scott, CMS, Government Task Leader
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Prepared by:
University of Colorado at Denver and Health Sciences Center
Colorado Foundation for Medical Care
CMS Contract: HHSM-500-2005-CO001C; Modification No. CO0004

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DOCUMENTATION OF THE PAYROLL DATA SPECIFICATIONS

1) Introduction

The Development of Staffing Quality Measures – Phase I: Continuation (SQM) project is designed to build on previous work conducted during Phase I by the Colorado Foundation for Medical Care (CFMC) and the University of Colorado at Denver and Health Sciences Center (UCDHSC) under contract with the Centers for Medicare & Medicaid Services (CMS). The purpose of the project is to continue development work on a wide array of staffing measures and to develop a set of payroll data reporting requirements that could be used to collect uniform data across nursing home facilities to generate nursing home staffing quality measures for use in a public reporting system. During Phase I of the project, the decision was made to collect payroll data from several national corporations to determine if common elements necessary for constructing staffing measures could be obtained. Through this effort a large payroll record database was constructed to develop and test quality measures derived from payroll data. Following the success of this initial data collection effort, it was determined that more detailed data specifications needed to be established to ensure uniform submission of payroll data in preparation for development of a system to generate nursing home staffing quality measures. Toward this goal, a draft payroll data specification has been developed during the initial months of the project continuation. This report provides information on the development of the draft specifications, an overview of the specifications, and next steps for testing the feasibility of collecting payroll data using the draft specifications.

2) Development of Draft Specifications

Information Learned From Phase I

During Phase I, 10 national nursing home corporations were invited to provide staffing information for their constituent nursing facilities. Invitations were extended to corporations through conference calls where the project team was able to gain insight into what corporations would and would not be able to provide with regard to employee staffing data. For example, corporate representatives reported that they would not be able to report direct versus indirect care hours per pay period for all categories of nursing staff. In addition, they would not be able to report hours by the unit where the individual worked (UCDHSC, 2004). Based on these calls 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.

Eight national nursing home corporations agreed to provide payroll data from their systems to support the development of staffing quality measures for this project. As a result, a database was constructed with payroll records from 1,453 facilities representing 48 states. In total, over 11.6 million individual payroll records and 172,563 individual personnel records were received. Although data extraction specifications were sent to

each corporation, corporations were permitted to modify the specification and therefore construction of the cross corporation staffing database was complicated by the fact that no standards existed for job title categorization, duration of pay periods, and reporting of daily census data. In addition, the specifications did not include detailed definitions for the requested data elements and did not address issues such as acceptable data values, date consistency requirements, and instructions for reporting missing values.

Findings from the Phase I payroll data collection effort suggest that several large corporations were able to provide the necessary data elements from their existing payroll systems to construct staffing measures. Even with a lack of standardization in Phase I, we were able to construct an identical set of measures for all facilities that provided the necessary data for the measures. Furthermore, this data collection and measure development effort helped to inform the project team of specific data anomalies and definitional issues that would need to be addressed through the creation of a detailed, uniform payroll data submission specification (UCDHSC, 2004; Kramer et. al., 2005).

Identification of Issues for Resolution

Project analysts reviewed the list of measures developed from Phase I and the scope of work (SOW) for the continuation project to determine the data elements for inclusion in the final payroll data specification. In addition, project analysts reviewed all data issues identified during Phase I, including data anomalies identified during the construction of the aggregate payroll database and those encountered in the process of measure development. Each issue was documented and a potential resolution presented to the project team, on bi-monthly project calls, for discussion and ratification. One issue, categorization and definition of Advanced Practice Nurses, involved an additional call with clinical experts outside of the project team. A summary of all issues discussed on the project calls along with proposed resolutions is presented in Appendix A.

Although the project team was able to identify a proposed resolution for all of the data specification issues, some of the resolutions will need to undergo further testing to determine the feasibility of the proposed resolution. Those resolutions that should be further tested are identified in Appendix A and are described briefly below.

- Job Categories –
    - ADON – During Phase I ADONs were classified into a unique job category as sufficient information was not available to classify this job title into either a direct patient care nursing category (RN, LPN) or nurse administrator category. As specific ADON measures were not identified as priority measures during the Phase I measure identification phase, this job category will not be retained. A question remains as to whether or not ADONs can be easily classified into one of the remaining job categories.
    - Advanced Practice Nurse (APN) – It was determined that the data specification would include a job category for APNs. However, it is unclear, based on the data received during Phase I, whether or not APNs are represented in a specific facility's payroll record or if these individuals

are charged to an administrative or corporate account. If APNs are not included in the facility payroll records then they will not be represented in the staffing measures. During the feasibility test, information on how APN hours are tracked and allocated at a facility level will be obtained.

- Productive and Non-Productive Hours
  - During Phase I facilities provided productive and non-productive hours that contained corrections to errors that occurred in prior pay periods. This resulted in negative payroll hours and/or extremely high hours for a given pay period. The current specification has been written to request "corrected" hours and rejects records with negative hours and/or higher than expected hours. Information on the feasibility of obtaining "corrected/reconciled" payroll records will be obtained during the feasibility test of the draft data specifications.
  - The payroll specification states that employee hours should be allocated to the facility where the employee worked and not to a "home" facility. Therefore if an employee is covering a shift at a facility, the payroll for that facility should contain a payroll record for that employee. During the feasibility test of the data specification, we will obtain information on how floaters or individuals covering shifts at a separate facility are allocated with regard to payroll.

- Contract Staff – The draft payroll specification was developed to include information on nursing home employees and does not include a mechanism to report information on contract staff hours. Contract staff hours were requested during Phase I however, only one facility was able to provide the requested information. Inclusion of contract staff hours in the payroll data specification is beyond the scope of this project and therefore will not be obtained during the feasibility test.

3) Overview of Draft Specifications

The draft data specifications are provided in Appendix B and consist of a Census specification that contains field definitions and data layout for reporting daily census data, a Pay Period specification that contains the field definitions and data layout for pay period data submission, and a Shift Level specification that contains field definitions and data layout for the shift level (raw time-clock) data submission. Census data is submitted for all facilities regardless of the payroll data submission type.

During Phase I, only one facility was able to provide shift level payroll data. Therefore, one of the goals of the current project is to obtain feedback from facilities on the feasibility and barriers to submitting shift level data. Corporations and/or individual nursing home facilities will review the Shift Level specification but will not submit shift level data during this continuation project.

4) Next Steps for Testing Draft Specifications

With the development of the draft specifications completed, the next step will be to obtain feedback on the specifications from nursing home corporations, payroll vendors, and specific nursing home facilities in order to identify barriers associated with meeting the data specification and to gain a better understanding of the burden associated with development and maintenance of a payroll data reporting requirement.

Review of shift level data specifications

Corporations who participated in Phase I will be asked to participate in a review of the shift level "raw time-clock" data specification during the first quarter of Calendar Year 2007. Individuals within the corporation directly involved in processing payroll, including both administrative and IT personnel (as appropriate), will be asked to participate in the review. During this review the corporation will be asked to;

- Describe (in writing) their current payroll process, specifically how they track shift level information and how this information is used to generate payroll for a given pay period.
- Review the draft data specification and describe (in writing) what would need to take place at their facility or within their corporation to comply with the specifications (e.g., the facility would need to migrate from a paper based system to an electronic system; the facility would have to learn how to extract the requested data item from their payroll system, etc.).
- Respond (in writing) to specific questions that arose during the development of the specifications (e.g., How are salary/administrative personnel represented in the payroll process – do they submit daily payroll records).
- Participate in a conference call (as needed) with project staff to clarify or elaborate on written responses.

Findings from this review will be included in the second deliverable for this task to be submitted in June 2007.

Development of data submission recommendations

In early 2007, the project team will review potential methods of delivery of the payroll data to support ongoing payroll data submission to CMS (e.g., electronic submission through a web-based system). In addition, the project team will specify additional submission requirements including the frequency of data submission, the volume of data to be submitted, and the reporting period (e.g., a calendar year, a quarter) for the payroll information needed to accurately calculate the quality measures. Final recommendations on payroll data submission will be presented in the June 2007 report.

Feasibility Test of the Pay Period Specification

A feasibility test of the Pay Period specification will be conducted during the second and third quarters of Calendar Year 2007. The primary goal of this task will be to test the feasibility of a sample of volunteer nursing facilities to review and comply with the CMS specified reporting requirements of the defined payroll data. Facilities will be asked to review the specifications, generate an extract file, and submit the resulting payroll data. In addition, facilities will be asked to comment on specific issues regarding barriers to complying with the data specifications and to address specific issues that arose during the development of the data specifications. A report describing the sample of facilities included in the feasibility test will be submitted at the end of April 2007.

References

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APPENDIX A: DATA SPECIFICATION ISSUES

Table A.1: Data Specification Issues

1. Specification Issues: Staff Classifications/Categories	
Data Element: Job Categories	
Definition: Job categories are classified into one of eleven common groups.	
1.1 Issue: During Phase I, 1551 individual job titles were provided by the facilities. These job categories were reviewed and collapsed into nine groups.	**Proposed Resolution:** We recommend that facilities be required to collapse existing job classifications into the nine common groups per specified guidelines. Job category definitions will be provided with a list of unique job titles.
1.2 Issue: Some facilities track employee hours based on the job function during a pay period. For example an individual may work in housekeeping 20 hours a week and as a CNA 20 hours a week and as a result two payroll records are provided the employee during a single pay period (one housekeeping record and one CNA record). Other corporations assign a single job category to an employee regardless of the duties they performed during a pay period.	**Proposed Resolution:** The data specifications will state that employees should be designated into one job classification group during a single pay period. Individuals who work in various job areas should be classified into the "highest" job category they are eligible to meet. For example, the CNA who performs both housekeeping tasks and CNA tasks should be classified as a CNA for all hours worked in the submitted payroll record.
1.3 Issue: When an employee is promoted and moves from one job group to another during a single pay period, should both job groups be reported or only one. If only one of the job groups is to be reported, which group should it be? For example, an RN moves to a DON position during a pay period. How should her/his time be treated?	**Proposed Resolution:** The data specifications will state that the employee's original job group is reported during the pay period the promotion occurred and then the new job group be reported for subsequent pay periods. This should reduce burden for those facilities/corporations who do not track multiple records within a pay period and reflects the likelihood that during a period of transition an employee is working in both positions (more of an expert in one and a novice in the other). During the feasibility test information on when an employee promotion goes into effect relative to pay periods will be obtained.
1.4 Issue: During Phase I, only one employee was coded into the Advance Practice Nurse job category. There is some indication that this is an important category in the state of New York and some support from the Stakeholder meeting that facilities should get credit for paying additional dollars for APNs. However, if an APN was performing as a physician-extender or performing predominately administrative duties then she/he would be classified into the Other Staff or Nurse Administrator category, respectively.	**Proposed Resolution:** An APN category will be included in the data specifications and will be assigned to those APNs who spend the majority of their time in direct patient care. The extremely low number of APNs identified in Phase I may result from APNs being charged to corporate administrative accounts versus a specific facility. During the feasibility test information on how APNs are charged will be obtained.

2. Specification Issues: Reporting of corrected productive and non-productive hours	
Data Elements: Total Productive Hours Total Non-Productive Hours	
Definitions: *Total Productive Hours* - Total number of hours worked during the pay period. This number cannot include hours for vacation leave, sick leave, corrections to previous pay periods, etc. This number does reflect hours worked for both direct and non-direct patient care. *Total Non-Productive Hours* – Total number of leave (sick, vacation, administrative) hours paid during the pay period.	
2.1 Issue: Phase I specifications did not indicate that payroll records should not contain adjustments/corrections to reconcile discrepancies in prior pay periods.	**Proposed Resolution**: We will specify that productive hours need to be reconciled/corrected hours for the pay period and not include hours to correct for over or under payments in prior pay periods.
2.2 Issue: During Phase I, four of the eight corporations provided productive and non-productive hours separately, three corporations provided productive hours only, and one corporation provided total hours (the sum of productive and non-productive hours).	**Proposed Resolution:** In order to calculate full-time/part-time status and to ensure we are accounting for leave of absences in payroll based retention & turnover measures we will require submission of productive and non-productive hours separately.
2.3 Issue: Some NH chains share employees between facilities but do not allocate those hours to the primary facility. For example, a CNA might be asked to cover a shift at "Facility A" but these hours are actually charged to her/his home facility "Facility B".	**Proposed Resolution:** The specification will state that payroll systems should allocate hours to facilities where the employee worked. Failure to do this will result in higher staffing rates at one facility and lower staffing rates at another. During the feasibility test, information will be obtained on how floaters or individuals covering shifts are allocated with regard to payroll.

3. Specification Issues: Calculation of turnover, retention, and tenure by staffing groups including individuals and positions with multiple departures and rehires.	
Data Element: Pay Period End Date	
Definition: The date the pay period ended. The pay period end date is used to calculate the turnover, retention, and tenure measures. The last pay period end date an employee worked during the reporting period and/or the last pay period end date an employee worked during the reporting period preceding a 60-day gap in payroll records is used as the end employment date for calculating retention, tenure, and turnover measures.	
3.1 Issue: During Phase I, we explored the use of payroll-based retention, turnover, and tenure measures. Historically, measures of employee retention, turnover, and tenure have been based on termination dates using personnel data. Analyses conducted during Phase I suggest that there is considerable agreement between retention and turnover measures based on payroll data compared to personnel data. For corporations that transfer individuals among facilities without officially terminating the employee, payroll-based measures of retention, turnover, and tenure will differ from measures based on personnel records. For our purposes, we propose defining an absence from a facility's payroll records of more than 60 days as a termination, and the departure date as the last date the employee appeared on a facility's payroll records.	**Proposed Resolution:** We proposed to use payroll-based measures of employee retention, turnover, and tenure. Using payroll data reduces burden for facilities and removes variability in these measures associated with differences in corporation and facility definitions of termination.
3.2 Issue: During Phase I, a corporation did not provide pay period end dates and therefore end dates were calculated as a fixed number of days from the pay period start date (i.e., 14 days).	**Proposed Resolution:** A pay period end date will be required for all payroll records as part of the data specification.
3.3 Issue: Variable pay period lengths – During Phase I corporations provided data for pay periods that ranged from 1 to 38 days. 3.55% of the pay periods were 15 days in length (representing bi-monthly pay periods), 24.37% of the pay periods were 7 days in length and 71.61% of the pay periods were 14 days.	**Proposed Resolution:** The data specification will require payroll data to be submitted for pay periods of 7 days, 14 days, or bi-monthly. During the feasibility test we should plan to obtain information from NHs whose pay periods do not fall within these timeframes to determine if they can meet this requirement. Larger pay periods lengths (e.g., > 15 days) are likely to reduce the precision of the measures.
Data Element: Position Start Date	
Definition: The date the employee began employment at the facility in the job group reported for the pay period.	
3.4 Issue: During Phase I employee start dates were obtained from personnel records. The project team had to merge the files together and then reconcile discrepancies between payroll data and personnel records (e.g., the employee started working before their official start date).	**Proposed Resolution:** The payroll data specifications will contain a field for employee start date. Facilities will be required to obtain this information (if not currently retained in the payroll system) from other sources and merge it into one data file for submission.

4. Specification Issue: Define number of part time vs. full time direct care nursing staff	
Data Element(s): Productive hours, non-productive hours, pay period start date, pay period end date	
Definition: Fulltime staff is defined as a weekly average of 35 (or more) hours per week based on productive and non-productive hours.	
4.1 Issue: During Phase I, conference calls conducted with NH chains indicated that it would be very difficult (and potentially inaccurate) for the chains to report employment status with regard to PT vs. FT work hours. Therefore, PT vs. FT status was determined based on the average number of hours worked per week over the reporting period. A threshold of 35 hours was established to distinguish FT from PT status.	**Proposed Resolution:** During the Phase I Continuation, FT and PT status will be determined in a similar manner to Phase I (e.g., average number of hours worked during the reporting period). Therefore the data specifications will not require submission of data elements to indicate FT and PT status.
5. Specification Issue: Reporting of staff who work in other units	
Data Element: No data element	
Definition: No definition	
5.1 Issue: During Phase I, information obtained during conference calls conducted with NH chains revealed that many of the NH chains we interviewed did not track employee hours for time worked in specific units within the NH. Therefore we did not collect information that would facilitate calculations for measures by specific units.	**Proposed Resolution:** Data elements for reporting staffing by unit will not be included in the data specification. Staffing measures will be calculated for all staff within the NH regardless of unit.
6. Specification Issues: Daily Census Data	
Data Element(s): Date; Bed Census	
Definition: Daily Census	
6.1 Issue: During Phase I daily census information was requested from facilities. Five of eight facilities were able to provide daily census data. The three remaining facilities provided monthly or annual average census data. NH comments from Phase I suggest that barriers to receiving daily census data included access to daily census data for historical records (we requested 2003 data) after a change in software systems had been undertaken.	**Proposed Resolution:** The data specification will **require** reporting of daily bed census. Staffing ratio measures are not valid when the measure cannot capture the variability in daily census.
6.2 Issue: Should census data be collected at a specific time of day?	**Proposed Resolution:** A review of current CMS data collection requirements that obtain daily census data did not indicate a specific time of day these data were collected. It is recommended that daily census be the census at 6:00am before admissions and discharges typically take place.

7. Specification Issue: Direct versus Indirect Care	
Data Element(s): No data element	
Definition: No definition	
7.1 Issue: During conference calls conducted prior to the Phase I data request, most NH chains indicated that they would not be able to provide information from their payroll systems on hours spent in direct patient care vs. indirect patient care.	**Proposed Resolution:** We will **not** collect elements for hours spent in direct versus indirect patient care at this time.
8. Specification Issue: Contract Staff	
Data Element(s): All elements requested from payroll data systems	
Definition:	
8.1 Issue: Only one NH chain was able to provide information on contracted staff during Phase I. Information obtained during conference calls suggest that many NHs do not track information on contract staff in a manner that would support integration into the current data specification. For example, one corporation was able to provide total dollars spent per month on contracted RNs but did not have information on the actual number of hours or days that the RNs worked.	**Proposed Resolution:** Currently staffing measures reflect measures for active employees and do not include contracted staff information.

Shift Level Payroll Data Specification Issues

9. Specification Issue: Reporting for Non-hourly Staff	
Data Element(s): All elements requested for Shift Level Payroll data reporting (Provider Medicare Number, Shift Start Date, Shift End Date, Shift Time In, Shift Time Out, Employee ID, Job Category, Hire Date)	
Definition:	
9.1 Issue: Salaried employees who are not required to punch in/out for specific shifts may not be represented in the shift level payroll data. This could include several job groups of interest for the staffing measures such as DONs, Nurse Administrators, and Administrators. During Phase I, a single corporation submitted shift-level payroll data and did submit shift-level records for salaried employees. These records had "fixed" date and time stamps (e.g., employees always punched in at 8:00 and out at 5:00 M-F).	**Proposed Resolution:** We will request that shift level payroll data include records for salaried employees that represent their expected hours worked (e.g., 40 hours, 20 hours, etc.). An alternative would be to permit submission of shift data for hourly employees and pay period data for salaried employees. During the feasibility test of the shift level data specifications we will examine the feasibility of nursing homes to provide shift level data for salaried employees. This resolution may be modified to comply with federal requirements for the Fair Labor Standards Act.

10. Specification Issue: Reporting zero (0) minutes for a shift	
Data Element(s): Shift Start Date, Shift End Date, Shift Time In, Shift Time Out	
Definition:	
10.1 Issue: During Phase 1 records were submitted with the same shift start and end date/time. These records represented zero minutes worked.	**Proposed Resolution:** We will reject records that indicate zero minutes worked for a specific shift.
11. Specification Issue: Missing data elements (such as time in or time out)	
Data Element(s): All elements requested for Shift Level Payroll data reporting (Provider Medicare Number, Shift Start Date, Shift End Date, Shift Time In, Shift Time Out, Employee ID, Job Category, Hire Date)	
Definition:	
11.1 Issue: Shift level payroll data were submitted during Phase 1 with missing data elements (e.g., Time In, Time Out).	**Proposed Resolution:** All required data elements would be indicated as part of the data specifications. Any records submitted with missing data elements will be rejected.

12. Specification Issue: Non-productive hours are not reported	
Data Element(s): All elements requested for Shift Level Payroll data reporting (Provider Medicare Number, Shift Start Date, Shift End Date, Shift Time In, Shift Time Out, Employee ID, Job Category, Hire Date)	
Definition:	
12.1 Issue: Non-productive hours may not be reported in the shift level data system. Non-productive hours are aggregated with productive hours to determine part-time vs. fulltime status and to determine when an employee departs from a facility.	**Proposed Resolution:** During Phase I, we determined that 32.5 hours would be used as the threshold for fulltime vs. part-time status when only productive hours were included in the payroll data submission (see page 20 of SQM – Phase I Final Report for details on the methodology used to arrive at 32.5 hours). (Note: when productive and non-productive hours are provided, 35 or more hours was considered fulltime status.) We recommend using only productive hours for calculating departure dates for employees and increasing the payroll "gap" for determining a departure from 60 days to 84 days. 84 days is equivalent to the 12 weeks of leave guaranteed under FMLA. This recommendation is for data submitted by shift or pay period. During the feasibility test we will explore the ability of nursing homes to provide non-productive hours as part of the shift level data submission. If facilities can provide this information, a flag to indicate productive vs. non-productive shifts will be included in the final data specification.
13. Specification Issue: Reporting overlapping shifts	
Data Element(s): Shift Start Date, Shift End Date, Shift Time In, Shift Time Out	
Definition:	
13.1 Issue: During Phase I records were submitted with overlapping shifts (e.g., An employee would have a shift from 7:00am to 3:00pm on 12/1/2003 and a second shift from 1:00pm to 5:00pm on 12/1/2003).	**Proposed Resolution:** During Phase I, the records were modified to eliminate overlap. In the example provided, the shift would be converted to a 7:00am – 5:00pm shift. We propose a similar approach to managing these records but will work with facilities during the feasibility test to understand what circumstances create these overlapping records and if this is the appropriate methodology for handling the records.

APPENDIX B: PAYROLL DATA SPECIFICATIONS

Submission of Census Data from Nursing Homes (Version 1.00)
Data Element Definitions

NOTE: Data specifications are subject to modifications pending full-scale use by participants in the feasibility study.

FACILITY IDENTIFIERS

Facility Medicare Provider Number

The Facility 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, W, Y, or Z, if the facility is a swing-bed unit in a hospital).

State Assigned Unique Facility ID Code

This facility ID code is assigned by the state to each facility for submission of MDS data to the state system. The same facility ID code should be used for submission of nursing home facility payroll data.

CENSUS DATA

Census Date

The Census Date is the date the census was taken for the reported record. Census is submitted for each day separately.

Resident Census

Resident Census is the total number of residents, regardless of payer source, in the nursing facility at 6:00am on the day the census is taken. Resident census does not include those residents for whom a bed is maintained due to absence from the nursing home for hospitalization or leave (i.e., does not include “bed holds”).

