

**Measures, Indicators, and Improvement of Quality of Life in Nursing Homes:  
Final Report**

**Volume 1: Methods and Results**

**Submitted to Centers for Medicare & Medicaid Services  
by Division for Health Services Research and Policy,  
School of Public Health, University of Minnesota  
Rosalie A. Kane, Principal Investigator  
Mary Pratt, Project Officer  
Karen Schoeneman, Associate Project Officer**

**June 2004**

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**This report is a product of the project: *Measures, Indicators, and Improvement of Quality of Life in Nursing Homes* (RFP: HCFA-98-002/PK), which was conducted from May 1, 1998 to July 31, 2003 under Master Contract # 500-96-0008 between the Centers for Medicare & Medicaid Services (CMS) and the University of Minnesota. Robert L. Kane is the director of the Master Contract, and Rosalie A. Kane, the project director. The views in the report are those of the researchers and not necessarily those of CMS or the project officers. M. Powell Lawton, PhD, Philadelphia Geriatric Center contributed to greatly to this work and was a co-author of early interim reports before his death in 2001. An draft version was submitted to CMS in march 2004, and this revision responds to CMS comments. For more information, contact Rosalie A. Kane at the Division of Health Services Research & Policy, School of Public Health, University of Minnesota, 420 Delaware St., SE, MMC 197, D-527 Mayo Building, Minneapolis, MN 55455, phone 612-624-5171, fax 612-634-5434, and email, kanex002@umn.edu.**

## Preface

In 1998, the Centers for Medicare & Medicaid Services (CMS), then the Health Care Financing Administration) contracted with the University of Minnesota to perform work in a project called: *Measures, Indicators, and Improvement of Quality of Life in Nursing Homes*. The project's major objectives were twofold: 1) develop and test measures and indicators of quality of life in nursing homes; and 2) study how the physical environments in nursing homes affect that quality of life.

Each major objective entailed many specific tasks and analyses, and two waves of large-scale data collection were conducted to develop and test the quality of life measures themselves. The purpose of this report is to gather in a single report a description of all the methods and results from this multifaceted 5-year study.

The authors are indebted to the project officer, Mary Pratt, for her unfailing helpfulness during this study, as well as to Karen Schoeneman, who served as an additional project officer with special emphasis on the applicability of the work to the nursing home survey and certification process. As always, the conclusions are not necessarily those of CMS or its project officers.

The authors also acknowledge the extraordinary contributions of M. Powell Lawton, PhD Philadelphia Geriatric Center, who worked on this project from its inception. His untimely death in January 2001 prevented most of the results and interpretations presented here to be informed by his involvement.

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- E. Resident-Level Protocol for Observation of Resident Affect
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- J. Administrative Interview and Archival Information
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- Q. Observation of Staff and Resident Interactions, Wave 2
- R. Administrative Questionnaire, Wave 2
- S. QOL Scales Scoring Document

### Transferability Materials

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- U. Observation of Resident and Staff Interactions for the Transferability Study
- V. Training Material for Transferability Observations
- W. Focus Group Guide

## Other

### X. Published articles from QOL project

**Kane, RA.** (2003). Definition, Measurement, and Correlates of Quality of Life in Nursing Homes: Towards a Reasonable Practice, Research, and Policy Agenda. *The Gerontologist*, 43 (Special Edition II), 28-36.

**Kane, RA.,** Kling, KC., Bershadsky, B., Kane, RL., Giles, K., Degenholtz, HB., Liu, J. & Cutler, LJ. (2003). Quality of life measures for nursing home residents. *Journal of Gerontology: Medical Sciences*, 58A (3), 240-248.

## **Executive Summary**

In May 1998, the Centers for Medicare & Medicaid Services (CMS) awarded the University of Minnesota a contract: *Measures, Indicators, and Improvement of Quality of Life in Nursing Homes*. The general objectives of the study were: 1), to develop and test measures and indicators of quality of life (QOL) for nursing home residents, and 2), to study how the physical environment, including private rooms, affected resident QOL. The resulting measures, tools, approaches and findings were meant to assist regulators for quality assurance efforts, providers for quality improvement efforts, and consumers, consumer advocates, and third-party purchasers seeking to compare nursing homes. The study, which concluded in July 2003, entailed 2 major waves of national data collection and many distinct areas of study and analysis. Volume 1 of this report summarizes the procedures and findings undertaken in the 5-year study period. Data collection instruments are appended to the report in Volume 2.

### **Introduction**

For the purposes of the study, a QOL *measure* was defined as an outcome experienced by a resident. In contrast, an *indicator* was defined as any feature of the program, staffing, physical environment, or policy that might be associated with QOL outcomes for all or a subset of nursing-home residents. CMS also requested that we distinguish between *off-site indicators* which could be derived from currently available sources such as the On-Line Survey Assessment and Review (OSCAR) data set or the nursing home Minimum Data Set (MDS), on the one hand, and *on-site indicators*, which refer to indicators that would require special data collection to generate.

By CMS intent, our work emphasized psychological and social aspects of QOL. Although health status, sensory status, cognitive status, pain, and emotional status are themselves often

perceived as dimensions of quality of life, we were charged with identifying and examining other domains of QOL not emphasized in the MDS. We also included domains of QOL (such as dignity and individuality) that are emphasized in current nursing home standards. Further, our focus was narrowed to older nursing home residents, mostly well over age 65. Therefore, our work cannot be generalized to younger nursing home residents, who often have developmental or mental health disabilities. We excluded from our purview nursing homes strictly targeted for people with mental retardation, developmental disability, or psychiatric conditions. We also eliminated swing beds in hospitals, nursing home care units in Veteran's Administration medical centers, states' Veterans Homes, and nursing homes that accepted neither Medicare or Medicaid.

We assumed that residents are the best source of information about the quality of their own lives because of the subjective nature of QOL outcomes. Accordingly, one goal was to determine to what extent people with dementia can report reliably on their quality of life, and how well the ability to collect QOL measures corresponded to cognitive impairment as noted on the MDS. Given that some residents would be unable to be interviewed about their lives because of cognitive disability, we also assumed a need to supplement resident self-report with reports from other sources and direct observations. Finally, along with other writers and researchers, we perceive QOL as a multidimensional construct.

### **Field Work Methods**

For the over-arching objective to develop and test measures and indicators, we identified 11 tasks: 1) review literature and existing QOL measures; 2) identify domains for psychological and social aspects of resident QOL, 3) identify an item pool to measure the domains; 4) develop reliable and valid measures of QOL outcomes; 5) determine the extent to which QOL can be measured directly in interviews with nursing home residents, including those deemed cognitively



impaired; 6) determine how many residents need to be interviewed to develop stable estimates of average QOL in a nursing home; 7) determine how a sample of facilities differ in resident-reported QOL; 8) determine how resident and facility characteristics affect QOL at the individual and facility level; 9) test proxies for resident self-report, including reports from direct care giving staff, reports from family members, and observation of resident affect; 10) develop and test facility-level observation tools for resident and staff interactions that might be a proxy for QOL for residents who cannot be interviewed; and 11) identify possible indicators of QOL based on existing data sets from OSCAR or the MDS or from additional information that could be collected from or reported on by facilities. Data collection proceeded in two major waves with piloting before each wave; the first wave fielded more inclusive instruments with the intent of testing more parsimonious approaches suggested by Wave 1 analysis in Wave 2. Special additional studies on development of a personality measure for nursing home residents, inter-rater reliability testing, and a transferability study were also undertaken.

### Wave 1

After pre-testing questionnaires, we drew the Wave 1 sample from 40 nursing homes in 5 states. The states (California, Florida, Minnesota, New Jersey, and New York) were selected with CMS involvement to reflect a range of policy environments based on variations in nursing home reimbursement levels, ownership patterns, regulatory history, and workforce characteristics. California, Florida, and New York were further narrowed into smaller areas, including, respectively, San Francisco and northern California, central Florida (an area comprising Tampa and St. Petersburg and Orlando and surrounding rural areas), and western New York (and area comprising Buffalo, Rochester, Syracuse, and Utica and surrounding rural areas). The nursing homes were randomly selected from the roster of eligible facilities so as to

equally include large and small nursing homes and urban and rural nursing homes. Because of CMS interest in single rooms, we also over-sampled in each state to include, when possible, at least 2 nursing homes with 75 per cent or greater residents in private rooms. We excluded facilities with less than 50 beds. Given the extensive commitment from participating facilities for Wave 1 and our desire to include nursing home personnel as partners in the efforts, the sampled facilities were allowed to decline participation. Only a few facilities did so, typically for reasons with which we concurred (e.g., a major construction project underway, or management changes and turmoil).

In each nursing home, we chose up to 5 nursing units, selecting any Alzheimer's Special Care Unit or rehabilitation unit, and randomly selecting from the remainder. (The average nursing home in the sample had 3 units, and only five (5) exceeded 5 units.) We then selected residents from those units using a computer program so as to result in a random stratified sample of 50 residents per facility evenly divided by residents with better or poorer cognitive functioning as defined by an MDS-derived cognitive measure. To divide the sample by cognitive status, we abstracted records 2-3 weeks prior to data collection and used a simple MDS-derived 6-point scale using short-term memory, long-term memory, and decision-making capability. We also over-sampled for residents in private rooms, allowing the sample to include as close as possible to 20% people in private rooms. Finally, as much as feasible, we divided residents evenly across units, selecting at least 10 residents from each unit, excluding residents in comas or vegetative states and younger residents from the sample. In a few small nursing homes, the exclusions combined with low occupancy resulted in a sample of fewer than 50 residents.

The purposes of Wave 1 data collection were to conduct the psychometric work needed to develop QOL scales in terms of scale consistency, reliability, concurrent validity, and factor

analysis, to determine the adequacy of proxy approaches for resident self-report, and to determine the sample size of residents needed to make facility-level estimates. During Wave 1, we also: collected extensive data on physical environments; collected quantitative and qualitative data on policies, procedures, and staffing in each facility (to explore possible QOL indicators and how to collect the data for them); and we piloted a facility-level observational approach to characterize interactions among residents and staff as a possible supplement to QOL measures. Wave 1 data ultimately included 1988 residents in 131 units in 40 facilities.

Prior to drawing the Wave 1 facility sample, we mailed a survey to all nursing homes in our study areas to determine the proportion of single rooms and the kind of quality of life initiatives then taking place. CMS was interested in whether facilities were using model tools developed by the two major nursing home trade associations. The proportion of the 987 responding facilities using these trade association tools varied from 3% in California to 19% in New Jersey. Many more facilities routinely collected feedback from residents using their own corporation's tools (varying from 49% of New Jersey respondents to 73% of California respondents). Proportions of residents in private rooms were low. The percent of responding nursing homes with nobody in a private room ranged from 33% in California to 5% in New York and New Jersey, and those with fewer than 25% in private rooms ranged from 86% in New Jersey to 58% in California. Only a tiny proportion of the responding facilities had 75% or more of their residents in private rooms: 6% in California, 3% in Florida and Minnesota, 4% in New Jersey, and 5% in New York.

## Wave 2

The purposes of Wave 2 data collection were to confirm the factors and properties of the QOL measures in a new sample, to examine individual factors associated with QOL in a sample that would include more racial variation and more short-stay residents than the Wave 1

procedures permitted, to examine facility factors associated with QOL in a more representative sample of facilities using extant data and data supplied by each administrator, and to test a shortened version of facility level observational tools.

We again sampled 5 states (substituting Maryland for New Jersey). We increased the number of facilities per state to 12 and sought efficiency by building the samples within a 30 mile radius of a major urban area. We also chose urban areas to increase the number of African American and Hispanic residents in the sample: the Wave 2 sample was centered in zip codes in central Los Angeles, central Baltimore, North Miami, Minneapolis, and Albany, NY. We arrayed facilities in these areas using an algorithm based on positive and negative extremes on regulatory citation history and staffing levels, and recruited facilities from the top and bottom of that distribution. Rather than stratifying residents based on cognition (which required an earlier step of sorting the residents by cognitive strata several weeks before the anticipated field visit, thus undercounting short-stay residents), we interviewed a random sample of residents. Unlike with Wave 1, we positioned participation in the 2nd wave as mandatory, with us conducting a “developmental survey” as an agent of CMS.

From Wave 1, we learned that completed interviews from 28 residents were ample to describe the facility on all the QOL domains we measured. Accordingly, we sought a sample of 28 residents per facility with completed interviews. Residents were approached in random order; those who could not complete an interview were excluded and the sampling continued until 28 interviews were produced. The Wave 2 sample included 1680 residents from 60 nursing homes.

### Transferability Study

After Wave 2 data were analyzed we conducted a separate study in Minnesota to determine the extent to which nursing home staff would obtain the same results as University of Minnesota

researchers in resident interviews and facility wide observations of resident and staff interactions. This component was conducted as a quasi-experiment wherein we examined whether the extent of training of facility personnel and the staff member's disciplinary background (nursing versus social work or activities) affected how congruent staff results were with those of researchers. This study took place in 8 nursing homes and entailed 4 staff assessors and 24 residents per facility for a total of 16 staff assessors and 192 residents. We conducted a similar transferability study with a sample of Maryland surveyors

#### Date Collection and Procedures

At each Wave, we hired 40 local interviewers (8 per state) and conducted 40 hours of training. Interviewers needed to achieve high inter-rater reliability with their trainers on environmental observations and on observations of resident and staff interactions before they went into the field. At Wave 2, we used a data collection form that could be entered in a scanning procedure. Wave 1 data collection was labor-intensive, entailing an average of three interviewers spending two to three weeks in the facility. Wave 2 procedures were streamlined, entailing only resident interviews and observation protocols; interviewer teams tended to complete them within a week in a facility.

#### **Resident Self-Report Measures**

As a result of an extensive literature review and interview process as well as focus groups, we ultimately chose to measure 11 domains of QOL. These were comfort, security, meaningful activity, relationships, enjoyment, functional competence (defined to mean that within their physical and cognitive limitations residents were as independent as they wanted to be), autonomy, dignity, privacy, individuality, and spiritual well-being. Each of these domains was construed as a resident outcome. For each, we identified a pool of candidate items of resident

self-report that might reflect each domain. We recognized that these outcomes would be sensitive to physical environments, facility policies and practices, and staffing patterns, and the team generated hypotheses about potential indicators related to the outcomes.

In Wave 1, we fielded a questionnaire with 4 to 13 putative items per domain that took 45 to 90 minutes to complete. The intent was to develop scales of more practical length from subsets of these items. The QOL items were embedded in a questionnaire that also included: demographic items, residents self-report on their experience of 10 emotional states (adapted from Meryl Brod's Dementia QOL measure), residents self report on 4 general satisfaction items, and a series of 12 summary ratings by residents on their QOL (one for each domain and "quality of life as a whole"). For most of the QOL items, we posed questions using 4-point Likert scales ("often, sometimes, rarely, never" or, for summary ratings "excellent, good, fair, poor").

Recognizing that some residents might be unable to use Likert responses, we allowed interviewers to revert to a dichotomous response pattern ("mostly yes or mostly no") when a resident could not reply with the Likert categories after 3 attempts. If a resident had repeated problems with the Likert response categories, the interviewer was allowed to conduct the entire interview using the binary categories. For only 5% of residents did we use 2 or more sittings to complete the questionnaire; most of these interviews were divided to accommodate the interviewer's or the resident's scheduling convenience, but in some instances the breaks accommodated resident fatigue.

All English-speaking residents over 65 were eligible for the study unless comatose or in a vegetative state. We ruled out 325 residents for an interview based on a screening determination that they were completely confused or incoherent or unable to rouse. We eliminated other residents who gave incoherent or non-responsive replies to 8 of the 13 comfort items at the

beginning of the questionnaire. Sixty per cent of all 1988 residents in the sample (1188 residents) were able to respond sufficiently for us to complete the bulk of the interview and calculate most scales. (The exact N varies by scale). The ability to calculate QOL scores decreased as the respondent's cognitive score result worsened, but we could calculate most QOL scores for many respondents with poor MDS-derived cognitive scores and were unable to calculate scores for a few residents with perfect cognitive scores.

We tested various ways of interpolating the binary responses into the Likert responses. We applied z-transformations for each item, separately for the Likert and for the binary response options and then combined the responses into one variable regardless of the response option used. For the majority of items, a score of 3.8 corresponded to "mostly yes" and 3.5 to "mostly no" responses, and we used this scheme throughout. A few items called for a dichotomous response from the beginning (e.g., having any resident as a close friend, having a confidante, developing a new interest since coming to the nursing home). So as not to under weight these questions, we coded "mostly yes" as a "4" and "mostly no" as a "1." We did our original scale development on subjects who had complete responses using Likert response options, and then tested whether and how interpolating the binary responses changed the results. In Wave 1, we required that 75% of items be completed for scales with 4 items and that 66% of items be completed for scales with 5 or more items; in such cases, missing items were recorded at the mean of the individual resident's responses for the remainder of the particular scale.

The first scales generated, which we refer to as the long QOL scales ranged from 3 to 13 items. The shortest scale, Enjoyment, was comprised of 3 food-related items, and is more properly dubbed Food Enjoyment. Scale consistency using Chronbach's alpha was acceptable for all but the Individuality scale. We looked at the inter-correlations and independence of the

scales; these procedures tended to eliminate items that may have been associated with a high rating for overall quality of life but that loaded with multiple scales. We tested concurrent validity by testing the hypothesis that each QOL domain would be positively associated with overall satisfaction and better emotional well-being. We also tested the hypothesis that each domain would be associated with the single summary rating for that domain by regressing each domain score against all summary items. These concurrent validity tests worked as expected. In some instances more than one summary item was related to the scale score but the intended summary item was most associated with the overall scale.

We conducted confirmatory factor analysis (CFA) on the remaining 76 items, finding that the individuality and relationship domains were practically indistinguishable. The individuality scale also had poor internal consistency. When we dropped individuality, a resultant 10-factor solution fit the data well.

We then relied on cluster analysis to somewhat reduce the scales to shorter versions, selecting the items within each domain scale that best preserved the integrity of the scale and discriminated that domain score from the others. We repeated all analyses on the short scales, which ranged from 3 to 6 items per scale. Results were similar to those achieved for the long scales. Once again, CFA resulted in a 10-factor solution, eliminating individuality. Alpha reliabilities fell slightly with the shorter scales, but only the individuality scale fell below .63 or greater. The inter-correlations among domains dropped as a result of the shortening procedure.

For the most part QOL was the same for the individuals with the better or worse cognitive functioning. Where we found significant differences, QOL was better in some domains for the persons with higher cognitive functioning and was better in other domains for the persons with worse cognitive functioning.



We fielded a revised instrument at Wave 2. We used only the short-scale items, and substituted a new 6-item scale for “individuality,” which was tested prior to fielding Wave 2. We approached residents in random order, did not interview residents who failed a simple conversational screen (i.e., tracking with a greeting and introduction of the study), and also terminated interviews with residents who failed to give coherent or usable responses to 4 of the 6 comfort questions at the beginning of the interview. In one facility we obtained fewer than 20 completed questionnaires and replaced the facility. In all others we were able to obtain our desired 28 completed questionnaires, although often facility staff had told us that only a handful of residents could be interviewed.

As with Wave 1, we were able to interview residents with poor cognitive performance. In Wave 2 a randomly selected sample of 1680 individuals completed the questionnaires, with 78.5% in the 3-5 cognitive range, connoting poorer cognitive functioning. The mean resident length of stay was almost 2 years, with 8.9% having stayed one month or less, and 6.2% having stayed between 1-2 months; 21.5% having stayed 3 months or less. The Wave 2 sampling approach made it possible to compare QOL of longer and shorter stay residents.

When we applied Confirmatory Factor Analysis, this time we were able to confirm an 11-factor solution that fit the data well. The scales, including the new Individuality scale, had adequate scale properties and concurrent validity, using the same procedures as in Wave 1. At Wave 2 we found it was possible to develop a sample that was balanced in cognition without an elaborate prior sampling scheme, and, thus, include short-stay residents in the sample.

### **Family and Staff Proxies for Resident QOL**

We conducted a test in Wave 1 data to examine how family and direct caregiver appraisals of residents’ QOL concur with the appraisals of the residents themselves and how consistent

family and direct care staff are with each other when no direct resident appraisal is possible. We conducted an in-person interview pertaining to each of the 1988 residents with a line staff member best likely to know the resident.

We sent mailed questionnaires to up to 3 family members per resident, rank-ordered by their estimated level of involvement with the resident. If more than one family member returned the questionnaire, we used the one with the greatest current involvement in the primary analyses. When no questionnaires were returned, we used telephone follow-up to remind respondents to return the survey, or, if they preferred, interviewed them by phone. This procedure resulted in our securing at least one family questionnaire for 1471 residents.

Our questionnaires used items that paralleled the QOL items administered to the residents. We excluded some domains in the proxy interviews. Neither family nor staff members were asked the items on spiritual well-being or relationships because they are so subjective to the residents. On the staff interviews, we also omitted the dignity items because that scale was comprised of items about how staff treated the resident and seemed to require a great deal of self criticism. We asked for the emotions ratings and the summary ratings from both proxies. As control variables we asked both staff and family questions about frequency of contact and familiarity with the resident, and staff members were also asked about educational levels and work shift.

We compared domain scores of various respondents by simple correlations of scale values, by comparing mean values across groups using ANOVA for independent samples, and by comparing matched samples of each proxy and the corresponding residents with t tests. To test the correlations, we used 3 different correlation statistics: Pearson, Kendall, and Spearman. We

also calculated Kappa statistics and inter-class correlations (ICC). To obtain Kappas, we dichotomized the continuous scores at both the 20<sup>th</sup> and the 25<sup>th</sup> percentiles.

In all correlations between staff and resident, the results are highly statistically significant, but the actual correlations show low values. Only 4 of Pearson correlations exceed .2; the Spearman coefficients are slightly higher and the Kendall slightly lower. The Kappa values, which improve if the 25<sup>th</sup> percentile is used for dichotomizing, are all below .2. Only 4 ICC values were above .2.

Family comparisons with residents are similar though the agreement is a little better than between staff and residents. Three Pearson coefficients exceed .2 though none reach .5. Neither the Kendall nor the Spearman perform better. All but one ICC value is above .2 but only one is above .4.

To explore whether resident characteristics affected the concordance of resident and proxy reports, we regressed the resident ratings against each proxy type rating controlling for resident's age, gender, ADL level, cognitive status, and length of stay. These adjustments made no difference. We also were unable to improve concordance very much by incorporating proxy characteristics and seeking a "best" model.

We also created QOL scores at the facility level for each proxy type by aggregating the scores and dividing by the number of respondents. When we compared these aggregate staff and family scores to aggregate resident ratings, we achieved much higher concordance than we did at the individual level. For staff, 5 of the possible 8 Pearson correlations with residents and 4 of the ICC values are above .4 and all are highly statistically significant despite the much smaller sample size when the N is reduced to 40 facilities. The pattern of concordance between resident

average scores and family average score in a nursing home is even stronger. For all but one domain (meaningful activity), the Pearson and ICC values are .4 or greater.

We concluded that staff and family are poor proxies for residents who cannot respond. Further, in a small reliability test of staff wherein we selected a second staff member equally familiar with the resident for 62 residents in 30 facilities, we found that staff members were poorly correlated with each other regarding the same resident. Thus, the idiosyncratic selection of a staff respondent may heavily influence results when staff proxies are used. Although aggregation of data to the facility level improves the correlations between proxy respondents and residents, the aggregation procedure conceals the discordance within individual dyads.

### **Resident Personality**

We developed personality measures suited for oral administration to nursing home residents and tested their effects on QOL self-ratings. Prior work on personality assessment tended to rely on rather long self-completed questionnaires, and the inclusion of many items that refer to work place performance. Self-completion is impractical for nursing home residents, some of the items are inappropriate, and the length of the batteries is a problem, especially if a personality inventory is to be combined with other assessment items.

We used the Big Five Personality Inventory (BFI), developed at University of California at Berkeley, as the starting point for developing an approach for nursing home residents. (We chose this instrument because its items were shorter and clearer than those in other available tools.) The BFI yields a score with reference to 5 personality traits: Extraversion, Neuroticism, Agreeableness, Conscientiousness, and Openness to Experience.

We first conducted a small pilot test with 200 residents after Wave 1 data collection wherein we administered all 44 of the BFI items in interviews with residents with only minor

modifications to fit a nursing home population. For example, we introduced an introductory instruction “to consider the kind of person you have been for most of your life” and modified items referring to employment. Analyses indicated that we could shorten the scales to 27 items.

In a second phase, we administered the 27 items to all residents in Wave 2. Analysis of Wave 2 data indicated that 2 of the 27 items did not perform as well as they did in the pilot and they were dropped. The resulting personality inventory consisted of 25 items, 5 each for Neuroticism, Extroversion, and Agreeableness, 6 for Openness, and 4 for Conscientiousness. Alpha reliabilities were all above .6.

We then conducted separate regressions for each QOL outcome measure to determine whether resident personality affected resident reported QOL after we controlled for resident functional status and cognition. QOL subscales differed in the extent to which they were linked with personality. Much more of the variance on Spiritual Well-being and Security were attributable to personality than for other domains, whereas Autonomy and Functional Competence were least affected by personality. High levels of Agreeableness were associated with higher levels of QOL on Comfort, Relationships, Dignity, Meaningful Activities, and Spiritual Well-being. High levels of Neuroticism were associated with lower scores on many QOL domains including Comfort, Meaningful Activities, Security, and Autonomy.

### **Facility-Level QOL Data**

We aggregated QOL at the facility level by domain and applied case-mix adjustments, using the QOL data we had collected, basic demographic data on the resident questionnaire (gender, race, and marital status), and MDS data. From the MDS data we created variables for ADL functioning, cognition, and length of stay since admission. Facility descriptors such as size and urban/rural location were drawn from our data base.

Analyses were conducted separately for Wave 1 and Wave 2. Two-way analysis of variance was used to compare difference of distributions for a given QOL domain within each facility and across facilities. Chi square tests were used to compare the proportion of outliers by facility characteristics. We used mixed-effect hierarchical linear models with main effects to fit the data. Ten (10) QOL domains were used at Wave 1 and 11 at Wave 2. Independent variables included combinations of random factors (Facility, Interviewer) and covariates (length of stay, age, education, race, gender, having adult children, and MDS-derived cognition and ADL measures).

In 23 of the 40 Wave 1 facilities, 2 or more domains were positive or negative by at least one standard deviation from the mean. Ten (10) facilities showed a consistently positive pattern and 13 a consistently negative pattern. Risk adjustment for patient characteristics made no dramatic changes. Adjusting for facility characteristics increased the variance in some domains and decreased it in others. When Interviewer was added as a random factor, 8 domains demonstrated a loss of relative variance and only 2 showed no change. At Wave 1, we found no difference in QOL by resident length of stay.

The pattern of facilities showing either negative or positive patterns of variation held up in Wave 2. Although Wave 2 resident sampling provided a much larger number of short stay residents, we found, as in Wave 1, that resident length of stay had no effect on QOL domains.

We estimated the number of residents needed to show a significant facility effect. At Wave 1, we had conservatively included 50 residents per facility. If we set the alpha level at .05 and power at .80, we needed 7 to 12 residents in the sample, depending on the QOL domain being measured. When we set more stringent standards of an alpha level of .01 and power of .90, we could detect a difference in all but 2 domains with a sample of 20 residents, but needed 23 residents for Functional Competence and Dignity. Therefore, we conservatively decided to

interview 28 residents per facility in Wave 2. When we repeated the analyses with the Wave 2 sample, we found a sample of 13 residents would be adequate for an alpha of .05 and power of .80 on all domains. For the more conservative alpha of .01 and power of .90, a sample of 20 was sufficient for all domains but dignity, and a sample of 25 was sufficient for all domains.

### **Shortened QOL Screeners**

CMS requested us to suggest a small number of items to screen for QOL that might be incorporated into MDS 3.0, which was about to be tested. Because for some purposes, CMS might be interested in an approach that was binary for all residents (e.g., to increase response rates and simplify administration), we worked within the existing data set to explore the best way to extrapolate the 4-point scales into the ‘mostly yes’ and ‘mostly no’ binary scales. We tested the three possible ways of reducing the Likert scales to binary scales, and found the best solution was to treat “often and sometimes” as “mostly yes,” and “rarely” and “never” as “mostly no.” Fielding the binary versions, however, was beyond our scope, and, thus, we are unsure about the distribution that would be yielded if binary versions were used at the outset.. Nor are we certain of the effect on responses if residents are asked only a few questions about QOL rather than a full-length QOL interview.

We developed a 34-item multidimensional approach (QOL-MD-34) that yields 9 domain scores. In these procedures, we included the summary items for each domain (11 items) in the item pool. The 34-item solution drops the Relationship domain because it was highly related to the Individuality domain, and combined items from the Meaningful Activity and Spiritual Well-being scales into an Activity Domain that includes participation in and enjoyment of religiously oriented activity but omits the items from Spiritual Well-Being that relate more to spiritual

fulfillment. The Security scale uses the summary item (in its binary form: Do you feel safe and secure?) as one of its 3 items.

We then proceeded to see how much multidimensionality could be achieved while producing a version with less than 20 items. The QOL-MD-14 is a 14-item scale that contains 14 items and taps Food Enjoyment (3 items), Security (3 items), Privacy (4 items) and the new Activity domain (4 items), the latter identical to the QOL-MD-34.

We also developed a short 14-item unidimensional QOL (QOL-14) scale that emphasized using items with a good ability to differentiate among facilities. Using one-way ANOVA followed by Tukeys B post hoc test for homogenous subgroups, we selected those 7 domains that distinguished among facilities at both waves of data collection. We selected the best pairs of items for those 7 domains by estimating inter-class correlations for all the pairs. The resultant 14-item scale has a good alpha reliability as a single scale, and contains 2-items each from the Privacy, Meaningful Activity, Individuality, Enjoyment, Security, Relationships, and Spiritual Well-Being scales. (We also proposed 2 items from the Dignity scale to produce a QOL-16 scale. Dignity differentiated facilities in Wave 1, shows within-facility variation, and is intrinsic to the QOL standards in the federal nursing home regulations.)

### **Facility-Level Protocols to Observe Staff and Resident Interactions**

We developed observational protocols for resident and staff interactions, and tested how such observations were related to resident-reported QOL. We identified observable positive and negative phenomena that might be seen during a meal, an activity, or a slow walk through the entire facility. Each interviewer performed 2 walkthroughs (one on a weekend), two meal observations, and two dinner observations in each facility at Wave 1.



Some frequently-observed behaviors did not differentiate facilities (e.g., the negative observations of residents sitting at the nursing station doing nothing or residents sitting at a dining table saying nothing, or the positive observations of staff pausing to answer resident questions, or residents visibly enjoying activities). Others occurred too infrequently to be useful for scales, though they are telling when they are observed. For example staff members were seen talking baby talk to residents at meals in 5% of 135 pairs of activity observations, staff members were seen talking roughly to a resident or threatening him/her in 5.1% of activity observations, and staff asked residents about weight, bowel movements or continence during an activity in 1.5% of observations. During meals, intimidating or threatening staff behavior was observed more frequently (seen in 11.8% of the 135 pairs of meal observations), quarrels among residents were observed in 9.6% of the dining observations; and staff queries about weight, bowel movements or continence at meals in 4.4%. A more positive observation, seeing a private dining room or area used by a resident and his/her guest, was noted in 6.7% of the observations. Based on these distributions, we dropped items from future iterations.

We correlated counts of positive and negative observations with domain scores. Significant relationships between total positive and negative counts in the expected directions were found for 20 of the 22 correlations. Counterintuitive finds were noted in two cases where a positive behavior count was negatively associated with the comfort domain and the autonomy domain.

We also created an overall QOL score combining domains. At Wave 1, several items predicted overall QOL. From the meal observations, 6 of the 24 items observed were statistically significant (including residents sitting at a table in silence, staff moving resident wheelchairs without discussion or permission, staff talking to each other over resident's head without involving the residents, residents being fed in a messy way, residents observed

expressing displeasure, and residents observed calling out in distress). From the activity protocol, 3 of the 24 items were significantly related to overall QOL, (namely all residents silent, staff talking with each other over resident's head, resident calling out in distress, and staff pursuing their own discussions during resident activities). From the 36 walkthrough items observed, 5 were significantly related to QOL ( namely: staff moving resident's wheelchairs without discussion, staff talking to each other over resident's head, resident expressing displeasure, and staff seen assisting a family member). We aggregated common features across all 3 forms of observation, finding 5 consistent predictors of QOL: staff talking over resident's head, staff moving resident's wheelchair without asking or explaining; resident expressed displeasure, resident calls out in distress and is ignored, and resident is disengaged.

One behavior that we hypothesized as positive (staff explaining a rule or policy to a resident) was negatively correlated with QOL. On debriefing observers, we found that such explanations were usually associated with telling residents that they were not allowed to do something and enforcing a restriction, which may account for the counter-intuitive finding.

For Wave 2, we streamlined our observational protocol to 4 walkthroughs at planned times in each facility; we incorporated timed observations of meals during the breakfast and dinner-time observations and organized activities during the morning and afternoon observations. We reduced the number of items to 16, relying heavily on those that were significantly related to QOL at Wave 1 and a few other items that seemed conceptually important, such as observing staff threatening residents. We included "staff imposing a restriction on resident," a negative observation, rather than the earlier positive "staff member is explaining a rule or policy." The frequency of observing any of the 16 items in a facility ranged from seeing a resident engaged in a solo activity in 77.6% of the facilities, staff answering resident questions in 61.5% of the

facilities, and residents disengaged at the nursing station in 52.5% of facilities to less frequently observed behaviors such as staff moving wheelchairs without discussion (seen in 14.3% of facilities), staff imposing a restriction on a resident (13.1%), staff discuss resident's private business in public (9.8%), staff speaking roughly or threatening residents (4.1%), and resident being fed messily (4.1%). At Wave 2, we allowed for an actual count of occurrences up to 9 times during an observation, but found that the additional information conveyed by the laborious and perhaps distracting effort to count the behaviors yielded little useful additional information.

The correlations between QOL domains and observations were much less impressive at Wave 2. The only statistically significant relationship was between the count of positive behaviors and the resident-reported privacy domain, and some non-significant correlations were in the opposite of the direction expected. We concluded that we had overly constrained the procedure in Wave 2 by limiting the number of observation occasions to 4 per facility and dramatically reducing the items to be observed.

Facility-level observations encompassed the entire facility, including dementia SCUs. Thus, we could potentially observe interactions involving residents who were not in the sample, and some of the sampled residents may not have been observed. Accordingly, the observation strategies could be pursued as a supplementary way of assessing QOL. To this end, we used one-way ANOVAs to explore which items usefully discriminated among facilities. With the 40 Wave 1 facilities, 7 items were highly discriminating in the Wave 1 meal observations, 8 in the Wave 1 activity observations, and 6 in the Wave 1 walk-through procedures. At Wave 2, we performed the analysis of the discriminating power of the 16 items using 61 facilities (we were able to count the observations in the facility with too small a sample of residents to use in the

QOL analyses). Eleven (11) of the 16 items were able to discriminate among these 61 facilities, 8 with ANOVAs significant at the 0.000 level.

### **On-Site Potential Indicators**

During Wave 1 of the study, we developed an extensive data base on the policies, practices, and staffing patterns of each of the 40 nursing-homes. The project director interviewed administrators, directors of nursing, directors of social work, and directors of activities (or designated members of their departments). We also examined archival information, including personnel records, activity department records, care planning records, resident council records, in-service education programs, and records of room changes. The ultimate goal was to identify structural and process aspects of the nursing homes that might prove to be indications of better or worse resident-reported QOL. We utilized the labor intensive approach of individual interviews with multiple informants to determine the feasibility of gathering various sorts of information in a consistent way. Based on the experience at Wave 1, we developed a single 4-page questionnaire on facility structure and process that was completed by the administrator or his/her designee when data collectors were in the facility for Wave 2.

We performed separate regression analyses with Wave 1 data (N = 40 NFs) and Wave 2 data (N=57) to seek relationships between the potential indicator and the facility-level QOL score by domain. When we had consistent data for both Waves, we performed a combined analysis, raising the N to 97 NFs. From this large number of regressions, we found a few features of NFs that were related to significantly better QOL on four or more QOL domains. In future work, we plan to develop composite indices reflecting topics (e.g., autonomy policies; rehabilitation and health care; activity and stimulation; continuity of staff; experience of staff) and to use cluster analyses to determine relationships to QOL.

In the 40 nursing facilities where we did the intensive data collection, we noted great variation in almost all the parameters we included. Attributes thought to affect QOL domains (e.g., permanent assignment of CNAs to residents; vigorous, individualized activity programs; individualized care-planning and routines) will need to be carefully defined before large numbers of facilities can be compared on this parameter. Even such well-established indicators as nursing staff ratios are subject to measurement error and interpretation.

Our analysis of the relationship between these process and structural indicators to date entailed univariate regressions between the putative indicator and the QOL domains; such regressions were performed with and without adjustment for resident characteristics (age, cognition, ADL, gender, and length of stay). Substantial numbers of the possible indicators were associated with better or worse QOL domain scores in four or more domains even after adjusting for resident characteristics. In future analyses (beyond the scope of this contract), we plan to aggregate the many items into clusters that signify patterns in a facility related to such factors as rehabilitation focus, active activity program, individualization of routines, consistency of personnel, and experience of personnel.

### **Off-Site External Indicators**

To examine potential correlations between external indicators and QOL we relied on data from MDS and OSCAR. The former included demographic and clinical data as well as the quality indicators developed by CHSRA. The OSCAR addressed various staffing measures and relevant deficiency rates on the annual surveys. We used Hierarchical Linear Modeling (HLM) to account for the nested nature of the resident data within facilities. Some resident characteristics were associated with variations in some QOL domains but no useful patterns emerged. Likewise the relationship between QIs and QOL is varied; the associations go in both directions such that

better QOL is not consistently linked to better quality of care. Higher levels of staffing are not consistently linked to better QOL. Different types of staff are associated with better outcomes in different QOL domains. For example, activities staffing is tied to Privacy and Meaningful Activity; administrative staff is tied to Functional Competence; LPN ratios are associated with lower Dignity scores. In general facilities with greater numbers of citations have lower QOL, but this trend is statistically significant for only Privacy and Autonomy.

### **Transferability**

Part of the project entailed determining the extent to which facility staff and surveyors could apply the interview tools and the observational tools with results similar to researchers. Two general factors might influence this concordance: first, the deliberate approaches used for data collection in research are inconsistent with the way that practitioners and surveyors conduct observations; and second, residents might behave and respond differently when questioned by staff or surveyors. CMS built into the project the question of whether nursing staff or psychosocial staff would perform better in conducting QOL assessments. Later we also decided to build in an exploration of whether staff could conduct the QOL evaluations with training materials as opposed to 2 days of in-person training.

We conducted the staff transferability study in 8 nursing homes in Minnesota. In each home, 2 nurses and 2 psychosocial staff members (social workers or activities personnel) participated. Each participant conducted 6 interviews that were paired with researcher interviews; interviews were performed 2-5 days apart and the order of interviews (staff first versus researcher first) was randomly altered. We built in a question to tap whether the respondent believed his or her quality of life had changed in the last few days. Staff and researchers also conducted walk-through observations together, each completing the protocols

independently. Half the nursing homes were randomly assigned to having their staff receive in-person training; staff from all nursing homes received a manual and an audio-tape on how to conduct the interviews and a number to phone with questions. This procedure resulted in 196 pairs of interviews, half done with a nurse and half with a psychosocially oriented staff member, and half with and half without in-person training. Analyses for congruence were done at the item and scale level. Qualitative de-briefing sessions were also conducted at the participating nursing homes.

Briefly, we found that researcher-staff member congruence at the scale level was as good as the test-retest congruence when both interviews were done by researchers. We found that discipline of staff member had no effect on congruence. In-person training decreased the number of missing items and the amount of use of binary rather than Likert scales but had no effects on concordance. Debriefing revealed that many staff members ignored the training materials or skimmed them, that some staff members were negative about the efforts (perceiving them as a waste of time and respondents as inaccurate), and that some staff members were positive about the experience (perceiving it as an opportunity to truly speak to residents in depth and glean their feelings, and to challenge themselves to improve QOL. Some staff believed that they had learned a lot from the experience. Positive or negative staff reactions were unrelated to discipline but seemed related to the roles and alternative time pressures they experienced; several MDS coordinators and charge nurses who participated were negative, whereas staff development nurses and part-time nurses were more positive, for example.

The small surveyor trial, which was conducted with 6 Maryland surveyors and entailed 24 paired interviews and observational protocols, had similar results. Surveyors achieved satisfactory concordance with researchers on both the interviews and observations.

This quasi-experiment suggested that under the right conditions staff can conduct QOL assessments. It is possible, however, that if such assessments were used for public reporting or regulatory purposes, the dynamic would be changed and the results affected.

### **Physical Environments**

Physical environments, for this study, were defined as the built environment and grounds, including furnishings, fixtures, decorations, and equipment, and the use of space. We developed a detailed approach to assessing elements of the physical environments at the level of the resident's room, the nursing unit where the resident resided, and the facility as a whole. This approach allowed us to link analytically the individual resident's characteristics, including his or her QOL, and his or her specific physical environment. The assessment tools were designed as checklists of easily observed phenomena that could be noted by an interviewer without prior expertise in design or environments. Global judgments (e.g. ratings of homeliness or functionality) were not required.

All environmental data were collected at Wave 1. The 40 research observers achieved excellent inter-rater reliability and concordance with their trainers before going into the field to conduct the room and bath evaluations, and spot checking throughout the data collection showed they maintained that standard. All facility and unit level environmental assessments were done by one team member (Lois J. Cutler), who also applied light meter readings and identified innovative and problematic environmental features for later detailed qualitative study.

Descriptive analysis showed many environmental deficits, including inadequate showers, few knobs and switches that were operable by residents, cluttered corridors, closet rods out of resident's reach, lighting levels that approximated conditions of blindness, lack of horizontal work space for residents, lack of a resident's bedside chair in many instance, access to the



outdoors, distances that residents needed to traverse, and many other substandard features. The more people sharing a resident room, the less likely the resident was to have ample spaces for privacy and activity at the unit and facility level.

We created composite indices of environmental attributes such as Visual Privacy, Function Enhancing Features, Life Enriching Features, and Environmental Controls for Residents. These Indices were constructed at Room, Unit, and Facility level, and an index of the Dining Environment was created on the basis of both unit and facility level observations. We present preliminary findings from cluster analysis that generates Environment Types, using data from all 3 levels. A NIH Career Award to Howard Degenholtz at the University of Pittsburgh will permit use of hierarchical modeling (resident in room in unit in facility) on how environmental cluster membership affects quality of life. In this study, we determined that being in a private room had a positive effect on QOL domains when controlling for resident characteristics.

### **Conclusions, Implications, and Recommendation**

This project resulted in a variety of tools that can be used to monitor and study QOL in nursing homes and other residential settings where older people receive care. We are encouraged by the extent to which residents can report on their own QOL. We are also encouraged by the new environmental tools that were developed for this project, and the prospect of further research in this area. Facility staff can collect QOL information under the right conditions, and the very act of collecting such data is likely to improve their awareness of resident need and preferences. We suggest a multi-faceted research agenda aimed both at improving QOL measures, including establishing cross-cultural relevance and exploring the sensitivity of such tools through longitudinal study, and also aimed at learning more about the determinants of QOL.

## **Chapter 1**

### **Introduction**

#### **General Objectives**

Under contract with the Centers for Medicare & Medicaid Services (CMS) between 1998 and 2003, we undertook a large-scale iterative study of quality of life (QOL) in nursing homes.

We had two general objectives, each with several components.

Objective 1.      Develop and test measures and indicators of QOL for nursing home residents;

Objective 2.      Determine how physical environments in nursing homes affect QOL.

The two objectives of the study are quite distinct in their goals and tasks, but are related. We used measures developed under Objective 1 as dependent variables in the analyses conducted for Objective 2. Moreover, sampling decisions for some of the field work were made with both major objectives in mind.

#### **Scope and Significance**

##### Why Focus on QOL

Almost immediately after the enactment of Medicare and Medicaid, nursing homes became the focus of intermittent and intense attention because of quality and access problems. The current regulatory system for nursing-home care with its attention to standard setting, quality assessment, and enforcement, has, in part, evolved as a response to well publicized quality deficits. An Institute of Medicine Committee operating from 1983-1985, issued far-reaching recommendations on nursing-home quality (Institute of Medicine, 1986). Building on this and other work taking place concurrently, the Nursing Home Reforms of 1987 took major steps to shape quality efforts for the next several decades, including: creating new quality standards for

QOL, resident rights and assessment; ushering in the development of the standardized Resident Assessment Instrument (RAI); developing a tiered approach to inspections; incorporating direct interviews with and observation of residents into quality assessments; establishing new intermediate sanctions short of removing the license of a substandard facility; and setting in motion the work to classify deficiencies by duration, scope, and severity.

Since 1987, nursing homes have, therefore, had explicit responsibility for meeting QOL standards. Also since then, the use of physical and chemical restraints in nursing homes has been curtailed with resultant improvement in QOL (Kane, Williams, Williams, & Kane, 1993). Nonetheless, regulatory attention has continued to focus on substandard care, which, of course, itself will affect QOL, rather than on QOL directly. In the decade since the 1987 reforms, quality indicators were forged using MDS data so that nursing homes could be profiled and compared according to care processes or outcomes—for example, incidence of new decubitus ulcers, or weight loss (Zimmerman et al., 1995). The development of measures and indicators for QOL had lagged behind. Surveyors express lack of confidence in citing facilities for QOL problems, and research showed that QOL citations were relatively seldom utilized (Harrington, Carrillo, Thollaug, & Summers, 1996).

The CMS contract with the University of Minnesota was meant to put a strong emphasis on QOL. It was let concurrently with other contracts that examined measures and indicators of quality of care for chronic and post-acute care in nursing homes (Abt Associates, 2001), examined MDS data accuracy, and studied ways to improve the survey process.

The importance of studying QOL goes beyond the CMS need to exercise its oversight and regulatory responsibility. The topic is also important because of mounting evidence that QOL is perceived as substandard in most nursing homes, even those that comply completely with quality

of care expectations. A new Institute of Medicine report released at the turn of the century concluded that although some progress had been made in improving overall quality of care in nursing homes, nursing homes are, nevertheless, dreaded institutions because of their toll on the QOL of their residents (Wunderlich & Kohler, 2001).

### Significance of Environmental Studies

The relationship between the physical environment of the nursing home and the QOL of residents is a topic of longstanding interest. Powell Lawton pointed out years ago that environments need to offer both stimulation and support, and that the frailer the individual the more they need environmental supports to enhance functioning (Lawton & Nahemow, 1973). At the time CMS let its QOL contract, considerable attention had been given to environmental modifications in traditional nursing homes designed to create smaller living neighborhoods. These were thought to be associated with better QOL.

CMS also requested that special attention be given to studying the effects of private rooms on QOL. Over the years, the literature is replete with speculation and many strong opinions on the advantages and disadvantages of shared rooms in nursing homes. During the 1970's and 1980's, some conventional wisdom asserted that the shared room offered advantages in companionship and less isolation for nursing home residents. In the face of intermittent research on consumer preferences and outcomes related to shared or private-occupancy accommodations (Jenkins, 1997) (Kane, Baker, Salmon, & Veazie, 1998) (Lawton & Bader, 1970) (Teresi, Holmes, & Monaco, 1993), shared rooms gradually have had fewer defenders on their intrinsic merits. Evidence has mounted that residents prefer privacy (even if rooms are smaller and the tradeoff is less public space) and that residents who do socialize with other residents often

choose someone other than their roommate for this friendship. More recent considerations focused on costs, both capital costs for building new facilities with single rooms and operational costs. Some attention has also been given to the question of whether all populations benefit equally from single rooms, and whether some consumers (perhaps those with dementia) receive some benefit in terms of reduced agitation from a shared room. The merits of single versus shared rooms has somewhat been conflated with the effects of mingling residents with and without dementia or separating some people with dementia into dementia special care units; obviously any negative effects of co-mingling those with and without dementia are mitigated by single occupancy rooms, which provide everyone with some private space.

The 1986 Institute of Medicine report recommended that CMS (then HCFA)<sup>1</sup> conduct a study of the benefits of single versus shared rooms for residents with various characteristics to help inform a possible mandated ratio of single rooms to shared rooms in all new construction or major renovations (Institute of Medicine, 1986). That private room study was not initially commissioned, but the recommendation along with the development of alternative assisted living services that typically have private rooms or apartments, underscored the importance of examining the effects of single rooms on QOL in the current study.

#### Expected Users of QOL Measures and Indicators

The resultant measures, protocols and research findings were meant to be used by multiple groups, including: survey and certification agencies; nursing homes themselves; and consumers and their agents. Possible uses for each potential group of users are discussed briefly below.

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<sup>1</sup> Henceforth, we will use CMS to designate the agency regardless of date reference.

Survey and certification personnel. Two general and not mutually exclusive considerations for Survey and Certification agencies undergirded the study: 1) the possibility of expanding and modifying current survey activities to better measure and address the statutory responsibility for QOL; and 2) the possibility of changing fundamental regulatory approaches regarding QOL. The Survey and Certification process has been extensively refined over the last decade, especially capitalizing on the investment in a uniform Resident Assessment Instrument (RAI), Minimum Data Set (MDS) and in Quality Indicators (QIs). However, attention to determining the adequacy of QOL has not kept pace with the developments in other spheres. The work reported here is meant to yield tools that surveyors could use to assess the QOL of individual residents and in facilities or to explore QOL in greater depth when a preliminary review suggests QOL may be lacking. It also could suggest strategies for sampling residents, including risk factors for a lower QOL and sample size needed to estimate QOL in a facility.

Surveyors currently rely heavily on data from the MDS (i.e. the resident assessment) and on the On-Line Survey and Certification Review (OSCAR), the computerized database that describes the results of the survey process and also records certain “census” data that facilities are required to submit to CMS in conjunction with the survey process. It is conceivable that new resident-specific data elements could be added to the MDS that explicitly relate to QOL, and that OSCAR could be based on data reported by facilities that are more relevant to QOL. The study was meant to yield recommendations in that regard and indeed has been used to inform the draft version of the MDS 3.0, being tested in the fall of 2003.

Finally, this line of study could raise issues about the adequacy of regulations themselves in relation to QOL. This is particularly likely in the area of physical environments.

Providers. QOL is an outcome best viewed on a continuum. Although from a regulatory perspective surveyors need to determine whether a facility has met a threshold of compliance, these determinations will have greatest relevance for a small subset of poor performing facilities. It is, therefore, likely that such facilities will already have been identified as substandard on quality of care.

Providers have an interest in identifying tools that can be used to characterize QOL in a facility so as to: a) compare their QOL to that of other facilities in the country and state; b) compare QOL of residents by resident characteristics or by distinct areas in the facility; and c) chart progress in improvement of QOL scores over time. Such tools could be used as the basis for a facility's Continuous Quality Improvement (CQI) efforts. To be useful in that regard, the tools should also tap positive aspects of QOL, not just the absence of negative results that would lead to regulatory citations. Also to be useful, tools must be easily understood and applied by facility staff. A test of feasibility of transferring tools to facility staff was built into this study.

Consumers, consumer advocates, and purchasers. The products of this study were meant to be useful for consumers and their agents. It was hoped that such tools could inform the presentation of comparative information about nursing homes to aid potential residents and their families in selecting a nursing home and purchasers of care in selecting programs to be covered in their plans; website technology makes such efforts particularly plausible. Also, groups such as long-term care ombudsmen and community-based case managers could potentially use the tools to generate their own information.

Other group care settings. This study was directed explicitly at nursing homes. Other care settings have evolved, however, besides nursing homes and the residents' own home. QOL is also an issue in residential care facilities, assisted living facilities, and adult foster care, for

example. Potentially, the measures and indicators developed in this study could be adapted to such rapidly proliferating settings. Tools are needed that permit comparisons of QOL for residents in nursing homes and in other licensed care settings.

### **Assumptions**

The following assumptions and decisions helped put boundaries around this ambitious project:

#### Emphasis on Psychological and Social Components of QOL

To avoid duplicating other efforts underway at CMS, the scope of this study emphasized social and psychological aspects of QOL rather than, for example, including health status and functional abilities as domains of QOL. Only two of the domains of QOL we ultimately selected overlap a little with MDS-derived measures. For example, the comfort domain may overlap with pain assessment on the MDS, but we emphasized the subjective experience of a wide variety of physical discomforts, not just physical pain; also we argue that physical comfort is an area that is particularly subjective and, therefore, needs to be measured through direct interview questions rather than staff ratings. We also developed a domain, called functional competence, which is related to abilities to perform ADL functions. Again our functional competence domain taps a different dimension, because our emphasis was on the extent to which residents believe they are as independent as they can be and want to be. Chapter 3 describes our domain definitions and how we arrived at them.

#### Inclusions and Exclusions of Residents

The scope of the work was explicitly defined to include residents with a range of cognitive capabilities, including those with advanced Alzheimer's disease, as long as they could reply to questions. The study also included both long-stay and recently admitted residents. In this study, however, we did not make an effort to develop an individual-level measure of QOL to be



applied to residents close to death that included quality of dying. Samples of residents within days of death, such as some hospice residents, would be too small for measurement development without an explicit effort to over-sample the dying and this seemed more suited to a subsequent study.

The scope of the study was largely limited to people over age 65. Although substantial numbers of younger adults are also served in nursing homes, their QOL may be defined somewhat differently than the QOL of the largely very old group of seniors in nursing homes. Moreover, the proportion of younger persons in any nursing home tends to be small. Thus, for this developmental study, we concentrated on the older resident.

#### Exclusions of Facilities

In keeping with our attention to seniors, we excluded from the study facilities dedicated to serving residents with mental retardation and developmental disabilities. We also excluded Veterans Administration Nursing Home Care Units and State Veteran's Homes and any facilities that accepted neither Medicaid nor Medicare. (This exclusion permitted us to utilize the databases in place under Medicare and Medicaid without missing data). We also excluded swing beds and any hospital-owned nursing homes where the nursing home was not clearly distinct from the hospital; many of the questions in this study concern physical environments and, within the resources available, we wanted to standardize those environments somewhat by excluding those in hospitals. To summarize, our focus was on nursing homes that accept either Medicare or Medicaid, excluding federal facilities, MR-DD facilities, and swing beds in hospitals.

### Residents as Gold Standard

This study took as a departure point that the reports of residents on the quality of their own lives should be sought and used whenever possible. QOL is, at least in large part, a subjective phenomenon, and no better substitute could be identified than asking the residents about their lives. Moreover, asking residents to model the very behavior needed in nursing homes to better individualize care; the very act of systematically talking to residents about their views of their own well-being rather than rating these same outcomes from a professional viewpoint can help bring about the desired results: better QOL.

### Need to Supplement Resident Self Report

On the other hand, the reports of residents of their QOL could be rendered inaccurate by a number of factors. Residents might understate their QOL because of intimidation, reluctance to criticize a service on which they are dependent, courtesy and a wish to appear grateful, lack of knowledge about what could be expected in terms of a better QOL, or accommodation to poorer QOL. For that reason, we wished to develop QOL measures with some other sources of data for comparison. More importantly, we were aware that substantial numbers of residents would be unable to give any verbal self-report at all, and their QOL was also a concern for the study.

### Multiple Sources of Information

In this study, we used four sources of information to measure QOL at the individual level: resident self-report, report of a knowledgeable staff member about a particular resident's QOL, report of a family member about his/her own relative's QOL, and systematic observation of the resident's emotions. We were interested in learning the extent to which the 3 other sources of resident-specific data (family report, staff report, and observation of residents) paralleled the resident self-report in its results. Although we intended to push hard to include self-reports from

residents with cognitive impairment, we also needed to develop a way of assessing QOL for an individual resident when that resident could not give his or her own report.

### Dimensionality of QOL

We conceptualized QOL as entailing multiple dimensions, or domains. As already stated, by design, the study emphasized psychological and social domains of QOL rather than including health status, functional abilities, emotional health, and cognitive abilities as aspects of QOL. But within the aspects of QOL that we covered, the task included specifying relevant QOL domains.

### **Measures and Indicators Defined**

For the purpose of this study, we defined a *measure* as any QOL outcome experienced by an individual resident. These could be reported by the residents themselves, by staff, or by family, or, to some extent observed, but such measures, regardless of data source, were meant to capture any specific resident's QOL outcomes. For this study, we initially identified and attempted to develop measures for 11 domains of QOL at the individual level. We also developed some general or summary measures of individual QOL for each individual.

We use the term *facility-level* QOL measures to refer to facility-wide averages on the individual QOL measures. We also designed the study so as to be able to generate aggregate scores for subsets of the nursing-home residents based on the geographic unit where the resident resided (i.e., the nursing unit) or on other resident characteristics (e.g., all residents with dementia at a specified threshold). If a measure of QOL is incapable of distinguishing among nursing homes, it is of little utility for regulatory purposes.

In contrast to the measures, an indicator was defined as a facility-level characteristic or attribute that could be studied for its *association with* resident-level QOL. To be useful, such indicators should predict QOL for the majority of a facility's residents or for a majority of some

subset of residents of interest even though individual residents can have results that run counter to the expected direction of the indicators. Indicators may include attributes of staffing, programming, or physical environments. It is possible that facility-level QOL measures collected at an earlier time also will serve as indicators for QOL at a subsequent time period.

We used the term *off-site indicator* to refer to data that could be assembled from extant data sets without a requirement that a facility be visited. Such indicator data currently could be derived from the Minimum Data Set (MDS) data that facilities submit to their states and CMS, and from data on the survey process and its results now found in the On-Line Survey and Certification Assessment Review (OSCAR). Some states aggregate other data such as complaint data in ways that might potentially be used as indicators of QOL. We are also collecting programmatic information on site that may serve as QOL indicators and lead to suggestions of additional information that could be provided by nursing home staff.

## **Organization of the Report**

This report brings together in one place all the major facets of work done under this 5-year project. In some instances, more detailed material is available in reports to CMS and from the authors. Earlier reports to CMS or published articles are cited when applicable.

Chapter 2 outlines in broad terms our research questions and methods of data collection and data analysis. Because the report touches on so many different kinds of analysis using such a wide array of data sets, for greater clarity we present the more detailed methodology content in the same chapters where results are presented.

Chapter 3 presents the results of our 2-stage work in creating measures of QOL. It discusses the development of the domain structure and the instruments. The two major sections of Chapter 2 present the results of Wave 1 and Wave 2 of data collection. Wave 1 analyses are particularly useful to show the proportions of residents with cognitive impairment who could complete QOL

interviews and from whom we could generate scales. In Wave 2, we confirmed slightly revised measures using a larger sample of facilities. This chapter presents the scale properties, validation data, and factor structure for the measures.

In Wave 1, we identified a line staff caregiver to complete QOL questions as proxy respondent for each participating resident, and we identified a family member to complete the QOL questionnaires as a proxy for most residents. Chapter 4 presents the analyses that show the extent to which families or staff were accurate proxies for resident responses. We also used a protocol to assess resident emotions (interest, happiness, sadness, anger, and anxiety) based on the Apparent Affect Rating Scale (Lawton, Van Haitsma, & Klapper, 1996). We present only limited analyses on this component, which we concluded was impractical for widespread application.

We developed a measure of personality suitable for administration to nursing home residents, which we administered in Wave 2. Chapter 5 describes the measure development and how personality, measured with this tool, was related to QOL.

The next step was to determine whether and how QOL measures distinguished among facilities. In Chapter 6, we present average QOL data, by facility, for both waves. We also describe how resident and facility characteristics affect QOL scores.

Chapter 7 describes approaches to developing short screeners on QOL using the larger battery of items.