GENERAL DATA SPECIFICATIONS NOTES:

Each data submission will consist of a header record, a series of data records, and a trailer record. There are separate entries for each field in the header record, data record, and trailer record. Entries (fields) are separated by dotted lines. Each record within a data file is 325 characters in length. The following information is provided for each entry:

ITEM IDENTIFIER/DESCRIPTION. The "Item Identifier/Description" column gives a standard label (e.g., "Rec_ID") for the field and a short description (e.g., "Record ID").

LEN. The "Len" column gives the length of the field in characters (bytes).

START. The "Start" column is the starting position for the field in the data record.

END. The "End" column is the ending position for the field in the data record.

SPECIFICATIONS. The "Specifications" column gives a variety of information concerning the data requirements for the field. If a specifications item in this column is tagged with an asterisk (*), then failure to comply with the specification will result in a record REJECTION. If a specification is not tagged with an asterisk (*), then failure to comply will result in a warning (non-fatal error) and the record will be ACCEPTED.

PICTURE. The "Picture" section provides basic format information for the field. A picture of "X" indicates a single alpha-numeric character, while "XX" or "X(2)" indicate two alpha-numeric characters. A picture of "9" represents a numeric character, while "99" or "9(2)" indicate two numeric characters. A picture of "YYYYMMDD" is used for fields indicating year (including century), month, and then day format and a picture of HHMMSS is used for fields indicating hour (0-24), minutes (0-59), and seconds (0-59.

TYPE. The "Type" section gives the type of data in the field. Types are CODE, COUNT, TEXT, DATE, and TIME.

RANGE. The "Range" section lists the permissible values for a field.

FORMAT INFO. The "Format Info" section indicates additional specifications for the required formatting of values for a field. Examples are requirements that text entries be upper case and left-justified, and that numeric count entries be right-justified and leading-zero filled.

CONSISTENCY. The "Consistency" section indicates when pairs of fields or groups of fields must have consistent values. For example, the consistency requirement for the Record Submission Date includes the specification:

"*1) Sub_Date cannot be greater than current date."

Uniform Data Specifications For Nursing Home Payroll Census Data Submission
Header Record Layout for Submission of Payroll Census Data from Nursing Homes (Version 1.0)

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
REC_ID	2	1	2	Picture:	X(2)	Type:	CODE
				*Range:	Upper case A followed by 1.		
Record ID				Format Info:			
				Consistency:			
FED_ID	12	3	14	Picture:	X(12)	Type:	CODE
				Range:	Valid code, sp(12)		
Facility Medicare Provider Number				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case. Allow + in first character to indicate pending		
				Consistency:	*1) This facility Medicare provider number (FED_ID) must match the facility Medicare provider number in each record of the submission file.		
ST_ID	15	15	29	Picture:	X(15)	Type:	CODE
				Range:	Valid code, sp(15)		
Facility Medicaid Provider Number				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case. Allow + in first character to indicate pending		
				Consistency:	*1) This facility Medicaid provider number (ST_ID) must match the facility Medicaid provider number in each record of the submission file.		
FAC_ID	16	30	45	Picture:	X(16)	Type:	TEXT
				*Range:	Valid Code		
State Assigned Unique Facility ID Code				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case.		
				Consistency:	*1) This facility ID code (FAC_ID) must match the facility ID in each record of the submission file.		
FAC_NAME	30	46	75	Picture:	X(30)	Type:	TEXT
				Range:	Text		
Facility Name				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FAC_ADDR_1	30	76	105	Picture:	X(30)	Type:	TEXT
				Range:	Text		
Facility Address Line 1				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FAC_ADDR_2	30	106	135	Picture:	X(30)	Type:	TEXT
				Range:	Text		
Facility Address Line 2				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FAC_CITY	20	136	155	Picture:	X(20)	Type:	TEXT
				Range:	Text		
Facility City				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FAC_ST	2	156	157	Picture:	X(2)	Type:	CODE
				Range:	Valid Code		
Facility State				Format Info:	Valid 2 character state code; upper case.		
				Consistency:			
FAC_ZIP	11	158	168	Picture:	X(11)	Type:	CODE
				Range:	Valid numeric ZIP code		
Facility ZIP Code				Format Info:	Left justified; no embedded dashes or spaces.		

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
				Consistency:			
FAC_CNTCT	30	169	198	Picture:	X(30)	Type:	TEXT
				Range:	Text		
Facility Contact Person Name				Format Info:	Left Justified; any letters must be upper case		
				Consistency:			
FAC_PHONE	10	199	208	Picture:	9(10)	Type:	TEXT
				Range:	Valid phone number		
Facility Contact Person Phone Number				Format Info:	Area code included; no embedded nonnumeric characters		
				Consistency:			
FAC_EXTEN	5	209	213	Picture:	X(5)	Type:	TEXT
				Range:	Valid extension, sp(5)		
Facility Contact Person Phone Extension				Format Info:	Left justified.		
				Consistency:			
FILE_DT	8	214	221	Picture:	YYYMMDD	Type:	DATE
				Range:	Valid Date		
File Creation Date				Format Info:			
				Consistency:	*1) Cannot be greater than current date.		
TEST_SM	1	222	222	Picture:	X	Type:	CODE
				Range:	0 (zero), 1Valid Code		
Test/Production Indicator				Format Info:			
				Consistency:	1) Value = 0 for test submissions to the State; value = 1 for production submission		
FILLER	100	223	322	Picture:	X(100)	Type:	FILLER
				Range:	Sp(100)		
Blank Filler				Format Info:	Always blank.		
				Consistency:			
DATA_END	1	323	323	Picture:	X	Type:	CODE
				*Range:	%		
Facility State				Format Info:	Must always = %.		
				Consistency:	1) Used to indicate end of data.		
CRG_RTN	1	324	324	Picture:	X	Type:	CODE
				*Range:	ASCII(013)		
Carriage Return (ASCII 013)				Format Info:	Must always be a carriage return (ASCII 013)		
				Consistency:			
LN_FD	1	325	325	Picture:	X	Type:	CODE
				*Range:	ASCII(010)		
Line Feed (ASCII 010)				Format Info:	Must always be a line feed (ASCII010)		
				Consistency:			

Uniform Data Specifications For Nursing Home Payroll Census Data Submission
Data Record Layout for Submission of Payroll Census Data from Nursing Homes (Version 1.0)

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
REC_ID	2	1	2	Picture:	X(2)	Type:	Code
				*Range:	Upper case C followed by 1.		
Record ID				Format Info:			
				Consistency:			
VERSION_CD	5	3	7	Picture:	X(5)	Type:	CODE
				*Range:	1.00		
Data Specification Version Code				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FED_ID	12	8	19	Picture:	X(12)	Type:	CODE
				Range:	Valid code, sp(12)		
Facility Medicare Provider Number				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case. Allow + in first character to indicate pending		
				Consistency:	*1) This facility Medicare provider number (FED_ID) must match the facility Medicare provider number in each record of the submission file.		
FAC_ID	16	20	35	Picture:	X(16)	Type:	TEXT
				*Range:	Valid Code		
State Assigned Unique Facility ID Code				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case.		
				Consistency:	*1) This facility ID code (FAC_ID) must match the facility ID in each record of the submission file.		
SUB_DATE	8	36	43	Picture:	YYYYMMDD	Type:	DATE
				*Range:	Valid Date		
Record Submission Date				Format Info:			
				Consistency:	*1) Sub_Date cannot be greater than current date.		
CORRECTION_NUM	2	44	45	Picture:	XX	Type:	COUNT
				*Range:	00-99		
Correction number for record				Format Info:	Right justify; pad left with zero.		
				Consistency:			
DELETE	1	46	46	Picture:	X	Type:	CODE
				*Range:	0,1		
Deletion Flag				Format Info:			
				Consistency:			
Census_DT	8	47	54	Picture:	YYYYMMDD	Type:	DATE
				*Range:	Valid Date		
Census Date				Format Info:			
				Consistency:	* 1) Census_DT cannot be prior to start of data reporting requirement. * 2) Census_DT cannot be greater than Sub-Date.		
Res_Census	4	55	58	Picture:	9(4)	Type:	COUNT
				*Range:	0001-9999		
Resident Census				Format Info:	Right justify; pad left with zero.		
				Consistency:			
FILLER	264	59	322	Picture:	X(264)	Type:	FILLER
				Range:	sp(264)		
Blank Filler				Format Info:	Always blank		

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
				Consistency:			
DATA_END	1	323	323	Picture:	X	Type:	CODE
				*Range:	%		
End of Data Termination Code				Format Info:	Must always = %		
				Consistency:	1. Used to indicate end of data.		
CRG_RTN	1	324	324	Picture:	X	Type:	CODE
				*Range:	ASCII(013)		
Carriage Return (ASCII 013)				Format Info:	Must always be a carriage return (ASCII 013)		
				Consistency:			
LN_FD	1	325	325	Picture:	X	Type:	CODE
				*Range:	ASCII(010)		
Line Feed (ASCII 010)				Format Info:	Must always be a line feed (ASCII010)		
				Consistency:			

Uniform Data Specifications For Nursing Home Payroll Census Data Submission
Trailer Record Layout for Submission of Payroll Census Data from Nursing Homes (Version 1.0)

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
REC_ID	2	1	2	Picture:	X(2)	Type:	CODE
				*Range:	Upper case Z followed by 0.		
Record ID				Format Info:			
				Consistency:			
TOT_REC	6	3	8	Picture:	9(6)	Type:	COUNT
				*Range:	Valid number		
Total Records Submitted				Format Info:	Right justified and leading zero filled.		
				Consistency:	*1) This field should include the total number of records in the submission file, including the header record, all Census records, and the trailer record.		
FILLER	314	9	322	Picture:	X(314)	Type:	FILLER
				*Range:	sp(314)		
Blank Filler				Format Info:	Always blank.		
				Consistency:			
DATA_END	1	323	323	Picture:	X	Type:	CODE
				*Range:	%		
Facility State				Format Info:	Must always = %.		
				Consistency:	1) Used to indicate end of data.		
CRG_RTN	1	324	324	Picture:	X	Type:	CODE
				*Range:	ASCII(013)		
Carriage Return (ASCII 013)				Format Info:	Must always be a carriage return (ASCII 013)		
				Consistency:			
LN_FD	1	325	325	Picture:	X	Type:	CODE
				*Range:	ASCII(010)		
Line Feed (ASCII 010)				Format Info:	Must always be a line feed (ASCII010)		
				Consistency:			

Submission of Pay Period Payroll Data from Nursing Homes (Version 1.00)
Data Element Definitions

NOTE: Data specifications are subject to modifications pending full-scale use by participants in the feasibility study.

FACILITY IDENTIFIERS

Facility Medicare Provider Number

The Facility 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, W, Y, or Z, if the facility is a swing-bed unit in a hospital).

State Assigned Unique Facility ID Code

This facility ID code is assigned by the state to each facility for submission of MDS data to the state system. The same facility ID code should be used for submission of nursing home facility payroll data.

EMPLOYEE IDENTIFIERS

Employee ID

A unique employee identifier must be submitted with each payroll record. The unique employee identification should not contain identifying information such as employee names or social security numbers. The same unique Employee ID must be used for an employee's tenure within a nursing home. If the employee leaves the nursing home and returns to its employ at a later point in time the facility may choose to retain the original employee ID or assign a new employee ID. A new employee ID should not be assigned when an employee is promoted within a nursing home facility.

Employee Start Date

The Employee Start Date is the date the employee began their employment at the nursing home. If the employee has left the nursing home for a period of time and returned as an employee the date provided should be the most recent start date.

STAFF JOB CATEGORIES

The data specification requires nursing home facilities to classify staff into one of nine job categories as defined below. Staff should be assigned to the appropriate job category based on their job title on the first day of the pay period being reported.

Registered Nurse – Those persons licensed to practice as registered nurses in the State where the facility is located. This category includes RN/ADONs whose primary[1] responsibilities involve direct patient care[2].

Licensed Practical/Vocational Nurse – Those persons licensed to practice as licensed practical/vocational nurses in the State where the facility is located. This category includes LPN/ADONs whose primary responsibilities involve direct patient care.

Certified Nurse Aide – Individuals who have completed a State approved training and competency evaluation program, or competency evaluation program approved by the State, or have been determined competent as provided in 483.150(a) and (3) and who are providing nursing or nursing-related services to residents. This category includes Medication Aides and Restorative Aides. CNAs in training should be classified as Non-Certified Nurse Aides (see below). If an individual works in two positions (e.g., CNA and housekeeping) all hours for this employee should be reported as CNA hours.

Non-Certified Nurse Aide – Individuals who are in training as a certified nurses aide or who are non-certified assistants/aides. This category includes Bathing Aide, Caregiver, Day Center Attendant, Feeding Assistant, Non-certified Aide, Nursing Assistant, Personal Care Assistant, and Resident Assistant. If an individual works in two positions (e.g., Nurse Assistant and Receptionist) all hours should be reported as Non-Certified Aide hours.

Advanced Practice Nurse (APN) – Those persons licensed as a registered nurse in the State where the facility is located and certified as a Nurse Practitioner or Clinical Nurse Specialist by a recognized national certifying body. This category includes only APNs whose primary responsibilities involve direct patient care. APNs performing physician-delegated tasks should be categorized into the Other Staff category and APNs whose primary responsibilities involve administrative duties should be categorized into the Nurse Administrator category.

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[1] Primary refers to greater than 50% of time.

[2] Involved in direct patient care is defined to mean that an individual is providing direct care to residents or is directly responsible for care provided to residents. Providing direct care means that an individual has responsibility for the residents' total care or some aspect of the residents' care. Resident contact is an intrinsic part of direct care. Directly involved in patient care includes, but is not limited to, such activities as assisting with activities of daily living (ADLs), performing gastro-intestinal feeds, giving medications, supervising the care given by CNAs, and performing nursing assessments to admit residents or notify physicians about a change in condition. [Final Rule – 42 CFR Part 483]

Director of Nursing[3] – Professional registered nurse(s) administratively responsible for managing and supervising nursing services within the facility.

Nurse Administrator – This category includes RNs and LPN/LVNs whose primary responsibilities are administrative and who do not perform direct patient care functions for the majority of their time (51% or more time in administrative duties). This category also includes other nurses whose principal duties are spent conducting administrative duties including, Assistant DON, Case Manager[4], CNA Instructor, CNA Supervisor, Coordinator of Wound Care, Director of Nurses in Training, Infection Control Nurse, Manager of Clinical Services, Medicare Coordinator, Nurse Liaison, Nurse Manager, Nurse Scheduler, Shift Supervisor, Patient Care Coordinator, Quality Improvement and/or Assurance Coordinator, Resident Assessment/MDS Coordinator, Staff Development Manager, and Unit Manager/Director.

Administrator – This category includes the Individual(s) responsible for all nursing home operations including the Administrator, Executive Director, Medical Director, and President. This category does not include vice presidents or other senior administrators, these job titles should be classified as Other staff. Administrator should be assigned to those positions that are responsible for the overall administration and patient care provided at the nursing home.

Other Staff – All staff not assigned to one of the eight categories listed above.

PAY PERIOD

Pay Period Start Date

The Pay Period Start Date is the first day of the pay period being reported. The date cannot overlap with prior pay periods submitted for the same employee working at the same nursing home.

Pay Period End Date

The Pay Period End Date is the last day of the pay period being reported. The date cannot overlap with prior pay periods submitted for the same employee working at the same nursing home. The pay period length (number of days between pay period start and end dates) cannot exceed 15 days and must be equal to a 7-day, 14-day, or a bi-monthly (15-day) pay period.

[3] The Director of Nursing and Nurse Administrator definitions may be modified, if warranted, to comply with the Fair Labor Standards Act.
[4] The words coordinator, manager, and director are used interchangeably for the various Nurse Administrator positions.

Productive Hours

Productive Hours includes the total number of hours worked during the pay period at the nursing home for the employee identified in the record. This number cannot include hours for vacation leave, sick leave, corrections to reconcile errors from previous pay periods, etc. This number does reflect hours worked in both direct and non-direct patient care. If an employee covers a shift at a facility within a nursing home corporation, the hours worked should be assigned to the respective facility and not allocated to a "home" or "primary" facility. If no productive hours were worked during the pay period the data element should be submitted with zero hours.

Nonproductive Hours

Nonproductive Hours includes the total number of hours paid during the pay period for leave (sick, vacation, administrative), bonuses, employee payouts, etc. If no nonproductive hours were paid during the pay period the data element should be submitted with zero hours.

GENERAL DATA SPECIFICATIONS NOTES:

Each data submission will consist of a header record, a series of data records, and a trailer record. There are separate entries for each field in the header record, data record, and trailer record. Entries (fields) are separated by dotted lines. Each record within a data file is 325 characters in length. The following information is provided for each entry:

ITEM IDENTIFIER/DESCRIPTION. The "Item Identifier/Description" column gives a standard label (e.g., "Rec_ID") for the field and a short description (e.g., "Record ID").

LEN. The "Len" column gives the length of the field in characters (bytes).

START. The "Start" column is the starting position for the field in the data record.

END. The "End" column is the ending position for the field in the data record.

SPECIFICATIONS. The "Specifications" column gives a variety of information concerning the data requirements for the field. If a specifications item is this column is tagged with an asterisk (*), then failure to comply with the specification will result in a record

REJECTION. If a specification is not tagged with an asterisk (*), then failure to comply will result in a warning (non-fatal error) and the record will be ACCEPTED.

PICTURE. The "Picture" section provides basic format information for the field. A picture of "X" indicates a single alpha-numeric character, while "XX" or "X(2)" indicate two alpha-numeric characters. A picture of "9" represents a numeric character, while "99" or "9(2)" indicate two numeric characters. A picture of "YYYYMMDD" is used for fields indicating year (including century), month, and then day format and a picture of HHMMSS is used for fields indicating hour (0-24), minutes (0-59), and seconds (0-59.

TYPE. The "Type" section gives the type of data in the field. Types are CODE, COUNT, TEXT, DATE, and TIME.

RANGE. The "Range" section lists the permissible values for a field.

FORMAT INFO. The "Format Info" section indicates additional specifications for the required formatting of values for a field. Examples are requirements that text entries be upper case and left-justified, and that numeric count entries be right-justified and leading-zero filled.

CONSISTENCY. The "Consistency" section indicates when pairs of fields or groups of fields must have consistent values. For example, the consistency requirement for the Pay Period End Date includes the specification:

"*1) The date must be at least 7 days after the pay period start date but no more than 15 days after."

Uniform Data Specifications For Nursing Home Payroll Pay Period Data Submission
Header Record Layout for Submission of Payroll Pay Period Data from Nursing Homes (Version 1.00)

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
REC_ID	2	1	2	Picture:	X(2)	Type:	CODE
				*Range:	Upper case A followed by 1.		
Record ID				Format Info:			
				Consistency:			
FED_ID	12	3	14	Picture:	X(12)	Type:	CODE
				Range:	Valid code, sp(12)		
Facility Medicare Provider Number				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case. Allow + in first character to indicate pending		
				Consistency:	*1) This facility Medicare provider number (FED_ID) must match the facility Medicare provider number in each record of the submission file.		
ST_ID	15	15	29	Picture:	X(15)	Type:	CODE
				Range:	Valid code, sp(15)		
Facility Medicaid Provider Number				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case. Allow + in first character to indicate pending		
				Consistency:	*1) This facility Medicaid provider number (ST_ID) must match the facility Medicare provider number in each record of the submission file.		
FAC_ID	16	30	45	Picture:	X(16)	Type:	TEXT
				*Range:	Valid Code		
State Assigned Unique Facility ID Code				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case.		
				Consistency:	*1) This facility ID code (FAC_ID) must match the facility ID in each record of the submission file.		
FAC_NAME	30	46	75	Picture:	X(30)	Type:	TEXT
				Range:	Text		
Facility Name				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FAC_ADDR_1	30	76	105	Picture:	X(30)	Type:	TEXT
				Range:	Text		
Facility Address Line 1				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FAC_ADDR_2	30	106	135	Picture:	X(30)	Type:	TEXT
				Range:	Text		
Facility Address Line 2				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FAC_CITY	20	136	155	Picture:	X(20)	Type:	TEXT
				Range:	Text		
Facility City				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FAC_ST	2	156	157	Picture:	X(2)	Type:	CODE
				Range:	Valid Code		
Facility State				Format Info:	Valid 2 character state code; upper case.		
				Consistency:			
FAC_ZIP	11	158	168	Picture:	X(11)	Type:	CODE
				Range:	Valid numeric ZIP code		
Facility ZIP Code				Format Info:	Left justified; no embedded dashes or spaces.		