Chapter 8 reports our development of a protocol for facility-level observations of resident and staff interactions, which were made during systematic walks through the facility, and stationary observations of meals and activities. These observational tools were meant to complement the QOL measures, and permit inclusion of units largely housing residents who

were unable to participate in interviews. The chapter reports the relationship between the observations and facility-level QOL scores.

Chapter 9 describes potential indicators of QOL collected in visits to the facilities at Wave 1, and, more compactly, in an administrator-completed questionnaire in Wave 2. The chapter discussed some of the challenges of collecting these data and describes their correlation with QOL.

Chapter 10 describes how specific extant data derived from the MDS and the On-Line Survey and Certification Assessment Review (OSCAR) are related to QOL.

Chapter 11 presents the results of a field test to determine the extent to which nursing home staff and state surveyors could apply the resident interview measures and the observations and achieve the same results as research interviewers.

Chapter 12 summarizes results of the environmental studies.

Chapter 13 briefly discusses the implications of all the work to date and describes desirable next steps for research with these data and follow-on studies. .

Volume 2 assembles all the questionnaires and protocols fielded in this study.

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## **Chapter 2**

### **General Methods**

The study had two over-arching objectives: to develop and test measures and indicators of quality of life (QOL) in nursing homes, and to study how physical environments affected QOL in nursing homes. In this chapter, we briefly describe our approach to each of these objectives.

#### **Develop and Test Measures and Indicators**

##### Research Tasks/Questions

To address this overarching objective, we articulated many separate tasks or questions:

1. Review literature and existing QOL measures, especially as they relate to frail older people.
2. Identify domains of QOL for residents of nursing homes.
3. Identify items to measure the QOL domains.
4. Develop reliable and valid measures of QOL.
5. Determine the extent to which QOL can be measured through direct interview with nursing-home residents, including with residents with cognitive impairments.
6. Determine how many residents need to be interviewed to develop stable estimates of average QOL in a facility.
7. Determine how facilities vary in their resident-reported QOL.
8. Determine how resident and facility factors affect QOL at the individual and facility level.
9. Test proxies for resident self-report, including responses of a resident's direct staff caregivers or resident's family member, and observation of resident affect.
10. Develop and test a facility-level observation tool as an additional proxy for resident QOL.



11. Identify possible indicators of QOL based on:
  - a. Existing data sets (MDS or OSCAR)
  - b. Data that could be collected from or reported by facilities.

### Two Waves of Data Collection Strategy

We collected and analyzed data for this study in two large-scale waves, or phases. The first data collection was fielded in 2000 and the second in 2001. In between Waves 1 and Wave 2, we collected extensive pre-test data on the Wave 2 protocol. After both Waves of data were collected, we conducted a separate study in the Spring of 2001 to examine the transferability of both interview and observation data collection to facility personnel and surveyors. Table 2.1 compares the two waves of the study on some key parameters.

Wave 1. Wave 1 entailed data collection in 40 facilities in 5 states. We endeavored to draw a sample of 50 residents per facility. Wave 1 constituted the first major fielding of the QOL instruments. We included a larger number of putative items than we expected ultimately to retain; our intent was to shorten and refine the instruments as a result of this empirical test. We also included a large sample of residents with the intent of ultimately determining minimum sample sizes. The main foci of Wave 1 data collection as related to the measures and indicators were:

- psychometric work to develop QOL scales (scale consistency, reliability, concurrent validity, factor analysis)
- determination of the extent to which persons with cognitive impairment or serious physical illnesses can respond to QOL interviews
- testing of proxy approaches to resident QOL

Table 2.1. Comparison of Wave 1 and Wave 2

Parameter	Wave 1	Wave 2
Purposes	Field test measures for psychometric work. Determine who can respond by cognition. Test proxy informants on resident QOL. Develop extensive on-site programmatic data for possible indicator development. Collect data for environmental component of study. Proxy data collected on all residents, including those who could not be interviewed.	Confirm QOL measures. Examine resident correlates of QOL including personality and length of stay. Test shortened observational protocol.
States	CA, FL, MN, NJ, NY	CA, FL, MD, MN, NY
NH sample criteria	Stratified by size and rural/urban, and oversampled for 75%+ in private rooms. Entire state (MN, NJ) or substate (CA, NY, FL) catchment areas, the latter with at least 300 nursing homes. Volunteer NHs. Sample size 40 facilities.	Facilities enumerated in driving range of urban areas (Albany, NY; Baltimore, MD; Los Angeles, CA; Miami/Fort Lauderdale, FL; Minneapolis/St. Paul, MN); selected from top and bottom of a list arrayed by citation and staffing features thought to influence quality. Sample size 60 facilities.
Resident sample criteria	Facility census enumerated by unit, cognitive status from MDS, and single room status; sampled so as to select up to 20% in single rooms if possible, an even division between high and low cognitive functioning, and even representation of up to 10 residents from each nursing unit.	Resident census approached in random order.
Sample size	50 residents per facility (actually total sample was 1988 because several facilities had fewer than 50 eligible, consenting residents after exclusions. Approximately 1200 interviewees with QOL data; N varied by domain.	28 residents actually completing QOL questionnaires; total sample 1680.
Other data collected or used.	Staff interview for each resident. Family questionnaire when possible. Apparent-affect rating scale for 20% random sub-sample and all who could not be interviewed. Detailed programmatic data, staffing data, and environmental data at room, unit, and NF level. Facility level observational protocols. MDS data for sample and facility and OSCAR data for facility.	Streamlined facility level observational protocol. Administrator self-report questionnaire on facility programmatic data. MDS data for sample and OSCAR data for facility.

As part of Wave 1, also, we did extensive in-person data collection on facility programs and

policies that might affect QOL. In Wave 1 nursing homes, we interviewed (at a minimum) administrators, directors of nursing and social work and activity directors and collected detailed staffing information at the unit level. The intent was to use this experience to further refine the way to define and collect information on organization features affecting QOL and to use early analysis as a way to develop items for an administrator self-report in subsequent data collection.

Facility and resident sampling at Wave 1 was partly constrained by a need to over-represent homes with private rooms and residents in private rooms for the environmental part of the study. CMS requested that the sample be divided into urban and rural facilities and large and small facilities. Technically, we had a right to go into facilities as a research extension of the survey agency, but because Wave 1 entailed a heavy burden of data collection, only facilities that readily consented were chosen for the final sample. At the resident level, besides over-sampling for those in private rooms, we stratified the sample to include half with better and half with poorer cognitive functioning using an MDS-based measure.

In Wave 1, the final resident sample was 1988, and the number for whom we have QOL data ranged from 1,081 to 835 depending on the domain.

Interim Data Collection. As a result of Wave 1 data collection, we made slight modifications in the QOL questionnaires. In the interim before Wave 2 data collection was fielded, we extensively pretested additional items on individuality. We also developed and tested a self-report tool to measure personality. These tests were conducted with a purposive sample 200 residents in 6 nursing homes in 2 states.

Wave 2 data collection. Wave 2 data collection was conducted in 60 facilities in 5 states. The facilities were sampled on a random-stratified basis. To stratify the sample we used an algorithm based on positive and negative extremes on survey citation history and staffing levels.

Based on Wave 1 experience, we used a strict random sampling of residents rather than stratifying for cognition, and we continued to approach residents in random order until we obtained a sample of 28 completed interviews. (From Wave 1, we had learned that 28 residents would be more than sufficient to gather stable facility-level measures on all domains.) Wave 2 data collection was much more streamlined than in Wave 1. Our goals were as follows:

- Confirm the factors and properties of the QOL measures.
- Examine individual factors associated with QOL, including personality (not collected in Wave 1) and length of stay (with many more short-stay residents than the Wave 1 procedure allows. In Wave 2, we also had more racial variation in the sample to consider analytically because we chose geographically compact urban areas centered in cities with high African American and Hispanic populations.
- Examine facility-level factors associated with QOL in this more representative sample, using extant data and data supplied by each administrator.
- Test a shortened facility level observational protocol.

In Wave 2, the final sample consisted of 1,680 residents most of whom had completed all the elements needed to measure 11 domains.

Transferability study. In this separate study, the Wave 2 QOL measures and a somewhat modified observation protocol were tested in paired administration with research interviewers and a) facility personnel, and b) surveyors. The goal was to determine the extent to which the practitioners were congruent with research interviewers. The field experiment for facility personnel contained arms to modify the discipline of the staff assessors (nurse staff versus social work and activities staff) and the training intensity and format.

## **Environmental Study**

### Research Tasks/Questions

In the environmental component of the study, we asked the following general questions:

1. How do nursing home physical environments vary on factors that might influence QOL?

2. Can we identify subtypes of facilities based on environmental features?
3. How do physical environments affect resident QOL?
4. What is the relationship between being in a private or a shared room and QOL?
5. What innovative design features could be identified, and how did they affect QOL?

### Data Collection

The study of physical environments required the development of new protocols for systematic data collection. Based on literature and expert opinion, we developed 3 observational checklists suitable for administration by a nonspecialist and largely without equipment for: rooms and baths; units; and overall facility. (Instruments and their development are discussed in Chapter 12, where environmental data are summarized). The room and bath protocols were administered during Wave 1 by the same data collectors who did the individual-level data collection, typically concurrently with administering the resident interview. The unit and facility protocols were completed by a single researcher (Lois Cutler) for the 40 facilities and for 131 nursing units.

After data from Wave 1 was collected and analyzed descriptively, innovative features were catalogued and selected for more intensive study using post-occupancy evaluation (POE) techniques. POEs entail detailed description of the features, systematic observation and behavior mapping, and interviews with those who use the environment (residents, visitors, staff, and volunteers).

Data reduction included creation of conceptually based composite scales to summarize and measure a variety of environmental attributes and cluster analyses to identify environmental types. Recognizing that residents live in rooms that are nested in units that are nested in facilities, hierarchical analysis was planned.

## **Procedures: Wave 1**

Below we provide considerable detail about sampling and procedures for Wave 1.

Procedures for Wave 2 were similar, but sampling and data collection were less complex.

Measures and analytic procedures are treated briefly but more fully described in the sections where the results are presented.

### Selection of States

CMS requested that the QOL work proceed in five states. We recognized that 5 states would not represent the states in the country. Nonetheless, we aimed to strengthen the credibility of the study by selecting states that varied in the structure of their nursing home industry, their reimbursement rates and policies, their reported quality, and their labor force composition.

To select the five states, we gathered information on nursing homes in all states. For practical reasons regarding cost, we then excluded Alaska and Hawaii. To ensure an adequate sample of participating nursing homes, we eliminated an additional nine states with fewer than 100 nursing homes. Information collected from secondary sources for the remaining 39 states included: bed supply; ownership status; Medicaid reimbursement rates; deficiency data, both for quality of care and QOL; and percentage of population in the 65+ age bracket. In addition, special factors were identified such as state interest in participating, service milieu, labor force issues and innovative QI efforts at the state level. The list of states was narrowed down to twenty that represented a variety of current long-term care environments. These twenty were then arrayed on a grid to highlight the states that represented the high and low ends of each of the parameters. In discussion with CMS, the list was winnowed down to 10 states and ultimately to the 5 that were chosen; each from a different CMS regional office. The 5 states ultimately

chosen were: California, Florida, Minnesota, New Jersey and New York.

Because of the large number of facilities and the large geographic area for managing field work in California, Florida, and New York, we worked with state representatives to identify logical regions that comprised from 300-400 facilities. A multi-county area around San Francisco Bay comprised of four Survey and Certification areas was chosen in California. The central area of Florida was chosen, including the Tampa/St. Petersburg and the Orlando area. In New York, the western area comprising Buffalo, Syracuse, Rochester, and environs but excluding Westchester, New York City and Long Island, was chosen. The entire states of Minnesota and New Jersey were selected for the sampling frames.

#### Survey of Facilities in Catchment Areas

CMS had specified that the sample include large and small nursing homes in rural and urban areas. We also needed to over-sample facilities with a high proportion of private rooms. In addition, CMS was initially interested in including some nursing homes that were using satisfaction measures developed by the national nursing home trade association. Because information about single versus private room arrangements is unavailable in state data bases (Florida, which did require facilities to report information on types of rooms, was an exception) and quality assurance practices were definitely unavailable, a special survey was needed to get that information. We sent a brief mailed survey to all the nursing homes in the catchment areas. The intent of this survey was both to help us design the sampling process for facilities and also to illuminate facility activities related to QOL.

Accordingly, we developed a one-page survey protocol suitable for faxing (see Volume 2, Appendix A). This was mailed or faxed to all facilities in the catchment area. It queried them about their physical facility design, their division into units, and their interest in and activities

related to QOL. Also, because we were considering purposively including in the sample some facilities thought to have high QOL, we invited nominations and self-nominations for excellence in QOL.

We mailed 1744 questionnaires to the specified geographic areas in our 5 states, and had a 57% response rate (ranging from 77% response in Minnesota to 57% in California). The overall results relevant to sample selection are shown in Table 2.2. Facilities rarely had a high proportion of private rooms, though the rates varied by state. Also in many facilities, substantial proportions of the residents lived in rooms with 3 or more residents (not shown on the table). This reinforced the need for purposive sampling of facilities with private rooms. We also found that few facilities were using consumer feedback tools developed by the national nursing home trade associations, though most purported to be doing something to get systematic feedback from residents.



Table 2.2. QOL Facility Survey Results

	<b>California N=143</b>	<b>Florida N=154</b>	<b>Minnesota N=336</b>	<b>New Jersey N=177</b>	<b>New York N=177</b>
<b>Surveys Returned</b>	47%	49%	77%	49%	53%
<b>Size Distribution:</b>					
less than 49 beds	31%	19 %	16%	16%	11%
50 –105 beds	52%	33%	57%	23%	31%
106 + beds	17%	47%	28%	62%	58%
Median size	69.5	104	79	119	120
<b>% Residents in Private Rooms</b>					
More than 75%	0.60%	3.24%	2.98%	3.91%	5.02%
74%-50 %	1.39%	2.59%	5.37%	1.11%	4.46%
49%-25%	6.99%	6.49%	11.34%	3.91%	14.52%
Fewer than 25%	58.00%	72.02%	67.67%	86.00%	70.94%
None	32.96%`	15.58%	12.53%	5.02%	5.02%
<b>Location:</b>					
Rural	9%	43%	65%	11%	46%
Urban	91%	57%	35%	89%	54%
<b>Information on units:</b>					
Mean # of units	1.84 units	2.24 units	2.14 units	2.76 units	3.35 units
Had dementia unit(s)	11%	27%	33%	15%	24%
Had hospice unit(s)	5%	7%	6%	2%	2%
Had rehabilitation unit(s)	23%	45%	20%	45%	32%
Had other specialty unit(s)	15%	16%	12%	15%	11%
<b>Consumer Feedback:</b>					
AHCA or AASHA process	3%	8%	9%	19%	11%
Own Corporation	73%	71%	58%	49%	60%
<b>Reported QOL initiatives</b>					
Use of physical space	50%	66%	68%	71%	64%
New construction	15%	21%	48%	37%	29%
Equipment & appliances	61%	60%	71%	69%	63%
Renovations	50%	53%	67%	63%	63%
Furnishings	55%	58%	68%	68%	66%
Staff - scheduling and deployment	53%	68%	56%	58%	53%
Policies and procedures	64%	71%	57%	73%	62%
Philosophy	65%	68%	60%	69%	65%
Staff Roles	57%	68%	60%	69%	58%
Resident Programs	80%	81%	70%	86%	75%
Other	47%	53%	575	64%	58%

### Selection of Facilities

We determined that we would select 7 of the 8 facilities needed per state in a random stratified manner, but that one (1) facility would be chosen as a perceived exemplar of a better-than-usual QOL. To select the exemplars in each state, we compiled a state-specific list of representatives from various organizations with statewide experience in nursing homes. In a telephone interview, we asked these respondents to nominate facilities that had made extraordinary strides in achieving a high QOL for its residents. The nominations were tallied and combined with nominations and self-nominations from the nursing home survey; nominated facilities were then rank-ordered in terms of number of nominations. The nursing home in each state with the highest number of recommendations was contacted and asked to participate. California respondents were unwilling to name facilities as exemplary, and we arbitrarily selected as the California exemplar a nursing home that had won a prize from the state survey agency the previous year for its work in individualizing residents and staff and that had a national reputation for its efforts to create a vibrant nursing-home community.

Except for the exemplar facilities, which in some cases did not respond to the initial survey, we used respondents to our QOL survey as the basis for selecting facilities. We realized that there would be an enormous field effort at each facility, and wanted to increase the chances of facility cooperation. We assumed that those facilities that returned the surveys were interested in QOL and, therefore, more willing to participate in the data collection process. Through the survey we also gained current information on private room status and occupancy, as well as information about any innovative design or systems that the respondent thought were in place.

In choosing the 8 facilities in any state, we needed to distribute them equally between urban/rural and large/small facilities. We also needed to include some facilities in each state

with high proportions of single rooms. We initially intended to include some facilities that utilized improvement tools developed either by the American Association of Homes and Services for Aging (AASHA) or the American Health Care Association (AHCA); our survey showed almost no use of those tools, and we dropped that sampling variable.

The facilities were first sorted into urban/rural, large/small categories using a system based on zip codes.<sup>1</sup> Facility size categories were determined based on the total response to our QOL survey. We established a minimum size of 50 beds for sample eligibility, thus eliminating 176 facilities. Facilities with 50 to 105 beds were deemed small and those with 106 or more beds were deemed large for the purpose of sampling.

Once the “exemplar” facility was identified and agreed to participate, it was placed in the appropriate category in terms of size and location. Facilities with a high proportion of private rooms (defined as 75% or more) were listed separately and randomly selected until two such facilities were selected for each state. These, too, were placed in their appropriate category in terms of size and location, and then random selection was used to fill out the rest of the urban/rural and large/small facilities grid.

### Recruitment of Facilities

Eight (8) facilities in each state were selected initially using the process described. Each received a letter of invitation, followed by a phone call to the administrator. If the facilities were willing to learn more about the study and what their participation entailed, a recruitment visit

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<sup>1</sup>National Resource and Policy Center on Rural Long-Term Care (1996). Guidebook for Operationalizing AoAs: Definition of Rural. Kansas City, KS. Under a grants from the Administration on Aging and the Kansas Geographic Bureau, separate guidebooks were created for all states, classifying each zip code as rural or urban. We used the guidebooks and accompanying CD's for the states in the study to classify each nursing home as to its rural or urban status.

Those facilities declining such a visit were replaced by the next facility in that size and location category, and the same procedure was followed. This continued until all 40 facilities were recruited to participate in the study. Half of the randomly sampled facilities declined on the basis of a telephone discussion; typical reasons given were: staff shortages at the managerial or line level, new construction, recent or expected ownership changes, and distrust of the regulatory process. Forty-nine facilities (49) were visited in order to achieve the sample of 40 facilities. Replacements after a visit occurred because: the facility did not qualify; the facility decided not to be involved; or management changes made original planned involvement impossible. For example, the study group decided to replace one facility after a visit revealed that it was a state-wide referral center for residents with severe mental health problems.

During the initial recruitment visit, the study was described to the administrator, and often to key personnel with the intent that prospective facilities would be well briefed on the scale and scope of the study and their own roles. We structured the first wave of data collection with the participating facilities as partners in the effort, and this stance encouraged participation. Our “recruitment packet” consisted of the personalized letter of invitation, a letter from CMS that designated our work as a study related to the survey process, a brochure outlining the study questions, information about sampling within the facility, and versions of newsletter text that could be used to inform residents, staff and families about the upcoming study.

Facilities were excluded if they were: federal homes (e.g., VA Nursing Home Care Units), State Veterans Homes, MR-DD Facilities, Psychiatric Facilities, Hospital Swing Bed Units or hospital-based facilities with no clear demarcation between hospital and SNF, or specialized facilities serving younger residents. We also excluded facilities with fewer than 50 beds.

### Selection of Units Within Nursing Homes

Because some nursing homes have considerable internal variation at the nursing unit level in terms of physical plant, staff, and case mix, it was recognized that a resident's location on a particular nursing unit could influence his or her QOL. Also, this study required measuring physical environments, and again we needed to do this at the unit level if only to explore the extent of variation in environments within facilities. The decision on how many units to select required consideration of the minimum number of residents needed from a unit to examine QOL on that unit and the resource constraints governing the total sample who could be assessed for QOL in any facility and the number of environments that could be assessed. Given the developmental nature of this measurement effort, it was initially determined to include 50 residents per facility and we also determined that there should be no fewer than 10 residents from a unit. Therefore, we limited the number of nursing units to 5, and built selection of units into our overall sampling plan.

During the visit to each sampled facility, information about the units was updated and verified by the administrator or director of nursing. If the facility had a dementia unit (SCU), it was automatically included. Given that the mean number of units per facility was 3, in most instances; all the units in the facility were chosen. Only 5 facilities had more than 5 units, and in one of those the sixth unit was a small ventilator unit largely serving younger people. The project director reviewed those facilities that had more than five units, eliminating the most appropriate units. This was usually determined by the number of private rooms and cognition level of the residents, since the final resident sample needed to over-sample the former and be evenly divided on the latter. Table 2.3 shows the distribution of 131 nursing units in the study by state.

Table 2.3. Distribution of Nursing Homes in Sample by State and Number of Units

State	1 unit	2 units	3 units	4 units	5 units	Total
California	1	2	4	-----	1	8
Florida	----	2	----	4	2	8
Minnesota	----	1	3	1	3	8
New Jersey	----	4	2	2	----	8
New York	-----	3	2	----	3	8
<b>Total</b>	1	12	11	7	9	40

### Selection of Residents

The study design required that we measure the QOL for residents who have both high and low cognitive functioning levels. The decision was made to draw the sample based on the last recorded MDS for the resident. Even if not precisely accurate for each individual, we believed this would assure us a mixed sample and, moreover, would reflect how the resident was officially perceived by the facility. We used information on cognitive functioning from items in section B1, B2, and B4, "Cognitive Patterns" (Minimum Data Set 2.0). Those residents who were considered to be in a vegetative state (B1) were excluded from the sample entirely. Then, for all residents, we collected their scores for B2a, B2b, and B4, and summed them (Figure 2-1). Residents who scored 0, 1, or 2 were considered to be high cognitive functioning and those with scores of 3, 4, or 5 were considered low functioning for the purposes of sampling. The

instrument we used is similar to Morris et al.'s Cognitive Performance Scales<sup>2</sup> without the incorporation of items on functional ability such as the feeding items.

<b>MDS 2.0 Section on Cognitive Patterns</b>		<b>Score</b>
B1. Comatose	(Persistent vegetative state/no discernible consciousness.) 0. No → calculate score as below. 1. Yes → drop from sampling frame.	
B2a. Short-term memory	(Recall of what was learned or known.) B2a. Short-term memory OK—seems to recall after 5 minutes.. 0. Short-term memory OK. 1. Short-term memory problem	0 or 1
B2b. Long-term memory	B2b. Long-term memory OK—seems/appears to recall long past 0. Long-term memory OK. 1. Long-term memory problem.	0 or 1
B4. Cognitive skills for daily decision-making.	(Made decisions regarding tasks of daily life.) 0. Independent—decisions consistent/reasonable. 1. Modified independence—some difficulty in new situations only. 2. Moderately impaired—decisions poor, cues/supervision required. 3. Severely impaired—never/rarely made decisions.	0-3
Total score.		0-5

Figure 2.1: Cognition Measure Used for Sampling Residents

Residents were sampled so as to achieve the following results: 1) inclusion of at least 20% in private rooms when possible; 2) an evenly divided sample of those falling into the higher or lower cognitive functioning; and 3) an even division within units. We developed a sampling grid that we asked each facility to complete to provide information on all residents living on the units included in the study. Through this mechanism, we collected each resident's name, date of birth, last four digits of their social security number, admission date, room number, number of residents occupying the room, most recent MDS assessment date, and data from the MDS on the items needed for us to calculate the cognitive scale. In those facilities that were unable to

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<sup>2</sup>Morris, J.N., Fries, B.E., Mehr, D.R., Hawes, C., Phillips, C., Mor, V., & Lipsitz, L.A. (1994). MDS cognitive performance scale, Journal of Gerontology: Medical Sciences, 49: M174-M182.

complete this data collection readily, a locally-based project interviewer did so. These sampling data were collected 2-3 weeks before the expected arrival of the QOL interviewers. Clearly, post-acute stay residents were, therefore, less likely to be available for the Wave 1 sample because they are often discharged within 20 days of admission.

We entered all sampling data into a database set up by units for each facility. An overall assessment was done for each facility, initially looking at private rooms on each unit and then at cognitive status. We then assigned a computer-generated random number to each resident. When completed, we used the sampling algorithm in Figure 2.2 to select the resident sample. As the figure illustrates, precedence was first given to selection of private rooms, then to assuring sufficient cognitively intact persons in the sample, and finally to the unit distribution. When the sample was drawn, we also drew replacements from the various units so that the Minnesota-based research group could instruct the field staff to make appropriate replacements for subjects who were deceased or had been discharged between the time we drew the sample and arrived at the nursing home. Residents were excluded from this process if they were: under age 65, comatose or in a vegetative state.

### **Tracking System**

Members of the Survey Center at the University of Minnesota were involved early in the pre-tests and development of the data collection instruments. Their efforts helped with developing the response category formats, clarifying questions for content, and preparing the training manual.



■Private Room Selection

- A. If  $\leq 10$  private rooms in the whole facility, include all. Once included,
  - ✓identify location of private rooms on perspective units
  - ✓identify resident's cognition functioning (high or low), and keep count of each
- B. If  $> 10$  private rooms,
  - ✓identify location of private rooms on each unit
  - ✓select number of residents according to the following distribution:
 

■ 2 units	5 residents	5 residents			
■ 3 units	3 residents	3 residents	4 residents		
■ 4 units	2 residents	3 residents	3 residents	2 residents	
■ 5 units	2 residents	2 residents	2 residents	2 residents	2 residents
- C. Compute number of residents remaining to achieve total of 25 residents with high cognitive functioning (MDS score 0-2).
- D. Complete sample for residents with low cognitive functioning (MDS score 3-5) equally across units, if possible.

■If there is a Dementia Unit (SCU), include at least 10 residents from this unit

- A. Select SCU residents using random number designation
  - ✓select at least ten residents
- B. Other residents in rooms with two or more residents
  - ✓complete roster with high cognitive functioning residents
  - ✓then complete low cognitive functioning residents using SCU residents first.

■If there is no dementia unit, work at the unit level

- A. Within each unit create a sample in the following order:
  - ✓Cognitively intact
  - ✓Other
- B. Complete sampling across units as equally distributed as possible with number of residents for:
 

■ 2 units	25 residents	25 residents			
■ 3 units	17 residents	17 residents	16 residents		
■ 4 units	12 residents	13 residents	13 residents	12 residents	
■ 5 units	10 residents	10 residents	10 residents	10 residents	10 residents

■Replacements

- ✓Each unit will have 5 replacements identified, if possible
- ✓If not evenly distributed, sample to distribute as evenly across corresponding units as possible.
- ✓As above check distribution of cognitive status and incorporate in the total count.
- ✓Again, complete complement of cognitively intact residents across units as possible, then add cognitively impaired
- ✓Track reasons for replacement

**Figure 2.2. Algorithm for selecting residents for the sample in each facility.**

Because of the large and complicated field effort, with many multi-page instruments for each resident at multiple sites, it was important to set up a good tracking system. While pre-testing the different instruments, discussions of issues helped to establish the workflow, and the tracking system evolved as a result. Our system was set up to ensure that we could account for every instrument that left the office.

A tracking system was developed to ensure that instruments were assigned correctly to the specific resident in the correct nursing home. We developed a system of serializing all resident-specific forms. Each type of booklet was given a unique number, i.e. the resident interview was assigned 52, resident observation 53, and so on. Each booklet was serialized with consecutive numbers so that all pages had the same number. Each resident was assigned a specific serial number. We then created a packet of instruments for each resident, all pre-labeled and serialized, including a tracking form.

### Logistics

While the instruments were being finalized, a massive field endeavor was planned. Because of the geographic location of the participating states, we approached the data collection in a step-wise fashion. We decided to roll-out the states in pairs, first Minnesota and Florida, then California, and finally New York and New Jersey. A time-line included training dates, and projected the start and completion dates of the facilities in each state. The training dates were: January 9-15, 2000 (Minnesota and Florida), March 5-11, 2000 (California), April 9-15, 2000 (New York and New Jersey).

The tasks to maintain the overall work flow included:

1. Finalizing recruitment of nursing homes in each state before training, including identifying the contact liaison in the facility and finalizing the selection of units.

2. Collecting names of all the residents on each unit with other demographic and MDS data.
3. Transferring the names to a facility database and specifying the resident sample.
4. Assigning a unique identifier for each resident and print labels.
5. Collating resident packets for each facility.
6. Preparing all other facility instruments which included facility-level observation for each interviewer, overall facility rating for each interviewer, and the reliability forms.
7. Double checking sample and all instruments against master list and boxing together by facility.

Once the instruments were completed for a facility, they were edited and data were entered. Receipt of forms from one facility triggered the release of forms for the next.

The survey center monitored the progress of the interviewer, reviewed returned forms for completeness, sent family names to the QOL staff, and prepared instruments for key punch. Double-entry keying was utilized, data corrected, and the completed data file was sent to the QOL staff for analysis. The work schedule was staggered across the states, creating overlaps.

Over the same time period that we were developing the sample, preparing the instruments, and processing the collected data for one group of states, the next states' facility recruitments were being completed and the interviewers recruited and hired.

### Hiring Interviewers

Two months prior to the first scheduled training in each area, ads were placed for research interviewers in local papers in the areas of the facilities in Florida and Minnesota. Our goal was to hire about 10 professional-level interviewers per state, preferably with experience in LTC. The survey center director and her associate director assigned full-time to the project interviewed and hired 8 individuals from Minnesota and 10 from Florida. Later 10 interviewers were hired

in California, and subsequently 8 for New Jersey and 9 for New York. Among the 45 interviewers were individuals with experience as administrators, nursing, social work, activities, psychology, education, research interviewing, and volunteers.

### Training

Each of the three QOL training sessions lasted for 7 days. The research interviewers were flown into the Twin Cities on Saturday evening, and housed close to campus in a motel that also had a room for training. The training schedule consisted of the following topics presented in a classroom-type setting:

- Overview of the study
- Mode of conduct while at the nursing homes
- Informed Consent (This study was classified as an extension of the Survey Agency process and, therefore, did not require formal informed consent for us to speak to residents and review records. However, the interviewers needed practice in communicating about the study, and gaining the cooperation of the residents.)
- Interview Technique (This included material about how to probe without biasing, how to answer questions and work with difficult residents, and how to maintain a conversational tone while strictly adhering to the categories of the questionnaires.)
- Resident interview review and practice
- Video and training for the affect rating scale<sup>3</sup>
- Overview of room and bath observations
- Staff interview review and practice
- Facility-wide observations
- Onsite work flow

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<sup>3</sup>We used a video developed by Lawton, MP in 1998 called Recognizing and Responding to Emotion in Persons with Dementia, produced by the Philadelphia Geriatric Center and distributed by Terra Nova Films, 9848 S. Winchester Avenue, Chicago, IL 60643, 800-779-8491.

After two days in the classroom with extensive role playing, the trainees were divided and sent to four local nursing homes where they practiced doing the resident interview, first with residents with higher cognitive functioning residents and then with residents with lower functioning residents, both under the direction of survey center staff. They also practiced their observation techniques, and had a special session with our environmental design specialist to learn the process of completing the Room and Bath assessment. After each onsite practice the group met with QOL and survey center staff to debrief and share questions, concerns and experiences.

The final full day of training consisted of testing and evaluation. All trainees were observed during interviews by staff of the survey center. Paired interviews and room and bath assessments were done to test inter-rater reliability. Paired observations of residents with QOL staff were also completed to ensure reliable observations. Any areas of weakness were noted. The last morning of training consisted of review of onsite procedure, communication, logistics, and first assignments.

To reinforce the training and assist with issues during implementation at the sampled facilities, staff from our survey center accompanied the interviewers during their first 3-5 days onsite in each state. The interviewers for any specific state were divided into two groups and assigned to one of the larger facilities. The survey center personnel helped them get organized and assisted in planning their work flow. In addition, the survey center personnel worked with any of the interviewers who may have needed more help in one of the various data collection areas.

### On-site Data Collection Procedures

Once the interviewers were onsite, several different steps needed to be completed to ensure a complete and efficient data collection effort. These steps included:

- Meeting with the site contact to exchange information about the facility tour and meet key staff on the facility units.
- Reviewing the sample list with the site contact and making replacements when necessary.
- Reviewing the onsite tracking grid and assigning residents to interviewers.
- Obtaining names of staff to assist them with getting family names, and then collecting the family information to send to University of Minnesota, from where the questionnaires were mailed.
- Identifying staff who have worked with sampled residents, obtaining their work schedules, and setting up appointments to complete staff interview.
- Seeking out residents to establish interview schedules and, when necessary, replacing residents according to the established protocol.
- Assigning interviewers to complete various reliability procedures (described below).
- Setting up schedules to assure that all meal and weekend observations are completed as required by protocol.

Interviewers were divided into two or three groups in a state and sent as a team into separate facilities. That way we had only two or three facilities in each state with active interviewing at any one time, and were able to be available for questions and follow-up. Interviewers alternated in the team leader role, which carried responsibility for coordinating communication with facility staff, assuring that all components of the protocols were complete, and sending materials back to the University of Minnesota. The survey center made a supervisor available at all times to answer any questions that arose in the field, and daily communication was planned between the team leader at each site and the survey center.

## Reliability Testing

After we established our procedures in the first facilities in the first two states, we introduced some formal testing of inter-interviewer reliability. These tests were conducted in 31 facilities.

Test-retest of Resident Interview. The purpose of this test was to determine whether the resident's reports would remain stable over short time periods. In planning the test/retest reliability for the resident instrument, we were concerned that subjecting a resident to a second complete interview would be an unnecessary burden. In each of the 31 facilities where we performed these tests, 5 residents were selected and each was re-interviewed on 2 or 3 domains, the general questions on emotions, and summary items on QOL. To accomplish this, the interview tool was divided into 5 sections and in each facility a resident received a fifth of the domain items plus the general sections. To minimize interviewer variability, the same interviewer did the original interview and the re-test components<sup>4</sup>.

Inter-Staff Reliability. In a different type of reliability testing, we explored how sensitive the staff interview might be to the idiosyncratic selection of a particular staff member. In each facility where this test was conducted, the team leader selected a second staff member to respond about 2 residents, one with higher and one with lower cognitive functioning. In each case, the second staff member selected had equal exposure to and chance to know the resident. The second staff member was not informed that his or her interview was for reliability purposes, and he or she received the same incentive and was interviewed under the same circumstances as respondents in the main data set. Again, the same interviewer conducted both interviews to minimize the effect of the interviewer style on the results.

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<sup>4</sup>Results in the test-retest proved difficult to interpret and the N reduced because of post-hoc rearrangements of items into scales. Therefore, we did a separate test-retest reliability with the finished instrument in three many level facilities at the end of Wave 2 Data collection.

Inter-observer reliability on room and bath protocol. To test the room and bath instrument, the interviewers doubled up on two room and bath environments, one shared and one private if possible. The team leader and one of the interviewers went together and completed the assessment independently but at the same time.

Inter-observer Reliability of Facility-Wide Observations. To test the facility observation instrument, the facility walk-through, one activity observation, and one meal observation were completed with two people doing it together and completing it independently. The facility walk-through was to be done independently of the other facility walk-throughs already assigned to individuals. For the activity and meal observations, a second observer simultaneously completed an independent rating.

The data collection effort at Wave 1 for all resident-specific data (resident interview, related staff interview, room and bath protocol, Apparent Affect Rating Scale, identification of family contacts for each resident), facility-level observation protocols, and all reliability testing at a facility required 2 to 3 weeks time for teams of 2 to 4 data collectors.

#### Environmental facility-wide assessments and on-site indicators

All the unit-level and facility-level observations were done by a single assessor with a doctorate in housing and design. This assured consistency in the observations, since the alternative of training 45 interviewers, each of whom would do few unit and facility observations was unacceptable. As a result of this effort, in addition to data on 1988 resident rooms and baths, we also have environmental data on 131 nursing units and 40 facilities.

In addition, the project director visited all 40 facilities to collect data on procedures, policies, and staff deployment that might lead to proxy indicators of QOL. Briefly summarized here, the data collection effort included the following mixture of interview protocols and



collection of quasi-archival material:

- Interview with the administrator or his/her designee.
- Interview with the director of nurses or his/her designee.
- Interview with the director of activities and/or his/her designee.
- Interview with the director of social work and/or his/her designee.
- Collection of detailed information about nurse staffing by day, shift, and level, both from payroll and registries, for each 4 specified one-week periods.
- Collection of activities records.
- Collection of admission materials and resident manuals.

As the study progressed, other materials were collected, including records from care planning conferences and lists of staff development materials. Also, depending on the facility and its programs, at times interviews were conducted with additional types of personnel, including chaplains, staff developers, and dietary personnel.

## **Procedures, Wave 2**

We continued with the states selected for Wave 1 with the exception that we used Maryland instead of New Jersey. This afforded us a state in easy distance of CMS, and an opportunity to sample a larger number of African American residents. We were also responsive to Maryland's strong interest in participating in the study; at that time, Maryland was developing its own nursing home report card system and was interested in including a QOL component.

In contrast to Wave 1, (where we intended to select urban and rural facilities and stratified the sample accordingly) in Wave 2 we maximized field convenience by attempting to work within a 20 or if necessary 30 mile radius of a central zip code. We planned to begin with a central zip code in a populous urban area and enumerate nursing homes surrounding that central zip code. We hoped to have a sampling frame of 100 nursing homes from which to select a

target of 12 nursing homes per state. In Minnesota and Maryland, we built the sample around the two obvious large metropolitan areas: the Twin Cities (Minneapolis and St. Paul) and Baltimore, respectively. In California, Florida, and New York, we chose different areas of the state from the Wave 1 data collection. Specifically, we went to the Los Angeles area for California and the Miami/Fort Lauderdale area for Florida. We had planned to center the New York sample in Westchester County to incorporate a populous suburban area just outside of New York City. Because the New York data collection was planned to be phased in during October 2001, we changed our plans to respond to the disruption of the attack on the World Trade Center. We, therefore, drew the New York sample around the Albany area, ending up with a somewhat smaller pool of facilities from which to select than for other areas and a larger radius for travel.

Using OSCAR data, we arrayed the facilities in the catchment area in rank order using a score based on data on selected quality-of-life related deficiencies and staffing information. (As in Wave 1, we deleted facilities with fewer than 50 beds, psychiatric or MR/DD facilities, State Veterans Homes, and hospital swing bed units. We sampled facilities in rank order, seeking 6 working down from the top, and 6 working up from the bottom of this list. This procedure was meant to generate extremes on parameters that might possibly influence QOL.

We wrote to the facilities included in the sample, including a letter from CMS describing participation as mandatory. Six (6) facilities refused to participate without stronger directives from CMS, and ultimately we and CMS decided not to enforce that requirement and engender ill-will for the study: all refusals were in California and Florida, where recent litigation made nursing homes loath to be involved in studies. We deleted other facilities from the list because, on further exploration, they were psychiatric facilities; they served largely young people, or had almost a complete non-English-speaking resident population. It was noteworthy that we dropped

8 facilities from the Los Angeles area based on the language criterion. The use of an inner city zip code as the fulcrum resulting in nursing homes where residents largely spoke Spanish, Korean, Vietnamese, Japanese, and Armenian. The excluded facilities were equally likely to have been drawn from either the top or bottom of the sample list.

The census was sent to the research team a few days before the expected data collection in the facility, permitting us to array the sample in random order, and to note admission date with the census. Residents were approached in this random order and, as in Wave 1, comatose residents or residents under age 65 were excluded. Additionally, no resident was interviewed before he or she had been in the facility for at least 4 days. In Wave 2, we continued data collection until we had obtained 28 residents who were capable of completing an interview sufficiently for us to construct at least 9 of 11 QOL domain scores. This required approaching more residents in some facilities than others. Although facility personnel not uncommonly argued that we should skip them because they were certain that 28 residents capable of being interviewed could not be found, we declined to accept that prediction as a reason to drop a facility from the sample. As it turned out, we failed to obtain enough interviews in only one of the 60 facilities first sampled needed to be replaced because we failed to obtain enough interviews. Typically teams of 2-3 data collectors completed the resident interviews and observations in a facility within about a week's time.

Training and field work quality procedures mirrored those of Wave 1 with one difference. We prepared the interview tool in a form that could be scanned and were able to determine in real-time and make corrections of missing data. This also eliminated the key punching step.

This chapter has summarized major methods used in Waves 1 and 2 of data collection. Information about many of the data collection tools themselves are reserved for the chapters

where the results are presented. Similarly, the sampling approach and measurements for the special study of transferability to nursing home personnel and surveyors are presented in Chapter 11 along with those results. Appendix B through Appendix O in Volume 2 contain all the instruments fielded at Wave 1, including the following resident-level instruments: resident interview (Appendix B); staff interview about the resident (Appendix C); family interview about the resident (Appendix D); and resident affect rating scales, an approach we piloted but have not utilized in our analyses to date (Appendix E).

## **Chapter 3**

### **Developing and Testing Resident-Reported Quality of Life Measures**

This chapter describes our approach to developing Quality of Life (QOL) measures and the results of scale development during two waves of data collection. It begins with a review of the background on QOL measurement, especially for nursing home residents and the state of the art of QOL measurement at the time we began the project. It describes the fielding and psychometric work on two iterations of QOL measures, and the domain structure of those measures. It also discusses the extent to which residents with cognitive impairment are able to complete direct interviews on their QOL.

#### **Background**

##### QOL Measurement in General

QOL tends to be the subject matter of novelists and philosophers. In the last few decades of the 20<sup>th</sup> century, it also became the province of psychometricians, health services researchers, and health policy-makers, who have tried to translate the construct into one or more scales to use to measure the deliberate outcomes of health interventions or consequences of health care gone wrong. QOL is sometimes contrasted with more narrow outcomes related to physical health.

Some scholars simply use QOL as a summary term, connoting a multidimensional appraisal of a variety of important aspects of life, including health outcomes (Arnold, 1991). When used this way, QOL is either summarized into a single score or profiled in a series of scores reflecting different components or domains of QOL. The term health-related quality of life (HRQOL) narrows the QOL concept to aspects of life affected by a person's health condition and its treatment; literally hundreds of HRQOL measures are available, some relating to general health-related QOL and some to QOL related to a specific disease. Thinking about adults of all ages,

some commentators state that the “agreed upon” domains of HRQOL are: physical health and functioning, emotional health, cognitive functioning, role performance and work productivity, sexual functioning, and life satisfaction. To reduce such dimensions to a smaller number of items, the SF-36 measure was created; it has been further shortened and its various versions are frequently used to measure QOL (Ware Jr. & Sherbourne, 1992). In the same vein, the World Health Organization has created the WHOQOL, a 28-item questionnaire that includes items tapping a wide range of physical, functional, psychological, social, and satisfaction elements (Kuyken & Orley, 1994) and the EuroQol reduces HRQOL to 5 items, each tapping one domain: mobility, self care, usual activities, pain/discomfort, and anxiety/depression (Dolan, 1997).

In some health contexts, HRQOL is narrowly interpreted. For example, in the 1960s measures of the ability to perform tasks of daily living was proposed as a way of looking at outcomes for rehabilitation patients that went beyond disease parameters to consider QOL (Katz, Ford, Moskowitz, Jackson, & Jaffee, 1963). Four decades later, the widespread acceptance of ADL scales remains a substantial accomplishment, yet the ability to toilet, eat, transfer, dress, and bathe independently should hardly be equated with having a good QOL. Similarly, in the oncology literature, a disease-free interval sometimes stands in for QOL, but now broader applications in oncology look to psychological well-being and social involvement as signifying QOL. Because the conditions of the lives of older people are significantly altered when they move to nursing homes, a broader concept of QOL is indicated than mere HRQOL.

#### QOL Measurement for Older People

We literally identified thousands of articles on QOL with a key word search. Less common are articles that deal with QOL of older people. It is reasonable to assume that the dimensions relevant to QOL might change for seniors compared to younger adults.

Three edited volumes have appeared since 1991 summarizing QOL for elders (Abeles, Gift, & Ory, 1994; Birren, Lubben, Rowe, & Deutchman, 1991; Noelker & Harel, 2001).

Taken together, the chapters in these books cover a wide variety of topics, including social, psychological, environmental, functional, health, and family dimensions.

In the first of these volumes, Lawton proposed a model of QOL that would include behavioral competence (assessed by third parties), perceived QOL (with items paralleling behavioral competence spheres but assessed through the subjective appraisal of the older person), environmental dimensions (i.e. objective features of the social and physical environment that might influence outcomes), and psychological well-being, the latter perceived as “the ultimate outcome in a causal model (Lawton, 1991, p. 11).” In this formulation, Lawton also stressed that QOL has temporal dimensions including reflection on the past and expectation of the future as well as appraisal of the present, a comment also made by Atchley, in his emphasis on the need for cues in the present that reinforce identity (Atchley, 1991), and by Svensson, in his claim that people who evaluate their QOL “must engage in some form of autobiographical process with the intention of evaluating and synthesizing the meanings and involvements that have been experienced so far (p.258), and that those who compose a successful synthesis are most likely to experience a good QOL (Svensson, 1991). Similarly, Katz and Gurland posit a holistic concept that they call “an irreducible network of interwoven parts, encompassing the elders themselves (mind, body, and spirit), their animate and inanimate environment, their life experiences in time and space, and the functions or powers created by the interwoven parts” (p. 341) (Katz & Gurland, 1991).

Anita Stewart proposed a conceptual framework laying out 14 domains of QOL for older people: physical functioning, self maintenance, usual activities, social functioning, sexual

functioning & intimacy, psychological well-being and distress, cognitive functioning, pain and discomfort, energy/fatigue, sleep, self-esteem, sense of mastery, perceived health, and life satisfaction; many of these domains were organized into sub-categories (Stewart & King, 1994). QOL is clearly a multidimensional construct, but which and how many dimensions are appropriate to tap when considering the well-being of older individuals who receive LTC is less clear.

### QOL for Nursing Home Residents

As part of the nursing home regulatory reforms of 1987, CMS previously had already developed the MDS and had accomplished substantial work in developing quality of care indicators. Therefore, our work at the University of Minnesota called for developing QOL measures that reflected domains that were either omitted from or not especially emphasized in the MDS. We needed to determine what elements should be examined for nursing home residents with reasonably good cognitive functioning. Adding to the complexity, we also needed to consider how, if at all, we could assess QOL of residents with moderate or severe cognitive impairment for whom inferences about their QOL are difficult to make..

The inquiry needs to be brought to older long-term care consumers themselves. The exercise of asking older people what is important to them with reference to their QOL is an essential step in defining the constructs, but is fraught with peril. If older people with no need for long-term care are polled, they may have different and higher expectations for their QOL than their more frail counterparts. They may also be more willing to perceive that a decent QOL is possible even when one has contracted difficult conditions (e.g., stroke, Parkinson's disease, severe arthritis, dementia) that create the need for long-term care. Given problems in learning directly about the values and preferences of nursing-home residents, the information is most



often gathered on small samples of the residents easiest to interview or engage in focus groups.

These limitations notwithstanding, research evoking the resident voice on the elements of a good QOL tends to find that residents care about aspects of relationships, activity, stimulation, and security (Abt Associates, 1996; Cohn & Sugar, 1991; NCCNHR, 1865). Commentators also stress the importance of control and autonomy, bringing both theory and empirical findings to buttress that contention (Abeles, 1991; Kane et al., 1997).

Our review identified several researchers who were working to develop simple self-report QOL measures that could be completed by residents with substantial dementia. Most noteworthy is a 13-item rating of aspects of life developed by Rebecca Logsdon and others (Logsdon, Gibbons, McCurry, & Terri, 1999) and a longer dementia QOL battery (D-QOL) developed by Meryl Brod, Anita Stewart, and others, which includes self-rating on presence of various emotions (Brod, Stewart, Sands, & Walton, 1999; Stewart, Sherbourne, & Brod, 1996). The D-QOL comprises 5 QOL domains: aesthetics; positive affect, negative affect, self-esteem, and feelings of belonging. Other approaches permit merging data provided by residents themselves, family members, and staff. One such approach of Rabins and colleagues was the ADHLQ, which has five domains: social interaction; awareness of self; feeling and mood; enjoyment of activities; and response to surroundings (Rabins, Kasper, Kleinman, Black, & Patrick, 1999). Collectively, these efforts gave credence to the idea that it would be possible to obtain QOL data directly from residents. Though some of the tools elicit only binary data, others, including the Brod et al. tool successfully used 5-point scales.

Similarly Schnelle and Simmons reported success with measures gleaned directly from nursing home residents who participated in their studies of urinary incontinence treatment (Simmons et al., 1997). During the late 1990's under a small business grant from the National

Institute on Aging, Uman and colleagues from the Los Angeles firm, Vial Research, tested an approach to self-reported quality, which they called Resident Experience and Assessment of Life or REAL (Uman, 1995; Uman & Urman, 1997). Using the REAL, interviewers hired by the firm asked the resident a variety of direct questions including factual ones as to whether they received help with a variety of ADL functions. At the time we reviewed it, the REAL generated 6 factors: Help and Assistance; Communication with Staff; Autonomy and Choice; Companionship; Safety and Security; Food and Environment. The response choices were yes-no. What few preliminary data were then available showed little variation among residents on their responses to the REAL items.<sup>1</sup>

A tendency can be noted to use satisfaction measures as the major resident-reported gauge of nursing home quality and to conflate satisfaction results with QOL. When this contract was let in 1998, both nursing home national trade associations were in the midst of developing self-reported satisfaction tools, and many individual facilities and nursing home chains had their own satisfaction ratings. Some authorities proposed using the MDS-derived QI's combined with resident and family satisfaction surveys as overall quality measures.

By definition, measuring satisfaction entails eliciting a subjective appraisal from the resident, but satisfaction can include many domains besides QOL, including appraisals of various aspects of care (Smith, 2000; Cohen-Mansfield, Ejaz, & Werner, 2000; Zimmerman & Bowers, 2000). We found a huge number of nursing home satisfaction tools, partly as a result of our 5-state survey described in Chapter 2. Additionally, the American Association of Homes and Services for the Aging had done a survey of its members and identified hundreds of similar tools.

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<sup>1</sup>We were able to locate little published data on the REAL. On a recent visit, the developer's Website claimed relationships between REAL items and MDS-derived Quality Indicators. We last visited the site, <http://www.vitalresearch.com>, August 23, 2003.

These tools typically have not been studied for their psychometric properties and the facilities utilizing them typically use convenience samples and obtain low response rates.

New regulatory standards on QOL and on Residents' Rights were promulgated in 1987. These standards emphasize the maintenance of the dignity of the individual, provision of individual choices and opportunities for participation in their own care planning, their choices for how to spend their time, and facility governance, as well as respecting each resident's individuality and preferences. The Residents' Rights standard additionally asserts rights to association, privacy, information, and the full gamut of civil rights of citizens. Because these elements have been associated with nursing home QOL and are part of what the surveyors seek to enforce, they needed to be incorporated into the QOL measures.

## **Identifying QOL Domains**

### Approach

One of the first tasks in this project was to identify QOL domains. Although it is feasible to develop brief unidimensional measures to stand in for QOL, most authorities view QOL as a multidimensional construct. The work performed under this CMS Task Order was meant to give attention to important elements of well being in nursing homes that are not well captured by existing measures of quality of care and health outcomes. The Task Order specified, for example, that perceived health, ability to perform activities of daily living (ADL), cognitive ability, and emotional health (all aspects that are sometimes considered part of a QOL construct) were outside our scope. These exclusions were logical because many brief self-report measures have been well-established to measure those constructs. Accordingly, we emphasized the psychological and social aspects of QOL.

## Domain Selection

To establish domains of QOL, we undertook the following steps:

- Review of literature on aspects of a good life for older people, and studies of what is important to older people with disabilities, including those in nursing homes. Among the many sources used for this work, an important source was the qualitative, more “anthropological” components of the Abt evaluation of the nursing home survey process (Abt Associates, 1996). Also useful were focus group and interview studies that directly queried older people about the relative importance of various aspects of their everyday life in contributing to their well-being ((Bowers & Joyce, 1996) (Degenholtz, Kane, & Kivnick, 1997; Green, Hawes, Wood, & Windsong, 1998; Kane et al., 1997; NCCNHR, 1865; Salmon & Weber, 1998), anthropological and ethnographic treatments of life and work in nursing homes (Bennett, 1980; Diamond, 1992) (Gubrium, 1993), (Henderson, 1995; Henderson & Vespari, 1995; Lidz, Fischer, & Anrold, 1992) Lidz, Fischer & Arnold, 1992; (Retsinas, 1986) (Shield, 1988); psychological analysis of the stresses of nursing home life and how to ameliorate them (Tobin, 1991, 1999); and first hand or fictionalized accounts by nursing home residents or front-line staff (Laird, 1985; Tisdale, 1987) (Tulloch, 1975, 1995).
- Review of existing summary measures of “psychosocial” QOL to identify the domains. These include general QOL measures and measures tailored to people with dementia.
- Discussion with a wide variety of stakeholders (providers, regulators, professionals, family councils, advocates) and with identified technical consultants to the project.<sup>2</sup>

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<sup>2</sup>For example, helpful input was gathered at a stakeholders meeting assembled by HCFA (CMS) in September 1998, the 1998 national meeting of the American Association of Survey and Certification Agencies and a 1998 meeting of the Minnesota Survey and Certification workers, meetings of American Association of Homes and Services for the Aging’s state affiliate in Minnesota and regional affiliate in Rochester, NY; meetings of the American Health Care Association state affiliates in Minnesota and Florida, a Family Council Workshop sponsored by the Minnesota Advocacy Center for Long-Term Care; and a meeting sponsored by the California Health Care Foundation during which multiple stakeholders considered what consumers want to know in selecting nursing homes. Among the organizations sending material for review were: the American Dietetic Association, the National Association of Social Workers, the American Association of Home and Services for Aging, the American Health Care Association, and several hospice organizations. Individual comments at various times were made by Sarah Greene Burger, National Citizens Coalition for Nursing Home Reform; Dale Dannefer, Rochester, NY; Rosemary Fagin, Lifespan of Greater Rochester; Iris Freeman, Minnesota Advocacy Center for Long-Term Care; Charlene Harrington, University of California at San Francisco; Mary Jane Koren, Samuels Foundation, New York, NY; LuMarie Polivka-West, Florida Health Care Association; J. Munroe, Life Services Network of Illinois; Mary Tellis-Nyack, Beverly Enterprises; William Thomas, The Eden Alternative; Catherine Unsino, New York City; Kimberly Van Haitsma, Philadelphia Geriatric Center; Carter Catlett Williams, Rochester, NY; and Keren Brown Wilson, Assisted Living Concepts, Portland, OR. We made site visits to selected nursing homes where we made observations and conducted discussions about the nature of a good QOL with key staff; these include Evergreen Retirement Community in Oshkosh, WI; Catholic Eldercare in Minneapolis, MN; Jewish Home for the Aged and Monroe County Community Hospital in Rochester, NY; and Fairport Baptist Home, in Fairport, NY. In-person or telephone discussions were held with state regulatory officials in states where the field work was planned, often followed up by written materials describing best practices in QOL matters. Contacts included: Brenda Klutz, California Department of Health Services; Laura Leeds and Kathleen Cantaben, New York State Department of Health; Polly Lever, Florida Agency for Health Care Administration; Kathy Morris Bill Conroy, New Jersey Health Department; and Michael Triplett and Mary Absolon from the Minnesota Health Department.

- Review of the statues and F-tags in current use related to QOL. These “QOL F-tags” fall under a variety of standards besides the one labeled “QOL.” It was important to ensure that the content related to specific deficiencies that surveyors are expected to cite was covered under the proposed domains.

As a result of the above activities, we identified 11 domains that, taken together, could provide an overview of QOL. These are: autonomy, individuality, dignity, privacy, enjoyment, meaningful activity, relationships, security, comfort, spiritual well-being, and functional competence. Table 3.1 identifies the QOL domains and their definition.

### Further Review of Existing Measures

We took the following steps to identify and review existing measures of overall QOL and of the eleven selected outcome domains.

- We used key words to search the published literature on topics such as loneliness, spiritual well-being, social activity, social relationships, autonomy, and dignity.
- Typically, we identified one or more recent review articles for each domain, which, in turn, led us to more specific instruments, articles, and researchers. We also reviewed recent books and journal issues dealing with assessment of older people (Gallo, Reichel, & Anderson, 1995; Rubenstein, Wieland, & Bernabei, 1995). In this effort, we were assisted because the investigators were in the process of writing a sequel to their 1981 book on assessment tools for use with older people (Kane & Kane, 2000) and had been reviewing materials for that new book in 1997 and 1998.
- We cross-referenced these searches with terms like “aging” and “nursing homes” for both the domain-specific reviews and the reviews of general literature on “QOL” and “health-related QOL,” where much of the voluminous literature is not pertinent to our context or target group.
- We searched for measures developed for assisted living setting serving older people. A key marketing tool of assisted living is that it will offer residents a better QOL than does the nursing home and, therefore, it was of interest to see whether and how that concept had been made operational.
- We conducted a specific literature review on QOL measures for people with Alzheimer’s disease or other dementia.
- We conducted a specific literature review for measures of physical environments for older people.

- We examined measures developed for various studies, such as the cooperative trial of Alzheimer's Special Care Units in nursing homes. This was facilitated by the fact that three of the principals for the CMS QOL study were investigators in that Initiative and had access to the assessment materials developed (Teresi, Lawton, Ory, & Holmes, 1994).
- We contacted investigators based on summaries of their research abstracts, and we wrote for and received a large number of measures that were mentioned in the program of the 1997 Gerontological Society of America.

### **Comments about Existing Tools**

Having assembled and reviewed hundreds of instruments that might be used to measure overall QOL for seniors or one of our QOL domains, we made the following generalizations about the state of the QOL measurement in nursing homes at the time our study began.

- QOL measures varied enormously in their length, level of synthesis, and number and nature of domains tapped. No single measure could be taken off the shelf and used for QOL in nursing homes.
- Many measures that are meant to be summary measures of all aspects of functioning including physical such as the SF-36 (Ware Jr., 1996) and its shorter version, the SF-12 (Ware, Kosinski, & Keller, 1996) give little attention to the constructs that are specific to a good QOL in nursing homes.
- Many existing measures in use to measure QOL for older people are too highly summarized to be a good guide to or measure of the effects of quality improvement efforts, nor do they tap specifically into the dimensions of QOL that are part of the federal nursing home regulations, such as dignity, individualization, and autonomy or self-determination.
- Some promising approaches are still new and without established psychometric properties or norms.
- Considerable effort has been made to measure satisfaction of nursing home residents and their family members, including tools developed by the industry. The tendency of most residents to report satisfaction is a generic problem noted in the literature.