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
				Consistency:			
FAC_CNTCT	30	169	198	Picture:	X(30)	Type:	TEXT
				Range:	Text		
Facility Contact Person Name				Format Info:	Left Justified; any letters must be upper case		
				Consistency:			
FAC_PHONE	10	199	208	Picture:	9(10)	Type:	TEXT
				Range:	Valid phone number		
Facility Contact Person Phone Number				Format Info:	Area code included; no embedded nonnumeric characters		
				Consistency:			
FAC_EXTEN	5	209	213	Picture:	X(5)	Type:	TEXT
				Range:	Valid extension, sp(5)		
Facility Contact Person Phone Extension				Format Info:	Left justified.		
				Consistency:			
FILE_DT	8	214	221	Picture:	YYYMMDD	Type:	DATE
				Range:	Valid Date		
File Creation Date				Format Info:			
				Consistency:	*1) Cannot be greater than current date.		
TEST_SM	1	222	222	Picture:	X	Type:	CODE
				*Range:	0 (zero), 1Valid Code		
Test/Production Indicator				Format Info:			
				Consistency:	1) Value = 0 for test submissions to the State; value = 1 for production submission		
FILLER	100	223	322	Picture:	X(100)	Type:	FILLER
				*Range:	Sp(100)		
Blank Filler				Format Info:	Always blank.		
				Consistency:			
DATA_END	1	323	323	Picture:	X	Type:	CODE
				*Range:	%		
Facility State				Format Info:	Must always = %.		
				Consistency:	1) Used to indicate end of data.		
CRG_RTN	1	324	324	Picture:	X	Type:	CODE
				*Range:	ASCII(013)		
Carriage Return (ASCII 013)				Format Info:	Must always be a carriage return (ASCII 013)		
				Consistency:			
LN_FD	1	325	325	Picture:	X	Type:	CODE
				*Range:	ASCII(010)		
Line Feed (ASCII 010)				Format Info:	Must always be a line feed (ASCII010)		
				Consistency:			

Uniform Data Specifications For Nursing Home Payroll Pay Period Data Submission
Data Record Layout for Submission of Payroll Pay Period Data from Nursing Homes (Version 1.00)

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
REC_ID	2	1	2	Picture:	X(2)	Type:	CODE
				*Range:	Upper case B followed by 1.		
Record ID				Format Info:			
				Consistency:			
VERSION_CD	5	3	7	Picture:	X(5)	Type:	CODE
				*Range:	1.00		
Data Specification Version Code				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FED_ID	12	8	19	Picture:	X(12)	Type:	CODE
				Range:	Valid code, sp(12)		
Facility Medicare Provider Number				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case. Allow + in first character to indicate pending		
				Consistency:	*1) This facility Medicare provider number (FED_ID) must match the facility Medicare provider number in each record of the submission file.		
FAC_ID	16	20	35	Picture:	X(16)	Type:	TEXT
				*Range:	Valid Code		
State Assigned Unique Facility ID Code				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case.		
				Consistency:	*1) This facility ID code (FAC_ID) must match the facility ID in each record of the submission file.		
SUB_DATE	8	36	43	Picture:	YYYYMMDD	Type:	DATE
				*Range:	Valid Date		
Record Submission Date				Format Info:			
				Consistency:	*1) SUB_DATE cannot be greater than current date.		
CORRECTION_NUM	2	44	45	Picture:	XX	Type:	COUNT
				*Range:	00-99		
Correction number for record				Format Info:	Right justify; pad left with zero.		
				Consistency:			
DELETE	1	46	46	Picture:	X	Type:	CODE
				*Range:	0,1		
Deletion Flag				Format Info:			
				Consistency:			
EMP_ID	16	47	62	Picture:	X(16)	Type:	TEXT
				Range:			
Unique Employee Identifiier				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case.		
				Consistency:	1) The same employee ID must be used across pay periods during a contiguous employment period. 2) The number should not contain identifying information such as employee names or social security numbers. 3) *This item cannot be blank.		
EMP_ST_DT	8	63	70	Picture:	YYYYMMDD	Type:	DATE
				*Range:	Valid Date		
Employee Start Date				Format Info:			

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
				Consistency:	1) Should be most recent start date for the employee *2) Must be prior or equal to the pay period start date *3) Must be prior or equal to the SUB_DATE		
JOB_CAT	2	71	72	Picture:	XX	Type:	CODE
				*Range:	01-09		
Employee Job Category				Format Info:	Right justify; pad left with zero. 01= Registered Nurse 02=Licensed/Vocational Nurse 03=Certified Nurses Aide 04=Non-Certified Nurse Aide 05=Advanced Practice Nurse 06=Director of Nursing 07=Nurse Administrator 08=Administrator 09=Other Staff		
				Consistency:			
PAY_P_ST_DT	8	73	80	Picture:	YYYYMMDD	Type:	DATE
				*Range:	Valid Date		
Pay Period Start Date				Format Info:			
				Consistency:	*1) The date must be at least 7 days prior to the pay period end date but no more than 15 days prior. *2) The date cannot overlap with an existing pay period for the same employee working within the same nursing home.		
PAY_P_END_DT	8	81	88	Picture:	YYYYMMDD	Type:	DATE
				*Range:	Valid Date		
Pay Period End Date				Format Info:			
				Consistency:	*1) The date must be at least 7 days after the pay period start date but no more than 15 days after. *2) The date cannot overlap with an existing pay period for the same employee working within the same nursing home. *3) The date cannot be prior to the SUB_DATE.		
PROD_HOUR	3	89	91	Picture:	999	Type:	NUMBER
				*Range:	000-180		
Total Productive Hours for the pay period				Format Info:	Right justify; pad left with zero. No embedded dashes or spaces		
				Consistency:	*1) The total number of productive hours cannot exceed an average of twelve hours per day over the pay period.		
NPROD_HOUR	3	92	94	Picture:	999	Type:	NUMBER
				*Range:	000-999		
Total Non productive hours for the pay period				Format Info:	Right justify; pad left with zero. No embedded dashes or spaces		
				Consistency:			
FILLER	228	95	322	Picture:	X(228)	Type:	FILLER
				Range:	sp(228)		
Blank Filler				*Format Info:	Always blank		
				Consistency:			
DATA_END	1	323	323	Picture:	X	Type:	CODE
				*Range:	%		
End of Data Termination Code				Format Info:	Must always = %		

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
				Consistency:	1. Used to indicate end of data.		
CRG_RTN	1	324	324	Picture:	X	Type:	CODE
				*Range:	ASCII(013)		
Carriage Return (ASCII 013)				Format Info:	Must always be a carriage return (ASCII 013)		
				Consistency:			
LN_FD	1	325	325	Picture:	X	Type:	CODE
				*Range:	ASCII(010)		
Line Feed (ASCII 010)				Format Info:	Must always be a line feed (ASCII010)		
				Consistency:			

Uniform Data Specifications For Nursing Home Payroll Pay Period Data Submission
Trailer Record Layout for Submission of Payroll Pay Period Data from Nursing Homes (Version 1.0)

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
REC_ID	2	1	2	Picture:	X(2)	Type:	CODE
				*Range:	Upper case Z followed by 0.		
Record ID				Format Info:			
				Consistency:			
TOT_REC	6	3	8	Picture:	9(6)	Type:	COUNT
				*Range:	Valid number		
Total Records Submitted				Format Info:	Right justified and leading zero filled.		
				Consistency:	*1) This field should include the total number of records in the submission file, including the header record, all Census records, and the trailer record.		
FILLER	314	9	322	Picture:	X(314)	Type:	FILLER
				Range:	sp(314)		
Blank Filler				*Format Info:	Always blank.		
				Consistency:			
DATA_END	1	323	323	Picture:	X	Type:	CODE
				*Range:	%		
Facility State				Format Info:	Must always = %.		
				Consistency:	1) Used to indicate end of data.		
CRG_RTN	1	324	324	Picture:	X	Type:	CODE
				*Range:	ASCII(013)		
Carriage Return (ASCII 013)				Format Info:	Must always be a carriage return (ASCII 013)		
				Consistency:			
LN_FD	1	325	325	Picture:	X	Type:	CODE
				*Range:	ASCII(010)		
Line Feed (ASCII 010)				Format Info:	Must always be a line feed (ASCII010)		
				Consistency:			

Submission of Shift Payroll Data from Nursing Homes (Version 1.0)
Data Element Definitions

NOTE: Data specifications are subject to modifications pending full-scale use by participants in the feasibility study.

FACILITY IDENTIFIERS

Facility Medicare Provider Number

The Facility 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,W, Y, or Z, if the facility is a swing-bed unit in a hospital).

State Assigned Unique Facility ID Code

This facility ID code is assigned by the state to each facility for submission of MDS data to the state system. The same facility ID code should be used for submission of nursing home facility payroll data.

EMPLOYEE IDENTIFIERS

Employee ID

A unique employee identifier must be submitted with each payroll record. The unique employee identification should not contain identifying information such as employee names or social security numbers. The same unique Employee ID must be used for an employee's tenure within a nursing home. If the employee leaves the nursing home and returns to its employ at a later point in time the facility may choose to retain the original employee ID or assign a new employee ID. A new employee ID should not be assigned when an employee is promoted within a nursing home facility.

Employee Start Date

The Employee Start Date is the date the employee began their employment at the nursing home. If the employee has left the nursing home for a period of time and returned as an employee the date provided should be the most recent start date.

STAFF JOB CATEGORIES

The data specification requires nursing home facilities to classify staff into one of nine job categories as defined below. Staff should be assigned to the appropriate job category based on their job title on the first day of the pay period being reported.

Registered Nurse – Those persons licensed to practice as registered nurses in the State where the facility is located. This category includes RN/ADONs whose primary[5] responsibilities involve direct patient care[6].

Licensed Practical/Vocational Nurse – Those persons licensed to practice as licensed practical/vocational nurses in the State where the facility is located. This category includes LPN/ADONs whose primary responsibilities involve direct patient care.

Certified Nurse Aide – Individuals who have completed a State approved training and competency evaluation program, or competency evaluation program approved by the State, or have been determined competent as provided in 483.150(a) and (3) and who are providing nursing or nursing-related services to residents. This category includes Medication Aides and Restorative Aides. CNAs in training should be classified as Non-Certified Nurse Aides (see below). If an individual works in two positions (e.g., CNA and housekeeping) all hours for this employee should be reported as CNA hours.

Non-Certified Nurse Aide – Individuals who are in training as a certified nurses aide or who are non-certified assistants/aides. This category includes Bathing Aide, Caregiver, Day Center Attendant, Feeding Assistant, Non-certified Aide, Nursing Assistant, Personal Care Assistant, and Resident Assistant. If an individual works in two positions (e.g., Nurse Assistant and Receptionist) all hours should be reported as Non-Certified Aide hours.

Advanced Practice Nurse (APN) – Those persons licensed as a registered nurse in the State where the facility is located and certified as a Nurse Practitioner or Clinical Nurse Specialist by a recognized national certifying body. This category includes only APNs whose primary responsibilities involve direct patient care. APNs performing physician-delegated tasks should be categorized into the Other Staff category and APNs whose primary responsibilities involve administrative duties should be categorized into the Nurse Administrator category.

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[5] Primary refers to greater than 50% of time.

[6] Involved in direct patient care is defined to mean that an individual is providing direct care to residents or is directly responsible for care provided to residents. Providing direct care means that an individual has responsibility for the residents' total care or some aspect of the residents' care. Resident contact is an intrinsic part of direct care. Directly involved in patient care includes, but is not limited to, such activities as assisting with activities of daily living (ADLs), performing gastro-intestinal feeds, giving medications, supervising the care given by CNAs, and performing nursing assessments to admit residents or notify physicians about a change in condition. [Final Rule – 42 CFR Part 483]

Director of Nursing[7] – Professional registered nurse(s) administratively responsible for managing and supervising nursing services within the facility.

Nurse Administrator – This category includes RNs and LPN/LVNs whose primary responsibilities are administrative and who do not perform direct patient care functions for the majority of their time (51% or more time in administrative duties). This category also includes other nurses whose principal duties are spent conducting administrative duties including, Assistant DON, Case Manager[8], CNA Instructor, CNA Supervisor, Coordinator of Wound Care, Director of Nurses in Training, Infection Control Nurse, Manager of Clinical Services, Medicare Coordinator, Nurse Liaison, Nurse Manager, Nurse Scheduler, Shift Supervisor, Patient Care Coordinator, Quality Improvement and/or Assurance Coordinator, Resident Assessment/MDS Coordinator, Staff Development Manager, and Unit Manager/Director.

Administrator – This category includes the Individual(s) responsible for all nursing home operations including the Administrator, Executive Director, Medical Director, and President. This category does not include vice presidents or other senior administrators, these job titles should be classified as Other staff. Administrator should be assigned to those positions that are responsible for the overall administration and patient care provided at the nursing home.

Other Staff – All staff not assigned to one of the eight categories listed above.

SHIFT DATA

Shift level payroll data must be provided for all employees including salaried employees. Records for salaried employees should represent their expected hours worked (e.g., 40 hours, 20 hours, etc.) during the data submission period but do not need to reflect their actual hours. For example, a week of payroll records for a salaried employee could be reported as five records (one for Monday, one for Tuesday, etc.) all reporting hours worked from 8:00am to 4:00pm.

Shift Start Date

The Shift Start Date is the date the reported shift for the employee began.

[7] The Director of Nursing and Nurse Administrator definitions may be modified, if warranted, to comply with the Fair Labor Standards Act.
[8] The words coordinator, manager, and director are used interchangeably for the various Nurse Administrator positions.

Shift Start Time

The Shift Start Time is the exact time the reported shift began.

Shift End Date

The Shift End Date is the date the reported shift for the employee ended.

Shift End Time

The Shift End Time is the exact time the reported shift ended.

GENERAL DATA SPECIFICATIONS NOTES

Each data submission will consist of a header record, a series of data records, and a trailer record. There are separate entries for each field in the header record, data record, and trailer record. Entries (fields) are separated by dotted lines. Each record within a data file is 325 characters in length. The following information is provided for each entry:

ITEM IDENTIFIER/DESCRIPTION. The "Item Identifier/Description" column gives a standard label (e.g., "Rec_ID") for the field and a short description (e.g., "Record ID").

LEN. The "Len" column gives the length of the field in characters (bytes).

START. The "Start" column is the starting position for the field in the data record.

END. The "End" column is the ending position for the field in the data record.

SPECIFICATIONS. The "Specifications" column gives a variety of information concerning the data requirements for the field. If a specifications item in this column is tagged with an asterisk (*), then failure to comply with the specification will result in a record REJECTION. If a specification is not tagged with an asterisk (*), then failure to comply will result in a warning (non-fatal error) and the record will be ACCEPTED.

PICTURE. The "Picture" section provides basic format information for the field. A picture of "X" indicates a single alpha-numeric character, while "XX" or "X(2)" indicate two alpha-numeric characters. A picture of "9" represents a numeric character, while "99" or "9(2)" indicate two numeric characters. A picture of "YYYYMMDD" is used for fields indicating year (including century), month, and then day format and a picture of HHMMSS is used for fields indicating hour (0-24), minutes (0-59), and seconds (0-59.

TYPE. The "Type" section gives the type of data in the field. Types are CODE, COUNT, TEXT, DATE, and TIME.

RANGE. The "Range" section lists the permissible values for a field.

FORMAT INFO. The "Format Info" section indicates additional specifications for the required formatting of values for a field. Examples are requirements that text entries be upper case and left-justified, and that numeric count entries be right-justified and leading-zero filled.

CONSISTENCY. The "Consistency" section indicates when pairs of fields or groups of fields must have consistent values. For example, the consistency requirement for the Shift End Time includes the specification:

"*1) The Shift End Time must be greater than the Shift Start Time."

Uniform Data Specifications For Nursing Home Shift Payroll Data Submission
Header Record Layout for Submission of Shift Payroll Data from Nursing Homes (Version 1.00)

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
REC_ID	2	1	2	Picture:	X(2)	Type:	CODE
				*Range:	Upper case A followed by 1.		
Record ID				Format Info:			
				Consistency:			
FED_ID	12	3	14	Picture:	X(12)	Type:	CODE
				*Range:	Valid code, sp(12)		
Facility Medicare Provider Number				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case. Allow + in first character to indicate pending		
				Consistency:	*1) This facility Medicare provider number (FED_ID) must match the facility Medicare provider number in each record of the submission file.		
ST_ID	15	15	29	Picture:	X(15)	Type:	CODE
				*Range:	Valid code, sp(15)		
Facility Medicaid Provider Number				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case. Allow + in first character to indicate pending		
				Consistency:	*1) This facility Medicaid provider number (ST_ID) must match the facility Medicaid provider number in each record of the submission file.		
FAC_ID	16	30	45	Picture:	X(16)	Type:	TEXT
				*Range:	Valid Code		
State Assigned Unique Facility ID Code				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case.		
				Consistency:	*1) This facility ID code (FAC_ID) must match the facility ID in each record of the submission file.		
FAC_NAME	30	46	75	Picture:	X(30)	Type:	TEXT
				Range:	Text		
Facility Name				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FAC_ADDR_1	30	76	105	Picture:	X(30)	Type:	TEXT
				Range:	Text		
Facility Address Line 1				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FAC_ADDR_2	30	106	135	Picture:	X(30)	Type:	TEXT
				Range:	Text		
Facility Address Line 2				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FAC_CITY	20	136	155	Picture:	X(20)	Type:	TEXT
				Range:	Text		
Facility City				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FAC_ST	2	156	157	Picture:	X(2)	Type:	CODE
				Range:	Valid Code		
Facility State				Format Info:	Valid 2 character state code; upper case.		
				Consistency:			

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
FAC_ZIP	11	158	168	Picture:	X(11)	Type:	CODE
				Range:	Valid numeric ZIP code		
Facility ZIP Code				Format Info:	Left justified; no embedded dashes or spaces.		
				Consistency:			
FAC_CNTCT	30	169	198	Picture:	X(30)	Type:	TEXT
				Range:	Text		
Facility Contact Person Name				Format Info:	Left Justified; any letters must be upper case		
				Consistency:			
FAC_PHONE	10	199	208	Picture:	9(10)	Type:	TEXT
				Range:	Valid phone number		
Facility Contact Person Phone Number				Format Info:	Area code included; no embedded nonnumeric characters		
				Consistency:			
FAC_EXTEN	5	209	213	Picture:	X(5)	Type:	TEXT
				Range:	Valid extension, sp(5)		
Facility Contact Person Phone Extension				Format Info:	Left justified.		
				Consistency:			
FILE_DT	8	214	221	Picture:	YYYMMDD	Type:	DATE
				Range:	Valid Date		
File Creation Date				Format Info:			
				Consistency:	*1) Cannot be greater than current date.		
TEST_SM	1	222	222	Picture:	X	Type:	CODE
				Range:	0 (zero), 1Valid Code		
Test/Production Indicator				Format Info:			
				Consistency:	1) Value = 0 for test submissions to the State; value = 1 for production submission		
FILLER	100	223	322	Picture:	X(100)	Type:	FILLER
				Range:	Sp(100)		
Blank Filler				Format Info:	Always blank.		
				Consistency:			
DATA_END	1	323	323	Picture:	X	Type:	CODE
				*Range:	%		
Facility State				Format Info:	Must always = %.		
				Consistency:	1) Used to indicate end of data.		
CRG_RTN	1	324	324	Picture:	X	Type:	CODE
				*Range:	ASCII(013)		
Carriage Return (ASCII 013)				Format Info:	Must always be a carriage return (ASCII 013)		
				Consistency:			
LN_FD	1	325	325	Picture:	X	Type:	CODE
				*Range:	ASCII(010)		
Line Feed (ASCII 010)				Format Info:	Must always be a line feed (ASCII010)		
				Consistency:			

Uniform Data Specifications For Nursing Home Shift Payroll Data Submission
Data Record Layout for Submission of Shift Payroll Data from Nursing Homes (Version 1.00)

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
REC_ID	2	1	2	Picture:	X(2)	Type:	CODE
				*Range:	Upper case S followed by 1.		
Record ID				Format Info:			
				Consistency:			
VERSION_CD	5	3	7	Picture:	X(5)	Type:	CODE
				*Range:	1.00		
Data Specification Version Code				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FED_ID	12	8	19	Picture:	X(12)	Type:	CODE
				Range:	Valid code, sp(12)		
Facility Medicare Provider Number				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case. Allow + in first character to indicate pending		
				Consistency:	*1) This facility Medicare provider number (FED_ID) must match the facility Medicare provider number in each record of the submission file.		
FAC_ID	16	20	35	Picture:	X(16)	Type:	TEXT
				*Range:	Valid Code		
State Assigned Unique Facility ID Code				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case.		
				Consistency:	*1) This facility ID code (FAC_ID) must match the facility ID in each record of the submission file.		
SUB_DATE	8	36	43	Picture:	YYYYMMDD	Type:	DATE
				*Range:	Valid Date		
Record Submission Date				Format Info:			
				Consistency:	*1) SUB_DATE cannot be greater than the current date.		
CORRECTION_NUM	2	44	45	Picture:	XX	Type:	COUNT
				*Range:	00-99		
Correction number for record				Format Info:	Right justify; pad left with zero.		
				Consistency:			
DELETE	1	46	46	Picture:	X	Type:	CODE
				*Range:	0,1		
Deletion Flag				Format Info:			
				Consistency:			
EMP_ID	16	47	62	Picture:	X(16)	Type:	TEXT
				Range:			
Unique Employee Identifiier				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case.		
				Consistency:	1) The same employee ID must be used across pay periods during a contiguous employment period. 2) The number should not contain identifying information such as employee names or social security numbers. 3) *Cannot be blank		
EMP_ST_DT	8	63	70	Picture:	YYYYMMDD	Type:	DATE
				*Range:	Valid Date		
Employee Start Date				Format Info:			
				Consistency:	1) Should be most recent start date for the employee		

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
					*2) Must be prior to the Shift Start Date *3) Must be prior to the SUB_DATE		
JOB_CAT	2	71	72	Picture:	XX	Type:	CODE
				*Range:	01-08		
Employee Job Category				Format Info:	Right justify; pad left with zero. 01= Registered Nurse 02=Licensed/Vocational Nurse 03=Certified Nurses Aide 04=Non-Certified Nurse Aide 05=Advanced Practice Nurse 06=Director of Nursing 07=Nurse Administrator 08=Administrator 09=Other Staff		
				Consistency:			
SHIFT_ST_DT	8	73	80	Picture:	YYYYMMDD	Type:	DATE
				*Range:	Valid Date		
Shift Start Date				Format Info:			
				Consistency:	*1) The Shift Start Date must be prior to the Shift End Date *2) The Shift Start Date cannot overlap with an existing Shift Start Date the same employee working within the same nursing home.		
SHIFT_ST_TM	6	81	86	Picture:	HHMMSS	Type:	TIME
				*Range:	Valid Time		
Shift Start Time				*Format Info:	HH is the number of complete hours that have passed since midnight (00-24), mm is the number of complete minutes that have passed since the start of the hour (00-59), and ss is the number of complete seconds since the start of the minute (00-60). If the hour value is 24, then the minute and second values must be zero.		
				Consistency:	*1) The Shift Start Time must be prior to the Shift End Time.		
SHIFT_END_DT	8	87	94	Picture:	YYYYMMDD	Type:	DATE
				*Range:	Valid Date		
Shift End Date				Format Info:			
				Consistency:	*1) The Shift End Date must be greater than the Shift Start Date. *2) The Shift End Date cannot be greater than the Sub_Date		
SHIFT_END_TM	6	95	100	Picture:	HHMMSS	Type:	TIME
				*Range:	Valid Time		
Shift End Time				*Format Info:	HH is the number of complete hours that have passed since midnight (00-24), MM is the number of complete minutes that have passed since the start of the hour (00-59), and SS is the number of complete seconds since the start of the minute (00-60). If the hour value is 24, then the minute and second values must be zero.		
				Consistency:	*1)The Shift End Time must be greater than the Shift Start Time.		
FILLER	222	101	322	Picture:	X(222)	Type:	FILLER
				*Range:	sp(222)		
Blank Filler				Format Info:	Always blank		
				Consistency:			
DATA_END	1	323	323	Picture:	X	Type:	CODE
				*Range:	%		
End of Data Termination Code				Format Info:	Must always = %		
				Consistency:	1. Used to indicate end of data.		

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
CRG_RTN	1	324	324	Picture:	X	Type:	CODE
				*Range:	ASCII(013)		
Carriage Return (ASCII 013)				Format Info:	Must always be a carriage return (ASCII 013)		
				Consistency:			
LN_FD	1	325	325	Picture:	X	Type:	CODE
				*Range:	ASCII(010)		
Line Feed (ASCII 010)				Format Info:	Must always be a line feed (ASCII010)		
				Consistency:			

Uniform Data Specifications For Nursing Home Shift Payroll Data Submission
Trailer Record Layout for Submission of Shift Payroll Data from Nursing Homes (Version 1.00)

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
REC_ID	2	1	2	Picture:	X(2)	Type:	CODE
				*Range:	Upper case Z followed by 0.		
Record ID				Format Info:			
				Consistency:			
TOT_REC	6	3	8	Picture:	9(6)	Type:	COUNT
				*Range:	Valid number		
Total Records Submitted				Format Info:	Right justified and leading zero filled.		
				Consistency:	*1) This field should include the total number of records in the submission file, including the header record, all Census records, and the trailer record.		
FILLER	314	9	322	Picture:	X(314)	Type:	FILLER
				*Range:	sp(314)		
Blank Filler				Format Info:	Always blank.		
				Consistency:			
DATA_END	1	323	323	Picture:	X	Type:	CODE
				*Range:	%		
Facility State				Format Info:	Must always = %.		
				Consistency:	1) Used to indicate end of data.		
CRG_RTN	1	324	324	Picture:	X	Type:	CODE
				*Range:	ASCII(013)		
Carriage Return (ASCII 013)				Format Info:	Must always be a carriage return (ASCII 013)		
				Consistency:			
LN_FD	1	325	325	Picture:	X	Type:	CODE
				*Range:	ASCII(010)		
Line Feed (ASCII 010)				Format Info:	Must always be a line feed (ASCII010)		
				Consistency:			

Appendix D

Development of Staffing Quality Measures - Phase I: Continuation

Task 4.3: Specifications for Submission of an Electronic Payroll Data Extract File

Final Subtask Report
June 30, 2007

Submitted on June 30, 2007 to:
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1. Introduction

The Development of Staffing Quality Measures – Phase I: Continuation (SQM) project is designed to build on previous work conducted during Phase I by the Colorado Foundation for Medical Care (CFMC) and the University of Colorado at Denver and Health Sciences Center (UCDHSC). The purpose of the project is to continue development work on a wide array of staffing measures and to develop a set of payroll data reporting requirements that could be used to collect uniform data across nursing homes to generate nursing home staffing quality measures for use in a public reporting system.