Table 3.1: Specification of QOL Domains

Definition of resident Outcome	Implication for facility indicators
<b>Autonomy:</b> Residents take initiative and make choices for their lives and care.	NF policies, practices, & staff permit & encourage residents to take initiative, & make choices to direct their lives.
<b>Individuality.</b> Residents express preferences and pursue their past and current interests while living at the nursing home, maintaining a sense of their own personal identify and continuity with their past.	NF staff are aware of residents' preferences & interests. NF policies and practices and staff behavior promote each resident's individuality. Staff behavior and resident's immediate environments show markers of the residents' backgrounds and present interests.
<b>Dignity.</b> Residents perceive that their dignity is intact and respected and do <u>not</u> experience feelings of being belittled, de-valued, or humiliated.	NF policies & practices & staff behavior maintain & promote residents' sense of dignity & do not belittle, devalue, or humiliate residents.
<b>Privacy.</b> Residents experience a sense of bodily privacy, have the ability to keep personal information confidential, & have sufficient opportunities to be alone and to communicate and interact with others in private	Facility policies & practices & staff behavior are sensitive to residents' modesty, desires to determine how & to whom their information & feelings are disclosed, & desires to be alone, or with others unobserved.
<b>Enjoyment.</b> Residents express or exhibit pleasure and enjoyment, verbally and nonverbally. Conversely, they do not express or exhibit unhappiness, distress, and lack of enjoyment.	Facility policies, practices, and staff behavior promote resident enjoyment
<b>Meaningful activity.</b> Residents engage in discretionary behavior, either active activity or passive observation, that they find interesting, stimulating, worthwhile. Conversely, they are not bored.	The facility policies & practices & the behavior of staff encourage residents to engage in tasks & activities that interest or stimulate them
<b>Relationships.</b> Residents engage in meaningful person-to-person interchange where the purpose is social.	NF policies & practices promote & do not deter residents' ability to have meaningful person-to-person interchanges with other residents, staff and with family & friends outside the facility.
<b>Security/safety.</b> Residents feel secure and confident about their personal safety and security of their possessions and have clarity about rules and practices.	The NF does all possible to produce a perception of safety & security, and to enable residents to keep their possessions intact. It presents expectations clearly & applies them fairly & flexibly.
<b>Comfort.</b> Residents experience minimal physical symptoms like pain, aches, nausea, dizziness, constipation, & itching, or discomfort from being cold, hot, thirsty or in an uncomfortable position. They perceive that staff notices & attends to their physical comfort.	Staff notice & attend to resident's physical comfort, including attempting to discover and assist those who cannot easily express themselves.
<b>Spiritual well-being.</b> Residents perceive that their needs and concerns for religion, prayer, meditation, moral values, and meaning in life are met	Policies, practices, and staff behavior show respect for each resident's religious beliefs and practices and moral values and facilitate their needs for religious observances, prayer, and meditation.
<b>Functional competence.</b> Residents function independently in the NF in keeping with their abilities & preferences.	Policies, practices, & staff behavior encourage and do not discourage residents from being independent around self-care, care of their environment, or mobility.

- As already noted, considerable emphasis had been given to measure well-being, including QOL, for people with dementia in nursing homes. Some of these measures concentrate on behavioral symptoms exhibited by the person with dementia, which tend to render caregiving difficult but may not always equate with a poor QOL as experienced by the person with dementia. Most of the approaches for examining functioning of the person with dementia rely on the summary reports of caregivers. In staff report or caregiver report measures, we give the greatest credence to those that have highly specific reference points for the way each item is defined. The MOSES tool is one of the better-established tools of this nature, and we drew on it for our own line-staff report measure. The development and testing of self-report measures of QOL directly with people with dementia is a newer phenomenon.
- Extant tools to examine QOL of nursing home residents were more pertinent to people with dementia than to a cognitively intact resident. This was also true of the tools to rate physical environments, many of which were developed for studies of dementia special care units.

### **Measurement Development: Wave 1**

As Chapter 2 indicated, our intent was to field a longer instrument in Wave 1 than might be practicable in order to identify the items to preserve in longer and shorter scale. The shorter scales were then to be tested at Wave 2. We further intended to use Wave 1 to determine how well nursing home residents with various states of cognitive ability would be able to participate in the interview. Thus, in Wave 1 we drew a random stratified sample of residents in each of 50 facilities (including those with higher and lower cognitive functioning).

### **Questionnaire**

As a result of all the review and preliminary work described, we identified an item pool for the identified 11 QOL domains. As indicated in Chapter 1, our intent was to develop self-report measures to which nursing-home residents would respond directly. After pre-testing eighty-eight (88) candidate items were fielded in Wave 1 for the 11 QOL domains. Preliminary assignments to domains ranged from 4-13 items. The QOL items were embedded in a longer questionnaire that also included: some demographic data, self-assessment of emotional state,



and a series of summary items rating QOL (a general statement for each QOL domain and one for life as a whole), and a series of items on satisfaction. The Wave 1 questionnaire is found in Volume 2, Appendix B.

One of the innovative features of our approach was the effort to combine a more graduated set of response categories for residents who could use them with a reversion to a binary response set for those who could not handle Likert scales for any or all the questionnaire. Accordingly, seventy-two (72) of these potential QOL items provided a 4-point Likert response format, usually with the choice, “often, sometimes, rarely, never.” The protocol required that the interviewers encourage the respondent to reply using Likert formats. After 3 attempts to evoke a Likert-type response, the interviewer offered respondents a response choice of “mostly yes” or “mostly no.” Of the remaining 13 QOL candidate items, 7 were asked in a dichotomous format from the outset. These included questions for which a Likert response would make no sense. These included 3 items in the social relationship category (i.e. considering any resident to be a close friend, having a confidante, and being a confidante), 3 meaningful activity items (i.e. developing a new interest, continuing with an old interest, and leaving the facility grounds for a non-medical reason), and 1 individuality item (bringing something to the nursing home that made the resident feel at home). Four (4) questions were posed in terms of whether some activity (e.g., taking walks, taking of baths, being outdoors, and participating in religious observances) happened too much, not enough, or the right amount; these trichotomous questions were eventually treated dichotomously with the right amount contrasted to “too much” or “not enough.” Finally, one item had 5 possible choices and one had three.

Emotional well-being. We adapted part of the Dementia-QOL scale (Brod, et al., 1999;

Stewart, Sherbourne, & Brod, 1996) to measure emotional well-being.<sup>3</sup> Residents were asked how often they experienced 10 feeling states (lonely, happy, bored, angry, contented, worried, interested in things, sad, afraid, and looking forward to the future) during the last few weeks (often, sometimes, rarely, or never). As with the QOL items, we developed an alternative format for the emotions, which simply asked whether or not they had felt the particular emotion in the last two weeks. This combined scale yielded a Cronbach alpha of .80. According to Lawton's model of QOL, self reported QOL (one of his four dimensions) should be correlated with emotional health, another dimension in his schema (Lawton, 1991).

Satisfaction. Also, for comparison with our QOL measures, we asked 4 global questions, each on a 4-point scale, about satisfaction tapping the nursing home's services and programs, their own room and bathroom; the physical setting other than their room and bathroom; and the likelihood of recommending the nursing home to a friend. A comparable yes-no fall-back format was for residents who could not use the Likert option. The combined scale had an alpha of .75.

Summary ratings. Residents rated the QOL in their nursing home according to 11 summary items (each reflecting a QOL domain) and his/her life as a whole. For example, we asked, "considering your life at \_\_, how would you rate the quality of your life as far as feeling physically comfortable: excellent, good, fair, poor." "Having the privacy you want?" These ratings too offered both Likert and binary response formats.

### Data Collection

All English-speaking residents over 65 were eligible for the sample unless comatose or in a vegetative state. No sampled residents were eliminated for interviews without in-person

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<sup>3</sup>The DQOL included 5 ratings of kinds of enjoyment, 24 ratings of feeling states, and an overall QOL rating. Subjects rated the frequency of each feeling state on 5-point scales. This work established the ability of people with dementia to complete multiple ratings. We modified the approach by selecting fewer feeling states and used a four-point response scale, which mirrored the response set for our other QOL items.

screening; 325 residents who could not be roused or respond coherently to a screening protocol based on securing responses to a greeting were not interviewed. Interviews were attempted for all others, but interviewers were permitted to abort the interview if residents gave non-responsive or incoherent answers to 8 of the 13 comfort items on the first page of the questionnaire.

Interviews lasted 45 to 90 minutes and were ordinarily conducted in residents' rooms.

Occasionally, because of residents' schedules or fatigue levels, interviews were done in several sittings. Divided data collection was needed for only 5% of the QOL interviews. Using the Likert responses did not account for longer interviews; interview length was increased when the resident was gregarious or in need of help in becoming oriented to the interview.

## **Wave 1 Findings**

### Developing a scoring system

Because residents could shift between the Likert-type and binary response options during the interview, we generated a procedure to combine the two response formats. As a first step in achieving comparability across the two response options, we applied z-transformations for each item, separately for the Likert and dichotomous response options. The results of these z-transformations were combined into one variable that included information from all residents who had answered the question, regardless of response option chosen. For each of these combined z-transformed items, we examined the "yes" and "no" responses relative to the Likert-type responses. For the majority of items, the "yes" and "no" responses corresponded to 3.8 and 1.5 respectively in the metric of the Likert-type responses. Because our goal was to create a simple method of interpolating these dichotomous responses into the Likert-type responses, we adopted this recoding scheme for all items that offered both response sets.

Using this information, the following transformation was used to generate item scores for all

individuals who provided a valid response (i.e., Likert-type or “yes/no”): most positive Likert = 4; positive binary = 3.8, positive Likert = 3, negative Likert = 2, negative binary = 1.5, most negative Likert = 1. In applying these scales we required that 75% of all items needed for the scale be completed, in which case we imputed the items with missing or “don’t know” responses to the mean of that scale for the particular individual. For the small number of dichotomous items, we coded yes as 4 and 1 as no, so as not to count positive responses on important questions (e.g., having any resident as a close friend, having a confidante, developing a new interest) as less than the Likert style questions that were scored between 4 and 1. The 5 possible responses to the question “How often have you been outside?” were scored using equal intervals between 4 and 1, and the item “Do you consider one or more staff members to be a friend” was scored as 4 for “more than one,” 3 for “one,” 1 for “none.” We required that 75% of items be completed for scales with 4 items and at least 66% for scales with 5 or more items, in which cases we imputed the missing items to the mean of that individual for the scale. No missing items were allowed for the 3 item scale.

#### Validation and Item reduction.

We specified a priori which items we thought should load on each of the 11 domains, with the domain assignments ranging from 14 to 4 items. Although we fielded 88 candidate items, we eliminated 12 items from analyses because of highly skewed distributions or high rates of non-response. Confirmatory factor analysis (CFA) on the remaining 76 items suggested that the individuality and relationship domains were practically indistinguishable ( $r = .99$ ). Because the reliability of the individuality scale was poor ( $\alpha = .56$ ), we dropped this domain. The resultant model had 10 factors and fit the data well ( $\chi^2 = 6024$ ,  $df=2310$ ,  $p < .0001$ ; RMSEA = .044; CFI = .973).

We assessed concurrent validity by testing the hypothesis that each QOL domain is positively correlated with overall satisfaction and with better emotional well-being. We also tested the hypothesis that each domain would be associated with the single summary rating of that domain by regressing each domain score on all summary items.

Each question was developed to tap at least one domain; in some cases an item could readily have been logically placed in more than one domain. We used regression models to test the relationship between the domain scale scores and the summary items that were considered to assess each domain. Likewise we used the same approach to examine the linkage between the single item that reflected overall QOL and each of the domain scales.

To develop and test the domain scores we used a data set comprised of those respondents who were able to answer at least 85% of the Likert response items for the domain-related questions. We then combined these respondents with those who were able to answer 85% of these items using either Likert formats or a dichotomous response format. To pool the two response formats, we created Z scores for the Likert responders and interpolated the dichotomous responses into these. All analyses were then conducted using the z-scored data.

The first step in creating the domain scores was to specify the most appropriate domain for each question. Several key project staff participated in an exercise of independent ratings and differences were resolved prior to submitting the final list.

This part of the analysis utilized the reliability routine in SPSS. Specifically, for each QOL domain, we calculated the alpha reliability of the items that were a priori assigned to that domain. We then went through an iterative process where we eliminated individual items that had low item-total correlations, and then examined how that impacted the reliability.

From this process, we created a set of long QOL subscales for the 11 domains. As table 3.2

shows, the longer scales ranged from 13 to 3 items, with 8 having 6 or more items. The Enjoyment Scale contains only 3 items, all concerning food and dining ambiance. These 3 items formed a strong scale whereas other items related to enjoyment migrated to other scales. Essentially, therefore, Enjoyment measures Food Enjoyment rather than general enjoyment.

We undertook a variety of analyses with the longer scales. Specifically, we investigated the inter-correlations among the scales. We also examined how well each scale predicted the appropriate summary item as a validity check. In addition, we performed regressions to test the relationships between the scales and the summary scores to ensure that each scale was predictive of the appropriate summary item. To pursue the idea that many of these domains were closely related, we examined the inter-correlations among the 11 domain scales. We also used a series of step-wise regressions in which all items were used to predict the summary items for each domain.

Table 3.2. Number of Items per Long Domain Scale

<b>Domain</b>	<b>Number of Items</b>
Security	13
Comfort	12
Meaningful Activity	9
Autonomy	9
Relationships	7
Individuality	7
Dignity	6
Functional competence	6
Privacy	5
Spiritual well-being	5
Enjoyment	3

We performed analyses to examine the behavior of the QOL domain scales for residents with substantial cognitive impairment. As the previous chapter indicated, we selected residents so that roughly half the sample would be in the higher cognitive functioning range and half in the

lower using a scoring process based on each resident's MDS. The approach resulted in a score of 0-5, as shown in Table 3.3. For analytic purposes we divided into groups of residents with scores of 0-2 for higher cognitive functioning (42.5%) and 3-5 for lower cognitive functioning (57.5%).

Table 3.3. Distribution of Cognitive Scores in Overall Sample

<b>Cognitive score</b>	<b>Percent of residents</b>
0	18.4.
1	11.3
2	12.8
3	12.7
4	29.0
5	15.8

After performing the basic psychometric analyses on the first scales that we developed, we attempted to create shorter versions. To do this we relied on cluster analysis. The goal of this analysis was to select the items within each domain scale that best preserved the integrity of the scale and discriminated that domain score from the others.

#### Response Rates Wave 1

Table 3.4 provides descriptive statistics for the entire sample (1988) and 4 sub-samples: those for whom we could calculate no domains, those for whom we could calculate 1-4 domains, those for which we could calculate 5-8 domains, and those for whom we could calculate and 9 or more domains (N=1125).<sup>4</sup> Sixty (60) per cent or more residents could respond sufficiently for scale calculation, and residents who could complete any domains were likely to complete all or most. Gender made no difference in completion rates, but older age, poorer ADL functioning, poorer cognitive functioning, and longer length of stay were all highly significantly related to a

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<sup>4</sup> As a result of factor analysis, we eventually created 10 long scales. We then reduced the scale length in a procedure described in this chapter. As different items are used for domains and different imputation rules, the numbers who complete by domain change slightly. The principles remain the same: we could calculate domain scores for about 60% of residents. Given the

lesser likelihood of being able to complete the questionnaire. Although older residents were less likely to complete, nonetheless, we were able to construct QOL scores from large numbers of very old residents; 71% of the whole sample were 81 or older and 67% of those for whom we could complete 9-11 domain scores were 81 or older (not shown in the table). The relationship between MDS-cognition score and completion was strong, but again some residents with poor cognition were able to complete the tool. Of the 1988 in the sample, 44.5% had cognitive scores of 4 or 5; we could calculate 9 or more domain scales from 24% of that group, compared to 45% of those with scores of 0 and 1. Conversely, 24% of the 1225 residents for whom we could calculate 9 or more domain scores fell in the 4-5 cognitive score range. Because the sampling method was based on enumeration of the census 2-3 weeks prior to interviewing, very short-stay residents are under-represented and only 14% had been admitted within the last 3 months.

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similarities, we do not repeat these analyses for each version of the scales.



Table 3.4. Description of Sample by Scale Completion for Long Scales (in Percents)

Trait	Total sample N=1988	Number of Domains Completed			
		0 N=672	1-4 N=104	5-8 N=87	9-11 N=1125
<b>Female</b>	76.7	80	75	76	75
<b>Mean age *</b>	85.3	86.6	86.7	87.4	84.2
<b>Cognition score †</b>					
0 (best)	19	4	9	9	29
1	11	4	5	10	16
2	13	5	15	14	17
3	13	10	14	18	14
4	29	38	40	40	22
5	16	39	16	8	2
<b>Cognitive group*</b>					
0-2	13	29	33	33	43
3-5	87	71	67	67	57
<b>Mean Months Length of Stay*</b>	32.56	40.9	33.52	26.68	27.94
<b>ADL group#</b>					
Needs help with 0-2 ADLS	75	55	73	82	86
Needs help with 3-5 ADLS	25	45	27	18	14
<b>Bed mobility and/or eating*</b>					
Needs help with neither	79	60	78	86	91
Needs help with one or both	21	40	22	14	9

\* All significant differences are at  $p < 0.000$ . Chi-squares were used for categorical variables (gender, ADL group, cognitive group, and those needing help with bathing and/or toileting [not tabled].) ANOVAs were used for age and length of stay.

† Percentage may be more or less than 100% due to rounding.

# ADLs used in this scale are: bed mobility, eating, transferring, toilet use, and dressing.

### Alpha Reliabilities for Longer Scales: Wave 1

Table 3.5 shows the Chronbach's alpha coefficients for the each domain score for the two cognitive groups. Ideally, alpha coefficients should be above .7. For those with higher cognitive functioning, this test was met in 7 domain scores and came close to being met in 3 more (.64 or better). Only the score for individuality fell short of the standard for alpha reliabilities. The coefficients for the lower cognitive group are almost as good. More fail the .70 test but all but one has an alpha score .63 or above. Again the poorest performing domain was individuality.

Table 3.5. Long Scales: Scale Reliability by Cognition Level

<b>Domain</b>	<b>Alpha for long scales</b>			
	<b>N</b>	<b>Cog score 0, 1, 2</b>	<b>N</b>	<b>Cog Score 3, 4, 5</b>
Comfort	418	.72	357	.67
Functional competence	436	.82	505	.80
Privacy	411	.74	438	.67
Autonomy	293	.64	206	.68
Dignity	488	.77	561	.77
Meaningful activity	406	.64	335	.63
Enjoyment	487	.71	594	.72
Individuality	438	.57	347	.54
Relationships	470	.70	463	.68
Security	369	.79	282	.76
Spiritual well-being	425	.65	428	.64

### Residents with Lower Cognitive Functioning

The numbers of residents from whom we have data available to construct scales vary with the criterion applied to the data. For example, Table 3.6 shows these “response rates” using two criteria: residents able to answer 85% or more of the questions when Likert items are combined with dichotomous items; and residents able to answer 75% of the questions using either the Likert or dichotomous format. Using the less stringent criterion, 16% of the lower cognitive group and 55% of the higher cognitive group were able to provide useful responses.

Table 3.6. Percent of Useful Respondents by Different Completeness Rules

% Usable Responders			
% of questions answered	All respondents	High cognitive (0-2 MDS)	Low cognitive (3-5 MDS)
75+% of questions answered with combined dichotomous & Likert formats	32.3	54.6	15.9
85% of questions answered with combined Likert & dichotomous formats	25.8	45.1	11.5

Because the patterns of responses for the groups with higher and lower cognitive functioning are important in suggesting strategies that might be useful in tapping the QOL for those who cannot reliably respond, we examined the differences in these patterns in several ways. The first approach was to see how cognitive status affected the overall QOL scores. When cognitive status was added as an explanatory variable in the regression on facility score for each domain, it did not produce a substantial effect size, as measured in proportions of a standard deviation. In all but individuality the effect size was less than 0.3; for privacy, enjoyment and comfort the effect size was less than 0.2. Table 3.7 shows mean QOL scores by cognition group.

Because cognitive status is closely linked to response mode (i.e., Likert or dichotomous), we regressed both the cognitive status and type of response on the domain scores. Response mode was not significant in any, but cognitive status was significant in four domains: comfort, enjoyment, individuality, and privacy. However, the direction of the effect was equally divided. The mean scores for resident groups with higher and lower cognitive groups for each domain are shown in Table 3.7. Because these are Z scores, the neutral mean score is 0.

Table 3.7. Long Scales: Mean Z-Scores of Residents by Cognition

Domain	Higher cognition group mean	Lower cognition group mean
Autonomy	-.04	.03
<b>Comfort*</b>	.037	-.053
Dignity	-.04	.05
<b>Enjoyment*</b>	.08	-.08
Functional competence	-.007	.006
<b>Individuality*</b>	-.06	.09
Meaningful activity	.02	-.02
<b>Privacy*</b>	-.08	.11
Relationships	-.03	.05
Security	.003	-.02
Spiritual well-being	-.02	.03

\*Statistically significant differences between those with higher and lower cognitive function.

#### Long Scales: Correlations Among Domains

Although we have been able to develop psychometrically sound domain scores, the domains themselves overlap each other both conceptually and statistically. Not only did they largely yield a single factor in the original exploratory factor analysis, but the correlations among the domains are considerable, as shown in Table 3.8. Five correlation coefficients are above 0.5 and 34 are above 0.4.

Table 3.8. Summary Score Correlations for Individual Residents

	A. Physical Comfort	B. Functional competence	C. Privacy	D. Autonomy	E. Dignity	F. Meaningful activity	G. Enjoyment	H. Individuality	I. Relation- ships	J. Security	K. Spiritual well-being	L. Life as a whole
A. Physical comfort	1.00	.391	.350	<b>.440</b>	.339	.384	<b>.453</b>	.396	.326	.385	.296	<b>.469</b>
B. Functional competence		1.00	.333	<b>.420</b>	.303	.339	.385	<b>.435</b>	.334	.311	.294	.318
C. Privacy			1.00	<b>.476</b>	<b>.436</b>	.397	.373	<b>.406</b>	.309	<b>.430</b>	.319	.350
D. Autonomy				1.00	<b>.498</b>	<b>.467</b>	<b>.474</b>	<b>.504</b>	.394	<b>.416</b>	.362	<b>.451</b>
E. Dignity					1.00	<b>.406</b>	.389	<b>.409</b>	.336	<b>.445</b>	.324	.395
F. Meaningful activity						1.00	<b>.535</b>	<b>.528</b>	<b>.477</b>	.357	.394	<b>.419</b>
G. Enjoyment							1.00	<b>.589</b>	<b>.474</b>	<b>.411</b>	.357	<b>.590</b>
H. Individuality								1.00	<b>.481</b>	<b>.434</b>	.376	<b>.487</b>
I. Relationships									1.00	<b>.404</b>	<b>.419</b>	<b>.410</b>
J. Security										1.00	.370	<b>.409</b>
K. Spiritual well-being											1.00	<b>.417</b>
L. Life as a whole												1.00

To test the validity of domain scales we regressed the summary measures for each domain against each domain scale. The results are shown in Table 3.9. When all respondents are considered, the corresponding summary measure was significantly correlated with the domain scale every time; however, so too were several other summary scores. When responders with higher cognitive function were examined separately, the pattern was maintained. The only exception was for individuality. The pattern held for the lower cognitive-functioning group with two exceptions (comfort and individuality).

Table 3.9. Regressions to Predict Scale Scores Using Domain Summary Items

Domain	N	All		High cognitive		Low cognitive	
		Summary item match	Other summary item match	Summary item match	Other summary item match	Summary item match	Other summary item match
Comfort	775	Yes	Dig, Pri	Yes	Dig, FC	No	
Functional competence	941	Yes	Aut, Ind	Yes	Aut, SWB	Yes	Ind
Privacy	849	Yes	Dig, FC, Sec	Yes		Yes	
Autonomy	499	Yes	FC, Rel	Yes	FC, Rel	Yes	FC, Ind, Rel
Dignity	1049	Yes	Cmf, Pri, Rel, Sec	Yes	Cmf, MA, Rel	Yes	Enj, Pri
Meaningful activity	741	Yes	Enj, FC, Ind, Rel	Yes	FC, Rel	Yes	Dig, Sec
Enjoyment	981	Yes	Aut, Cmf, MA	Yes	Cmf	Yes	Aut, Cmf, MA
Individuality	785	Yes	Enj, MA, Rel	No	Enj, MA	No	Rel
Relationships	933	Yes	SWB	Yes	Dig, Enj	Yes	
Security	651	Yes	Cmf, Dig, FC, Pri	Yes	Cmf, FC	Yes	Cmf, FC, Pri
Spiritual well-being	853	Yes	Enj, MA	Yes	Enj, MA	Yes	MA

\*The N varies by domain, with most of the large difference between the 1049 who contributed to the data on dignity and the 499 who contributed to the data on autonomy accounted for by variation in the numbers of lower cognitive functioning residents for whom the scale was available. For example, this ranged from 206 for autonomy to 561 for dignity.

Another test of validity was obtained by regressing the domain scores against the ultimate summary measure, the respondent's rating of life as a whole. As shown in Table 3.10, among the group with higher cognitive functioning four domains are significantly related to life as a whole (comfort, meaningful activity, individuality, and spiritual well-being). Among the group with lower cognitive functioning, four domains are also significant but they are largely different (enjoyment, security and spiritual well-being, as well as relationships which is negatively correlated).

Table 3.10. Long Scales: Regression of Domains with "Life as a Whole" by Cognitive Status

<b>Domain</b>	<b>Total (N = 747 )</b>	<b>High cognitive (N = 499 )</b>	<b>Low cognitive (N = 248 )</b>
<b>Comfort</b>	.060	<b>.114*</b>	-.056
Functional competence	-.035	-.073	.084
Privacy	-.042	-.068	.026
<b>Meaningful activities</b>	<b>.101*</b>	<b>.113*</b>	.063
<b>Enjoyment</b>	<b>.105*</b>	.077	<b>.190*</b>
<b>Individuality</b>	<b>.158*</b>	<b>.197*</b>	.088
<b>Relationships</b>	-.009	.042	<b>-.174*</b>
<b>Security</b>	<b>.135*</b>	.057	<b>.242*</b>
<b>Spiritual well-being</b>	<b>.175*</b>	<b>.154*</b>	<b>.234*</b>
Autonomy	.040	.045	-.098
Dignity	.007	.087	-.002

\* Statistically significant relationship to life as a whole,  $p < .05$ .

#### Shorter Scales: Wave 1

We next used cluster analysis to produce a short version of the instrument that could be even more useful in a practical nursing-home setting while maintaining the hypothesized domain structure. A list of all 45 possible pairings of the 10 remaining domains was constructed. The items for each pair were then subjected to a cluster analysis using the squared Euclidean distance as the similarity metric and Ward's method was the clustering algorithm. The resulting

dendrogram was examined to determine whether the items did indeed form two clusters that corresponded to the a priori classifications of the items. Items that were frequently assigned to domains that did not match the a priori assignment were eliminated. This approach makes few assumptions about the distribution of the data; and, because it uses a limited number of items in each step, it reduces the loss of power due to item non-response. In addition, cluster analysis enabled us to maximize the independence of the domains. This effort produced a parsimonious subset of 42 items. Finally, we used CFA to validate the domain structure of the short version of the scale. We tested a 10 factor congeneric model with a 2nd order factor structure in which all 10 of the QOL domains loaded onto one higher order factor (i.e., the latent variable QOL).

Results of the CFA on the final version of the short scales supported a 10 factor structure with 42 items. The data fit the model well ( $\chi^2=2441$ ,  $df=1024$ ,  $p<.000$ ; RMSEA = .041; CFI = .985). Table 3. 11 presents the standardized CFA regression weights for each item. All parameters were statistically significant (Figure 3.1). The paths from the 2<sup>nd</sup> order overall QOL factor (labeled QOL) to each domain were statistically significant. The regression weights ranged from .194 for comfort to .471 for functional competence.



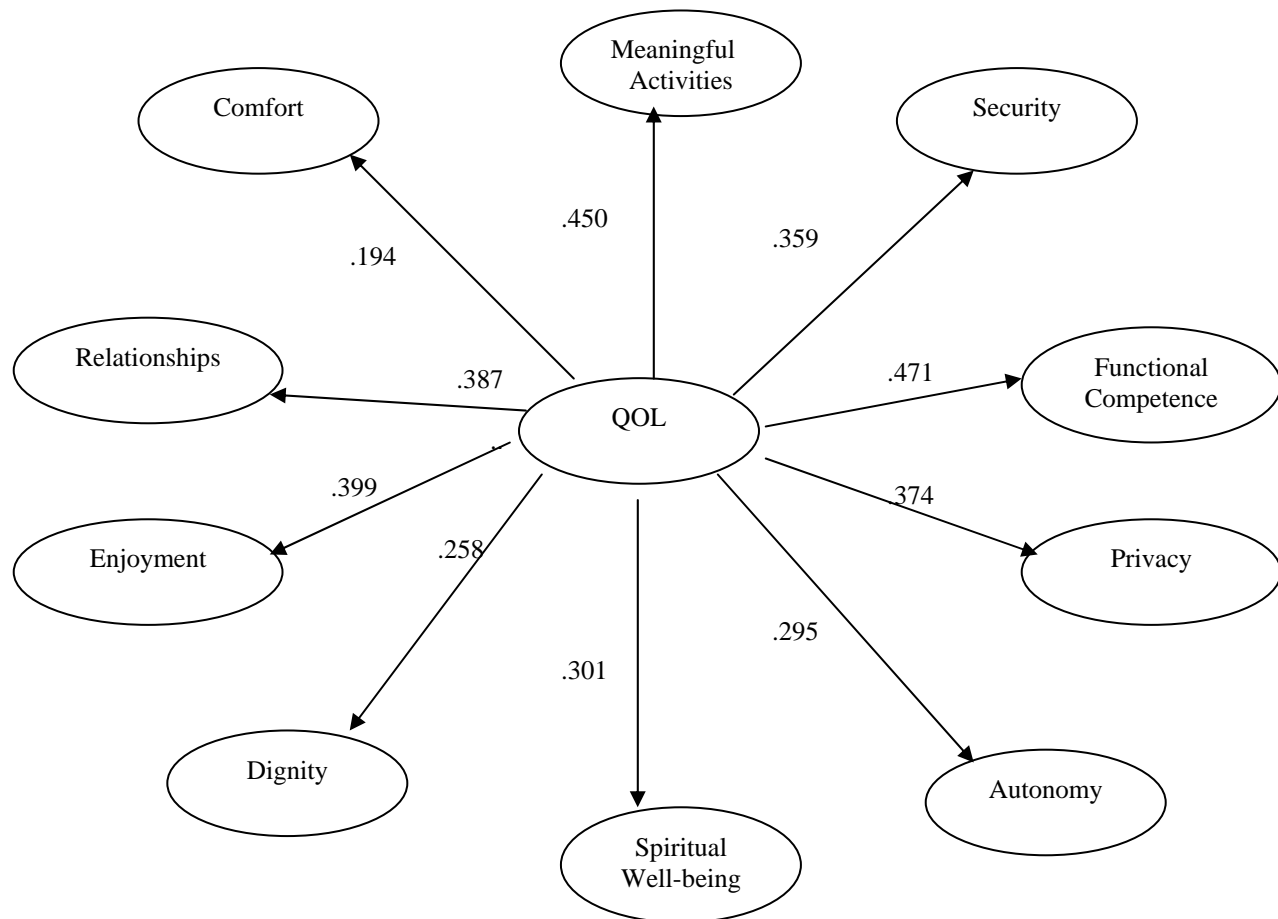


Figure 3.1. Domain loadings on overall QOL based on the second order confirmatory factor analysis of the short scales.

The rest of the analyses related to the short scales developed at Wave 1 are based on the 10 domains confirmed by the Confirmatory Factor Analysis rather than 11 domains.

Table 3.11. Standardized Regression Coefficients of Observed Variables on Latent QOL Factors

<b>Domains</b>	<b>Abbreviated Items*</b>	<b>Coefficient</b>
<b>Comfort</b>		
	Too cold	.347
	So long in same position it hurts	.537
	In physical pain	.516
	Bothered by noise in own room	.512
	Bothered by noise elsewhere in NH	.488
	Gets a good night's sleep.	.500
<b>Security</b>		
	Possessions are safe	.458
	Clothes lost or damaged in laundry	.388
	Confident can get help when needed	.799
	Can get doctor or nurse quickly	.687
	Afraid because of how self or others treated	.465
<b>Meaningful Activity</b>		
	Gets outdoors as much as wants.	.424
	How often gets outdoors	.437
	Enjoyable things to do at NH on weekends	.576
	Enjoys organized activities at nursing home	.552
	Gives help to others	.380
<b>Relationships</b>		
	Easy to make friends at nursing home	.628
	Considers any resident to be close friend	.380
	Staff stop just to have friendly conversation	.557
	Consider 1 or more staff to be a friend	.574
	NH makes it easy for family & friends to visit	.577
<b>Functional Competence</b>		
	Easy to get around room by self	.674
	Easily can reach things you need	.692
	Can get to bathroom quickly anywhere in nursing home	.583
	Can easily reach toilet articles	.750
	Take care of things & room as much as wanted	.603

<b>Table 3. 11, continued</b>		
<b>Domains</b>	<b>Abbreviated Items*</b>	<b>Coefficient</b>
<b>Enjoyment</b>		
	Like the food here	.771
	Enjoy mealtimes at NH	.746
	Get favorite foods here	.592
<b>Privacy</b>		
	Can be alone when want to	.624
	Can make a private phone call	.476
	Can visit with someone in private	.744
	Can be together with other resident in private	.731
	Staff knock & wait before entering	.436
<b>Dignity</b>		
	Staff treats you politely	.690
	Staff treats you with respect	.731
	Staff handles you gently	.697
	Staff respects your modesty	.596
	Staff takes time to listen to you	.569
<b>Autonomy</b>		
	Go to bed at the time you want	.554
	Get up in the morning when you want	.453
	Can you decide what clothes to wear	.459
	Successful in making changes at NH	.470
<b>Spiritual Well-Being</b>		
	Participate in religious activities	.390
	Religious observances have meaning	.413
	Feel your life has meaning	.759
	Feel at peace	.678

\*Item text has been shortened because of space considerations.

Table 3.12 shows the alpha reliability for the shortened scales for the entire group and by cognition status. The N varies for each analysis because the number of respondents for whom we could construct the domains varies. All standardized domain scores range from 4 (better QOL) to 1 (worse QOL). The mean scores tended to be positive (higher than 2) but considerable variation was present. As shown in Table 3.12, the measures of internal consistency (Cronbach's alpha) of each scale ranged from .77 for functional competence to .53 for meaningful activity. We compared the alpha reliability for the high cognitive group to the low cognitive group by calculating 95% confidence interval around the alpha from the high cognitive group. The alpha coefficients from the low cognitive group were not statistically different than the high cognitive group except for privacy and enjoyment. The reliability of these two scales in the low cognitive group was .66.

Table 3.12. Reliability of Domain Scores by Cognitive Function

	N	mean (sd)	Alpha		
			all	hi cognition	low cognition
Comfort	1066	3.02 (.06)	.62	.63	.59
Security	931	3.40 (.56)	.65	.66	.62
Meaningful activity	907	2.69 (.72)	.53	.53	.53
Relationships	992	3.07 (.70)	.64	.63	.66
Functional competence	962	3.25 (.74)	.77	.76	.79
Enjoyment	1081	3.22 (.73)	.71	.73	.66*
Privacy	849	3.34 (.63)	.70	.72	.66*
Dignity	1076	3.67 (.43)	.76	.76	.75
Autonomy	766	3.30 (.64)	.59	.58	.60
Spiritual well-being	966	3.15(.70)	.64	.65	.61

\* Alpha in the low cognition group was significantly different from the high cognition group at  $p < .05$ .

As Table 3.13 shows, correlations among domains reinforced the CFA in demonstrating that the domains are correlated but sufficiently independent to reinforce that different constructs are being measured. Only 3 of 45 possible correlations between pairs of domains exceeded .4 (between dignity and security, functional competence and autonomy, and spiritual well-being and relationships. None of the possible pairs had a correlation of .5 or more and 28 of them were .3 or less.

Table 3.13. Correlations Among Domain Scores for Short Wave 1 Scales

	Comfort	Security	Meaningful Activity	Relationships	Functional Competence	Enjoyment	Privacy	Dignity	Autonomy	Spiritual Well-being
Comfort	1.00	.36	.12	.08	.23	.26	.20	.26	.19	.11
Security		1.00	.25	.25	.29	.35	.26	.49	.33	.23
Meaningful Activity			1.00	.39	.35	.30	.27	.24	.29	.31
Relationships				1.00	.22	.34	.32	.35	.23	.41
Functional Competence					1.00	.22	.35	.30	.46	.18
Enjoyment						1.00	.18	.30	.26	.33
Privacy							1.00	.37	.37	.22
Dignity								1.00	.34	.24
Autonomy									1.00	.16
Spiritual Well-being										1.00

We compared each QOL domain score with scales measuring two constructs that we expected to be related but not redundant: emotional well-being and satisfaction. Table 3.14 shows the results for the emotions scale. The correlation coefficients were all statistically significant, but the patterns of correlations suggest that the emotions score was sufficiently different from the QOL scales that different constructs are being measured. Table 3.15 shows the same result when the domain scores are correlated with the global satisfaction scale. Correlations were performed separately by cognitive stratum. Again correlations were in the desired direction, statistically significant, and at level that suggests the constructs are related but different.

Table 3.14 Correlations between QOL Short Scales and Emotions by Cognition Group

QOL domain	Correlations* with Emotions Scale†		
	All residents	Residents with high cognitive function (0-2)	Residents with low cognitive function (3-5)
Comfort	.40	.42	.35
Security	.42	.38	.48
Meaningful activity	.29	.30	.26
Relationships	.27	.24	.30
Functional competence	.29	.27	.31
Enjoyment	.35	.33	.39
Privacy	.24	.22	.29
Dignity	.33	.33	.34
Autonomy	.29	.30	.27
Spiritual well-being	.34	.37	.29

\*All correlations are significant at the 0.01 level using two-tailed tests.

†Emotions summed for the scale are: happy, sad, contented, angry, afraid, worried, bored, interested in things, lonely, and looking forward to the future. The alpha for this summative scale is .80.

Table 3.15. Correlations Between QOL Short Scales and Global Satisfaction by Cognition Group

QOL domain	Correlations* with Satisfaction Scale†		
	All Residents	Residents with high cognitive function (0-2)	Residents with low cognitive function (3-5)
Comfort	0.30	0.36	0.20
Security	0.45	0.50	0.37
Meaningful activity	0.31	0.33	0.27
Relationships	0.37	0.36	0.38
Functional competence	0.23	0.24	0.20
Enjoyment	0.38	0.42	0.32
Privacy	0.31	0.30	0.35
Dignity	0.44	0.47	0.41
Autonomy	0.25	0.26	0.24
Spiritual well-being	0.32	0.30	0.37

\*All correlations are significant at the 0.01 level using two-tailed tests.

† The satisfaction scale was developed from 4 questions rating satisfaction with the programs and services, satisfactions with one's own room and bath, satisfaction with the rest of the facility environment, and likelihood of recommending this facility. The alpha for this summative scale is .75.

We regressed each QOL domain score against the full array of summary ratings (not tabled).

The domain scale score was always significantly associated with the matching summary item at the .001 level. The domain score was sometimes also significantly correlated with one or more additional domain summary items, but the largest regression coefficient was with the summary rating for the appropriate domain.

### Summary of Wave 1 Findings

The Wave 1 work showed us that it was feasible to interview large numbers of NF residents and to create measures of relevant aspects of QOL for them. Interviews sufficient to develop QOL scales were completed for about 60% of residents (the percentage varying between the 11 long and short scales and the 10 long and short scales because the different scale lengths led to different imputation conventions). This result was achieved even though at least half the sample included the more impaired levels on a cognitive performance scale; only 19% of the sample had



a perfect score cognitive score, and 17% had the worst possible cognitive score. By comparison, among all residents in the sample nursing homes from which the samples were drawn, 13% had a perfect score and 29% had a score of 5, suggesting that we somewhat over-sampled those with higher cognition. A 1993 national sample of nursing home residents using the same scale found slightly better rates of cognitive functioning; 16% had no cognitive impairment and 23% were severely impaired.

We confirmed 10 distinct factors that each related to an overall construct of QOL in both longer and shorter scales. The merit of the shorter scales is practicality; although for some domains the difference in length is no more than 1 item, the security, comfort, and autonomy scales were shortened respectively by 8, 7, and 4 items. Longer scales will still be useful for more in-depth exploration of quality improvement efforts related to a particular domain.

The scales performed well in several tests of concurrent validity (correlation with a summary item for the particular scale, correlation with ratings of emotion, and correlation with global satisfaction ratings). We make no claim, however, that we have tapped the entire construct of QOL. For some purposes, measures of affect, functional status, and self-perceived health should be fielded along with our measures to produce a more fully rounded picture of QOL. Self-reported measures of such domains are readily available in the gerontology literature, and could be added to our battery for research or quality assurance purposes. Indeed, we did include affect measures in this study for purposes of concurrent validity testing and found them correlated, as expected. Continued pursuit of a measure of individuality seems warranted given its theoretical importance.

## Wave 2 Findings

Between Wave 1 and Wave 2, we made small modifications to item wording. We also redesigned the Individuality scale, which had worked poorly in Wave 1. We tested that scale with a purposive sample of 200 residents in volunteering nursing homes, achieving a .8 alpha reliability. Based on this pilot work, the 6 items fielded for individuality were:

- Taking all staff together, nurses, aides, and others, does the staff know about your interests and what you like?
- Do staff members know you as a person?
- Are people working here interested in your experiences and the things you have done in your life?
- Do staff here take your preferences seriously?
- Do residents here know you as a person?
- Are your personal wishes and interests respected here?

The tool additionally contained 6 comfort items, 5 functional competence items, 5 privacy items, 5 dignity items, 6 meaningful activity items, 5 relationship items, 4 autonomy items, 3 enjoyment items, 5 security items, and 4 spiritual well-being items. With the 6 individuality items, the protocol contained 54 items.

In Wave 2, we improved the formatting of the items and developed stronger quality control procedures to avoid inadvertently missing items. As with Wave 1, we used Likert response sets for most of the items with a binary fall back.

For Wave 2 sampling, we secured census information from the nursing homes, excluded persons under age 65 and persons in a coma or vegetative state, and approached all other residents in random order for QOL interviewing. As before, we eliminated residents who could not be roused or participate in a simple screening conversations, or who failed to give coherent

or usable responses to 4 of the first 6 questions. In addition, after the interview, the questionnaire was reviewed and, if the resident did not answer the items sufficiently for us to construct at least 9 of the 11 scale scores, that resident was replaced. Our goal was to obtain 28 completed interviews for analysis in each of 60 facilities. In 1 facility, we secured fewer than 20 completed questionnaires and replaced the facility. In all others, we were able to complete 28 interviews even when staff warned us this would be impossible because of cognitive impairment in the facility. The number of people we needed to approach to obtain 28 interviews ranged widely; in a few facilities we had almost exhausted the census to do so.

Table 3.16 describes the sample at Wave 2. The final sample included 1676 residents, all of whom completed the items needed for 9 to 11 domains. (Although we observed the same imputation rules as we had for Wave 1, our modified format was easier for residents to complete and we had very few missing data.) Because we draw a random sample of the residents immediately before we visited, we were able to have a much larger representation of shorter stay residents. As with Wave 1, we were able to interview large numbers of people who fell in the more disabled half of the scoring that we used for cognitive functioning. We used the same 0-5 score for cognitive functioning as we did in Wave 1, and 48.9% of the sample had scores of 3-5, connoting the lower end of cognitive functioning.

Once again we performed Confirmatory Factor Analysis (CFA) using all 54 items. This time, as Figure 3.2 shows, we were able to confirm the 11 factors. Table 3.17 displays the correlations among the domains, showing that they are related but independent. The dignity and security domains and the autonomy and privacy domains are the most intercorrelated.

Table 3.16. Characteristics of Wave 2 Sample

<b>Trait</b>	<b>Proportion of sample</b>
Female	72.7%
Mean age	83.6
Cognition score	
0	21.7%
1	14.1%
2	15.3%
3	14.3%
4	27.7%
5	6.9%
Cognitive score group	
0 – 2 (higher)	51.1
3 – 5 (lower)	48.9
ADL impairments	
0	5.9
1	7.8
2	7.8
3	14.2
4	30.9
5	33.4
ADL score group	
0 – 2	21.5
3-5	78.5
Bed mobility and/or eating	
Needs help w/ neither	29.5
Needs help w/ 1 or both	70.5
Mean of length of stay (months)	23.97
Length of Stay	
0 - 1 month	8.9
1 - 2 months	6.2
2 - 3 months	5.2
3 - 4 months	4.3
4 - 5 months	4.2
5 - 6 months	3.7
6 - 12 months	15.5
> 12 months	52.2
LOS group	
0 - 3 months	20.2
> 3 months	79.8

Table 3.17. Correlations among Domains: Wave 2

	Comfort	Functional Competence	Privacy	Dignity	Meaningful Activities	Enjoyment	Individuality	Relationships	Security	Spiritual Well-being	Autonomy
Comfort	1.000	0.223	0.195	0.304	0.183	0.266	0.171	0.143	0.356	0.123	0.210
Functional Competence		1.000	0.370	0.278	0.384	0.294	0.211	0.250	0.250	0.166	0.419
Privacy			1.000	0.348	0.337	0.220	0.271	0.300	0.299	0.142	0.363
Dignity				1.000	0.320	0.355	0.457	0.399	0.531	0.244	0.380
Meaningful Activity					1.000	0.355	0.378	0.426	0.262	0.386	0.348
Enjoyment						1.000	0.371	0.310	0.353	0.345	0.323
Individuality							1.000	0.565	0.400	0.383	0.345
Relationships								1.000	0.273	0.359	0.345
Security									1.000	0.178	0.341
Spiritual Well-being										1.000	0.207
Autonomy											1.000

Correlations are all significant at the 0.01 level using 2-tailed tests.

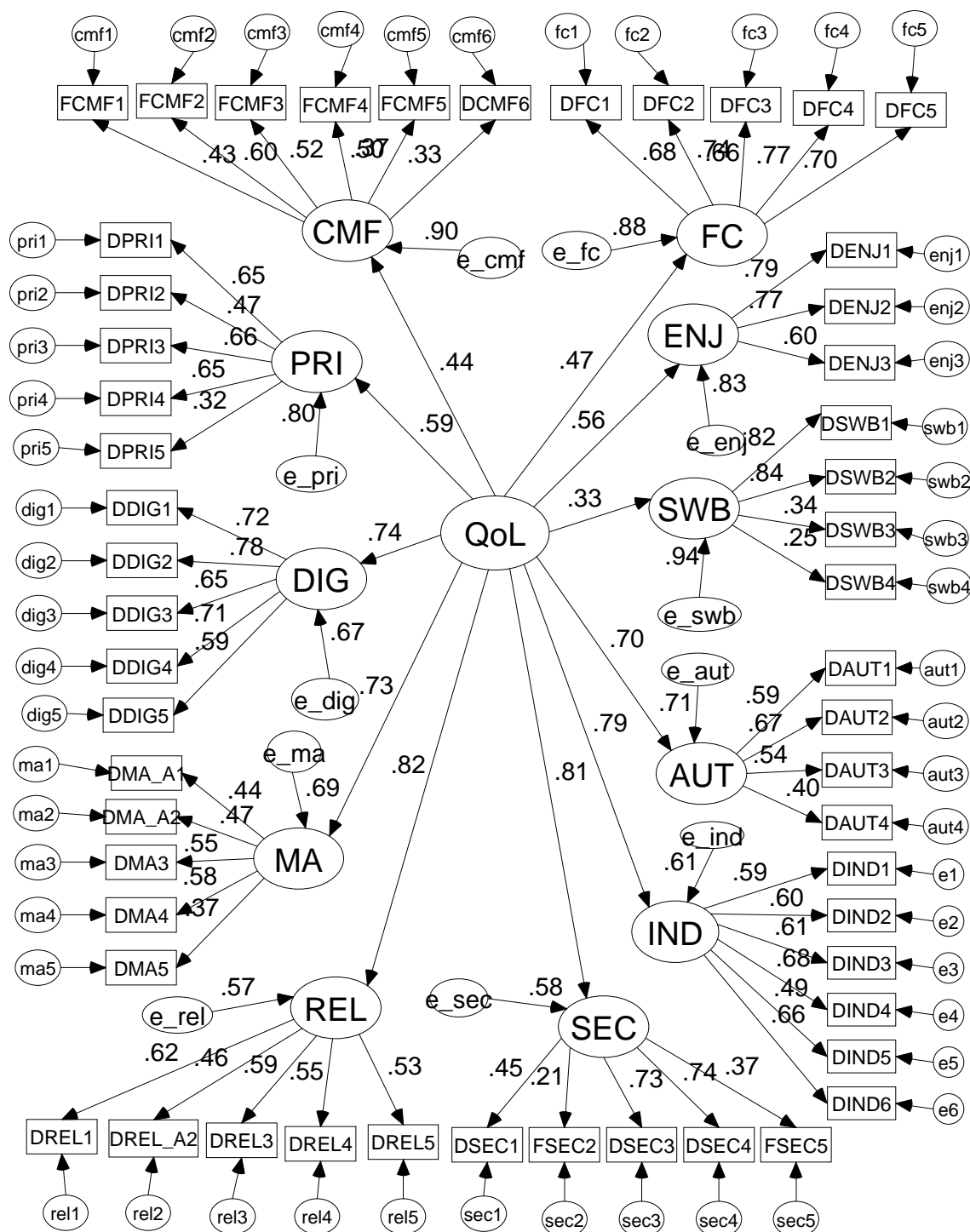


Figure 3.2. Confirmatory Factor Analysis, Wave 2. 11 Domain: With cases of those who answered all 53 questions (959 cases). Model Fit Index: Ration of Chi-Square over degree of freedom: 3.24; RMSEA: 0.048. CMF is Comfort, FC is Functional Competence, AUT is Autonomy, SWB is Spiritual Well-being, IND is Individuality, MA is Meaningful Activity, REL is Relationships, DIG is Dignity, PRI is Privacy, ENJ is Enjoyment, SEC is security and QoL is Quality of Life.

Table 3.18 Regression to Predict Scale Wave 2 Scores Using Summary Items for the Domains

Domain	Total			High COG (MDS 0,1,2)			Low COG		
	N	Summary Match Items	Others matched	N	Summary match items	Others matched	N	Summary match items	Others matched
Comfort	1448	Yes	Privacy, Enjoyment, Security, Spiritual Well-being	748	Yes	Privacy, Enjoyment	694	No	Functional Competence, Enjoyment, Security, Spiritual Well-being
Functional Competence	1448	Yes	Privacy, Autonomy, Enjoyment, Relationships	748	Yes	Privacy	694	Yes	Autonomy, Enjoyment, Individuality
Privacy	1445	Yes	Functional Competence, Autonomy, Security	747	Yes	Autonomy, Spiritual Well-being	692	Yes	Relationships
Dignity	1447	Yes	Comfort, Autonomy, Relationships, Security,	747	Yes	Comfort, Relationships	694	Yes	Comfort
Meaningful Activity	1444	Yes	Functional Competence, Autonomy, Enjoyment, Relationships, Security, Spiritual Well-being	747	Yes	Functional Competence, Privacy, Enjoyment, Relationships, Spiritual Well-being	692	Yes	Functional Competence, Autonomy, Enjoyment, Relationships, Security
Enjoyment	1422	Yes	Comfort, Functional Competence, Meaningful Activity, Security	738	Yes	Comfort, Functional Competence, Meaningful Activity	678	Yes	Comfort, Meaningful Activity, Security
Individuality	1427	Yes	Comfort, Functional Competence, Autonomy, Dignity, Meaningful Activity, Relationships	739	Yes	Comfort, Dignity, Meaningful Activity, Relationships	683	Yes	Comfort, Autonomy, Dignity, Functional Competence, Meaningful Activity, Security, Relationships
Relationships	1449	Yes	Autonomy, Meaningful Activity, Spiritual Well-being	748	Yes	Comfort, Meaningful Activities, Spiritual Well-being	695	Yes	Autonomy, Enjoyment, Meaningful Activity, Spiritual Well-being
Security	1444	Yes	Comfort, Privacy, Dignity, Individuality, Security	748	Yes	Comfort, Privacy, Dignity	690	Yes	Comfort, Dignity
Spiritual Well-being	1443	Yes	Privacy, Meaningful Activity, Enjoyment, Individuality, Relationships, Security	745	Yes	Functional Competence, Meaningful Activity, Enjoyment, Relationships, Security	693	Yes	Autonomy, Meaningful Activity, Enjoyment, Security
Autonomy	1448	Yes	Functional Competence, Individuality, Relationships	747	Yes	Functional Competence	695	Yes	Functional Competence, Individuality, Relationships

## Conclusions from Wave 2

In summary, the new individuality items work, and we were able to confirm 11 domains in Wave 2. The scales continued to have adequate scale properties. We were able to interview residents in the same proportions as we did in Wave 1. Without an elaborate stratified sample, a pure random sample resulted in a sample well balanced between residents with better and worse cognitive functioning as measured by the MDS. As we had found with Wave 1, we were able to interview and complete scales for residents who had poor MDS-derived cognitive scores.



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## **Chapter 4**

### **Family and Line Staff Proxies for Resident Reported Quality of Life**

Quality of life (QOL) is a personal and subjective phenomenon. In previous chapters, therefore, we argued that the person living the life is by far the best source of information about his or her QOL. A person cannot be expected to understand how another is experiencing his or her life unless that information is directly communicated. Nonetheless, studying the QOL experienced by nursing home residents using self-report alone would mean that a substantial number of potential respondents who cannot communicate directly because of severe cognitive impairment or some other impairment would be excluded. If these residents are to be included in any efforts to measure QOL, some sort of proxy is needed.

#### **Background**

Proxies are regularly used in health and functional surveys, including standard surveys like the National Health Interview Survey. The underlying assumption is that a responsible party has knowledge of facts about another person's health status and use of services. The MDS data relies almost exclusively on a variant of proxy responses to obtain information on nursing home residents. Staff members were expected to observe the residents and infer various items of information from the behaviors noted. Depending on the sections, the person completing the MDS was expected to gather information from a number of staff informants across shifts, from observing and talking to the resident, and/or consulting records.

When factual questions are at issue, accurate proxy data requires selection of a proxy with a high likelihood of knowing the information sought for the relevant time period. When the proxy is asked to respond about the moods, attitudes, and satisfaction of another person, error could occur because the proxy respondent brings his or her own preconceptions or vested

interests to the interpretation of the resident's views.

Proxy information can be used as a direct surrogate for data from a particular resident. Alternatively, proxy data can be aggregated to create a summary measure for a facility. In the latter case, the appropriate test relies not on direct correspondence but on whether the average of the proxy responses compares to the average of the resident responses. The second criterion is easier to meet than the first one.

Proxies are frequently used but their validity is rarely tested. In the National Hospice Study, for example, a substantial amount of the reports on pain control came from proxies because the patients were either already dead or too sick to respond; however, no evidence was presented to show that a third party could describe another person's pain (Greer et al., 1986). Systematic literature review of 24 clinical studies from 1990 to 1999 showed variation in agreement between proxies and older subjects according to the nature of the inquiry. These studies concluded that there was often good comparability around levels of functioning, although proxies tended to identify more impairment; agreement was also good with regard to subjective assessments of overall health, chronic physical conditions and physical symptoms. The investigators report that the limited evidence on agreement around preferences for type of setting was high but that agreement for health state preferences was low. Agreement levels for depressive symptoms and psychosocial well-being was low to moderate (Neumann, Araki, & Gutterman, 2000).

QOL measures have been created for specific conditions (e.g., cancer, hip fractures) or specific aspects of life (health-related QOL) while others are more general and strive to measure global QOL. The sixteen articles presented in Table 4.1 reflect this diversity. In six, the subjects of study are people with some type of cancer. In five, the population is specifically older adults

(although people over 65 are represented in the other categories as well) and in three of these, the population is people with Alzheimer's disease. Two articles examine proxies for people with chronic conditions (stroke and epilepsy) while two more focus on acute care (ICU patients) or treatment (coronary artery bypass surgery) and one additional article assessed proxies for adults with intellectual disabilities.

The nature of the proxy respondent varied in these studies. In eight, the proxy was someone who knew the study subject well in a non-professional capacity, such as a family member, next of kin, friend or informal caregiver. The study subject often nominated these proxies. In two studies the proxies were a health care provider (nursing assistants in one, group home staff in the other), whereas two others used either a family member or provider interchangeably as the proxy, taking whomever was available. Four studies included both a family member and a health care provider.

Despite this diversity in study subjects and proxies, the approach to validity or the criteria used to assess the proxy information was very similar. In fifteen of the sixteen studies, proxy responses were compared to study subject's self-reports. The authors varied on how they conceptualized this comparison. Most portrayed the study subject as a gold standard, with the subject's responses being considered correct and proxy responses that differed being viewed as wrong. A minority of the authors suggested that self-reports could also be wrong; they lamented the lack of gold standard or proposed that some other source, such as a clinical assessment or administrative records should be used as the criteria for either self or proxy responses.

Table 4.1: Studies Evaluating Proxies for QOL Measures

Author (cite)	Title	Topic/Goal	Population	Proxy	Approach to Validity	Method of Analysis
Results						
Albert et al., 1996.	<i>Quality of life in patients with Alzheimer's disease as reported by patient proxies</i>	To measure QOL for persons with AD in terms of affect and engagement in activities	130 people diagnosed with AD and assessed for QOL	Family or institutional care givers. Selection procedure not specified	State the gold standard of a clinical observation was not available. Relied on comparison of types of caregivers, test-retest and relationship between QOL measures and dementia severity.	T-test and Chi-squares for differences between proxies; Pearson correlations between QOL and dementia severity; regression models for the impact of cognitive and functional status on QOL. Kappa used for test-retest.
Family and institutional caregivers report in similar ways (this is for different subjects). Variation in QOL was captured by measures. The QOL measures and cognitive status were inversely related.						
Andresen, Patrick, Carter, & Malmgren, 1995	<i>Proxy reliability: health-related quality of life (HRQOL) measures for people with disability</i>	Compare self-reports and proxy responses on BRSS, SF-36 and ADL/IADL items	131 people from NHs, assisted/ independent living, and spinal cord injury centers.	Someone who knew target well (family, care providers, friends)	Self-report is considered the standard as HRQOL is described as intended to represent self-perception	Kappa, Interclass correlation coefficient, % agreement, direction and magnitude of disagreement
Proxy reports are biased and the direction and magnitude depends on the domain. There is more variation in individual questions than summary or scales. Relatives agreed with subjects more than friends or health care providers.						
Capuzzo, Grasselli, Carrer, Gritti, & Alvisi, 2000	<i>Quality of life before intensive care admission: agreement between patient and relative assessment</i>	Compare self-report and proxy responses	172 adult ICU patients	Relative considered to be the next of kin	Concordance between patient and relative report	Kappas weighted and unweighted; Bland-Altman level of agreement; logistic regression with agreement as DV; IV proxy characteristics
High kappas (global .78 and .82) items better for physical function than emotional. Relative (proxy) characteristics did not affect results.						