During the first phase of the Development of Staffing Quality Measures project [1], the decision was made to collect payroll data from several national nursing home corporations to construct a payroll record database for testing staffing quality measures derived from payroll data. The effort resulted in a collection of payroll data for 1,453 individual nursing homes from eight national nursing home corporations. Following the success of this initial data collection effort, it was determined that more detailed data specifications needed to be established to ensure uniform submission of payroll data in preparation for development of a system to generate nursing home staffing quality measures. Toward this goal, draft payroll data specifications were developed and provided to CMS in January 2007. The report discussed the details of the development of the draft specifications and recommended next steps in testing the draft specifications.

This current report reviews how the pay period payroll data may be submitted electronically to CMS. In particular, this report discusses the following issues: 1) electronic submission of pay period payroll data, 2) options for delivering payroll data to CMS, 3) submission system elements and recommendations, and 4) a set of ancillary issues related to the submission system. A second component of this task, obtaining feedback regarding the feasibility of submitting *shift level* payroll data, is described in a separate report "Feasibility Assessment of Electronic Submissions of Shift Level Payroll Data from Nursing Homes." [2]

2. Electronic Submission of Pay Period Payroll Data

2.1 Pay period payroll data elements and expected flat file size

The draft uniform data specifications for nursing home pay period data submission is provided in Appendix A. The general format of the draft specifications is a flat file that consists of a header record layout with 19 elements, the data record layout with 18 data elements, and a trailer record layout with six elements. Conceptually, the flat file contains data about the nursing home, its employees, and the employees' pay periods. Each record within a data file is 325 characters in length and each character within each record requires a byte of electronic storage. Every data file submission will consist of a header record as the first record, one or more data records, and a trailer record as the last record. One or more data records result from aggregating across all employees over all pay periods as required for a given submission frequency.

Table 1 provides the expected flat file size (in megabytes) for a nursing home for a range of total number of employees, pay periods lengths, and submission frequencies.[1] Note that N/A denotes Not Applicable and indicates instances where the nursing home's pay period would be longer than the submission frequency. Submission frequency for a given facility must be at least as long as the pay period length.

Table 1. Expected Flat File Size (megabytes) for a Single Payroll Data Submission [based upon pay period length and submission frequency].

Total Number of Employees	Pay Period Length	Expected Flat File Size (megabytes) for Specified Submission Frequency					
		Weekly	Bi-weekly	Monthly	Quarterly	Semi-annually	Annually
50	Weekly	0.02	0.03	0.07	0.20	0.42	0.85
50	Bi-weekly	N/A	0.02	0.03	0.10	0.21	0.42
50	Monthly	N/A	N/A	0.02	0.05	0.10	0.20
200	Weekly	0.07	0.13	0.26	0.78	1.69	3.38
200	Bi-weekly	N/A	0.07	0.13	0.39	0.85	1.69
200	Monthly	N/A	N/A	0.07	0.20	0.39	0.78
400	Weekly	0.13	0.26	0.52	1.56	3.38	6.76
400	Bi-weekly	N/A	0.13	0.26	0.78	1.69	3.38
400	Monthly	N/A	N/A	0.13	0.39	0.78	1.56

Given that the largest submission file size in Table 1 is approximately 6.8 megabytes (about one percent of the storage space on a writeable compact disk), the expected flat file size should not pose a significant storage burden on individual nursing homes.

Because the header and trailer records are small (i.e., 325 bytes each), more frequent submissions only minimally impact the total storage space required for a year's worth of data. That is, with 50 employees, a weekly pay period length, and weekly submission frequency, a nursing home would have a flat file of approximately 0.02 megabytes. At the end of the calendar year, this nursing home would have submitted 52 flat files requiring a total storage space of 1.04 megabytes, which is not much greater than the storage space required if the facility had just submitted payroll data at the end of the year (0.85 megabytes). Thus, storage space should not be a consideration in determining the optimal submission frequency.

2.2 Electronic submission frequency and anticipated burden on the state's submission and storage systems

Obviously, while different periods of time can be selected for the timing and frequency of submission of the pay period data flat file to CMS. There is an inherent trade-off between how often the flat file is submitted and the size of the flat file. At one extreme, nursing homes could be required to submit every pay period. Conversely, nursing homes could be required to submit their flat file only once a year and that flat file would comprise all of the pay periods for the

[1] Since Table 1 is provided for illustration purposes only, exact flat file size (in megabytes) for any combination number of employees, pay period lengths, and submission frequencies can be calculated by the following formula:

Flat file size (in megabytes) = [325 + 325 + (325 × Number of Employees) × Submission Frequency/Pay Period Length)]/1,000,000.

given year. The submission of data every pay period would allow for rapid corrections and adjustments to the flat file as needed. This implies an increased frequency and activity for the submission system, but only modest storage requirements at the time of submission. On the other hand, by submitting the flat file once per year, a single "data dump" of the pay period data can occur. However, such a flat file may make it harder to correct (especially with older pay period records) and may place a substantial burden on the state's submission and storage systems if the flat files are particularly large.

As an illustration of how submission frequency may impact the state's submission and storage systems, Table 2 gives the expected total storage requirements that might arise for the nursing homes in seven states assuming an average of 200 employees and bi-weekly pay periods. These states were selected because they represent the 100th, 95th, 75th, 50th, 25th, 5th, and 1st percentile in terms of the number of certified nursing homes per state in the United States [3].

Table 2. Expected Total Storage Size (megabytes) for Single Payroll Data Submission per Nursing Home [based upon pay period length and submission frequency] for Selected States.

State	Number of Certified Nursing Homes	Expected Total Storage Size (Megabytes) for Specified Submission Frequency				
		Bi-weekly	Monthly	Quarterly	Semi-annually	Annually
California	1,228	80.62	160.44	479.72	1038.46	2076.12
Illinois	749	49.17	97.86	292.60	633.39	1266.30
Wisconsin	379	24.88	49.52	148.06	320.50	640.76
Maryland	228	14.97	29.79	89.07	192.81	385.47
Rhode Island	84	5.51	10.97	32.81	71.03	142.01
Vermont	36	2.36	4.70	14.06	30.44	60.86
Alaska	15	0.98	1.96	5.86	12.68	25.36

As shown in Table 2, the state of California would require the largest expected annual storage space of approximately 2,100 megabytes if each of its 1,228 nursing homes had 200 employees each with bi-weekly pay periods, and yearly submission. Conversely, the state of Alaska would require the smallest expected annual storage space of approximately 25.4 megabytes for the same conditions. Thus, considering both of the possible expected storage extremes, storage requirements for total annual submissions of the flat files, regardless of pay period and submission frequency could range from as little as 25.4 megabytes (approximately 3.5% of the storage space on a writeable compact disk) to 2.1 gigabytes (approximately 2% of the storage space found on current personal computer hard drives). Consequently, the annual storage of the flat file submissions at the state level should not pose a significant burden.

2.3 Pay Period Payroll Data Verification

As shown in Appendix A and as detailed in Appendix B, the draft specifications indicate where potential fatal errors may occur during submission of the flat file. The presence of at least one of these fatal errors provides evidence to reject a nursing home's flat file.

While all of the fatal errors are listed in Appendix B, important fatal errors include the following:

- Facility Medicare provider number, facility Medicaid provider number, and state assigned unique facility ID code must all be valid codes and match each record of the flat file.
- Staff job categories must be one of the nine categories as listed in Appendix A.
- The length of the pay period must be at least seven days but no longer than 16 days.
- The start of the pay period must be chronologically before the end of the pay period.
- For each employee, productive and nonproductive (e.g., vacation or sick leave) hours for the pay period must be provided.

3. Options for the Delivery of Payroll Data to CMS

There are several options for the delivery of the payroll data flat files to CMS including: 1) the utilization of a secure web-based system to upload the payroll data flat files, 2) the attachment of the payroll data flat files to a Medicare Cost Report, 3) the inclusion of the payroll data flat files with an MDS submission, or 4) the modification of an existing submission system to accept the payroll data flat files. Each of these options has advantages and disadvantages.

3.1 Utilization of a Secure Web-Based System

A web-based system is a very attractive approach to submitting pay period payroll data to CMS. Such a system would not require that nursing homes use the Medicare Data Communications Network (MDCN). Alternatively, the nursing homes would rely on a secure broadband network for data submission. At present, however, not all nursing homes have access to the Internet and a secure web-based system does not currently exist for this proposed endeavor.

3.2 Attachment of the Payroll Data Flat Files to a Medicare Cost Report

Unlike a secure web-based system, the Medicare Cost Report system of submission is already in place. As such, since Medicare Cost Reports are submitted on a computer disk, it is reasonable that the payroll data flat files could accompany a Medicare Cost Report as a separate attachment. However, Medicare Cost Reports are initially sent to fiscal intermediaries, not to the parties who would need the payroll data. Further, Medicare Cost Reports are submitted annually corresponding to the nursing home's fiscal year. As such, not all nursing homes would be submitting their payroll data at the same time. Lastly, since Medicare Cost Reports are submitted annually, this would necessitate that annual payroll data files be submitted annually as well, thereby ruling out any other submission frequency.

3.3 Inclusion of the Payroll Data Flat Files with an MDS Submission

MDS submission is based upon a well-developed electronic system that all certified nursing homes must use. The QIES system has an established protocol for MDS submissions with which nursing homes are already familiar. The challenge with this approach, however, would be to modify the MDS submissions to accept the payroll data flat file. Both practically and conceptually, this approach is not attractive for the following reasons. First, MDS submissions are resident-level assessments while the payroll data file contains employee-level pay period information. The two file formats are completely different and have different intentions. Second, MDS submissions occur at least twice a month which would place a considerable burden on the payroll activities of the nursing home to coordinate the payroll data flat file with the MDS submission.

3.4 Modification of an Existing System

The QIES system used for the MDS submission is a practical system that could be used to upload the payroll data files. The system is already in place, has an established protocol, and all certified nursing homes are required to use it for their MDS submissions. As such, to submit the payroll data flat files to CMS, it is recommended that the QIES system be modified to accept such files. The details for such a modification are provided in section 4.

4. Submission System Elements and Recommendations

4.1 Submission system and general process

We recommend that the QIES or a QIES-like system be used to submit the pay period payroll data. Since nursing homes are already required to submit MDS data through the QIES system and the MDS files are flat files, it seems reasonable that the QIES system (with appropriate modifications) could also be used for the submission of the flat files generated according to the draft specifications.

The process for submission of the flat files should be similar to the MDS submission process. That is, the pay period payroll data would be generated at the nursing home level for transmission to the state-level servers. The state-level servers would then submit the pay period payroll data to CMS. Given that this process is already in place for MDS submission, it is not necessary to develop a new process for payroll data submissions.

4.2 Submission system requirements for nursing homes

To access the QIES system, CMS has minimum system requirements for MDS submission with respect to a personal computer's (PC) hard drive size, RAM, chip speed, and accessibility. According to the Fall 2006 specifications, these requirements are: 500 Mb free space on the PC's hard drive, 256 Mb RAM, Pentium V 500 Mhz CPU, Windows 2000 or XP operating system, and a file transfer program (FTP) compatible with the QIES software. While every nursing home is required to have the specific hardware, not all nursing homes have Internet access and may need to use a modem to submit the flat file.

4.3 Frequency of submission: test and initial phases

Prior to reaching a steady state in the submission process, it is anticipated that there will be a heavier burden on nursing homes to adjust and comply with the draft specifications. This is to be expected until the nursing homes become familiar with the submission process and the draft specifications. The recommended length of time for the *test* and *initial* phases is approximately one year, with six months for the *test* phase and six months for the *initial* phase.

During the *test* phase, more frequent submissions (e.g., every pay period submitted following the close and reconciliation of that pay period) should be required initially from each nursing home. This is important as it provides an avenue to check the feasibility of the modified QIES system to accept the flat files and for the nursing homes to actually generate and submit the flat files per the specifications. Feedback to the nursing homes and QIES system coordinators should be provided promptly to ensure that appropriate and necessary corrective actions are taken to ensure that the submission process is working appropriately. Feedback would include: 1) receipt of flat file (i.e., has the flat file been received?), 2) structure of the flat file (i.e., is the flat file in the structure of the specifications?), and 3) data content of the flat file (i.e., does the flat file have the correct data?).

Once the *test* phase has ended, nursing homes should have become accustomed to the submission process and can begin the *initial* submission phase with their flat files. During the initial phase, the submission should occur less frequently (e.g., every other pay period or monthly) and eventually reduce to the submission frequency required for the production submission phase as described in section 4.4. Similar to the test phase, the initial phase should also provide nursing homes and QIES system coordinators with appropriate feedback. The data received from the *test* phase should not be used to calculate quality measures statistics; however *initial* phase data could be used. When both the *test* and *initial* submission phases have ended, the timing and frequency of data submission will shift to the *production* submission phase schedule.

4.4 Timing and frequency of production submission phase of the flat files

Two issues must be resolved related to the timing and frequency of submission of the flat files. First, the submission date requirement (i.e., that date at which all nursing homes must submit their flat files) needs to be specified such that the given date allows nursing homes sufficient time to close their pay period, reconcile any discrepancies in pay period records, and allow for variation in pay periods across nursing homes prior to submission to CMS. Second, given the effort required to reconcile pay period records, it is desirable that the frequency of submission be neither too short (e.g., monthly) nor too long (e.g., yearly). Monthly submissions, while being the most recent and easiest to correct should errors arise, would increase the frequency of submission and use of the QIES system. In contrast, annual submissions would have the largest flat files and the oldest records in the flat file may not be easily corrected. Hence, we recommend that nursing homes submit flat files two months after the close of the quarter, and then submit quarterly thereafter. Two months after the quarter should allow sufficient time for the nursing homes to reconcile any outstanding issues with the previous quarter's pay periods.

As an illustration of this recommendation, January 1 to March 31 would represent the first quarter. This quarter's flat file would be expected by May 30 (two months after the end of the quarter). Successive quarters would follow in a similar fashion: April 1 to June 30 received by August 31; July 1 to September 30 by November 30; and October 1 to December 31 by February 28 or February 29 for leap years.

The system should prompt the nursing homes at regular time intervals regarding upcoming due dates for flat file submission. These prompts could come in the form of messages that appear on the system when the user logs in, as e-mail reminders sent to the user's e-mail account, or as some other form of electronic reminder. As the due date approaches for the flat file submission, the prompts should appear with increased frequency (e.g., daily).

4.5 User responsible for flat file submission

Nursing homes or their corporations will need to identify the individual(s) responsible for the flat file submission. The identified individual could be an employee of the nursing home, corporation, or third-party vendor. For example, an appropriate individual at the nursing home level would be the business office manager or payroll supervisor. These individuals would require user IDs and passwords to access the system to submit the pay period payroll data.

The question of whether one user submits for one nursing home or one user submits for multiple nursing homes (similar to MDS submission) should be decided at the nursing home or corporation level. Since the pay period payroll data are collected at the nursing home level, the system used for flat file submission should be flexible enough to accommodate one user per nursing home or one user per many nursing homes.

4.6 Flat file data verification

There should be a data verification tool in place to inform nursing homes that their flat file was verified and accepted for both structure and data content. If the flat file submission was incorrect and/or rejected, the verification tool should indicate to the nursing home which data elements were in error, why the data elements were in error, and where these data elements are within the nursing home's pay period payroll data submission.

During file verification, nursing homes should be made aware of whether their flat file had fatal errors and that the flat file submission is rejected, or that their flat file had non-fatal errors and that their flat file, while being accepted, contains errors.

4.7 Process for submitting corrected pay period payroll data

Since the intent of the pay period payroll data is to provide consistent quality measures statistics based upon pay period payroll data, it is important that the nursing homes submit their data accurately and in a timely fashion. Understanding that incorrect data can and will be submitted, it is important to recognize how to encourage nursing homes to submit their data and if their data files are rejected, how they should rectify their submission.

If the flat file submission was submitted before the due date and was rejected, the nursing home should have until the due date to submit a corrected and acceptable new submission without penalty. However, if the corrected submission is received after the due date, the nursing home should be notified of its non-compliance and CMS should designate specific corrective actions associated with either isolated or repetitive non-compliances.

If a flat file submission has incorrect data that resulted in the submission being accepted with the nursing home receiving an error message, a protocol should be in place that allows the nursing home to correct the non-fatal errors at the time of the next regularly scheduled flat file submission. Since the non-fatal errors would not materially affect the core data elements that are required for CMS's quality measures statistics, the system can be more lenient with respect to how these types of errors are ultimately corrected.

4.8 Routine reporting capabilities

There should be standard reporting capabilities in the system to ensure that the nursing homes know that their flat file submission has been verified and accepted with an appropriate date and time stamp. Likewise, if the flat file has been rejected, the nursing homes should know when the flat file was rejected, under what circumstances the flat file was rejected, and what corrective actions must be taken to ensure that the subsequent re-submission of the flat file will not be rejected. Similarly, CMS should be able to receive periodic reports on the status of nursing homes with respect to which nursing homes have completed their quarterly flat file submission, which are pending, and which are delinquent by state.

CMS should also be able to query the reporting systems to obtain statistics regarding both the nature of the submissions (e.g., nursing home demographics such as state and city) and the content (e.g., productive versus non-productive hours by staff job type).

4.9 End-user support

Similar to the OASIS system used to submit MDS data, nursing homes that submit pay period payroll data should have an end-user support system in place. From CMS's perspective, the support should extend only as far as the submission system itself. As such, there should be state agency automation contacts, flat file submission education contacts, and other (yet-to-be-specified) state agency contacts. Nursing homes should be responsible for obtaining contact information related to the hardware (e.g., PC) and software (e.g., Internet browser or FTP application) used in support of the flat file submission.

4.10 Reporting quality measures statistics

The intent to regularly and continuously receive pay period payroll data from nursing homes is to construct and report a set of nursing home staffing based quality measures. In order to determine whether a nursing home is improving with respect to its staffing based quality measures, the staffing data should be received on a regular and ongoing basis. Further, quality measures statistics based on staffing can be reported only after 15 months of pay period payroll data have been reported during the production phase. The quality measures statistics (e.g., tenure and

turnover) would be derived from the first 12 months of data and the three subsequent months. The three subsequent months of data are needed to fully determine whether the employee was present during the initial 12 months. For example, assume that the 15 months of data span January 1, 2006 through March 31, 2007. If an employee drops out of the payroll data on December 1, 2007, without the subsequent three months of data, it would be difficult to determine whether that employee's absence is due to sick leave, vacation, or termination. The three months from January 1, 2007 to March 31, 2007 would allow an appropriate determination of the employee's status. Then, subsequent quality measures statistics can be calculated and adjusted accordingly with every new quarter's submission, where the oldest quarter of data is dropped and replaced with the newest quarter of data. Such an approach allows for trending of the quality measures statistics. However, it is important to recognize that there will be a lag in reporting and that the initial quality measures statistics for reporting will not be available for at least a year after the draft specifications have become a requirement.

5. Ancillary Issues

In anticipation of the pay period payroll data specifications becoming a reality for nursing homes, there are several outstanding issues related to the capability of nursing homes being able to comply. First, there is anecdotal evidence from CMS that a small fraction of nursing homes would be lacking the necessary information technology. Similarly, if a nursing home has non-electronic payroll and time-keeping records, the nursing home will have to convert the records into electronic format in order to be compliant with the draft specifications.

6. Summary of Findings

In summary, the specifications necessary for generating an extract file from payroll data that would be used for electronic submission to CMS are as follows:

- Both nursing home level and state server level storage space requirements are modest for the payroll data flat file. The draft specifications do not place a large storage burden on either the individual nursing homes or the state servers that would receive the flat files.
- A modified QIES-system should be used to upload the payroll data flat files. This system is already in place and nursing homes are already familiar with its operations.
- The modified QIES-system should have modules that inform users and CMS about flat file submission and verification, deadlines for submission, end-user support, and report generation.
- The submitted payroll data flat file should contain one quarter (i.e., three months) of payroll data per submission. The submission deadline should be two months after the end of the quarter.
- The submission process should be regular and continuous to ensure fair and consistent reporting of quality measures statistics.

7. Next Steps

A feasibility test of the draft pay period payroll data specifications will be conducted under a subsequent project task during the third quarter of 2007. The primary goal of this task will be to have a sample of nursing homes review draft pay period payroll data specifications and determine whether they can comply with the CMS specified reporting requirements. Nursing homes will be asked to review the draft specifications and generate and submit a flat file per the draft specifications. In addition, the sample nursing homes will be asked to comment on specific issues regarding barriers to complying with the draft specifications and other pending issues that arose during the development of the draft specifications. A report describing the sample of nursing homes that will be included in the feasibility test was submitted to CMS in April 2007. Based upon the findings of the feasibility test, the draft specifications may require modification.

8. References

[1] Development of Staffing Quality Measures – Phase I, Creation of the Nursing Home Staffing Database & Data Dictionary, UCDHSC and CFMC, July 25, 2005.

[2] Development of Staffing Quality Measures – Phase I: Continuation, Feasibility Assessment of Electronic Submissions of Shift Level Payroll Data from Nursing Homes, UCDHSC and CFMC, June 30, 2007.

[3] The Kaiser Family Foundation. www.statehealthfacts.org (Accessed online June 11, 2007).

Appendix A – Draft Pay Period Payroll Data Specifications

Draft Pay Period Payroll Data from Nursing Homes (Version 1.0)
Data Element Definitions

FACILITY IDENTIFIERS

Facility Medicare Provider Number

The Facility 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, W, Y, or Z, if the facility is a swing-bed unit in a hospital).

State Assigned Unique Facility ID Code

This facility ID code is assigned by the state to each facility for submission of MDS data to the state system. The same facility ID code should be used for submission of nursing home payroll data.

EMPLOYEE IDENTIFIERS

Employee ID

A unique employee identifier must be submitted with each payroll record. The unique employee identification should not contain identifying information such as employee names or social security numbers. The same unique Employee ID must be used for an employee's tenure within a nursing home. If the employee leaves the nursing home and returns to its employ at a later point in time the facility may choose to retain the original employee ID or assign a new employee ID. A new employee ID should not be assigned when an employee is promoted within a nursing home.

Employee Start Date

The Employee Start Date is the date the employee began their employment at the nursing home. If the employee has left the nursing home for a period of time and returned as an employee the date provided should be the most recent start date.

STAFF JOB CATEGORIES

The data specification requires nursing homes to classify staff into one of nine job categories as defined below. Staff should be assigned to the appropriate job category based on their job title on the first day of the pay period being reported.