Author (cite)	Title	Topic/Goal	Population	Proxy	Approach to Validity	Method of Analysis
	Results					
Curtis & Fernsler, 1989	<i>Quality of Life of Oncology hospice patients: a comparison of 90 patient &amp; primary caregiver reports</i>	Compare self-report and proxy	23 hospice patients with cancer	Primary caregiver (mostly spouses, others include daughters, friends, nephews)	No statement of which is viewed as correct, rather that disagreement indicates poor communication/ misunderstanding and may affect care.	Comparison of patient and caregiver means for each item and a total score. T-tests of differences between the means
	No significant difference on overall rating or 13 items. Pain ratings differed (p=.02) with patients reporting lower levels of pain.					
Dorman & Waddell, 1997	<i>Are proxy assessments of health status after stroke with the EuroQOL questionnaire feasible, accurate, and unbiased?</i>	To assess the utility of proxies for stroke patients	122 patients from a stroke registry	Relative or friend selected by patient and available at time of interview	Comparison to patient as the correct answer as it is stated that the patient's view is more likely to be valid given QOL is about perceptions; however. finds no accepted gold standard	Kappas, Bland & Altman plot and Intraclass correlation coefficient. Subgroup analysis by whether patient was able to complete questionnaire independently or was interviewed
	Better agreement with proxies for patients who were able to complete questionnaire than those requiring interview. Agreement best for self-care and worst for psychological outcomes.					
Epstein, Hall, Tognetti, Son, & Conant, 1989	<i>Using proxies to evaluate quality of life: can they provide valid information about patients= health status and satisfaction with medical care.</i>	Compare patient and proxy responses, determine characteristics associated with difference	60 clients over 65 years old from one health service clinic	Close family member or friend	Implied that patient response is the standard	Pearson correlation with z-stats to test for differences across subgroups. Mean differences and these regressed on proxy and subject characteristics
	Correlations ranging from .62 - .73 for 4 health status measures. Lower (.43) for satisfaction. Means were significantly different for satisfaction and emotional health. Higher number of hours helping was related to disagreement on functional status with proxy reporting more disability					

Author (cite)	Title	Topic/goal	Population	Proxy	Approach to validity	Method of analysis
	Results					
Hays et al., 1995	<i>Agreement between self reports and proxy reports of quality of life in epilepsy patients</i>	Compare patient and proxy reports of QOL in order to understand the implications of using proxies.	292 patients with epilepsy	Person who had contact with the patient at least once a week	Comparison to patient response, discriminant validity (higher correlations patient-proxy than among scales), lack of scatter bias (relation between patient- proxy and level of QOL)	Average absolute value of the difference, mean bias, standard deviation of difference. Product-moment and intra-class correlations. Multitrait-multimethod analysis of product-moment correlations. Forward stepwise regression using difference and patient, proxy characteristics.
	Agreement was moderate. Means closer than individual scores. Higher education was only characteristic associated with patient-proxy difference. Agreement better for observable measures (working, driving, social& physical function) than subjective (emotions, discouragement, social support)					
Hickey & Bourgeois, 2000	<i>Health-related quality of life (HR-QOL) in nursing home residents with dementia</i>	To test several measures with nursing home residents assess the utility of proxy data	107 nursing home residents with dementia	90 nursing assistants assigned to care for residents selected for the study	Comparison of resident and staff reports, and whether the comparisons were consistent over time.	Correlations on only one of the measures tested (The Geriatric Depression Scale)
	Resident and NA reports were not related and NAs reported almost twice as many symptoms as residents					
Moinpour & Lyons, 2000	<i>Substituting proxy ratings for patient ratings in cancer clinical trials: an analysis based on a Southwest Oncology Group trial in patients with brain metastases</i>	To explore how bias due to the use of proxies may affect the assessment of a treatment in a longitudinal clinical trial	51 patients in a clinical trial of post-surgical care for brain metastases	Selection method not specified. Primarily spouses and daughters, though relationship was missing for 22%	Patient report considered gold standard. Validity of proxy determined in part by whether its use as a surrogate for patient report alters conclusions.	Lin's concordance statistic (similar to ICC), graphical comparisons of difference versus the average of the two, and weighted Kappas. Double repeated measures analyses of impact of proxy on longitudinal estimates of treatment effect.
	Statistics and plots that show poor to moderate agreement between patient and proxy. Modeling results suggest that use of proxy data would change estimate of treatment effect.					

Author (cite)	Title	Topic/goal	Population	Proxy	Approach to validity	Method of analysis
	Results					
Novella & Jochum, 2001	<i>Agreement between patients' and proxies' reports of quality of life in Alzheimer's disease</i>	Study agreement between patients with AD; determine what factors influence agreement and if proxies systematically under or over estimate QOL	76 Patients with AD	Two types of proxies: 1. family members; 2. care providers	Patient report considered the standard and difference between patient and proxy defined as bias.	Percent of exact agreement across items in each subscale of the measure. ICC for subscale scores. Mean difference and effect size for subscale scores.
	Poor to moderate agreement overall. Better agreement for observable measures of function than subjective components. Spouses and nurses agreed with subject more than children or nurse's aides					
Page & Verhoef, 1995	<i>Quality of life, bypass surgery and the elderly</i>	Determine if QOL is affected by coronary artery bypass surgery (CABS) and compare patient and proxy ratings both pre and post-op	18 patients over 65 who had CABS from one primary care facility	Selection method not specified. 15 were spouses, others were brother, daughter and friend	States that agreement was the criteria used, but that it is unknown whether the patient or proxy response is more valid	Wilcoxon's match-pair signed-ranks test
	Generally good agreement. Pre-op there were differences in depression and anxiety and in the overall function score with patients reporting more negatively. Post-op no differences were found.					
Sigurdardottir & Brandberg, 1996	<i>Criterion-based validation of the EORTC QLQ-C36 in advanced melanoma: the CIPS questionnaire and proxy raters</i>	Validate scales in a QOL measure and determine the feasibility of using nurses and/or relatives as proxies	52 melanoma patients with metastases receiving chemotherapy	Nurses who worked on ward where patients were treated and next of kin selected by patient	Used patient responses as reference. Never compared nurse and family responses	Correlations between subscale scores for patient-nurse and patient-relative pairs and mean difference in scores
	Very low correlations between nurse and patient measures with nurses underrating subjective symptoms and overrating well being. Family correlations were moderate to high with no significant mean differences					

Author (cite)	Title	Topic/goal	Population	Proxy	Approach to validity	Method of analysis
	Results					
Sneeuw et al., 1997	<i>The use of significant others as proxy raters for the quality of life of patients with brain cancer</i>	Evaluate the level of agreement between patient and proxy ratings	103 patients with recently diagnosed or recurrent brain cancer	Significant other named by subject	Agreement of proxy with subject defines the quality of the proxy measure	ICC for test-retest reliability of both subject & proxy; % exact & approximate agreement & ICC for proxy subject agreement, ANOVA for factors affecting agreement; Repeated ANOVA and ICC comparisons for change in agreement over time.
	Exact agreement greater than 50%; approximate over 90%. Agreement was lower for patients with worse mental and physical function and for patients whose function deteriorated. Response bias was consistent (proxies lower) but small.					
Sneeuw et al., 1998	<i>Evaluating the quality of life of cancer patients: assessments by patients, significant others, physicians and nurses</i>	Assess the usefulness of different types of proxies	90 cancer patients with various diagnoses treated with inpatient chemotherapy at one hospital	Significant other named by patient (90); ward physicians (15) and nurses (35)	Patient as reference for each proxy; agreement across all four raters was used; suspect responses could come from any of the raters, including the patient	t-tests for differences in mean scores, Intra class correlation coefficients, exact and proximate category agreement and simultaneous comparisons of the four raters
	Proxy responses are reasonably accurate and one type of proxy is not better. There is a U-shaped relationship between agreement & patient function with more agreement at low and high levels of function					
Stancliffe, 1999	<i>Proxy respondents and the reliability of the Quality of Life Questionnaire Empowerment factor</i>	To assess the reliability of proxy responses on a QOL subscale on empowerment	63 adults with intellectual disabilities in group homes or supportive housing	Community living staff who had extensive contact with study subject	Uses both comparison of proxy-subject and the mean of two proxies	Percent agreement and Spearman correlation coefficients
	Generally good agreement between subject and staff; however a small number of pairs had extreme differences. Agreement was best on concrete items and worse on items about decisions made in the past.					

Author (cite)	Title	Topic/goal	Population	Proxy	Approach to validity	Method of analysis
	Results					
Wilson, Dowling, Abdoell, & Tannock, 2000	<i>Perception of QOL by patients, partners and treating physicians</i>	3 way comparison of patient, partner, & MD assessments of QOL	71 patients with metastatic breast cancer; 29 with metastatic prostate cancer	spouse partner or 1 <sup>st</sup> degree relative for breast CA, spouse/partner for prostate CA) and oncologist	Patient self-report is the standard for comparison	ANOVAs with Mean absolute scores and differences; proportion of exact agreement and intra-class correlations between patient and proxy
	Mean agreements were high, but individual agreements were low. Differences were greater on the more subjective domains (social, relationships, role and sexual function).					

Although comparison to self-reports is the most frequent approach used to evaluate proxies, others were occasionally used as well. Three studies included characteristics of the measure (e.g., test-retest agreement/consistency or discriminate validity) or confirmation of a predicted relationship between the proxy reports and some other variables such as dementia severity or level of QOL in their assessments. The approach central to this research, the comparison of proxies, was used in two studies (one used this approach exclusively), while one additional study collected data from two proxies and compared each to the study subjects but never analyzed agreement across the two proxies.

The analytic methods used to quantify the agreement between self-reports by subjects and proxies or to identify factors that might affect agreement varied. In some cases studies used multiple analysis methods because they posed multiple questions. In others, the authors used different methods and explained that there is no consensus on the best measures as each measure has different problems. The most frequently used was the kappa statistic or the intra-class correlation coefficient (ten articles), both of which are measures of agreement adjusted for the probability of chance agreement. Other measures frequently used included correlations (six articles) and percent agreement (six articles). Another category of approaches focuses on the size and/or direction of the differences in responses. These were used in six articles and ranged from raw differences to graphical representations of standardized differences. Mean values for group responses were also compared using t-tests in four cases. When the research sought to determine how variables such as proxy demographics or frequency of contact between proxy and study subject affect agreement in responses different regression models and ANOVAs were used. Given the differences in populations, proxies, and analysis methods it is not surprising that the results and conclusions often differ as well. For the most part, investigators seemed to rely

on statistical significance to declare proxies as successful alternatives, but the actual correlation coefficients rarely exceeded 0.3, with an occasional 0.4.

With this background, the CMS nursing home QOL study examined the relationship between proxy information on QOL from two sources (family and direct care staff) and information provided directly by nursing home residents.

## **Methods**

### Sample

Family sample and data collection. For each resident in Wave 1, one or more family members identified by the resident and/or the nursing home as being close to the respondent received a mailed questionnaire. If no questionnaire was returned for a resident, we contacted the family member by phone, and offered the option of telephone completion. We ranked family members as to current closeness to the resident. If we received two questionnaires for a family member, we used the higher-ranking one for primary analyses (see Appendix D for family questionnaire and contact form).

Staff sample and data collection. For each resident in the Wave 1 sample, we also completed a staff contact form to identify line staff members on the day or evening shift who were most likely to be knowledgeable about that resident. To be eligible for inclusion, the staff member must have cared for the resident for at least two weeks. When primary CNA assignments were used, we identified the resident's primary caregivers. We, then, assigned a staff member who would be queried about each resident. When choices were available, we allocated the assignments in such a way that no staff member would provide responses related to more than five residents. Staff members received a ten-dollar Wal-Mart gift certificate for each proxy interview they completed. (See Appendix C for the questionnaire and staff contact form.)

## Instruments

The questionnaires for family and for staff were developed to parallel the questions posed to residents on QOL and on resident affect. Not all domains were included, however, because they were felt to be unknowable by a third party. Neither family nor staff members were asked the relationship or spiritual well-being items since they entail high subjectivity; and we omitted the dignity items in the staff questionnaire since they seemed to call for an unreasonable amount of self-criticism (e.g. do staff treat Mrs. Jones roughly while giving care). Accordingly, the staff data addressed eight domains and the family data addressed nine domains that were comparable to the resident questionnaire. Staff were interviewed in person and given a \$10 gift certificate for each interview. Both staff and family were asked questions about their familiarity and contact with the resident, which were used as control variables in the analysis.

## Statistical Analysis

Comparison across domains was done with simple correlations of scale values. We created comparable scales based on matching items for each of the proxy respondent groups and the residents. The scales for both staff and family closely approximate the resident scales in length, being either identical, 1 question shorter, or (in 2 instances for staff and 1 for family) 2 questions shorter. We compared the mean values across groups using ANOVA for independent samples and we compared matched samples of each proxy and the corresponding residents with t tests. To test the correlations, we used three different correlation statistics: Pearson, Kendall and Spearman, as well as calculating Kappa statistics and inter-class correlations (ICC). To obtain the Kappas, we dichotomized the continuous scores at both the 20<sup>th</sup> and 25<sup>th</sup> percentiles.



## Results

Table 4.2 shows the mean QOL scales for each of the three groups. For each domain the mean values are significantly different across the groups. Table 4.3 examines the correlations between resident and staff proxy ratings. Three different forms of the analyses are shown: the Pearson correlation coefficients, the kappa statistic based on using the 20<sup>th</sup> percentile, and the ICC. In all cases, the results are highly statistically significant but the actual values do not show high levels of correlation. Only four of the Pearson coefficients exceed 0.2. The Spearman coefficients were slightly higher, and the Kendall coefficients were lower. The kappa values were all below .2 and improved if the 25<sup>th</sup> percentile was used. Only four ICC values exceeded 0.2. A regression model was used to adjust proxy responses to account for case mix differences. The independent variables describing residents used in the model were derived from MDS data. We used the same MDS cognition scale reported in Chapter 2.

Table 4.2: Comparison of Mean QOL Values by Respondent Group

Domain	Residents		Staff		Families		F test	
	Mean	SD	Mean	SD	Mean	SD	F value	Sig
Comfort	3.02	0.62	3.00	0.57	2.89	0.57	21.424	0.0001
Functional Competency	3.25	0.74	3.09	0.96	2.85	0.99	57.500	0.0001
Privacy	3.34	0.63	3.53	0.68	3.44	0.66	29.252	0.0001
Dignity	3.67	0.43			3.81	0.36	-9.193	0.0001
Meaningful Activity	2.69	0.72	2.64	0.79	2.51	0.70	18.134	0.0001
Enjoyment	3.22	0.73	3.37	0.58	3.20	0.69	29.918	0.0001
Individuality	2.82	0.73	2.74	0.83	3.08	0.71	69.428	0.0001
Security	3.40	0.56	3.56	0.58	3.33	0.54	69.622	0.0001

Table 4.3: Correlations Between Resident and Staff Proxies

Domain	Pearson Correlation		Kappa (20 <sup>th</sup> percentile)		ICC	
	Coefficient	Sig.	Value	Sig.	Value	Sig.
Comfort	0.251	0.0001	0.056	0.0001	0.2498	0.0001
Functional Competency	0.365	0.0001	0.139	0.0001	0.3649	0.0001
Privacy	0.151	0.0001	0.060	0.0001	0.1470	0.0001
Meaningful Activity	0.262	0.0001	0.142	0.0001	0.2613	0.0001
Enjoyment	0.198	0.0001	0.174	0.0001	0.1891	0.0001
Individuality	0.212	0.0001	0.067	0.0001	0.2100	0.0001
Security	0.131	0.0001	0.037	0.0001	0.1314	0.0001
Autonomy	0.169	0.0001	0.063	0.0001	0.1655	0.0001

A similar analysis for the correlations between family proxies and residents is shown in Table 4.4. The level of agreement is a little better than for the staff correlations. Three Pearson correlations are 0.3 or higher. Neither the Kendall nor the Spearman coefficients perform better. The kappa values are all low. One kappa improves greatly if the 25<sup>th</sup> percentile is used; comfort has a value then of 0.3, still well below any acceptable level. All but one of the ICC values is greater than 0.2 but only one is greater than 0.4.

We performed similar analyses using the single summary rating response for each domain. These results are shown in Table 4.5. None of the Pearson coefficients for staff proxies was equal to 0.2. Nor were any of the ICC values. The family proxies performed slightly better; two of the Pearson coefficients were greater than 0.2, as were the ICC values for these same domains.

Table 4.4: Correlations Between Resident and Family Proxies

Domain	Pearson Correlation		Kappa (20 <sup>th</sup> percentile)		ICC	
	Coefficient	Sig.	Value	Sig.	Value	Sig
Comfort	0.260	0.0001	0.068	0.0001	0.2588	0.0001
Functional Competency	0.458	0.0001	0.111	0.0001	0.4475	0.0001
Privacy	0.226	0.0001	0.088	0.0001	0.2260	0.0001
Dignity	0.142	0.0001	0.083	0.0001	0.1408	0.0001
Meaningful Activity	0.364	0.0001	0.074	0.0001	0.3637	0.0001
Enjoyment	0.354	0.0001	0.136	0.0001	0.3540	0.0001
Individuality	0.259	0.0001	0.090	0.0001	0.2585	0.0001
Security	0.250	0.0001	0.061	0.0001	0.2503	0.0001
Autonomy	0.214	0.0001	0.106	0.0001	0.2695	0.0001

Table 4.5: Correlations Between Proxies and Residents for Summary Items

Domain	Residents vs. Staff				Residents vs. Family			
	Pearson	Sig.	ICC	Sig.	Pearson	Sig.	ICC	Sig.
Comfort	0.126	0.001	0.1244	0.0001	0.151	0.0001	0.1244	0.0001
Functional Competency	0.180	0.001	0.1795	0.0001	0.181	0.0001	0.1795	0.0001
Privacy	0.079	0.004	0.0774	0.0021	0.147	0.0001	0.0774	0.0021
Control-choice	0.073	0.009	0.0728	0.0045	0.199	0.0001	0.0728	0.0045
Dignity	0.110	0.001	0.1081	0.0001	0.132	0.0001	0.1081	0.0001
Interesting things to see & do	0.142	0.001	0.1396	0.0001	0.227	0.0001	0.1396	0.0001
Food enjoyment	0.120	0.001	0.1182	0.0001	0.248	0.0001	0.1182	0.0001
Following preferences	0.026	0.364	0.0256	0.1829	0.159	0.0001	0.0256	0.1829
Relationships	0.110	0.001	0.1097	0.0001	0.160	0.0001	0.1097	0.0001
Security	0.095	0.001	0.0949	0.0002	0.145	0.0001	0.0949	0.0002
Spiritual well-being	0.150	0.001	0.1501	0.0001	0.122	0.0001	0.1501	0.0001
Life as a whole	0.094	0.001	0.0936	0.0003	0.176	0.0001	0.0936	0.0003

Another test of agreement, using the measures of emotions derived from Brod and Stewart. (Brod, Stewart, Sands, & Walton, 1999), is shown in Table 4.6. The correlations between staff and residents were generally low; none of the Pearson coefficients or the ICC values reached 0.2. The correlations with family proxies were somewhat better. Three Pearson coefficients and two ICC values were greater than 0.2.

Table 4.6: Correlations Between Proxies and Residents for Emotion Items

Emotion	Residents vs. Staff				Residents vs. Family			
	Pearson	Sig.	ICC	Sig.	Pearson	Sig.	ICC	Sig.
Lonely	0.085	0.001	0.0831	0.0008	0.159	0.0001	0.1526	0.0001
Happy	0.149	0.0001	0.1405	0.0001	0.219	0.0001	0.2151	0.0001
Bored	0.071	0.009	0.0690	0.0052	0.206	0.0001	0.1969	0.0001
Angry	0.152	0.0001	0.1520	0.0001	0.188	0.0001	0.1860	0.0001
Contented	0.122	0.0001	0.1176	0.0001	0.191	0.0001	0.1887	0.0001
Worried	0.113	0.0001	0.1119	0.0001	0.160	0.0001	0.1567	0.0001
Interested	0.176	0.0001	0.1744	0.0001	0.228	0.0001	0.2273	0.0001
Sad	0.087	0.001	0.0850	0.0007	0.169	0.0001	0.1632	0.0001
Afraid	0.117	0.0001	0.1164	0.0001	0.101	0.002	0.1006	0.0008
Future					0.156	0.0001	0.1553	0.0001

To explore whether the characteristics of the residents affected the concordance of proxy and resident reports, we regressed the resident ratings against the proxy ratings incorporating measures of residents' age, gender, disability level, cognitive status, and length of stay. Table 4.7 shows that adjusting for resident characteristics did not affect the relationship of the proxy report. Nor did the full model account for much of the variance in the resident QOL reports. For staff reports, the best models could account for only 7-8% of the variance.

Table 4.7: Regression Coefficients for Resident Ratings by Domain: Residents vs. Staff

	Domain							
	Comfort	Functional Competence	Privacy	Meaningful Activity	Enjoyment	Individuality	Security	Autonomy
(Constant)	1.840	2.592	3.042	2.145	1.754	2.951	2.652	2.793
Proxy	0.262 <sup>†</sup>	0.292 <sup>†</sup>	0.133 <sup>†</sup>	0.235 <sup>†</sup>	0.268 <sup>†</sup>	0.158 <sup>†</sup>	0.122 <sup>†</sup>	0.128 <sup>†</sup>
LOS	0.073	0.037	0.000	0.075	0.009	0.108	-.140**	-0.037
Gender	0.009	0.037	-0.010	0.053	-0.030	-0.185 <sup>†</sup>	-0.008	-0.026
Age	0.003	-0.004	0.000	-0.002	0.006*	-0.006*	0.005**	0.002
ADL	-0.017	-0.086 <sup>†</sup>	-0.047**	-0.041*	-0.020	-0.032	-0.024	-0.079 <sup>†</sup>
MDS	0.032**	0.037**	-0.059	0.023	0.051 <sup>†</sup>	-0.052 <sup>†</sup>	-0.005	-0.011
R <sup>2</sup>	0.072	0.157	0.059	0.079	0.058	0.080	0.036	0.056

\* means statistically significant at the level of  $p < .05$ .

\*\* means statistically significant at the level of  $p < .01$ .

<sup>†</sup> means statistically significant at the level of  $p < .001$ .

For families, the best model (functional competence) accounted for 23% of the variance because of the strong role played by the ADL adjuster. The models for two other domains accounted for 14% (enjoyment) and 15% (meaningful activity) of the variance in resident reports. The effects of the cognitive variable were mixed. Resident cognitive status was sometimes positively and other times negatively related to the concordance with the resident's QOL rating. By contrast, the ADL dependency measure score was consistently negatively associated with the resident's QOL rating.

Table 4.8: Regression Coefficients for Resident Ratings by Domain: Residents vs. Family

	Domain								
	Comfort	Functional Competence	Privacy	Dignity	Meaningful activity	Enjoyment	Individuality	Relationships	Security
Constant	1.740	2.477	2.719	3.137	1.548	1.663	2.652	2.590	2.281
Proxy	0.276 <sup>†</sup>	0.344 <sup>†</sup>	0.191 <sup>†</sup>	0.154 <sup>†</sup>	0.371 <sup>†</sup>	0.366 <sup>†</sup>	0.230 <sup>†</sup>	0.239 <sup>†</sup>	0.249 <sup>†</sup>
LOS	0.090	0.038	0.056	-0.057	0.205**	0.025	0.249**	0.144*	-0.061
Gender	0.047	0.010	-0.009	-0.038	0.038	-.129*	-0.230 <sup>†</sup>	0.015	-0.033
Age	0.004	-0.004	0.001	0.001	0.000	0.004	-0.006	-0.004	0.005
ADL	-0.021	-0.076 <sup>†</sup>	-0.033	-0.031**	-0.027	-0.019	-0.030	-0.007	-0.020
Cognition	0.025*	0.055 <sup>†</sup>	-0.052 <sup>†</sup>	-0.018	0.045**	0.027	-0.057 <sup>†</sup>	-0.017	-0.005
R <sup>2</sup>	0.080	0.233	0.076	0.042	0.152	0.138	0.116	0.081	0.073

\* means statistically significant at the level of  $p < .05$ .

\*\* means statistically significant at the level of  $p < .01$ .

<sup>†</sup> means statistically significant at the level of  $p < .001$ .

The proxy ratings were used in a second way. For each type of respondent (resident, family, and staff), we created a mean score for each facility by averaging the proxy ratings for that facility. When these mean scores were compared by type of respondent, the levels of agreement were much higher than for the correlations at the individual level. Table 4.9 shows the Pearson correlations and ICC values for the mean respondent facility ratings for each applicable domain and the family member and staff means. The results are much stronger. Among the staff five of the possible 8 Pearson correlations and four ICC values are above 0.4 and all but one is statistically significant despite the much smaller sample size ( $N=40$ ). For family members the pattern is stronger. For all but one domain (meaningful activities) the Pearson correlations and

the ICC values are 0.4 or greater.

Table 4.9. Correlations of Facility Level Domain Scores Between Residents and Proxies

Domain	Residents vs. Staff				Residents vs. Family			
	Pearson	Sig.	ICC	Sig.	Pearson	Sig.	ICC	Sig.
Comfort	0.6355	0.0000	0.6352	0.0000	0.4136	0.0080	0.4134	0.0036
Functional Competency	0.4296	0.0057	0.3692	0.0088	0.6385	0.0000	0.5203	0.0002
Privacy	0.5863	0.0001	0.5539	0.0001	0.6125	0.0000	0.5488	0.0001
Dignity					0.5378	0.0003	0.5377	0.0001
Meaningful Activity	0.4053	0.0095	0.4024	0.0046	0.1267	0.4359	0.1247	0.2187
Enjoyment	0.2587	0.1069	0.2457	0.0607	0.5029	0.0009	0.5022	0.0004
Individuality	0.4523	0.0034	0.4522	0.0015	0.4951	0.0012	0.4882	0.0006
Relationships					0.5018	0.0010	0.4054	0.0043
Security	0.3317	0.0365	0.3307	0.0174	0.4337	0.0052	0.5504	0.0004
Autonomy	0.3162	0.0468	0.3069	0.0255	0.4501	0.0036	0.4317	0.0024

## Discussion

Faced with respondents who cannot respond fully or reliably, researchers routinely turn to proxies. Reliance on proxies must depend on the nature of the data being sought and the way it will be used. If the goal is to reproduce the reports given by the actual respondents, then proxies can perform in only circumscribed areas. If the goal is simply to create an overall aggregated score across many respondents, then the need for specific individual level agreement can be relaxed.

It is one thing to use proxies to provide information about factual events, such as hospital admissions or falls. There the basic question is the opportunity to witness the event and the usual



concerns about the accuracy of recall. It is quite another thing to rely on proxies to provide information about what another person thinks or feels. The poor results reported here speak strongly to the need to be very careful in employing such approaches. Although the choice of correlation statistic should be based on the nature of the data being analyzed, in this study the results were similar regardless of the statistic used.

This low level of agreement between either family or staff proxies and residents has forced us to be extremely cautious in using either family or direct staff as proxies for resident reports when we have any possibility of getting feedback from residents themselves. We still intend additional work with both the family and staff reports to see if any items might be helpful for approximating QOL for residents for whom self-report is impossible, and to see if any family or staff characteristics better predict congruence with residents. We are undertaking some additional work with the family questionnaire to consider its properties in its own right, considering family members as themselves consumers on behalf of their relatives with dementia.

Our results were quite similar to what others have reported in other settings. The difference lies in the fact that what they celebrated, we mourn. Achieving statistical significance with correlation coefficients on the order of 0.3 or less does not mean that one can comfortably substitute a proxy report for that of a resident. When one thinks of these results in terms of variance explained, a correlation of 0.3 means explaining less than 10% of the variance in the residents' report; even a correlation of 0.4 explains only 16% of the variance. We, thus, conclude that one should use proxy reports of nursing home residents' QOL very cautiously.

Comparing aggregated mean values represents a less stringent test of proxies. Here the individual pairs need not agree, as long as one high or low score in one group offsets a similarly high or low score in the other. Thus, for creating an aggregate score for a nursing home, family

proxies may work; but even in this more relaxed test, staff proxies did not fare well.

The generally poor performance of proxies who are customarily used as information sources should raise some alarms in other areas as well. The Minimum Data Set (MDS) mandated by CMS (HCFA) relies almost exclusively on observations and inferences from nursing home staff. In some cases measures of pain (Fries, et al. 2001) are created from these observations. Although there is a gross correlation with these generated measures and more typical measures of these phenomena, questions must arise about the ultimate validity of this approach.

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## **Chapter 5**

### **Personality and Quality of Life**

Although most of our efforts to find person-level predictors of resident's quality of life (QOL) focus on the resident's health status and social circumstances, we also considered that a given resident's personality might influence his or her QOL. For example, in a qualitative study of how residents perceive quality in general, Gubrium interviewed residents in several facilities where the quality of care seemed largely constant. He found that the residents' personalities and ways of looking at the world were related to whether they viewed the care as good or poor (Gubrium, 1993)

Though not in the scope of the original contract, the second wave of the QOL study afforded an opportunity to study how, if at all, personality traits affect resident's appraisals of their QOL. Although nursing homes are accountable for their residents achieving a reasonably good QOL regardless of their personality traits, a systematic study of the relationship between personality and perceived QOL might offer clues as to those at greatest risk for poor QOL outcomes.

A review of existing personality measures revealed that the measures that were currently available were not appropriate for nursing home residents. First, almost all the existing measures rely on self-completed questionnaires, which would be difficult for residents with visual, motor, or cognitive difficulties. Some interview-based assessments of personality have been developed, but the length of these measures, such as a 120-item battery by Trull et al., which even if suitable in content would be too long to complete within the context of the larger QOL interview (Trull et al., 1998). Further, relatively little work has been done to measure personality in seniors, the most noteworthy exception being the self-completed NEO by Costa and McCrae (Costa & McCrae, 1988, 1990, 1999). Almost no work has been done with nursing-home

residents. Given these considerations, we undertook the task of developing a short measure of personality that could be administered near the end of the QOL interview in Wave 2. This chapter reports on both the development of the measures and our findings.

## **Development of the Measures**

### Approach

In our approach to personality assessment, we were guided by the Five Factor Model of personality, which holds that five global personality traits are sufficient to describe individual differences at the broadest level (John, 1990). These “Big Five” traits are Extraversion (E), Neuroticism (N), Agreeableness (A), Conscientiousness (C), and Openness to Experience (O), which are also the traits modeled by many others. Our review of the literature on personality measurement led us to use, as a starting point for our interview-based assessment, the Big Five Inventory (BFI). We chose this measure because the instrument itself was relatively short, and the items were concise and simple. For example, the items in the NEO are much more complicated for oral administration. The 44-item BFI has been shown to have adequate, psychometric properties (John, & Sirvastava, 1999).