Registered Nurse – Those persons licensed to practice as registered nurses in the State where the facility is located. This category includes RN/ADONs whose primary[2] responsibilities involve direct patient care[3].

Licensed Practical/Vocational Nurse – Those persons licensed to practice as licensed practical/vocational nurses in the State where the facility is located. This category includes LPN/ADONs whose primary responsibilities involve direct patient care.

Certified Nurse Aide – Individuals who have completed a State approved training and competency evaluation program, or competency evaluation program approved by the State, or have been determined competent as provided in 483.150(a) and (3) and who are providing nursing or nursing-related services to residents. This category includes Medication Aides and Restorative Aides. CNAs in training should be classified as Non-Certified Nurse Aides (see below). If an individual works in two positions (e.g., CNA and housekeeping) all hours for this employee should be reported as CNA hours.

Non-Certified Nurse Aide – Individuals who are in training as a certified nurses aide or who are non-certified assistants/aides. This category includes Bathing Aide, Caregiver, Day Center Attendant, Feeding Assistant, Non-certified Aide, Nursing Assistant, Personal Care Assistant, and Resident Assistant. If an individual works in two positions (e.g., Nurse Assistant and Receptionist) all hours should be reported as Non-Certified Aide hours.

Advanced Practice Nurse (APN) – Those persons licensed as a registered nurse in the State where the facility is located and certified as a Nurse Practitioner or Clinical Nurse Specialist by a recognized national certifying body. This category includes only APNs whose primary responsibilities involve direct patient care. APNs performing physician-delegated tasks should be categorized into the Other Staff category and APNs whose primary responsibilities involve administrative duties should be categorized into the Nurse Administrator category.

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[2] Primary refers to greater than 50% of time.

[3] Involved in direct patient care is defined to mean that an individual is providing direct care to residents or is directly responsible for care provided to residents. Providing direct care means that an individual has responsibility for the residents' total care or some aspect of the residents' care. Resident contact is an intrinsic part of direct care. Directly involved in patient care includes, but is not limited to, such activities as assisting with activities of daily living (ADLs), performing gastro-intestinal feeds, giving medications, supervising the care given by CNAs, and performing nursing assessments to admit residents or notify physicians about a change in condition. [Final Rule – 42 CFR Part 483]

Director of Nursing[4] – Professional registered nurse(s) administratively responsible for managing and supervising nursing services within the facility.

Nurse Administrator – This category includes RNs and LPN/LVNs whose primary responsibilities are administrative and who do not perform direct patient care functions for the majority of their time (51% or more time in administrative duties). This category also includes other nurses whose principal duties are spent conducting administrative duties including, Assistant DON, Case Manager[5], CNA Instructor, CNA Supervisor, Coordinator of Wound Care, Director of Nurses in Training, Infection Control Nurse, Manager of Clinical Services, Medicare Coordinator, Nurse Liaison, Nurse Manager, Nurse Scheduler, Shift Supervisor, Patient Care Coordinator, Quality Improvement and/or Assurance Coordinator, Resident Assessment/MDS Coordinator, Staff Development Manager, and Unit Manager/Director.

Administrator – This category includes the Individual(s) responsible for all nursing home operations including the Administrator, Executive Director, Medical Director, and President. This category does not include vice presidents or other senior administrators, these job titles should be classified as Other staff. Administrator should be assigned to those positions that are responsible for the overall administration and patient care provided at the nursing home.

Other Staff – All staff not assigned to one of the eight categories listed above.

PAY PERIOD

Pay Period Start Date

The Pay Period Start Date is the first day of the pay period being reported. The date cannot overlap with prior pay periods submitted for the same employee working at the same nursing home.

Pay Period End Date

The Pay Period End Date is the last day of the pay period being reported. The date cannot overlap with prior pay periods submitted for the same employee working at the same nursing home. The pay period length (i.e., the number of days between pay period start and end dates) cannot exceed 15 days and must be equal to a 7-day, 14-day, or a bi-monthly (15-day) pay period.

[4] The Director of Nursing and Nurse Administrator definitions may be modified, if warranted, to comply with the Fair Labor Standards Act.
[5] The words coordinator, manager, and director are used interchangeable for the various Nurse Administrator positions.

Productive Hours

Productive Hours includes the total number of hours worked during the pay period at the nursing home for the employee identified in the record. This number cannot include hours for vacation leave, sick leave, corrections to reconcile errors from previous pay periods, etc. This number does reflect hours worked in both direct and non-direct patient care. If an employee covers a shift at a facility within a nursing home corporation, the hours worked should be assigned to the respective facility and not allocated to a "home" or "primary" facility. If no productive hours were worked during the pay period the data element should be submitted with zero hours.

Nonproductive Hours

Nonproductive Hours includes the total number of hours paid during the pay period for leave (sick, vacation, administrative), bonuses, employee payouts, etc. If no nonproductive hours were paid during the pay period the data element should be submitted with zero hours.

GENERAL DATA SPECIFICATIONS NOTES:

Each data submission will consist of a header record, a series of data records, and a trailer record. There are separate entries for each field in the header record, data record, and trailer record. Entries (fields) are separate by dotted lines. Each record within a data file is 325 characters in length. The following information is provided for each entry:

ITEM IDENTIFIER/DESCRIPTION. The "Item Identifier/Description" column gives a standard label (e.g., "Rec_ID") for the field and a short description (e.g., "Record ID").

LEN. The "Len" column gives the length of the field in characters (bytes).

START. The "Start" column is the starting position for the field in the data record.

END. The "End" column is the ending position for the field in the data record.

SPECIFICATIONS. The "Specifications" column gives a variety of information concerning the data requirements for the field. If a specifications item is this column is tagged with an asterisk (*), then failure to comply with the specification will result in a record REJECTION. If a specification is not tagged with an asterisk (*), then failure to comply will result in a warning (non-fatal error) and the record will be ACCEPTED.

PICTURE. The "Picture" section provides basic format information for the field. A picture of "X" indicates a single alpha-numeric character, while "XX" or "X(2)" indicate two alpha-numeric characters. A picture of "9" represents a numeric character, while "99" or "9(2)" indicate two numeric characters. A picture of "YYYYMMDD" is used for fields indicating year (including century), month, and then day format and a picture of HHMMSS is used for fields indicating hour (0-24), minutes (0-59), and seconds (0-59).

TYPE. The "Type" section gives the type of data in the field. Types are CODE, COUNT, TEXT, DATE, and TIME.

RANGE. The "Range" section lists the permissible values for a field.

FORMAT INFO. The "Format Info" section indicates additional specifications for the required formatting of values for a field. Examples are requirements that text entries be upper case and left-justified, and that numeric count entries be right-justified and leading-zero filled.

CONSISTENCY. The "Consistency" section indicates when pairs of fields or groups of fields must have consistent values. For example, the consistency requirement for the Pay Period End Date includes the specification:

"*1) The date must be at least 7 days after the pay period start date but no more than 15 days after."

Uniform Data Specifications For Nursing Home Payroll Pay Period Data Submission
Header Record Layout for Submission of Payroll Pay Period Data from Nursing Homes (Version 1.00)

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
REC_ID	2	1	2	Picture:	X(2)	Type:	CODE
				*Range:	Upper case A followed by 1.		
Record ID				Format Info:			
				Consistency:			
FED_ID	12	3	14	Picture:	X(12)	Type:	CODE
				Range:	Valid code, sp(12)		
Facility Medicare Provider Number				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case. Allow + in first character to indicate pending		
				Consistency:	*1) This facility Medicare provider number (FED_ID) must match the facility Medicare provider number in each record of the submission file.		
ST_ID	15	15	29	Picture:	X(15)	Type:	CODE
				Range:	Valid code, sp(15)		
Facility Medicaid Provider Number				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case. Allow + in first character to indicate pending		
				Consistency:	*1) This facility Medicaid provider number (ST_ID) must match the facility Medicare provider number in each record of the submission file.		
FAC_ID	16	30	45	Picture:	X(16)	Type:	TEXT
				*Range:	Valid Code		
State Assigned Unique Facility ID Code				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case.		
				Consistency:	*1) This facility ID code (FAC_ID) must match the facility ID in each record of the submission file.		
FAC_NAME	30	46	75	Picture:	X(30)	Type:	TEXT
				Range:	Text		
Facility Name				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FAC_ADDR_1	30	76	105	Picture:	X(30)	Type:	TEXT
				Range:	Text		
Facility Address Line 1				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FAC_ADDR_2	30	106	135	Picture:	X(30)	Type:	TEXT
				Range:	Text		
Facility Address Line 2				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FAC_CITY	20	136	155	Picture:	X(20)	Type:	TEXT
				Range:	Text		
Facility City				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FAC_ST	2	156	157	Picture:	X(2)	Type:	CODE
				Range:	Valid Code		
Facility State				Format Info:	Valid 2 character state code; upper case.		
				Consistency:			
FAC_ZIP	11	158	168	Picture:	X(11)	Type:	CODE
				Range:	Valid numeric ZIP code		
Facility ZIP Code				Format Info:	Left justified; no embedded dashes or spaces.		

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
				Consistency:			
FAC_CNTCT	30	169	198	Picture:	X(30)	Type:	TEXT
				Range:	Text		
Facility Contact Person Name				Format Info:	Left Justified; any letters must be upper case		
				Consistency:			
FAC_PHONE	10	199	208	Picture:	9(10)	Type:	TEXT
				Range:	Valid phone number		
Facility Contact Person Phone Number				Format Info:	Area code included; no embedded nonnumeric characters		
				Consistency:			
FAC_EXTEN	5	209	213	Picture:	X(5)	Type:	TEXT
				Range:	Valid extension, sp(5)		
Facility Contact Person Phone Extension				Format Info:	Left justified.		
				Consistency:			
FILE_DT	8	214	221	Picture:	YYYMMDD	Type:	DATE
				Range:	Valid Date		
File Creation Date				Format Info:			
				Consistency:	*1) Cannot be greater than current date.		
TEST_SM	1	222	222	Picture:	X	Type:	CODE
				*Range:	0 (zero), 1Valid Code		
Test/Production Indicator				Format Info:			
				Consistency:	1) Value = 0 for test submissions to the State; value = 1 for production submission		
FILLER	100	223	322	Picture:	X(100)	Type:	FILLER
				*Range:	Sp(100)		
Blank Filler				Format Info:	Always blank.		
				Consistency:			
DATA_END	1	323	323	Picture:	X	Type:	CODE
				*Range:	%		
Facility State				Format Info:	Must always = %.		
				Consistency:	1) Used to indicate end of data.		
CRG_RTN	1	324	324	Picture:	X	Type:	CODE
				*Range:	ASCII(013)		
Carriage Return (ASCII 013)				Format Info:	Must always be a carriage return (ASCII 013)		
				Consistency:			
LN_FD	1	325	325	Picture:	X	Type:	CODE
				*Range:	ASCII(010)		
Line Feed (ASCII 010)				Format Info:	Must always be a line feed (ASCII010)		
				Consistency:			

Uniform Data Specifications For Nursing Home Payroll Pay Period Data Submission
Data Record Layout for Submission of Payroll Pay Period Data from Nursing Homes (Version 1.00)

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
REC_ID	2	1	2	Picture:	X(2)	Type:	CODE
				*Range:	Upper case B followed by 1.		
Record ID				Format Info:			
				Consistency:			
VERSION_CD	5	3	7	Picture:	X(5)	Type:	CODE
				*Range:	1.00		
Data Specification Version Code				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FED_ID	12	8	19	Picture:	X(12)	Type:	CODE
				Range:	Valid code, sp(12)		
Facility Medicare Provider Number				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case. Allow + in first character to indicate pending		
				Consistency:	*1) This facility Medicare provider number (FED_ID) must match the facility Medicare provider number in each record of the submission file.		
FAC_ID	16	20	35	Picture:	X(16)	Type:	TEXT
				*Range:	Valid Code		
State Assigned Unique Facility ID Code				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case.		
				Consistency:	*1) This facility ID code (FAC_ID) must match the facility ID in each record of the submission file.		
SUB_DATE	8	36	43	Picture:	YYYYMMDD	Type:	DATE
				*Range:	Valid Date		
Record Submission Date				Format Info:			
				Consistency:	*1) SUB_DATE cannot be greater than current date.		
CORRECTION_NUM	2	44	45	Picture:	XX	Type:	COUNT
				*Range:	00-99		
Correction number for record				Format Info:	Right justify; pad left with zero.		
				Consistency:			
DELETE	1	46	46	Picture:	X	Type:	CODE
				*Range:	0,1		
Deletion Flag				Format Info:			
				Consistency:			
EMP_ID	16	47	62	Picture:	X(16)	Type:	TEXT
				Range:			
Unique Employee Identifier				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case.		
				Consistency:	1) The same employee ID must be used across pay periods during a contiguous employment period. 2) The number should not contain identifying information such as employee names or social security numbers. 3) *This item cannot be blank.		
EMP_ST_DT	8	63	70	Picture:	YYYYMMDD	Type:	DATE
				*Range:	Valid Date		
Employee Start Date				Format Info:			

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
				Consistency:	1) Should be most recent start date for the employee *2) Must be prior or equal to the pay period start date *3) Must be prior or equal to the SUB_DATE		
JOB_CAT	2	71	72	Picture:	XX	Type:	CODE
				*Range:	01-09		
Employee Job Category				Format Info:	Right justify; pad left with zero. 01= Registered Nurse 02=Licensed/Vocational Nurse 03=Certified Nurses Aide 04=Non-Certified Nurse Aide 05=Advanced Practice Nurse 06=Director of Nursing 07=Nurse Administrator 08=Administrator 09=Other Staff		
				Consistency:			
PAY_P_ST_DT	8	73	80	Picture:	YYYYMMDD	Type:	DATE
				*Range:	Valid Date		
Pay Period Start Date				Format Info:			
				Consistency:	*1) The date must be at least 7 days prior to the pay period end date but no more than 15 days prior. *2) The date cannot overlap with an existing pay period for the same employee working within the same nursing home.		
PAY_P_END_DT	8	81	88	Picture:	YYYYMMDD	Type:	DATE
				*Range:	Valid Date		
Pay Period End Date				Format Info:			
				Consistency:	*1) The date must be at least 7 days after the pay period start date but no more than 15 days after. *2) The date cannot overlap with an existing pay period for the same employee working within the same nursing home. *3) The date cannot be prior to the SUB_DATE.		
PROD_HOUR	3	89	91	Picture:	999	Type:	NUMBER
				*Range:	000-180		
Total Productive Hours for the pay period				Format Info:	Right justify; pad left with zero. No embedded dashes or spaces		
				Consistency:	*1) The total number of productive hours cannot exceed an average of twelve hours per day over the pay period.		
NPROD_HOUR	3	92	94	Picture:	999	Type:	NUMBER
				*Range:	000-999		
Total Non productive hours for the pay period				Format Info:	Right justify; pad left with zero. No embedded dashes or spaces		
				Consistency:			
FILLER	228	95	322	Picture:	X(228)	Type:	FILLER
				Range:	sp(228)		
Blank Filler				*Format Info:	Always blank		
				Consistency:			
DATA_END	1	323	323	Picture:	X	Type:	CODE
				*Range:	%		
End of Data Termination Code				Format Info:	Must always = %		

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
				Consistency:	1. Used to indicate end of data.		
CRG_RTN	1	324	324	Picture:	X	Type:	CODE
				*Range:	ASCII(013)		
Carriage Return (ASCII 013)				Format Info:	Must always be a carriage return (ASCII 013)		
				Consistency:			
LN_FD	1	325	325	Picture:	X	Type:	CODE
				*Range:	ASCII(010)		
Line Feed (ASCII 010)				Format Info:	Must always be a line feed (ASCII010)		
				Consistency:			

Uniform Data Specifications For Nursing Home Payroll Pay Period Data Submission
Trailer Record Layout for Submission of Payroll Pay Period Data from Nursing Homes (Version 1.0)

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
REC_ID	2	1	2	Picture:	X(2)	Type:	CODE
				*Range:	Upper case Z followed by 0.		
Record ID				Format Info:			
				Consistency:			
TOT_REC	6	3	8	Picture:	9(6)	Type:	COUNT
				*Range:	Valid number		
Total Records Submitted				Format Info:	Right justified and leading zero filled.		
				Consistency:	*1) This field should include the total number of records in the submission file, including the header record, all pay period records, and the trailer record.		
FILLER	314	9	322	Picture:	X(314)	Type:	FILLER
				Range:	sp(314)		
Blank Filler				*Format Info:	Always blank.		
				Consistency:			
DATA_END	1	323	323	Picture:	X	Type:	CODE
				*Range:	%		
Facility State				Format Info:	Must always = %.		
				Consistency:	1) Used to indicate end of data.		
CRG_RTN	1	324	324	Picture:	X	Type:	CODE
				*Range:	ASCII(013)		
Carriage Return (ASCII 013)				Format Info:	Must always be a carriage return (ASCII 013)		
				Consistency:			
LN_FD	1	325	325	Picture:	X	Type:	CODE
				*Range:	ASCII(010)		
Line Feed (ASCII 010)				Format Info:	Must always be a line feed (ASCII010)		
				Consistency:			

Appendix B – Fatal Errors in the Draft Pay Period Payroll Data Specifications

Appendix B

Fatal Errors in the Uniform Data Specifications for Nursing Home Payroll Pay Period Data Submission

The following is a list of the fatal errors by record location (i.e., header, data, or trailer) and by standard label that would occur in the draft specification. Failure to comply with the specification will result in a record rejection.

- Header record, REC_ID: Range must be an upper case A followed by the number 1.
- Header record, FED_ID: This facility Medicare provider number (i.e., FED_ID) must match the facility Medicare provider number in each record of the submission file.
- Header record, ST_ID: This facility Medicaid provider number (i.e., ST_ID) must match the facility Medicaid provider number in each record of the submission file.
- Header record, FAC_ID: This facility ID code (i.e., FAC_ID) must match the facility ID code in each record of the submission file.
- Header record, FILE_DT: The file creation date cannot be greater than the current date.
- Data record, REC_ID: Range must be an upper case B followed by the number 1.
- Data record, VERSION_CD: Range is five characters long and is of the form 1.00.
- Data record, FED_ID: This facility Medicare provider number (i.e., FED_ID) must match the facility Medicare provider number in each record of the submission file.
- Data record, FAC_ID: This facility ID code (i.e., FAC_ID) must match the facility ID code in each record of the submission file.
- Data record, SUB_DATE: The record submission date cannot be greater than the current date.
- Data record, CORRECTION_NUM: The correction number for the record must be right justified and two characters long, ranging from 00 to 99.
- Data record, EMP_ID: The unique employee identifier field must not be left blank.
- Data record, EMP_ST_DT: The employee start date must be a valid date and must be prior to or equal to the pay period start date (PAY_P_ST_DT) and must be prior to or equal to the record submission date (SUB_DATE).
- Data record, JOB_CAT: The job category must be within the two character range 01-09.
- Data record, PAY_P_ST_DT: The pay period start date must be at least seven days prior to the pay period end date (PAY_P_END_DT) but no more than 15 days prior, and the date cannot overlap with an existing pay period for the same employee working within the same nursing home.
- Data record, PAY_P_END_DT: The pay period end date must be at least seven days after the pay period start date but no more than 15 days after, the date cannot overlap with an existing pay period for the same employee working within the same nursing home, and the date cannot be prior to the submission date (SUB_DATE).
- Data record, PROD_HOUR: The total number of productive hours cannot exceed an average of 12 hours per day over the pay period.
- Data record, NPROD_HOUR: The total nonproductive hours must be within the three character range 000-999.
- Data record, FILLER: The blank filler must always be blank.

- Data record, DATA_END: The end of the data termination code is always given by a percentage sign (i.e., %).
- Data record, CRG_RTN: The carriage return is always given by the ASCII code 013.
- Data record, LN_FD: The line feed is always given by the ASCII code 010.
- Trailer record, REC_ID: Range must be given as an upper case Z followed by the number 0.
- Trailer record, TOT_REC: Total records submitted must include the total number of records in the submission file, including the header record, all data records, and the trailer record.
- Trailer record, FILLER: The blank filler must always be blank.
- Trailer record, DATA_END: The end of the data termination code is always given by a percentage sign (i.e., %).
- Trailer record, CRG_RTN: The carriage return is always given by the ASCII code 013.
- Trailer record, LN_FD: The line feed is always given by the ASCII code 010.

Appendix E

Development of Staffing Quality Measures- Phase I: Continuation

Task 4.3: Feasibility Assessment of Electronic Submissions of Shift Level Payroll Data from Nursing Homes

Final Subtask Report
June 30, 2007

Submitted on June 30, 2007 to:
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Table of Contents

1. Introduction

The Development of Staffing Quality Measures – Phase I: Continuation (SQM) project is designed to build on previous work conducted during Phase I by the Colorado Foundation for Medical Care (CFMC) and the University of Colorado at Denver and Health Sciences Center (UCDHSC). The overall goal of the project is to develop measures of staffing in nursing homes that can be used as quality measures for public reporting. Major tasks during the continuation phase of this project include: 1) an analysis of the relationship of staffing quality measures to outcome measures for the short and long stay populations in nursing homes, 2) a specification of payroll data reporting requirements, 3) an assessment of the feasibility for obtaining payroll data that meets the payroll data specifications, and 4) an analysis of contract staff hours.

The specifications of payroll data reporting requirements have been created and were reported to CMS in January, 2007 [1]. The draft data specifications (Appendix A) currently include the general format and content required for electronic submission of census data, pay period payroll data, and shift level payroll data. (*Shift level payroll data* are the "raw time-clock" data associated with each shift that an employee works (i.e., exact start and end time and dates) whereas *pay period payroll data* represent the aggregate of all shifts for a given period of time (i.e., the total number of hours worked over a given time period). This report is one of two reports being submitted to CMS in June 2007 that addresses specific components of the feasibility study of obtaining payroll data as specified in the reporting requirements. This report describes feedback from a small sample of nursing home corporations, nursing homes, and payroll vendors about specified payroll reporting requirements. Because CMS is also interested in exploring the possibility of calculating staffing measures that would require shift level data, this report also provides feedback from participants regarding the ease and desirability of obtaining and using raw time-clock (i.e., shift level) data instead of aggregated pay period data.

Shift level data would provide the opportunity to calculate more detailed staffing measures, such as shift-level staffing ratios or the proportion of shifts for which at least one registered nurse (RN) was present. The second June 2007 report to CMS [2] provides specifications for generating an extract file from payroll data that would facilitate routine submission of payroll data to CMS. Lastly, a third feasibility report will be provided to CMS in October 2007 that describes the practicability of distributing the specified reporting requirements to a sample of nursing homes and the delivery of such data. Attention will be given to understanding the burden and costs associated with the submission of payroll data.

2. Methods

CFMC contacted four of the nine corporations that participated in the first phase of this project to solicit their interest in participating in this additional aspect of the project. All of the corporations contacted for this project agreed to participate. Each corporation was asked if a sample of their nursing homes could also be interviewed. One of the corporations agreed to that request, and two of its nursing homes were interviewed. Identifying and obtaining payroll vendors to participate in feedback interviews was a challenge. Using contacts from CMS, CFMC, and the nursing home corporations, three payroll vendors agreed to participate.

The feedback process consisted of a series of semi-structured interviews with four nursing home corporations, two nursing home facilities associated with one of the nursing home corporations, and three national payroll vendors who provide services and software products to the nursing home industry. Project staff from UCDHSC provided the interview questionnaire (Appendix B) and draft shift level pay period data specifications (Appendix A) to the participants at least one week in advance of the scheduled interview and again one day prior to the interview. Representatives from the corporations included senior administrators in human resources, payroll, or quality management that had sufficient background knowledge in payroll data to appropriately evaluate the draft shift level payroll data specifications. Individuals representing the nursing homes consisted of nursing home administrators, human resources and/or payroll coordinators, and directors of nursing. Participants from the national payroll vendors were senior corporate executives with responsibility for nursing home activities. Each interview took approximately one hour to complete. After receiving consent from each entity, interviews were recorded on audiocassette for transcription and analysis purposes. Written transcripts were performed at UCDHSC.

In general, each interview consisted of two segments. The intent of the first segment was to obtain a general understanding of how the payroll process unfolds at the corporate or nursing home level, or if a vendor, the vendor's processes involved with the provision of payroll and time keeping activities. During the second segment of the interviews, participants were asked to comment on their ability to provide payroll data according to the specifications, including the ability to submit data at the shift level, changes that would need to occur to produce such data, and the barriers and burden involved with making the needed changes.

3. Interview Results

The results presented and discussed in this section are grouped by entity (i.e., corporation, nursing home, or payroll vendor) and are presented by interview topic. Attention has been given to maintain the anonymity of participants for this report.

3.1 Feedback from the Corporations

3.1.1 Payroll Process

The overall employee payroll process for employees was generally identical across the four corporations. All of the corporations indicated that their employees are issued identification badges that are used to "swipe in" and "swipe out" (i.e., clock-in or clock-out) according to their assigned shifts, thereby creating raw time-clock data. The swipe in and swipe out times are accumulated electronically and transmitted at the close of the pay period to a centralized payroll function that processes employee pay checks. All corporations viewed a centralized payroll function as a necessity given the number of nursing homes that belong to each corporation. Hence, none of the individual nursing homes within these four corporations performs its own payroll processing. Pay periods, however, varied across corporations and are typically determined at the nursing home level rather than at the corporate-level. Nursing homes typically follow weekly, bi-weekly, or bi-monthly pay periods depending upon their geographic location, existence of a unionized labor force, or some other regional or market requirement. For

example, one corporation indicated that it has 14 different pay periods used by its 216 nursing homes.

The time keeping systems were also fairly consistent across the four corporations. Three of the four corporations used the Kronos system, while the fourth corporation relied on Ceridian. However, all corporations noted the fluidity of ownership associated with nursing homes and the cost of updating or replacing time keeping systems. Consequently, it is quite likely that not all nursing homes within a given corporation at any given point in time may be using exactly the same time keeping system.

3.1.2 Shift Level Data

Given that all employees' swipe in and swipe out data are recorded electronically, all shift level data are also available electronically. Similar to the payroll process, corporations indicated that there is no single shift designation that is used across their nursing homes. Rather, shifts may be set by the nursing home as appropriate for its operations. Three of the corporations record the swipe in and swipe out times associated with the start of their employees' shifts, lunch breaks, and the end of shifts. However, one corporation required that their employees swipe in and swipe out for every break in their shifts, including 15 minute breaks.

The corporations indicated some variation with respect to how they reconcile errors or omissions in time clock data. Variation exists in the method for the correction process (e.g., paper and/or electronic forms) and the individuals involved in the correction process (e.g., employee, supervisor, or payroll clerk). All corporations indicated that the errors or omissions would generally be corrected by the close of the payroll process within which the error or omission occurred. The closer the error or omission was to the end of the payroll process, however, the more likely the correction would occur in the subsequent payroll period. The correction process would be initiated at the nursing home level as the nursing home would be the first place where the error or omission would be identified.

3.1.3 Salaried Employees and Shift Level Data

The corporations were very consistent in how they provided payroll data for salaried employees, such as department heads, administrators, and directors. In general, pseudo-shifts would be created in the time keeping system that assigned, for example, five 8-hour shifts to the individuals. It was noted, however, that the shifts may not necessarily correspond to the actual hours worked by the salaried individuals, nor would the hours correspond to shifts typically worked by hourly employees. Also, one corporation noted that in nursing homes with a small number of employees, salaried employees may be required to swipe in and swipe out as non-salaried employees do when performing non-administrative or non-managerial activities.

3.1.4 Productive and Nonproductive Shift Level Data

All corporations expressed no difficulty in distinguishing between productive and nonproductive (e.g., sick leave or vacation leave) shift level data. The corporations indicated they could flag the

hours that corresponded to productive hours and nonproductive hours in their time keeping system per employee and per pay period.

3.1.5 Conceptual and Technical Data Elements from the Draft Shift Payroll Data Specifications

The conceptual data elements in the draft shift payroll data specifications (i.e., facility identifiers, employee identifiers, and shift data) were viewed by the corporations as being available electronically but not necessarily residing in the same databases. For example, the employee start date would typically be found in a human resources database, while the start of an employee's shift would reside in the time keeping database. Additionally, an employee's job category would have to be cross-walked with the payroll data job category definitions to ensure that the employee's corporate job category would be consistent with the proposed job categories given in the data specifications. Consequently, the assembly of the data elements into a single file would require a nontrivial amount of effort to: 1) select the needed data elements from the various databases, 2) verify that the data elements are consistent with the data specifications, and 3) combine the data elements into a single file.

The technical data elements in the draft shift payroll data specifications (i.e., header record, data record, and trailer record elements) were viewed by the corporations as being similar to the conceptual data elements but with some reservations. The corporate-level respondents required additional clarification of the exact nature of some of the data elements, including test/production indicator (i.e., TEST_SM) and correction number for record (i.e., CORRECTION_NUM).

When viewing the draft shift payroll data specifications as a whole, the corporations generally concluded that they are capable of providing the shift level payroll data per the specifications, but the perceived level of effort to generate such a submission varied widely. Responses ranged from "this is a chip shot" to "that … would be most problematic because that will require programming of [the data specification's] logic." Depending upon the technical capability of the corporation, the specifications were viewed either as something that is already part of their existing operations or something that could be done, but not without some effort. In fact, one corporation stated "Let's just say - lots of effort!"

3.1.6 Additional Personnel and Non-Personnel Resources

As may be expected, the corporations were somewhat vague about resource requirements associated with producing and submitting data to CMS according to the draft shift payroll data specifications. All of the corporations recognized that the submission of shift level data could have serious consequences for the corporate information technology infrastructure. One corporation noted "System performance would be my main concern at this point right now," but followed with "I'm not sure that we know exactly how much design labor and effort it would take." Another corporation was quite detailed (down to the FTE and hardware requirements). This corporation's representative stated, "This would be what we would consider to be a serious technological burden because we would need to literally assign a project manager to go through the specifications and to map those to the present system." This corporation indicated the need for a programmer, a person to test the system once it is in place, a junior level analyst, and a person to maintain the system, and additional server space either locally at the nursing home or

at the corporate offices. This sentiment was echoed by another corporate participant: "I would definitely say this would require additional FTEs on our part." However, the fourth corporation was already able to do this for its nursing homes in one state because that state requires the submission of shift level payroll data.

3.1.7 Overall Reaction to the Draft Shift Level Payroll Data Specifications

In general, the corporations appreciated the opportunity to provide input to the process and wanted to be contacted for additional project activities, as needed. The corporations tended to view the specifications as two successive pieces. First, in order to create the data in the format as specified, there would be a one-time modification that would be accomplished with or without considerable effort. Second, the expectation was that once the data were in the format required, the ongoing submission of the data was generally viewed as doable and would eventually become as routine as the MDS submission process.

Respondents found that almost all of the data requested in the specifications would be available electronically. However, the overriding issue was the assembly of the data in the form of the specifications. This aspect would likely require cross-linking databases from human resources (i.e., employee start dates, job categories) with time keeping (i.e., swipe in and swipe out times, and the like), in addition to creating new data fields (i.e., staff job categories). Again, this would be a one-time modification to the corporations' existing systems.

3.2 Feedback from the Nursing Homes

3.2.1 Payroll Process

One of the corporations invited two of their nursing homes to participate in the payroll process interviews. Because the two nursing homes were from the same corporation, their process was identical. Both nursing homes use Kronos for their time keeping system. Their time keeping process incorporates employee name badges coupled with biometric identifiers (i.e., fingerprint scans) that are used to swipe in or to swipe out. At the end of the pay period, all of the swipes are collected, verified, and approved prior to submitting to the corporate office for payroll processing.

3.2.2 Shift Level Data

Given the level of technology in place at these corporate nursing homes, all swipe in and swipe out times are electronically recorded, except for paid breaks (i.e., 15 minute breaks). They expressed a preference that all swipe in and swipe out times being recorded (except for the paid breaks) in order to keep track of employee availability and protect the facility's liabilities.

If errors or omissions occur during the swipe in and swipe out process, (e.g., an employee fails to swipe in for a shift), the errors are corrected prior to the close of the pay period. Staff from one of the nursing homes indicated that employee timecards (i.e., the collection of swipe in and swipe out for a given employee for a given day) are verified on a daily basis. This occurs for two reasons. First, employees may remember what hours they worked during a pay period if

edits are done in a timely fashion, and secondly, closing a pay period takes less time if all of the corrections are made prior to the close out process.

The nursing home participants also added more detail on how employees that are shared across nursing homes, such as physical therapists, are allocated and expensed. In essence, the shared employee has a home facility. Their time and labor expenses can be allocated to any nursing home that employs the individual. This is accomplished through a "labor transfer key" on their time keeping system.

3.2.3 Salaried Employees and Shift Level Data

Similar to the responses from the corporations, the facilities responded that the salaried employees could be accounted for by creating pseudo-shifts indicating a 40-hour work week. Likewise, the nursing homes noted that the pseudo-shifts may not correspond exactly with the hours actually worked by the salaried employees.

3.2.4 Productive and Nonproductive Shift Level Data

Similar to the corporate responses, the nursing homes responded that productive and nonproductive shift level data could be obtained electronically, if appropriate flags to indicate productive versus nonproductive hours were used.

3.2.5 Conceptual and Technical Data Elements from the Draft Shift Payroll Data Specifications

Unlike the corporations, the nursing homes were unable to articulate what would be required to submit shift level payroll data to CMS. As corporate-owned nursing homes, the corporation would do all of the work centrally and distribute the applications to the nursing homes to run as needed. The nursing homes did indicate, however, that the conceptual data elements are available but would require some alterations to make them consistent with the draft data specifications.

3.2.6 Additional Personnel and Non-Personnel Resources

Given that the nursing homes' corporate office would develop and manage the applications in support of the specifications, the nursing home participants did not expect that any additional personnel or non-personnel resources would be required at least at the outset for the nursing homes.

The nursing home participants did express some concern over the submission process. If the submissions were to occur at the nursing home level, it was recommended that the submissions to CMS should occur daily during normal business hours. The rationale for this preference was that access to the Kronos system is restricted to facility administration and payroll personnel who typically have 9-5, Monday-through-Friday positions.

3.2.7 Overall Reaction to the Draft Shift Level Payroll Data Specifications

The nursing home participants found the draft shift level payroll data specifications acceptable, but because the majority of the responsibilities associated with implementing the specifications would be handled solely at the corporate level, the potential impact may have been missed or not fully understood.

3.3 Feedback from the Payroll Vendors

3.3.1 Services and Products for the Long-Term Care Community

According to the payroll vendor participants, the vendor community today typically develops and delivers a comprehensive payroll system that includes the ability to create an initial base of static information for each employee, and then on a periodic basis, captures the total hours worked over a pay period and creates the paychecks. Additional services might include maintaining an employee history of payroll periods, processing and generating quarterly and annual returns, and/or maintaining minimal human resources data. It was also noted that most of the vendors do not build or maintain time clock information. Instead, the vendors build interfaces to third-party time clock companies so that the time clock will feed the data into the payroll system for the calculation and production of payroll checks.

3.3.2 Service and Product Customization

Typically, the vendors offer a very sophisticated core system that can be modified as needed by the customer, such as setting individualized pay frequencies, specific state and city tax calculations, or particular job classifications. According to one vendor, "The vendor sets up system parameters that are the same across their customer base and then they assist their customer in defining what specific parameters are needed."

The vendors noted that their products are customized very infrequently. Because data specifications are tied to payroll, the vendors indicated that changes typically occur on an annual basis. Payroll processing is viewed as a fairly static activity, relative to billing or clinical applications that undergo frequent changes. Instead, vendors often look forward to changes in federal or state regulations, as the changes provide opportunities to offer new services or products to their customers.

Vendors noted that customer involvement can be identified through user groups and other mechanisms such as service contracts. Typically, changes are not radical customization of the vendors' services or products. Rather, changes are minor and are brought about by changes in tax calculations or federal or state regulations.

Vendors track customer requests and questions in order to determine the functionality of current service and product offerings. If there is sufficient demand for new or modified service and product offerings, a business case is built to justify changes to the service or product.

3.3.3 Conceptual and Technical Data Elements from the Draft Shift Payroll Data Specifications

From the vendors' perspective, the conceptual data elements should be a straightforward data acquisition. Some of the corporations' concerns were echoed by the vendors, however. In particular, these concerns included the need to link data sources to obtain the required data (e.g., employee start date with shift start times), staff job categories designated in the data specifications, and the ability to distinguish hours worked in a specific job classification if the employee works multiple jobs on the same shift (e.g., CNA or dietary aide performing housekeeping duties).

The vendors felt that the file layout for the technical data elements was exactly what their programmers would need. Their inclination was that it is not difficult to create a flat file for submission. Rather, the challenge will be to motivate the vendor to provide the service or product to the nursing home. This motivation, it was noted, was expected to come from the nursing home community expressing a need to have the data specifications or from the introduction of a regulation requiring the nursing home community to comply with the data specifications.

3.3.4 Additional Personnel and Non-Personnel Resources

Vendors were unable to identify specific additional personnel and non-personnel resources that would be needed for this work. Similar to the nursing home corporations, the general consensus from the vendors was that the data specifications do not appear to be too difficult to program nor to maintain. Vendors were more concerned with how to send such a file (e.g., electronic transmission of the flat file), what to do if there is a problem in sending the file (e.g., receipt of the file), and how to store and access archived files (e.g., storage space).

3.3.5 Overall Reaction to the Draft Shift Level Payroll Data Specifications

Overall, the vendors felt that the draft shift level payroll data specifications are logical and achievable for nursing homes. The concern, as echoed by the corporations, remains in the ability to bring all of the data elements into one cohesive file as defined by the data specifications.

4. General Observations

In summary, all of the parties that were interviewed found the draft shift-level payroll data specifications to be logical and able to be programmed so that the data could be submitted. For the most part, all of the data elements required by the data specifications reside somewhere within the databases housed by either the nursing home corporation or the individual nursing home. The challenge remains in the ability to successfully extract the data elements into a single flat file and provide a consistent framework from which to submit the flat file to CMS.

Several interesting observations were noted regarding how the draft specifications use the term "shift" versus how the entities interpreted the term. In particular, the definition of shift may need to be re-examined. While all respondents required their employees to swipe in at the start of a shift, swipe out for an unpaid meal break (e.g., lunch), swipe back in after the unpaid meal break,

and swipe out for the end of the shift, some respondents noted that they also require employees to swipe out and in for breaks. This may create a potential bias for coverage if breaks are not treated equally across facilities in the determination of the staffing measures. Further, there was some confusion over the use of the term "shift" to represent a swipe in and swipe out sequence as defined in the draft specifications rather than, for example, a 7 a.m. to 3 p.m. shift.

There are several limitations with these interview results. First, the corporations and nursing home participants were selected from for-profit corporations. As such, their views may not have been representative or indicative of all nursing homes. Second, the sample size for this feedback assessment was small. Consequently, inferences to the larger nursing home community should be drawn with caution.

5. Summary

Based upon the nine interviews, the following findings are noted:

- The majority of data elements required in the specifications are already available electronically, but not necessarily in the same database.
- Some effort will be required to obtain all of the data elements as per the specifications, but such efforts could generally be viewed as a one-time activity for the nursing homes or corporations. The overall level of effort, however, may not be trivial.
- Corporate-owned nursing homes appear to have little involvement in the development and maintenance of a system to support the data specifications.
- While the payroll vendors are capable of providing a product to meet the data specifications, the vendors will do so only if there is sufficient demand from their customers or if federal regulations require the changes.
- The size of the flat file, the frequency of submission to CMS, and other issues such as storage, retrieval, and query of the flat files, are all areas that will require additional consideration.

6. Next Steps

The remaining steps in this project will pertain to the data specifications for *pay period* payroll data. In order for a nursing facility to submit an electronic extract file for pay period payroll data, guidance must be provided with respect to the: 1) data submission platform, 2) quantity of data submitted, 3) frequency of data submitted, and 4) technical considerations surrounding such a submission on a regular and predictable basis. These aspects are being addressed in a separate report to CMS in June 2007 [2]. In addition, a feasibility test will be conducted this summer to examine the ability of nursing homes to generate a pay period data file per the data specifications. Further investigation and testing of *shift level* payroll data is not anticipated within the confines of this project.

7. References

[1] Development of Staffing Quality Measures – Phase I: Continuation, Documentation of the Payroll Data Specifications, Final Report, UCDHSC and CFMC, January 16, 2007.

[2] Development of Staffing Quality Measures – Phase I, Specifications for Submission of an Electronic Payroll Data Extract File, UCDHSC and CFMC, June 30, 2007.

Appendix A: Draft Shift Level Payroll Data Specifications

Draft Shift Payroll Data from Nursing Homes (Version 1.0)
Data Element Definitions

FACILITY IDENTIFIERS

Facility Medicare Provider Number

The Facility 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,W, Y, or Z, if the facility is a swing-bed unit in a hospital).

State Assigned Unique Facility ID Code

This facility ID code is assigned by the state to each facility for submission of MDS data to the state system. The same facility ID code should be used for submission of nursing home facility payroll data.

EMPLOYEE IDENTIFIERS

Employee ID

A unique employee identifier must be submitted with each payroll record. The unique employee identification should not contain identifying information such as employee names or social security numbers. The same unique Employee ID must be used for an employee's tenure within a nursing home. If the employee leaves the nursing home and returns to its employ at a later point in time the facility may choose to retain the original employee ID or assign a new employee ID. A new employee ID should not be assigned when an employee is promoted within a nursing home facility.

Employee Start Date

The Employee Start Date is the date the employee began their employment at the nursing home. If the employee has left the nursing home for a period of time and returned as an employee the date provided should be the most recent start date.

STAFF JOB CATEGORIES

The data specification requires nursing home facilities to classify staff into one of nine job categories as defined below. Staff should be assigned to the appropriate job category based on their job title on the first day of the pay period being reported.

Registered Nurse – Those persons licensed to practice as registered nurses in the State where the facility is located. This category includes RN/ADONs whose primary[1] responsibilities involve direct patient care[2].

Licensed Practical/Vocational Nurse – Those persons licensed to practice as licensed practical/vocational nurses in the State where the facility is located. This category includes LPN/ADONs whose primary responsibilities involve direct patient care.

Certified Nurse Aide – Individuals who have completed a State approved training and competency evaluation program, or competency evaluation program approved by the State, or have been determined competent as provided in 483.150(a) and (3) and who are providing nursing or nursing-related services to residents. This category includes Medication Aides and Restorative Aides. CNAs in training should be classified as Non-Certified Nurse Aides (see below). If an individual works in two positions (e.g., CNA and housekeeping) all hours for this employee should be reported as CNA hours.

Non-Certified Nurse Aide – Individuals who are in training as a certified nurses aide or who are non-certified assistants/aides. This category includes Bathing Aide, Caregiver, Day Center Attendant, Feeding Assistant, Non-certified Aide, Nursing Assistant, Personal Care Assistant, and Resident Assistant. If an individual works in two positions (e.g., Nurse Assistant and Receptionist) all hours should be reported as Non-Certified Aide hours.

Advanced Practice Nurse (APN) – Those persons licensed as a registered nurse in the State where the facility is located and certified as a Nurse Practitioner or Clinical Nurse Specialist by a recognized national certifying body. This category includes only APNs whose primary responsibilities involve direct patient care. APNs performing physician-delegated tasks should be categorized into the Other Staff category and APNs whose primary responsibilities involve administrative duties should be categorized into the Nurse Administrator category.

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[1] Primary refers to greater than 50% of time.

[2] Involved in direct patient care is defined to mean that an individual is providing direct care to residents or is directly responsible for care provided to residents. Providing direct care means that an individual has responsibility for the residents' total care or some aspect of the residents' care. Resident contact is an intrinsic part of direct care. Directly involved in patient care includes, but is not limited to, such activities as assisting with activities of daily living (ADLs), performing gastro-intestinal feeds, giving medications, supervising the care given by CNAs, and performing nursing assessments to admit residents or notify physicians about a change in condition. [Final Rule – 42 CFR Part 483]

Director of Nursing[3] – Professional registered nurse(s) administratively responsible for managing and supervising nursing services within the facility.

Nurse Administrator – This category includes RNs and LPN/LVNs whose primary responsibilities are administrative and who do not perform direct patient care functions for the majority of their time (51% or more time in administrative duties). This category also includes other nurses whose principal duties are spent conducting administrative duties including, Assistant DON, Case Manager[4], CNA Instructor, CNA Supervisor, Coordinator of Wound Care, Director of Nurses in Training, Infection Control Nurse, Manager of Clinical Services, Medicare Coordinator, Nurse Liaison, Nurse Manager, Nurse Scheduler, Shift Supervisor, Patient Care Coordinator, Quality Improvement and/or Assurance Coordinator, Resident Assessment/MDS Coordinator, Staff Development Manager, and Unit Manager/Director.

Administrator – This category includes the Individual(s) responsible for all nursing home operations including the Administrator, Executive Director, Medical Director, and President. This category does not include vice presidents or other senior administrators, these job titles should be classified as Other staff. Administrator should be assigned to those positions that are responsible for the overall administration and patient care provided at the nursing home.

Other Staff – All staff not assigned to one of the eight categories listed above.

SHIFT DATA

Shift level payroll data must be provided for all employees including salaried employees. Records for salaried employees should represent their expected hours worked (e.g., 40 hours, 20 hours, etc.) during the data submission period but do not need to reflect their actual hours. For example, a week of payroll records for a salaried employee could be reported as five records (one for Monday, one for Tuesday, etc.) all reporting hours worked from 8:00am to 4:00pm.

Shift Start Date

The Shift Start Date is the date the reported shift for the employee began.

[3] The Director of Nursing and Nurse Administrator definitions may be modified, if warranted, to comply with the Fair Labor Standards Act.
[4] The words coordinator, manager, and director are used interchangeably for the various Nurse Administrator positions.

Shift Start Time

The Shift Start Time is the exact time the reported shift began.

Shift End Date

The Shift End Date is the date the reported shift for the employee ended.

Shift End Time

The Shift End Time is the exact time the reported shift ended.

GENERAL DATA SPECIFICATIONS NOTES

Each data submission will consist of a header record, a series of data records, and a trailer record. There are separate entries for each field in the header record, data record, and trailer record. Entries (fields) are separated by dotted lines. Each record within a data file is 325 characters in length. The following information is provided for each entry:

ITEM IDENTIFIER/DESCRIPTION. The "Item Identifier/Description" column gives a standard label (e.g., "Rec_ID") for the field and a short description (e.g., "Record ID").

LEN. The "Len" column gives the length of the field in characters (bytes).

START. The "Start" column is the starting position for the field in the data record.

END. The "End" column is the ending position for the field in the data record.

SPECIFICATIONS. The "Specifications" column gives a variety of information concerning the data requirements for the field. If a specifications item in this column is tagged with an asterisk (*), then failure to comply with the specification will result in a record REJECTION. If a specification is not tagged with an asterisk (*), then failure to comply will result in a warning (non-fatal error) and the record will be ACCEPTED.

PICTURE. The "Picture" section provides basic format information for the field. A picture of "X" indicates a single alpha-numeric character, while "XX" or "X(2)" indicate two alpha-numeric characters. A picture of "9" represents a numeric character, while "99" or "9(2)" indicate two numeric characters. A picture of "YYYYMMDD" is used for fields indicating year (including century), month, and then day format and a picture of HHMMSS is used for fields indicating hour (0-24), minutes (0-59), and seconds (0-59).

TYPE. The "Type" section gives the type of data in the field. Types are CODE, COUNT, TEXT, DATE, and TIME.

RANGE. The "Range" section lists the permissible values for a field.

FORMAT INFO. The "Format Info" section indicates additional specifications for the required formatting of values for a field. Examples are requirements that text entries be upper case and left-justified, and that numeric count entries be right-justified and leading-zero filled.

CONSISTENCY. The "Consistency" section indicates when pairs of fields or groups of fields must have consistent values. For example, the consistency requirement for the Shift End Time includes the specification:

"*1) The Shift End Time must be greater than the Shift Start Time."

Uniform Data Specifications For Nursing Home Shift Payroll Data Submission
Header Record Layout for Submission of Shift Payroll Data from Nursing Homes (Version 1.00)

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
REC_ID	2	1	2	Picture:	X(2)	Type:	CODE
				*Range:	Upper case A followed by 1.		
Record ID				Format Info:			
				Consistency:			
FED_ID	12	3	14	Picture:	X(12)	Type:	CODE
				*Range:	Valid code, sp(12)		
Facility Medicare Provider Number				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case. Allow + in first character to indicate pending		
				Consistency:	*1) This facility Medicare provider number (FED_ID) must match the facility Medicare provider number in each record of the submission file.		
ST_ID	15	15	29	Picture:	X(15)	Type:	CODE
				*Range:	Valid code, sp(15)		
Facility Medicaid Provider Number				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case. Allow + in first character to indicate pending		
				Consistency:	*1) This facility Medicaid provider number (ST_ID) must match the facility Medicaid provider number in each record of the submission file.		
FAC_ID	16	30	45	Picture:	X(16)	Type:	TEXT
				*Range:	Valid Code		
State Assigned Unique Facility ID Code				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case.		
				Consistency:	*1) This facility ID code (FAC_ID) must match the facility ID in each record of the submission file.		
FAC_NAME	30	46	75	Picture:	X(30)	Type:	TEXT
				Range:	Text		
Facility Name				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FAC_ADDR_1	30	76	105	Picture:	X(30)	Type:	TEXT
				Range:	Text		
Facility Address Line 1				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FAC_ADDR_2	30	106	135	Picture:	X(30)	Type:	TEXT
				Range:	Text		
Facility Address Line 2				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FAC_CITY	20	136	155	Picture:	X(20)	Type:	TEXT
				Range:	Text		
Facility City				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FAC_ST	2	156	157	Picture:	X(2)	Type:	CODE
				Range:	Valid Code		
Facility State				Format Info:	Valid 2 character state code; upper case.		
				Consistency:			

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
FAC_ZIP	11	158	168	Picture:	X(11)	Type:	CODE
				Range:	Valid numeric ZIP code		
Facility ZIP Code				Format Info:	Left justified; no embedded dashes or spaces.		
				Consistency:			
FAC_CNTCT	30	169	198	Picture:	X(30)	Type:	TEXT
				Range:	Text		
Facility Contact Person Name				Format Info:	Left Justified; any letters must be upper case		
				Consistency:			
FAC_PHONE	10	199	208	Picture:	9(10)	Type:	TEXT
				Range:	Valid phone number		
Facility Contact Person Phone Number				Format Info:	Area code included; no embedded nonnumeric characters		
				Consistency:			
FAC_EXTEN	5	209	213	Picture:	X(5)	Type:	TEXT
				Range:	Valid extension, sp(5)		
Facility Contact Person Phone Extension				Format Info:	Left justified.		
				Consistency:			
FILE_DT	8	214	221	Picture:	YYYMMDD	Type:	DATE
				Range:	Valid Date		
File Creation Date				Format Info:			
				Consistency:	*1) Cannot be greater than current date.		
TEST_SM	1	222	222	Picture:	X	Type:	CODE
				Range:	0 (zero), 1Valid Code		
Test/Production Indicator				Format Info:			
				Consistency:	1) Value = 0 for test submissions to the State; value = 1 for production submission		
FILLER	100	223	322	Picture:	X(100)	Type:	FILLER
				Range:	Sp(100)		
Blank Filler				Format Info:	Always blank.		
				Consistency:			
DATA_END	1	323	323	Picture:	X	Type:	CODE
				*Range:	%		
End of Data Termination Code				Format Info:	Must always = %.		
				Consistency:	1) Used to indicate end of data.		
CRG_RTN	1	324	324	Picture:	X	Type:	CODE
				*Range:	ASCII(013)		
Carriage Return (ASCII 013)				Format Info:	Must always be a carriage return (ASCII 013)		
				Consistency:			
LN_FD	1	325	325	Picture:	X	Type:	CODE
				*Range:	ASCII(010)		
Line Feed (ASCII 010)				Format Info:	Must always be a line feed (ASCII010)		
				Consistency:			

Uniform Data Specifications For Nursing Home Shift Payroll Data Submission
Data Record Layout for Submission of Shift Payroll Data from Nursing Homes (Version 1.00)

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
REC_ID	2	1	2	Picture:	X(2)	Type:	CODE
				*Range:	Upper case S followed by 1.		
Record ID				Format Info:			
				Consistency:			
VERSION_CD	5	3	7	Picture:	X(5)	Type:	CODE
				*Range:	1.00		
Data Specification Version Code				Format Info:	Left Justified; any letters must be upper case.		
				Consistency:			
FED_ID	12	8	19	Picture:	X(12)	Type:	CODE
				Range:	Valid code, sp(12)		
Facility Medicare Provider Number				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case. Allow + in first character to indicate pending		
				Consistency:	*1) This facility Medicare provider number (FED_ID) must match the facility Medicare provider number in each record of the submission file.		
FAC_ID	16	20	35	Picture:	X(16)	Type:	TEXT
				*Range:	Valid Code		
State Assigned Unique Facility ID Code				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case.		
				Consistency:	*1) This facility ID code (FAC_ID) must match the facility ID in each record of the submission file.		
SUB_DATE	8	36	43	Picture:	YYYYMMDD	Type:	DATE
				*Range:	Valid Date		
Record Submission Date				Format Info:			
				Consistency:	*1) SUB_DATE cannot be greater than the current date.		
CORRECTION_NUM	2	44	45	Picture:	XX	Type:	COUNT
				*Range:	00-99		
Correction number for record				Format Info:	Right justify; pad left with zero.		
				Consistency:			
DELETE	1	46	46	Picture:	X	Type:	CODE
				*Range:	0,1		
Deletion Flag				Format Info:			
				Consistency:			
EMP_ID	16	47	62	Picture:	X(16)	Type:	TEXT
				Range:			
Unique Employee Identifier				Format Info:	Left Justified; no embedded dashes or spaces; any letters must be upper case.		
				Consistency:	1) The same employee ID must be used across pay periods during a contiguous employment period. 2) The number should not contain identifying information such as employee names or social security numbers. 3) *Cannot be blank		
EMP_ST_DT	8	63	70	Picture:	YYYYMMDD	Type:	DATE
				*Range:	Valid Date		
Employee Start Date				Format Info:			
				Consistency:	1) Should be most recent start date for the employee		

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
					*2) Must be prior to the Shift Start Date *3) Must be prior to the SUB_DATE		
JOB_CAT	2	71	72	Picture:	XX	Type:	CODE
				*Range:	01-09		
Employee Job Category				Format Info:	Right justify; pad left with zero. 01= Registered Nurse 02=Licensed/Vocational Nurse 03=Certified Nurses Aide 04=Non-Certified Nurse Aide 05=Advanced Practice Nurse 06=Director of Nursing 07=Nurse Administrator 08=Administrator 09=Other Staff		
				Consistency:			
SHIFT_ST_DT	8	73	80	Picture:	YYYYMMDD	Type:	DATE
				*Range:	Valid Date		
Shift Start Date				Format Info:			
				Consistency:	*1) The Shift Start Date must be prior to the Shift End Date *2) The Shift Start Date cannot overlap with an existing Shift Start Date the same employee working within the same nursing home.		
SHIFT_ST_TM	6	81	86	Picture:	HHMMSS	Type:	TIME
				*Range:	Valid Time		
Shift Start Time				*Format Info:	HH is the number of complete hours that have passed since midnight (00-24), mm is the number of complete minutes that have passed since the start of the hour (00-59), and is the number of complete seconds since the start of the minute (00-60). If the hour value is 24, then the minute and second values must be zero.		
				Consistency:	*1) The Shift Start Time must be prior to the Shift End Time.		
SHIFT_END_DT	8	87	94	Picture:	YYYYMMDD	Type:	DATE
				*Range:	Valid Date		
Shift End Date				Format Info:			
				Consistency:	*1) The Shift End Date must be greater than the Shift Start Date. *2) The Shift End Date cannot be greater than the SUB_DATE		
SHIFT_END_TM	6	95	100	Picture:	HHMMSS	Type:	TIME
				*Range:	Valid Time		
Shift End Time				*Format Info:	HH is the number of complete hours that have passed since midnight (00-24), MM is the number of complete minutes that have passed since the start of the hour (00-59), and SS is the number of complete seconds since the start of the minute (00-60). If the hour value is 24, then the minute and second values must be zero.		
				Consistency:	*1)The Shift End Time must be greater than the Shift Start Time.		
FILLER	222	101	322	Picture:	X(222)	Type:	FILLER
				*Range:	sp(222)		
Blank Filler				Format Info:	Always blank		
				Consistency:			
DATA_END	1	323	323	Picture:	X	Type:	CODE
				*Range:	%		
End of Data Termination Code				Format Info:	Must always = %		
				Consistency:	1. Used to indicate end of data.		

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
CRG_RTN	1	324	324	Picture:	X	Type:	CODE
				*Range:	ASCII(013)		
Carriage Return (ASCII 013)				Format Info:	Must always be a carriage return (ASCII 013)		
				Consistency:			
LN_FD	1	325	325	Picture:	X	Type:	CODE
				*Range:	ASCII(010)		
Line Feed (ASCII 010)				Format Info:	Must always be a line feed (ASCII010)		
				Consistency:			

Uniform Data Specifications For Nursing Home Shift Payroll Data Submission
Trailer Record Layout for Submission of Shift Payroll Data from Nursing Homes (Version 1.00)

Item Identifier/Description	Len	Start	End	Specification (* Indicates Fatal Error)			
REC_ID	2	1	2	Picture:	X(2)	Type:	CODE
				*Range:	Upper case Z followed by 0.		
Record ID				Format Info:			
				Consistency:			
TOT_REC	6	3	8	Picture:	9(6)	Type:	COUNT
				*Range:	Valid number		
Total Records Submitted				Format Info:	Right justified and leading zero filled.		
				Consistency:	*1) This field should include the total number of records in the submission file, including the header record, all shift records, and the trailer record.		
FILLER	314	9	322	Picture:	X(314)	Type:	FILLER
				*Range:	sp(314)		
Blank Filler				Format Info:	Always blank.		
				Consistency:			
DATA_END	1	323	323	Picture:	X	Type:	CODE
				*Range:	%		
End of Data Termination Code				Format Info:	Must always = %.		
				Consistency:	1) Used to indicate end of data.		
CRG_RTN	1	324	324	Picture:	X	Type:	CODE
				*Range:	ASCII(013)		
Carriage Return (ASCII 013)				Format Info:	Must always be a carriage return (ASCII 013)		
				Consistency:			
LN_FD	1	325	325	Picture:	X	Type:	CODE
				*Range:	ASCII(010)		
Line Feed (ASCII 010)				Format Info:	Must always be a line feed (ASCII010)		
				Consistency:			

Appendix B – Interview Questionnaires

- Questionnaire provided to nursing home corporations

Shift Level Data Specification Review Interview Questions

There will be 2 components to this interview. First, we will ask you to describe your current payroll process. Second, we will ask you to review and respond to the draft shift level data specification (see the document titled "Draft Shift Payroll Data from Nursing Homes (Version 1.0)" that was included with the interview questions).

Section 1 – Your Current Payroll Process

To help you describe your current payroll process, please answer the following questions.

1. How does an employee at your nursing home facility get paid? That is, how does shift level (that is, the exact day and time that an employee "punches in" and "punches out") data become pay periods (that is, bi-weekly or monthly pay periods)? Then, in turn, how do pay period records become a paycheck for the employee?

1b. Describe how the payroll process (including tracking of shift level data) may differ across facilities within your corporation.

2. How do you track shift level (that is, the exact day and time that an employee "punches in" and "punches out") information?

3. Do you record all "punches" (that is, every time an employee "punches in" and "punches out") or only "punches" associated with the start and end of a given shift? Would you prefer to record all "punches" or only the "punches" associated with the start and end of each shift? Why?

4. What happens at your organization when an employee fails to punch in or out for a shift? How and when is the missing time corrected in the shift level data?

5. Are corrections made to shift records if an employee or supervisor identifies an error in the recorded hours? If so, how and when are these corrections made?

6. If you have employees (such as Advanced Practice Nurses) who are shared amongst several facilities, how is their time assigned to facilities? How is their payroll expense assigned to facilities?

7. Do you currently track employee shift hours in electronic format?

8. What software system(s) and/or payroll company(ies) do you use to track shift data and/or generate payroll records? If you use multiple software systems or payroll companies, please describe each system. If you have a contact person with the software(s) and/or payroll company(ies), may we have permission to contact them?

Section 1 – Your Current Payroll Process (continued)

9. Are there employees who are not included in the shift level data records? For example, do salaried employees such as the Director of Nursing (DON) appear in the shift level data? If so, which job categories are not included in the shift level data records?

10. If you do not track shift level data for all employees (for example, salaried employees), would your organization be able to submit shift records that represent the average daily hours worked for all salaried employees? For example, for a fulltime employee, would you be able to submit a shift level record that represents the typical hours worked by this individual on a daily basis (for example, 8:00am to 4:00pm, Monday through Friday)?

11. How difficult would it be for your organization to provide non-productive hours (that is, sick leave and/or vacation leave) as part of the shift level data submission? Specifically, could you create a "filler" or "dummy" shift record for the missing shift? This "filler" or "dummy" record would also include a flag to indicate the hours were for non-productive purposes.

Section 2 – The Draft Shift Payroll Data Specification

Prior to answering the questions in this section, please refer to the document titled "Draft Shift Payroll Data from Nursing Homes (Version 1.0)" that was included with the interview package.

1. Review the document titled "Draft Shift Payroll Data from Nursing Homes (Version 1.0)" and describe what would need to take place at your facility or within your corporation to comply with the specification (for example, we would need to migrate from a paper based system to an electronic system for tracking shift hours; we would have to learn how to extract the requested data elements from our existing payroll system, etc.).

2. Consider the following ***conceptual data elements*** as defined in the document titled "Draft Shift Payroll Data from Nursing Homes (Version 1.0)":

    1. Facility Identifiers
        1.1. Facility Medicare Provider Number
        1.2. State Assigned Unique Facility ID Code
    2. Employee Identifiers
        2.1. Employee ID Number
        2.2. Employee Start Date
        2.3. Staff Job Categories
    3. Shift Data
        3.1. Shift Start Date
        3.2. Shift Start Time
        3.3. Shift End Time
        3.4. Shift End Date

Section 2 – The Draft Shift Payroll Data Specification (continued)

Question 2 continued

a. Which of the above data elements would be ***readily available*** for you to provide electronically?
b. Which of the above data elements would you be able to provide electronically with ***minor alterations*** to your current system? What type of alterations would be necessary to provide these elements?
c. Which of the above data elements would be ***most problematic*** for you to generate electronically? Why?

3. Consider the following ***technical data elements*** as defined in the document titled "Draft Shift Payroll Data from Nursing Homes (Version 1.0)":

1. Header Record Layout
   - 1.1. REC_ID (Record ID)
   - 1.2. FED_ID (Facility Medicare Provider Number)
   - 1.3. ST_ID (Facility Medicaid Provider Number)
   - 1.4. FAC_ID (State Assigned Unique Facility ID Code)
   - 1.5. FAC_NAME (Facility Name)
   - 1.6. FAC_ADDR1 (Facility Address Line 1)
   - 1.7. FAC_ADDR2 (Facility Address Line 2)
   - 1.8. FAC_CITY (Facility City)
   - 1.9. FAC_ST (Facility State)
   - 1.10. FAC_ZIP (Facility ZIP Code)
   - 1.11. FAC_CNTCT (Facility Contact Person Name)
   - 1.12. FAC_PHONE (Facility Contact Person Phone Number)
   - 1.13. FAC_EXTEN (Facility Contact Person Phone Extension)
   - 1.14. FILE_DT (File Creation Date)
   - 1.15. TEST_SM (Test/Production Indicator)
   - 1.16. FILLER (Blank Filler)
   - 1.17. DATA_END (End Of Data Termination Code)
   - 1.18. CRG_RTN (Carriage Return, ASCII Code 013)
   - 1.19. LN_FD (Line Feed, ASCII Code 010)
2. Data Record Layout
   - 2.1. REC_ID (Record ID)
   - 2.2. VERSION_CD (Data Specification Version Code)
   - 2.3. FED_ID (Facility Medicare Provider Number)
   - 2.4. FAC_ID (State Assigned Unique Facility ID Code)
   - 2.5. SUB_DATE (Record Submission Date)
   - 2.6. CORRECTION_NUM (Correction Number For Record)
   - 2.7. DELTE (Delete Flag)
   - 2.8. EMP_ID (Unique Employee Identifier)
   - 2.9. EMP_ST_DT (Employee Start Date)
   - 2.10. JOB_CAT (Employee Job Category)

Section 2 – The Draft Shift Payroll Data Specification (continued)

Question 3 (continued)

2.11. SHIFT_ST_DT (Shift Start Date)
2.12. SHIFT_ST_TM (Shift Start Time)
2.13. SHIFT_END_DT (Shift End Date)
2.14. SHIFT_END_TM (Shift End Time)
2.15. FILLER (Blank Filler)
2.16. DATA_END (End Of Data Termination Code)
2.17. CRG_RTN (Carriage Return, ASCII Code 013)
2.18. LN_FD (Carriage Return, ASCII Code 010)

3. Trailer Record Layout
   3.1. REC_ID (Record ID)
   3.2. TOT_REC (Total Records Submitted)
   3.3. FILLER (Blank Filler)
   3.4. DATA_END (End of Data Termination Code)
   3.5. CRG_RTN (Carriage Return, ASCII Code 013)
   3.6. LN_FD (Line Feed, ASCII Code 010)

a. Which of the above data elements would be ***readily available*** for you to provide electronically?
b. Which of the above data elements would you be able to provide electronically with ***minor alterations*** to your current system? What type of alterations would be necessary to provide these elements?
c. Which of the above data elements would be ***most problematic*** for you to generate electronically? Why?

4. In considering both the conceptual and technical data elements, what additional personnel resources (for example, database programmer) would you need to support the development and maintenance of shift level data submission? Please indicate if these resources would include resources from your software vendor(s) and/or payroll company(ies) to help develop programming to extract the requested data elements, etc.

5. In considering both the conceptual and technical data elements, what additional non-personnel resources (for example, updated software, additional hardware) would you need to support the development and maintenance of shift level data submission?

6. In general, how would systems within your organization need to change to support electronic submission of shift level data (for example, we would need to track employee hours per shift electronically)?

THANK YOU VERY MUCH FOR YOUR PARTICIPATION!

Appendix B – Interview Questionnaires

- Questionnaire provided to nursing homes

Shift Level Data Specification Review Interview Questions

There will be 2 components to this interview. First, we will ask you to describe your current payroll process. Second, we will ask you to review and respond to the draft shift level data specification (see the document titled "Draft Shift Payroll Data from Nursing Homes (Version 1.0)" that was included with the interview questions).

Section 1 – Your Current Payroll Process

To help you describe your current payroll process, please answer the following questions.

1. How does an employee at your nursing home facility get paid? That is, how does shift level (that is, the exact day and time that an employee "punches in" and "punches out") data become pay periods (that is, bi-weekly or monthly pay periods)? Then, in turn, how do pay period records become a paycheck for the employee?

1b. Describe the payroll process (including tracking of shift level data) at your facility.

2. How do you track shift level (that is, the exact day and time that an employee "punches in" and "punches out") information?

3. Do you record all "punches" (that is, every time an employee "punches in" and "punches out") or only "punches" associated with the start and end of a given shift? Would you prefer to record all "punches" or only the "punches" associated with the start and end of each shift? Why?

4. What happens at your facility when an employee fails to punch in or out for a shift? How and when is the missing time corrected in the shift level data?

5. Are corrections made to shift records if an employee or supervisor identifies an error in the recorded hours? If so, how and when are these corrections made?

6. If you have employees (such as Advanced Practice Nurses) who are shared amongst several facilities, how is their time assigned to facilities? How is their payroll expense assigned to your facility?

7. Do you currently track employee shift hours in electronic format?

8. What software system(s) and/or payroll company(ies) do you use to track shift data and/or generate payroll records? If you use multiple software systems or payroll companies, please describe each system. If you have a contact person with the software(s) and/or payroll company(ies), may we have permission to contact them?

Section 1 – Your Current Payroll Process (continued)

9. Are there employees who are not included in the shift level data records? For example, do salaried employees such as the Director of Nursing (DON) appear in the shift level data? If so, which job categories are not included in the shift level data records?

10. If you do not track shift level data for all employees (for example, salaried employees), would your organization be able to submit shift records that represent the average daily hours worked for all salaried employees? For example, for a fulltime employee, would you be able to submit a shift level record that represents the typical hours worked by this individual on a daily basis (for example, 8:00am to 4:00pm, Monday through Friday)?

11. How difficult would it be for your facility to provide non-productive hours (that is, sick leave and/or vacation leave) as part of the shift level data submission? Specifically, could you create a "filler" or "dummy" shift record for the missing shift? This "filler" or "dummy" record would also include a flag to indicate the hours were for non-productive purposes.

Section 2 – The Draft Shift Payroll Data Specification

Prior to answering the questions in this section, please refer to the document titled "Draft Shift Payroll Data from Nursing Homes (Version 1.0)" that was included with the interview package.

1. Review the document titled "Draft Shift Payroll Data from Nursing Homes (Version 1.0)" and describe what would need to take place at your facility to comply with the specification (for example, we would need to migrate from a paper based system to an electronic system for tracking shift hours; we would have to learn how to extract the requested data elements from our existing payroll system, etc.).

2. Consider the following ***conceptual data elements*** as defined in the document titled "Draft Shift Payroll Data from Nursing Homes (Version 1.0)":

    4. Facility Identifiers
        4.1. Facility Medicare Provider Number
        4.2. State Assigned Unique Facility ID Code
    5. Employee Identifiers
        5.1. Employee ID Number
        5.2. Employee Start Date
        5.3. Staff Job Categories
    6. Shift Data
        6.1. Shift Start Date
        6.2. Shift Start Time
        6.3. Shift End Time
        6.4. Shift End Date

Section 2 – The Draft Shift Payroll Data Specification (continued)

Question 2 continued

d. Which of the above data elements would be ***readily available*** for you to provide electronically?
e. Which of the above data elements would you be able to provide electronically with ***minor alterations*** to your current system? What type of alterations would be necessary to provide these elements?
f. Which of the above data elements would be ***most problematic*** for you to generate electronically? Why?

3. Consider the following ***technical data elements*** as defined in the document titled "Draft Shift Payroll Data from Nursing Homes (Version 1.0)":

4. Header Record Layout
   - 4.1. REC_ID (Record ID)
   - 4.2. FED_ID (Facility Medicare Provider Number)
   - 4.3. ST_ID (Facility Medicaid Provider Number)
   - 4.4. FAC_ID (State Assigned Unique Facility ID Code)
   - 4.5. FAC_NAME (Facility Name)
   - 4.6. FAC_ADDR1 (Facility Address Line 1)
   - 4.7. FAC_ADDR2 (Facility Address Line 2)
   - 4.8. FAC_CITY (Facility City)
   - 4.9. FAC_ST (Facility State)
   - 4.10. FAC_ZIP (Facility ZIP Code)
   - 4.11. FAC_CNTCT (Facility Contact Person Name)
   - 4.12. FAC_PHONE (Facility Contact Person Phone Number)
   - 4.13. FAC_EXTEN (Facility Contact Person Phone Extension)
   - 4.14. FILE_DT (File Creation Date)
   - 4.15. TEST_SM (Test/Production Indicator)
   - 4.16. FILLER (Blank Filler)
   - 4.17. DATA_END (End Of Data Termination Code)
   - 4.18. CRG_RTN (Carriage Return, ASCII Code 013)
   - 4.19. LN_FD (Line Feed, ASCII Code 010)
5. Data Record Layout
   - 5.1. REC_ID (Record ID)
   - 5.2. VERSION_CD (Data Specification Version Code)
   - 5.3. FED_ID (Facility Medicare Provider Number)
   - 5.4. FAC_ID (State Assigned Unique Facility ID Code)
   - 5.5. SUB_DATE (Record Submission Date)
   - 5.6. CORRECTION_NUM (Correction Number For Record)
   - 5.7. DELTE (Delete Flag)
   - 5.8. EMP_ID (Unique Employee Identifier)
   - 5.9. EMP_ST_DT (Employee Start Date)
   - 5.10. JOB_CAT (Employee Job Category)

Section 2 – The Draft Shift Payroll Data Specification (continued)

Question 3 (continued)

5.11. SHIFT_ST_DT (Shift Start Date)
5.12. SHIFT_ST_TM (Shift Start Time)
5.13. SHIFT_END_DT (Shift End Date)
5.14. SHIFT_END_TM (Shift End Time)
5.15. FILLER (Blank Filler)
5.16. DATA_END (End Of Data Termination Code)
5.17. CRG_RTN (Carriage Return, ASCII Code 013)
5.18. LN_FD (Carriage Return, ASCII Code 010)

6. Trailer Record Layout
   6.1. REC_ID (Record ID)
   6.2. TOT_REC (Total Records Submitted)
   6.3. FILLER (Blank Filler)
   6.4. DATA_END (End of Data Termination Code)
   6.5. CRG_RTN (Carriage Return, ASCII Code 013)
   6.6. LN_FD (Line Feed, ASCII Code 010)

d. Which of the above data elements would be ***readily available*** for you to provide electronically?
e. Which of the above data elements would you be able to provide electronically with ***minor alterations*** to your current system? What type of alterations would be necessary to provide these elements?
f. Which of the above data elements would be ***most problematic*** for you to generate electronically? Why?

4. In considering both the conceptual and technical data elements, what additional personnel resources (for example, database programmer) would you need to support the development and maintenance of shift level data submission? Would these occur at the facility level or corporate level? Please indicate if these resources would include resources from your software vendor(s) and/or payroll company(ies) to help develop programming to extract the requested data elements, etc.

5. In considering both the conceptual and technical data elements, what additional non-personnel resources (for example, updated software, additional hardware) would you need to support the development and maintenance of shift level data submission? Would these occur at the facility level or corporate level?

6. In general, how would systems within your facility need to change to support electronic submission of shift level data (for example, we would need to track employee hours per shift electronically)?

THANK YOU VERY MUCH FOR YOUR PARTICIPATION!

Appendix B – Interview Questionnaires

- Questionnaire provided to payroll vendors

Payroll Data Specification Review Interview Questions

There are two components to this interview. First, we will ask you to describe your corporation and/or your experience with nursing home payroll processing. Second, we will ask you to review and respond to the draft payroll data specifications. In support of those questions, please refer to the documents titled "Draft Shift Payroll Data from Nursing Homes (Version 1.0)" and "Draft Pay Period Payroll Data from Nursing Homes (Version 1.0)" that accompany the interview questions. To expedite your review, the main differences in elements between the Shift Level Payroll Data document and Pay Period Level Payroll Data document are highlighted in ***bold italics***.

Section 1 – Your Corporation/Experience

To help you describe your corporation, please answer the following questions.

1. In general, what payroll services and products does/did your corporation provide to the Long-Term Care Community?

1b. With respect to electronic payroll and time keeping, what services and products does your corporation provide?

1c. Do the long-term care facilities/corporations ever send you their census data and expect that you will combine it with payroll data to produce additional reports?

1d. Do the long-term care facilities/corporations expect that you will process payroll information for contract staff? This might include in-house contract staff or out-of-house pool staff.

2. Do you allow your customers/clients to customize your services or products? If so, how? If not, please go to question 4.

2b. If a customer wishes to change a service or data collection process, how does that happen? How frequently do you permit this to occur? How long does it take to implement a change? How is it billed?

3. How involved are your customers/clients in the customization of your services or products?

4. How do you identify your customer/client needs?

5. In general, how often does your corporation introduce new services or products? What is the typical impetus for a new product or service?

Section 2 – The Draft Payroll Data Specifications

Prior to answering the questions in this section, please refer to the document titled "Draft Shift Payroll Data from Nursing Homes (Version 1.0)" that was included with the interview package. As already mentioned, the terms given in ***bold italics*** below identify the main differences between the collection of Shift Level and Pay Period Level data. We will focus primarily on discussing the collection of shift level payroll data but would also be interested in knowing if collecting data at the pay period level would present any additional issues/burdens/costs.

1. Review the document titled "Draft Shift Payroll Data from Nursing Homes (Version 1.0)" and describe what would need to take place within your corporation to comply with the specification (for example, we would need to modify our existing payroll products; we would have to create a new payroll product, etc.).

2. Consider the following ***conceptual data elements*** as defined in the document titled "Draft Shift Payroll Data from Nursing Homes (Version 1.0)":

    7. Facility Identifiers
        7.1. Facility Medicare Provider Number
        7.2. State Assigned Unique Facility ID Code
    8. Employee Identifiers
        8.1. Employee ID Number
        8.2. Employee Start Date
        8.3. Staff Job Categories
    9. Shift Data (***Pay Period***)
        9.1. Shift Start Date (***Pay Period Start Date***)
        9.2. Shift Start Time (***Pay Period End Date***)
        9.3. Shift End Time (***Total Productive Hours for the Pay Period***)
        9.4. Shift End Date (***Total Non Productive Hours for the Pay Period***)

    g. Which of the above data elements would be ***readily available*** for you to provide electronically with your current products?
    h. Which of the above data elements would you be able to provide electronically with ***minor alterations*** to your current products? What type of alterations would be necessary to provide these elements?
    i. Which of the above data elements would be ***most problematic*** for you to generate electronically? Why?

Section 2 – The Draft Payroll Data Specifications - Continued

3. Consider the following ***technical data elements*** as defined in the document titled "Draft Shift Payroll Data from Nursing Homes (Version 1.0)":

1. Header Record Layout
   - 6.7. REC_ID (Record ID)
   - 6.8. FED_ID (Facility Medicare Provider Number)
   - 6.9. ST_ID (Facility Medicaid Provider Number)
   - 6.10. FAC_ID (State Assigned Unique Facility ID Code)
   - 6.11. FAC_NAME (Facility Name)
   - 6.12. FAC_ADDR1 (Facility Address Line 1)
   - 6.13. FAC_ADDR2 (Facility Address Line 2)
   - 6.14. FAC_CITY (Facility City)
   - 6.15. FAC_ST (Facility State)
   - 6.16. FAC_ZIP (Facility ZIP Code)
   - 6.17. FAC_CNTCT (Facility Contact Person Name)
   - 6.18. FAC_PHONE (Facility Contact Person Phone Number)
   - 6.19. FAC_EXTEN (Facility Contact Person Phone Extension)
   - 6.20. FILE_DT (File Creation Date)
   - 6.21. TEST_SM (Test/Production Indicator)
   - 6.22. FILLER (Blank Filler)
   - 6.23. DATA_END (End Of Data Termination Code)
   - 6.24. CRG_RTN (Carriage Return, ASCII Code 013)
   - 6.25. LN_FD (Line Feed, ASCII Code 010)

2. Data Record Layout
   - 2.1. REC_ID (Record ID)
   - 2.2. VERSION_CD (Data Specification Version Code)
   - 2.3. FED_ID (Facility Medicare Provider Number)
   - 2.4. FAC_ID (State Assigned Unique Facility ID Code)
   - 2.5. SUB_DATE (Record Submission Date)
   - 2.6. CORRECTION_NUM (Correction Number For Record)
   - 2.7. DELTE (Delete Flag)
   - 2.8. EMP_ID (Unique Employee Identifier)
   - 2.9. EMP_ST_DT (Employee Start Date)
   - 2.10. JOB_CAT (Employee Job Category)
   - 2.11. SHIFT_ST_DT (Shift Start Date) (***Pay Period Start Date***)
   - 2.12. SHIFT_ST_TM (Shift Start Time) (***Pay Period End Date***)
   - 2.13. SHIFT_END_DT (Shift End Date) (***Total Productive Hours for Pay Period***)
   - 2.14. SHIFT_END_TM (Shift End Time) (***Total Non Productive Hours for Pay Period***)
   - 2.15. FILLER (Blank Filler)
   - 2.16. DATA_END (End Of Data Termination Code)
   - 2.17. CRG_RTN (Carriage Return, ASCII Code 013)
   - 2.18. LN_FD (Carriage Return, ASCII Code 010)

Section 2 – The Draft Payroll Data Specifications - Continued

Question 3 continued

3. Trailer Record Layout
   3.1. REC_ID (Record ID)
   3.2. TOT_REC (Total Records Submitted)
   3.3. FILLER (Blank Filler)
   3.4. DATA_END (End of Data Termination Code)
   3.5. CRG_RTN (Carriage Return, ASCII Code 013)
   3.6. LN_FD (Line Feed, ASCII Code 010)

   g. Which of the above data elements would be ***readily available*** for you to provide electronically with your current products?
   h. Which of the above data elements would you be able to provide electronically with ***minor alterations*** to your current products? What type of alterations would be necessary to provide these elements?
   i. Which of the above data elements would be ***most problematic*** for you to generate electronically? Why?

4. In considering both the conceptual and technical data elements, what additional personnel resources (for example, software engineer, database programmer) would you need to support the development and maintenance of products that would enable nursing homes to provide shift level data submission as specified above? Please be as specific as possible. Are you able to project the possible cost for such additional resources?

5. In considering both the conceptual and technical data elements, are there additional non-personnel resources (for example, updated software, additional hardware) needed to support the development and maintenance of shift level data submission? If so, what are these non-personnel resources? Please be as specific as possible. Are you able to project the possible cost for the additional resources?

6. In general, how would services and products within your corporation need to change to support electronic submission of shift level data/pay period data by nursing homes? Please be as specific as possible.

THANK YOU VERY MUCH FOR YOUR PARTICIPATION!

Appendix F

Development of Staffing Quality Measures-Phase I: Continuation

Task 5.1: Description of the Sample of Nursing Facilities to be Included in the Feasibility Test of the Use of the Electronic Payroll Data Extract File

Final Subtask Report

April 30, 2007

Submitted on April 30, 2007 to:
Ms. Mary Weakland, CMS, Government Task Leader
Dr. Jean Scott, CMS, Government Task Leader
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Prepared by:
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University of Colorado at Denver and Health Sciences Center
CMS Contract: HHSM-500-2005-CO001C; Modification No. CO0004

Table of Contents

1. Introduction

The overall goal of the Development of Staffing Quality Measures – Phase I Continuation (SQM) project is to develop a measure or measures of staffing in nursing homes that can appropriately be used as a quality measure for public reporting. The scope of Task 5.1 is to distribute the CMS specified reporting requirements to a sample of volunteer nursing facilities and evaluate their ability to deliver the defined payroll data within those specifications. The nursing facilities will be asked to review the data specifications, generate an extract file, and submit the resulting payroll data to a source to be determined. The cost and burden of the activities will be identified.

2. Nursing Facility Selection Criteria

The nursing facilities were chosen to assure representation from the broadest range of payroll systems. Every attempt was made to include payroll systems representing national vendors as well as individual nursing home level systems. For profit and not-for-profit nursing facilities, as well as those engaged in culture change, were included. Other considerations for selection were:

- Location - rural vs. urban
- Number of beds – large vs. small
- Ownership – independent, corporate, hospital-based
- Size of the corporation - large vs. small
- Location of payroll vendor – in-house vs. external

No more than nine entities will be included in this feasibility test in order to ensure that the project is working within the guidelines of the Paperwork Reduction Act (PRA) of 1995 and Circular No. IRM-402 – Information Collection.

3. Methodology for Selection of the Nursing Facilities

A sample of sixteen nursing facilities that could potentially be recruited to participate in the feasibility test was presented to the CMS Government Task Leaders, CMS Project Officer, and SQM project team members from the University of Colorado at Denver and Health Sciences Centers (UCDHSC) and the Colorado Foundation for Medical Care (CFMC). The project members provided feedback on the sample nursing facilities in relation to the identified criteria. Changes were made to reflect their recommendations and were incorporated into this final report. Eight of nine nursing homes were chosen for immediate recruitment. The SQM team postponed identification of the ninth nursing facility in order to provide for a possible adjustment in the nursing facility mix during the feasibility test implementation. Other changes may occur if needed to gain the most information and provide for the most comprehensive test. The results will inform a much larger feasibility test that is expected to be initiated at a later date.

4. Nursing Facility Selection Grid:

The following grid contains the nursing facilities considered by the SQM team for inclusion in the Task 5 feasibility test. The grid is divided into the following sections:

- Independent Nursing Facilities
- Large Corporations
- Small Corporations
- Hospital Based Nursing Facilities

The grid is further subdivided to indicate ownership, profit status, bed size, urban vs. rural location, type of payroll vendor, involvement in culture change, and rationale for inclusion in the feasibility test.

Nursing Facility	**Ownership**	**Type of Ownership:** **Independent** **Corporate** **Hospital based**	**For profit: (F)** **Not-for-profit: (N)**	**Bed Size**	**Location:** **Urban** **Rural**	**Payroll Vendor:** **In-house** **External**	**Culture Change Involvement**	**Rationale for Inclusion in the Feasibility Test**
Independent Nursing Facilities								
Brookside Inn Castle Rock, CO	Private*	Independent	F	120 beds	Urban	TBD**	TBD	• Independent • For profit • Urban
Eben Ezer Lutheran Care Center Brush, CO	Private* – affiliated with the Evangelical Lutheran Church of America	Independent	N	132 beds	Rural	TBD	Yes	• Independent • Not-for-profit • Rural • CC

Nursing Facility	Ownership	Type of Ownership: Independent Corporate Hospital based	For profit: (F) Not-for-profit: (N)	Bed Size	Location: Urban Rural	Payroll Vendor: In-house External	Culture Change Involvement	Rationale for Inclusion in the Feasibility Test
Independent Nursing Facilities, cont.								
Holly Heights Denver, CO	Family Owned*	Independent	F	133 beds	Urban	TBD	Yes	• Independent • For profit • Urban • CC
Mapleton Care Center Lakewood, CO	Owner/ Operator*	Independent	N	100 beds	Urban	TBD	TBD	• Independent • Not-for-profit
Large Corporations								
The Villas at Sunny Acres, Thornton, CO or Contact ownership to identify a nursing facility. One of five corporate headquarters is located in Colorado	Catholic Health Initiatives*	Large Corporation • In 19 states • 5 nursing facilities in Colorado	N	99 beds 38-104 beds for Colorado facilities	Urban in Colorado	TBD	TBD	• Large Corporation • Not-for-profit • Urban

Nursing Facility	Ownership	Type of Ownership: Independent Corporate Hospital based	For profit: (F) Not-for-profit: (N)	Bed Size	Location: Urban Rural	Payroll Vendor: In-house External	Culture Change Involvement	Rationale for Inclusion in the Feasibility Test
Large Corporations, cont.								
Good Samaritan Society Fort Collins Village, Fort Collins, CO or Contact Bill Kubat for larger facility outside Colorado	Evangelical Lutheran Good Samaritan Society	Large Corporation • In 24 states • Have 154 nursing facilities • 3 nursing facilities in Colorado	N	58 beds in Colorado facility Other facilities vary widely in size	Urban	TBD	Yes	• Large Corporation • Not-for-profit • Urban • CC
Bel-Aire Center Newport, VT or Contact Irene Fleshner to identify a rural nursing facility	Genesis HealthCare Corporation	Large Corporation • In 13 states • Have 181 nursing facilities • No facilities in Colorado	F	44 beds	Rural	Genesis payroll division. PeopleSoft	TBD	• Large Corporation • For profit • Rural

Nursing Facility	Ownership	Type of Ownership: Independent Corporate Hospital based	For profit: (F) Not-for-profit: (N)	Bed Size	Location: Urban Rural	Payroll Vendor: In-house External	Culture Change Involvement	Rationale for Inclusion in the Feasibility Test
Large Corporations, cont.								
Cherry Hills Health Care Center, Englewood, CO or Contact ownership to identify a nursing facility	Kindred Healthcare	Large Corporation • 28 states • 242 facilities • 5 facilities in Colorado	F	95 beds	Urban	Kronos	TBD	• Large Corporation • For profit • Urban
Small Corporations								
Health Care Center of Franklin Park Denver, CO – 93 beds or Mountain Vista Wheat Ridge, CO – 168 beds	American Baptist Homes of the Midwest*	Small Corporation • 4 nursing facilities in 3 states • 2 facilities are in Colorado	N	93-163 beds	Urban	TBD	TBD	• Small Corporation • Not-for-profit • Urban

Nursing Facility	Ownership	Type of Ownership: Independent Corporate Hospital based	For profit: (F) Not-for-profit: (N)	Bed Size	Location: Urban Rural	Payroll Vendor: In-house External	Culture Change Involvement	Rationale for Inclusion in the Feasibility Test
Small Corporations, cont.								
St. Paul Health Center Denver, CO or Contact ownership	Colavria*	Small Colorado Corporation • 3 facilities in Colorado	F	140 75-165 beds	Urban	TBD	Yes	• Small Corporation • For profit • Urban • CC
Walsenburg CC, Walsenburg, CO or Contact ownership – for a rural facility	CopperSands*	Small Colorado Corporation • 5 nursing facilities	N	42 beds 40 – 84 beds	Rural Urban and Rural	TBD	TBD	• Small Corporation • Not-for-profit • Rural
Laguna Rainbow Elder Care Casa Blanca, NM or Contact ownership for another rural facility	Pinon Management*	Small Colorado Corporation • 16 facilities • 15 facilities in Colorado • 1 facility in New Mexico • Some are owned and others are managed	F	58 beds 35 – 128 beds	Rural	TBD	TBD	• Small Corporation • For profit • Rural

Nursing Facility	**Ownership**	**Type of Ownership:** **Independent Corporate Hospital based**	**For profit: (F)** **Not-for-profit: (N)**	**Bed Size**	**Location:** **Urban Rural**	**Payroll Vendor:** **In-house External**	**Culture Change Involvement**	**Rationale for Inclusion in the Feasibility Test**
Hospital Based Nursing Facilities								
Exempla – St. Joseph Hosp. Denver, CO– 36 beds - TCU and/or Exempla Lutheran Medical Ctr. Wheat Ridge, CO – 18 beds – TCU and/or Exempla Colorado Lutheran Home Arvada, CO - 120 beds Affiliated with Lutheran Hospital	Exempla Colorado*	Hospital based Hospital based Hospital affiliated	N	18-120 beds	Urban	TBD	Exempla Colorado Lutheran Home is involved in culture change	• Hospital based • Not-for-profit • Urban

Nursing Facility	Ownership	Type of Ownership: Independent Corporate Hospital based	For profit: (F) Not-for-profit: (N)	Bed Size	Location: Urban Rural	Payroll Vendor: In-house External	Culture Change Involvement	Rationale for Inclusion in the Feasibility Test
Hospital Based Facilities, cont.								
St. Thomas More Progressive Care Center, Canon City, CO Affiliated with St. Thomas More Hospital	Catholic Health Initiatives*	Hospital Affiliated	N	116 beds 38-104 beds for Colorado facilities	Rural	TBD	TBD	• Hospital affiliated • Not-for-profit • Rural
McKee Medical Center Nursing Home – TCU Loveland, CO	Banner Health*	Hospital based	N	17	Urban	TBD	TBD	• Hospital based • Not-for-profit • Urban
Conejos County La Jara, CO	Conejos County*	Hospital based	N	31	Rural	TBD	TBD	• Hospital based • Not-for-profit • Rural

*** New Data Use Agreement Required**

**** To Be Determined**

5. Nursing Facilities Identified for Initial Recruitment into the Task 5 Feasibility Study

On April 26, 2007, CMS staff and SQM team members selected the following nursing facilities for initial recruitment into the Task 5 feasibility study:

- Eben Ezer Lutheran Care Center, Brush, CO
- Holly Heights Nursing Center, Denver, CO
- Good Samaritan Society Fort Collins Village, Fort Collins, CO
- Bel-Aire Center, Newport, VT
- Saint Paul Health Center, Denver, CO
- Laguna Rainbow Elder Care, Casa Blanca, NM
- Exempla Colorado TCUs and Nursing Facility, CO
- Conejos County TCU, La Jara, CO

A significant number of the nursing facilities are located in Colorado. It is hoped that this geographical proximity to the SQM team will provide for increased personal contact and enhance participation in the feasibility test.