Our efforts at developing an interview-based assessment of personality in nursing facility (NF) residents proceeded in two phases. In the first phase, a pilot study, we administered the original 44 items of the BFI in a sample of NF residents. The goal of this exercise was to shorten the scale and to determine whether the items worked in an interview administration mode, with a nursing home population. Analyses of the results of this pilot study indicated that the measure could be shortened to 27 items. In the second phase, this 27-item scale was administered at the end of the QOL interview in Wave 2 of data collection. Analyses of the Wave 2 data indicated that 2 of the 27 items did not perform as well in Wave 2 as they did in the pilot study. Thus, the

final personality assessment consisted of 25 items. Specifics of these analyses are presented below.

#### Pilot Study.

In the pilot study, we used a convenience sample of 14 nursing facilities in Minnesota, Florida and New Jersey. Six interviewers who had served as data collectors in Wave 1 collected the data for this pilot study. A convenience sample of 200 residents from these nursing homes participated in the study (46 males and 154 females). The interview for the pilot study included 56 questions that were asked of each participant. (Twelve of those items were related to the refinement of the individuality scale as reported in Chapter 5). The last 44 items of the protocol were adapted from the BFI and are presented in Table 5.1 (John & Srivastava, 1999). In the pilot, interviewers were instructed to approach alert residents because at this stage we used only the five-level response format mirroring that of the original test, and because we intended to seek feedback from respondents on the items and procedure itself.

Based on a small pretest before the pilot, we made a few modifications to the instrument. Importantly, the framing question was changed from the original: “I see myself as someone who...” to “As you look back on your whole life, do you see yourself as someone who...” The reason for this change was that without being anchored by a lifetime perspective, residents tended to focus on their current experience in the nursing home. Comments made by the residents revealed the need for this modification. A number of the items refer to the respondent’s stance towards work tasks, and the original wording invited a statement that he or she no longer did any work. Second, the wording for some of the items was modified slightly. For example, in some cases a more difficult wording was replaced by a simpler wording (e.g., “perseveres” was replaced with “sticks with”).



Table 5.1 Descriptive Statistics and Factor Analysis Results for the Original BFI Items

Item	EFA Factor Loadings						
	Mean	SD	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
1. Is talkative (e)	3.39	1.20	-.058	.121	-.063	.202	<b>.592</b>
2. <i>Tends to find fault with others (-a)</i>	2.51	1.23	-.074	-.024	.255	.233	.040
3. Does a thorough job (c)	4.31	.80	<b>.524</b>	.035	.046	.129	-.136
4. <i>Is depressed, blue (n)</i>	2.29	1.17	-.085	.009	-.322	-.212	-.119
5. Is original, comes up with new ideas (o)	3.41	1.11	.069	<b>.582</b>	-.180	.195	.059
6. Is reserved or slow to express an opinion (-e)	2.95	1.26	-.053	.157	.093	-.026	<b>.563</b>
7. <i>Is helpful and unselfish with others (a)</i>	4.24	.68	.239	-.032	-.045	.391	-.152
8. Can be somewhat careless (-c)	2.18	1.10	<b>.525</b>	.109	.001	.017	-.116
9. Is relaxed, handles stress well (-n)	3.59	1.16	.036	.033	-.327	-.345	.041
10. Is curious about many different things (o)	3.82	1.07	-.067	<b>.633</b>	-.089	.073	.048
11. <i>Is full of energy (e)</i>	4.06	.99	<b>.485</b>	.220	-.124	.186	.101
12. Starts quarrels with others (-a)	1.63	.78	.098	-.037	.112	<b>.469</b>	-.025
13. Is a reliable worker (c)	4.43	.64	<b>.505</b>	.037	-.105	.258	-.001
14. Can be tense or anxious (n)	3.06	1.15	-.001	.012	<b>-.551</b>	-.062	.084
15. Is ingenious, a deep thinker (o)	3.60	1.11	.128	<b>.445</b>	-.100	.192	-.119
16. <i>Is enthusiastic (e)</i>	3.95	.92	.070	<b>.452</b>	-.032	.176	.201
17. Has a forgiving nature (a)	4.23	.77	-.132	-.119	.174	<b>.684</b>	.006
18. <i>Tends to be disorganized (-c)</i>	2.34	1.15	<b>.508</b>	.008	.145	-.179	.007
19. Worries a lot (n)	3.02	1.27	.267	.050	<b>-.711</b>	-.096	-.071
20. Has an active imagination (o)	3.59	1.11	.114	<b>.532</b>	-.135	-.061	.150
21. Tends to be quiet (-e)	3.42	1.17	-.105	-.045	.096	-.121	<b>.767</b>
22. Is generally trusting (a)	4.16	.74	-.129	.123	-.036	<b>.704</b>	.084
23. Tends to be lazy (-c)	1.93	1.04	<b>.901</b>	-.103	-.116	-.074	.002
24. <i>Is emotionally stable, not easily upset (-n)</i>	3.55	1.06	-.111	-.185	-.334	-.226	.107
25. Is inventive (o)	3.02	1.22	-.056	<b>.660</b>	.066	-.185	-.112
26. <i>Has an assertive personality (e)</i>	3.47	1.13	.325	.203	.191	-.171	.154
27. <i>Can be cold and aloof (-a)</i>	2.40	1.17	.128	-.156	.161	<b>.422</b>	.134
28. Sticks with a task until it is finished (c)	4.18	.81	<b>.672</b>	-.087	-.014	.018	-.085
29. Can be moody (n)	2.62	1.18	-.245	.049	<b>-.451</b>	.041	-.082
30. <i>Values artistic, aesthetic experiences (o)</i>	3.59	1.07	-.163	<b>.578</b>	.105	-.013	-.018
31. Is sometimes shy, inhibited (-e)	2.91	1.25	.145	.042	<b>.436</b>	-.107	<b>.402</b>
32. Is considerate and kind to almost every one (a)	4.31	.63	.293	-.080	.052	<b>.616</b>	-.056
33. Does things efficiently (c)	4.16	.65	<b>.581</b>	.048	-.117	.125	-.087
34. <i>Remains calm in tense situations (-n)</i>	3.70	1.01	.231	-.240	-.325	<b>-.431</b>	.343
35. <i>Prefers work that is routine (-o)</i>	3.23	1.15	-.098	.306	.178	-.099	.000
36. Is outgoing, sociable (e)	3.90	.96	-.005	.200	.148	.375	.381
37. <i>Is sometimes rude to others (-a)</i>	2.00	1.05	.201	.050	.101	.265	-.337
38. <i>Makes plans and follows through with them (c)</i>	3.91	.94	.320	.245	.087	.012	.052
39. Gets nervous easily (n)	2.71	1.17	.045	.161	<b>-.742</b>	.037	-.047
40. Likes to reflect, play with ideas (o)	3.46	1.09	.014	<b>.647</b>	-.134	.070	.106
41. <i>Has few artistic interests (-o)</i>	2.91	1.22	.043	<b>.473</b>	-.034	-.023	-.038
42. Likes to cooperate with others (a)	4.21	.69	.093	.061	-.230	<b>.645</b>	.029
43. <i>Is easily distracted (-c)</i>	2.44	1.06	.390	-.074	.306	-.069	.117
44. <i>Is sophisticated in art, music or literature (o)</i>	2.87	1.25	-.085	<b>.502</b>	.156	-.274	-.150

Note:  $n = 182$ . The letters in parentheses after each item indicate which trait the item is intended to measure; a negative sign before the letter indicates an item that is reverse coded: (e) extraversion, (a) agreeableness, (c) conscientiousness, (n) neuroticism, (o) openness. Items in italics were eliminated to create the 27-item version of the BFI. Factor loadings greater, in absolute value, than .4 are in bold. Italicized items are the ones that were dropped after the pilot study.

The analyses of the pilot study data proceeded in three stages. First, we examined how well the 44 BFI items measured the big five traits, by testing the reliability of the trait subscales using the scoring recommended by John and Srivastava (1999). Second, to shorten the measure, we conducted an exploratory factor analysis (EFA). Using the EFA results, combined with separate analyses of internal reliability for each trait, we identified a subset of items that had reasonable psychometric properties. Third, the 27-item scale was subjected to a confirmatory factor analysis (CFA) to determine whether the hypothesized five-factor structure provided a good fit to the data.

The means and standard deviations for the 44 BFI items are presented in Table 5.1. At the level of traits, the BFI performed reasonably well in our sample, with alpha coefficients ranging from .65 to .73. Next, we conducted an exploratory factor analysis of the correlations among the items, followed by promax rotation. Five correlated factors were extracted, and the factor loadings from this EFA are presented in Table 5.1.

The goal of the procedures used to generate a short version of the BFI was to create a version of the scale that included 5 or 6 items per trait. Two sources of information were used to shorten the measure. First, we used the loadings from the EFA, identifying items with the highest loadings on the factors. Second, we examined the internal reliability of the 5 highest loading items on each factor. Then, by running a series of internal reliability calculations, we checked to see if any of the items with a lower factor loading contributed to a higher level of internal reliability at the level of the trait. This iterative process resulted in a 27-item BFI scale. The 17 items that were eliminated are in italics in Table 5.1.

Table 5.2 presents the number of items per trait in the 27-item scale, as well as the reliabilities of these shorter scales. The shorter BFI scales were significantly (all  $p < .001$ ) correlated with the longer parent scales. The correlation between the shorter and original BFI scales for the five traits were .93 for Neuroticism, .91 for Extraversion, .89 for Openness, .84 for Agreeableness, and .92 for Conscientiousness.

Table 5.2. Scale Qualities for 27-item Version of the BFI

Trait	<u>27-Item BFI</u>	
	# of items	Reliability
Neuroticism	5	0.67
Extroversion	5	0.66
Openness	6	0.73
Agreeableness	5	0.64
Conscientiousness	6	0.67

Finally, we conducted a CFA to test whether the hypothesized five-factor structure could explain the correlations among the items. The CFA confirmed the five-factor structure of the data, chi-square = 424.78,  $df=314$ . The RMSEA of the model (.044) was below the .05 threshold, indicating a good fit to the data.

### Wave 2 Large-Scale Application

In the next phase of our research, we administered the 27-item BFI instrument in the Wave 2 data collection. The 27-item BFI was included at the end of the interview protocol, after 66 items that assess QOL (See Volume 2, Appendix P, p. 9). The introductory comments were: “Here are some ways of describing personalities. We would like to know how much you agree or disagree with these statements as they apply to you. There are no right or wrong answers to these questions.” Then, we used the anchoring phrase, “Thinking of yourself during your whole life, do you see yourself as someone who . . .” The responses offered were “disagree strongly, disagree, neutral/don’t know, agree, strongly agree.” The original form worded the categories as “strongly disagree, disagree” and at the other end, “agree, agree strongly,” which made the

choices hard to distinguish when read aloud. We also used a large-print response card to assist those residents who had impaired vision.

At this point, we also offered respondents the same possibility of using a reduced response set if they had difficulty using 5 choices. We reverted to “agree/disagree.” Although we did not read “don’t know” as a choice, residents who said they did not know were recorded at the mid-point of a 3-point scale. Of the 1,271 participants with valid responses to all 27 items, 818 exclusively used the Likert-type response options (64.4%), 225 exclusively used the trichotomous responses (17.7%), and the remaining 228 participants used some combination of Likert-type and trichotomous responses (17.9%).

A question of interest was whether cognitive status influenced a resident’s choice of using the Likert-type responses or the simpler trichotomous responses. Table 5.3 shows the percentage of respondents at each level of our 6-point cognitive functioning scale (0=highest cognitive functioning and 5=lowest cognitive functioning) who chose the Likert-type responses for each of the 27 items in the analysis.

To be included in the analysis sample, a resident had to provide a valid response to all 27 of the personality items. The majority of the residents in the analysis sample were women (71.9%). The sample ranged in age from 56.8 to 106.0, with an average age of 83.2 (SD = 8.1.). Approximately one-fifth of the analysis sample (19.9%) had been residing in the NF for less than three months.

Table 5.3 Percentage of Respondents Choosing Likert-type Responses by Cognition

Item	Cognitive Score					
	0	1	2	3	4	5
1. Is talkative (e)	77	71	72	63	56	57
2. Starts quarrels with others (-a)	77	70	69	58	55	52
3. Does a thorough job (c)	77	69	67	60	54	49
4. Is relaxed, handles stress well (-n)	77	68	69	61	54	46
5. Is original, comes up with new ideas (o)	72	67	67	60	53	43
6. Is reserved or slow to express an opinion (-e)	74	67	69	58	53	45
7. Has a forgiving nature (a)	74	69	68	57	54	42
8. Can be somewhat careless (-c)	73	69	67	56	52	40
9. Can be tense or anxious (n)	73	67	68	56	52	43
10. Is curious about many different things (o)	72	67	67	56	52	40
11. Tends to be quiet (-e)	75	66	67	57	52	41
12. Is generally trusting (a)	73	66	67	55	52	40
13. Is a reliable worker (c)	74	67	66	56	52	43
14. Worries a lot (n)	74	67	67	56	50	42
15. Is a deep thinker (o)	70	65	65	57	50	41
16. Is sometimes shy, inhibited (-e)	71	66	68	56	50	44
17. Is considerate and kind to almost everyone (a)	73	68	67	56	50	41
18. Tends to be lazy (-c)	73	66	67	57	51	44
19. Can be moody (n)	73	66	65	55	51	43
20. Has an active imagination (o)	71	66	67	55	49	43
21. Is outgoing, sociable (e)	73	67	65	55	50	43
22. Likes to cooperate with others (a)	73	66	65	55	50	43
23. Sticks with a task until it is finished (c)	72	64	68	55	50	40
24. Gets nervous easily (n)	73	66	66	55	49	41
25. Likes to reflect, play with ideas (o)	70	65	65	54	49	42
26. Does things efficiently (c)	70	65	65	54	48	42
27. Is inventive (o)	68	66	65	54	48	39
Number of respondents (total 1668)	362	235	256	238	462	115

To make the analysis most comparable to the Pilot Study, we conducted an exploratory factor analysis of the 27 BFI items using the 818 respondents who provided Likert-type responses for all 27 of the personality items. Unexpectedly, a few items did not load on the expected factor in the analysis. An examination of the EFA results from the 27 items (not presented here) suggested that 2 of the items needed to be eliminated from the analysis. Thus, the final scale that emerged from the Wave 2 analysis consisted of 25 items. The means of these items, as well as their factor loadings from a different exploratory factor analysis that was conducted on this revised collection of 25 items are presented in Table 5.4. In general, the factor

loadings reveal that Conscientiousness and Agreeableness were not as distinct from each other as they were in the Pilot Study. In particular, item #3, which is intended to measure Conscientiousness, loaded more highly on the Agreeableness factor. Despite this high loading we elected to maintain item #3 in the Conscientiousness scale. Without item #3, the Conscientiousness scale drops to an unacceptably low alpha reliability. Table 5.5 characterizes this 25-item version of the BFI, including the alpha reliabilities.

A CFA was conducted to test whether the hypothesized five-factor structure could explain the correlations among the 25 items. Although the fit was not as good in Wave 2 as it was in the pilot study, the CFA generally confirmed the five-factor structure of the data, chi-square = 777, df=265. The RMSEA of the model (.049) was just below the .05 threshold, indicating a good fit to the data.

Table 5.4 Descriptive Statistics and Factor Analysis Results for the 25-item BFI in Wave 2

Item	Mean	SD	EFA Factor Loadings				
			Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
1. Is talkative (e)	3.28	1.18	.160	-.052	<b>.489</b>	.130	-.069
2. Starts quarrels with others (-a)	.97	.78	<b>.500</b>	.051	-.056	-.251	.085
3. Does a thorough job (c)	3.97	.80	<b>.410</b>	-.078	.047	.130	.271
4. Is relaxed, handles stress well (-n)	2.58	.99	-.207	<b>-.412</b>	.113	-.259	-.015
5. Is original, comes up with new ideas (o)	3.39	1.03	-.074	.087	.045	<b>.689</b>	.199
6. Is reserved or slow to express an opinion (-e)	2.09	1.07	-.102	-.004	<b>.489</b>	.058	-.084
7. Has a forgiving nature (a)	3.98	.81	<b>.525</b>	.087	-.072	-.012	.068
8. Can be tense or anxious (n)	3.19	1.07	.089	<b>-.620</b>	-.052	.040	.000
9. Is curious about many different things (o)	3.75	.91	.273	-.045	-.069	<b>.429</b>	-.111
10. Tends to be quiet (-e)	2.49	1.04	-.103	-.066	<b>.752</b>	-.042	-.021
11. Is generally trusting (a)	4.01	.71	<b>.767</b>	.049	-.028	-.046	-.131
12. Worries a lot (n)	3.14	1.16	.093	<b>-.760</b>	.037	-.065	.076
13. Is a deep thinker (o)	3.55	.99	.190	-.089	-.072	<b>.419</b>	.050
14. Is sometimes shy, inhibited (-e)	2.00	1.10	.071	.136	<b>.587</b>	-.080	.061
15. Is considerate & kind to almost everyone (a)	4.09	.65	<b>.694</b>	-.004	-.009	-.088	.080
16. Tends to be lazy (-c)	1.20	.98	.142	.167	.026	.010	<b>.400</b>
17. Can be moody (n)	2.85	1.09	-.103	<b>-.437</b>	-.012	.154	-.201
18. Has an active imagination (o)	3.51	1.07	-.030	.033	-.051	<b>.713</b>	-.154
19. Is outgoing, sociable (e)	3.68	.94	.375	.048	.347	.195	.026
20. Likes to cooperate with others (a)	4.02	.62	<b>.654</b>	-.096	.058	.043	.218
21. Sticks with a task until it is finished (c)	4.05	.71	.341	-.077	-.019	.191	<b>.520</b>
22. Gets nervous easily (n)	2.90	1.13	-.023	<b>-.790</b>	.003	-.056	.078
23. Likes to reflect, play with ideas (o)	3.48	.99	.021	-.025	.035	<b>.624</b>	.119
24. Does things efficiently (c)	3.94	.72	.303	-.158	-.075	.251	<b>.490</b>
25. Is inventive (o)	3.13	1.10	-.197	.073	.012	<b>.694</b>	.270

Note: N=818. Loadings with an absolute value above .4 are in bold.

Table 5.5 Scale Qualities for 25-item Version of the BFI

25-Item BFI		
Trait	# of items	Reliability
Neuroticism	5	0.68
Extraversion	5	0.61
Openness	6	0.73
Agreeableness	5	0.62
Conscientiousness	4	0.62

### Relationship Between QOL and Personality

We have conducted some preliminary analyses linking personality and QOL. Specifically, separate regressions were run for each QOL outcome measure, and the independent variables that were entered included: a brief cognitive functioning scale (derived from the MDS), a measure of physical functioning (derived from the MDS), and the five personality traits. The results of these regressions are presented in Table 5.6.

Table 5.6 Regression Results Predicting QOL Using Cognitive and Physical functioning and Personality.

QOL Domain	R <sup>2</sup> Due to Cognition & Function	BFI R <sup>2</sup> Change	Total R <sup>2</sup>	% of Explained Variance Attributable to BFI
Spiritual Well Being	.002	.056	.058	97
Security	.013	.067	.080	84
Individuality	.008	.034	.042	81
Comfort	.022	.077	.099	78
Relationships	.015	.024	.039	62
Dignity	.039	.049	.088	57
Meaningful Activities	.047	.027	.074	36
Privacy	.033	.014	.047	30
Enjoyment	.034	.013	.047	28
Autonomy	.069	.017	.086	20
Functional Competency	.223	.014	.237	6

Table 5.6 should be read going across the rows. For example, the first line presents the results for the regression for Spiritual Well-being. The first number (.002) indicates the amount of variance explained by the cognitive and physical functioning measures, when both were entered in the first step of the regression. The second number (.056) indicates the amount of variance explained by all 5 traits, when entered in the second step. The third number indicates the total amount of variance explained by the first two steps of the regression, and the final column presents the percentage of explained variance that can be attributed to personality. An examination of the final column suggests that the QOL subscales differ in the extent to which they are related to personality. Measures of Spiritual Well-being and Security are most closely linked with personality, whereas measures such as Autonomy and Functional Capacity show much smaller relationships with personality.

Table 5.6 shows the amount of variance in each trait that can be explained by all five traits when entered simultaneously. When looking at the specific pattern of results at the trait level, two broad patterns emerged. First, high levels of Agreeableness were associated with higher levels of QOL (e.g., comfort, relationships, dignity, meaningful activities, spiritual well-being). Second, Neuroticism was associated with lower scores on many of the QOL domains, including comfort, meaningful activities, security, and autonomy.

### **Areas for Continued Investigation**

Our work on personality and QOL is ongoing. A number of general questions are guiding our next research efforts. For example, the results related to quality have been done on the Likert-type responses only. We are currently conducting further analyses to determine the extent to which we can add trichotomous responses without adversely affecting our ability to measure personality; we will begin by exploring the characteristics of residents who use the trichotomous



responses sometimes or all the time to those who use only Likert. Finally, as mentioned above, the preliminary analyses linking personality and QOL need to be finalized and expanded.

### **Concluding Comments**

We believe that our efforts to assess personality in a nursing home population have yielded a brief interview measure that will be useful in understanding the many processes that culminate in a given individual's level of QOL. Though we would have preferred that the reliabilities for all of the scales meet the generally recommended level of .70 or higher, there are a number of reasons to expect lower reliability in our data. These include the small number of items used to measure each trait, possible resident fatigue experienced by the end of a long interview, and modifications made to the original scale. Thus, on the whole, we are encouraged by our analyses using the personality measure to date, and are pursuing multiple follow-up analyses.

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## **Chapter 6**

### **Patterns of Quality of Life in Facilities**

Once we developed scales to use to characterize an individual resident's quality of life (QOL), we could explore additional questions, particularly: what characteristics are associated with residents reporting a better or worse QOL on various domains; and to what extent are nursing homes distinguished from each other by the QOL that their residents tend to report. For regulatory purposes, it may be important to determine that facilities do indeed differ in the average reported QOL of their residents. For a nursing home's own continuous quality improvement efforts, information about correlates of QOL at the individual level could help target the efforts.

#### **Background**

Central to all facility-level uses of the QOL data is an assumption that nursing homes should be held accountable for QOL outcomes of interest. Nursing homes differ from many other health care programs in that, for many residents, they serve as dwelling places for long periods of time. The nursing home, therefore, has the potential to influence residents' lives for better or worse on outcomes that are far broader than health status. Arguably, the nursing home's effects on its residents' QOL are at least as important as the more traditional measures of quality of care that are routinely collected.

Some controversy exists, as yet uninformed by much data, about the extent to which a nursing home can actually influence the social and psychological domains of QOL. For example, outcomes such as meaningful activity, relationships, and the like may be heavily determined by social factors outside facility control, such as family structure and availability, quality of family relationships, and resident's interests, education, and even personality. It is also

reasonable to hypothesize that QOL levels in a nursing home will be related to various health and disability characteristics such as: health status, prognosis, functional abilities, sensory abilities, pain, persistent serious depressive illness, and cognitive abilities. These factors can affect how a resident appraises his or her QOL. Nursing homes, however, can likely influence some of these potential mediators of QOL directly, especially pain, functional status, and depression (particularly depressive affect that is not part of a longstanding psychiatric diagnosis). Although it is difficult for nursing homes to overcome the effects of extreme sensory impairment, high disease burden, irreversible cognitive impairment, and poor prognoses, we suggest that nursing homes can take effective steps to improve or maintain QOL for those who may be at highest risk of poor QOL, including those with dementia, those who are facing imminent death, and those who have limited external social support systems.

Indicators of quality of a health-care organization may be expressed at several levels. One way to generate indicators is to identify facility-level structural and process factors that relate to outcomes of interest, such as nursing staff levels or infection control. Another approach is to aggregate individual level data on outcomes of interest (e.g. proportion of bedsores, proportion of urinary tract infections) to describe the facility. When such outcomes are aggregated, adjustments are necessary for aspects of the case-mix that are out of the control of the facility. Using the second approach, nursing home data generated through the Minimum Data Set (MDS) have been under study for more than a decade and various health-oriented outcome indicators have been developed using different case-mix adjustment strategies. For quality assurance purposes, and for presenting meaningful comparative data to the public, it is necessary to avoid describing nursing homes as better in quality if a substantial amount of the differences can be attributed to the characteristics of the residents who are admitted. On the other hand, one must

not over-adjust and, therefore, fail to hold nursing homes accountable for characteristics of residents that they may be able to change (e.g. bed-bound, wheelchair-bound residents, or residents who are depressed).

A central task in creating a facility-level measure of QOL is to adjust appropriately for differences in case mix across facilities, although this need is not always appreciated (Davis, 1991). The choice of case-mix adjusters is important; they should reflect elements that might influence QOL, but they should not include items that are under the control of the nursing home, lest important differences in quality are adjusted away. Although a growing body of information is available on case-mix adjustment for quality of care in nursing homes (Braun, 1991) (Mukamel, 1997) (Phillips et al., 1996; Porell & Caro, 1998), little work has been done on QOL.

## **Methods**

### Data

Data for these analyses are derived from the resident interviews in the two waves of data collection, information abstracted from each resident's chart (e.g., birth date, date of admission), and data derived from the MDS. In addition to QOL data, the resident interview also collected basic demographic data (e.g., gender, race, marital status). We had acquired the MDS files for all the residents in all the 101 participating facilities for 18 months prior to our data collection for both Wave1 and Wave 2. This permitted us to use individual information on each resident in the sample for adjustment purposes; for example, we used data from the cognition and ADL sections for such adjustments. It also permitted us to create facility averages of case-mix characteristics of interest. For adjustment purposes, we used the MDS evaluation closest to the time of the resident interview to create the cognitive and ADL adjustment. The latter was based on a count of the number of ADLs in which the resident was rated as requiring assistance.

Finally, facility descriptors such as size, urban or rural location were drawn from our own data base.

### Analysis

The comparison of QOL among facilities was implemented on two levels: raw scores and scores adjusted for differences in patient characteristics. First, QOL scores were calculated using all available resident-level responses and aggregated by facilities to obtain non-adjusted, facility-level average QOL scores. Resident-level data were also used to develop a case-mix adjusted model that regressed individual QOL scores on selected resident characteristics obtained from MDS data. These included ADL, cognition, age, gender, and length of stay. Length of stay was dichotomized into less than three months and three months or more.

To enable the comparison of facilities while adjusting for patient characteristics, differences were calculated between the observed individual QOL scores and the expected QOL scores calculated based on the case-mix adjusted model described above. The standardized resident-level residuals were averaged by facility to obtain facility-level adjusted scores. The distribution of the facility-level adjusted scores for all facilities was transformed using z-scores. As a result, the differences among facilities were expressed in units of the standard deviation of average scores for all facilities. By construction (assuming close to a normal distribution), we could expect that approximately half of all facilities would have positive and another half would have negative standardized scores in the range from minus three to plus three.

Two-way analysis of variance was used to compare the differences in distributions among the reports for a given domain within each home and across the homes. Chi square tests were used to compare the proportion of outliers by characteristics of the facilities. Statistical tests were implemented using SPSS 10.1.

Mixed-effect hierarchical linear models with main effects were used to fit the data. Ten components of the QOL instrument were used as dependent variables in Wave 1 and 11 in Wave 2. Independent variables included various combinations of random factors (Facility, Interviewer), and covariates. The design of the models reflected nesting of the data. The allocation of Interviewers by Facilities was not planned in advance and post hoc cross-tabulation revealed very unbalanced design with many empty cells. This imbalance dictated the use of a Type 4 sum of squares that can accommodate the design with empty cells. Covariates included in the models served as risk-adjustors and included length of stay in the nursing facility and MDS-based cognition score (six-level ordinal variable), the ADL score, age and education (five-level ordinal variable), and binary variables representing race, marital status, gender, and the presence of children. These variables were constructed based on the measured values to obtain reasonably unskewed distributions. Calculations were implemented using the General Linear Model procedure in SPSS 11.0.

## **Results**

### Wave 1 Findings

Results are presented separately for Waves 1 and 2. The characteristics of the Wave 1 facility sample are shown in Table 6.1, which also contrasts the sample facilities to the national profile on some parameters. The mean size of facilities in the resultant sample was 128 beds; the median was 109.

Table 6.1 Wave 1 Facility Characteristics (N=40)

Characteristics	National Rates <sup>a</sup>	Sample Facility Rates	Source of Data
Mean No. of Beds (Range)	108	128 (49-289)	Initial contact survey
% Urban		50%	Initial contact survey
Mean % single rooms (Range)		24.42% (0,100%)	Initial contact survey
Mean staff/resident ratio (Range)	0.60 – 1.00	0.62 (0.13 – 0.92) <sup>b</sup>	OSCAR
% Proprietary	65.2% (6.7 in AL – 82 in OK)	37.5%	Initial contact survey
Mean % Medicaid residents (Range)	67.7% (49.4 in IA – 84.7 in AL)	67% (0 – 97%)	Initial contact survey
Mean % residents with better cognition—i.e., score of 0-2 <sup>c</sup> (Range)		42.6% (11 – 76%)	MDS

Notes:

- a. National rates come from 1999 – 2000 (Source: AHCA Facts and Trends: Nursing Facility Sourcebook 2001).
- b. Staffing number comprises FTEs of CNAs, LPN/LVNs, and RNs (whether contracted, full time, or part time).
- c. Based on the same 6-point MDS-derived cognitive function scale described in Chapter 2 (range from 0-5).

By design, half the sample was rural. There was a considerable range in staffing. The proportion of homes that were proprietary was much lower than the national average, partly because Minnesota and New York have high numbers of nonprofits, but also because most of the refusals occurred in for-profit facilities, whereas all the facilities over-sampled for private rooms were nonprofit. There was considerable variation in the proportion of cognitively impaired residents. This distribution was generally similar across four of the states (averaging about 55%), but California homes had a much higher proportion (67%) than the rest of the sample.

The mean facility scores for each domain are shown in Table 6.2. We created an average score across domains by dividing the additive scale by the number of questions for the particular domain. Each QOL domain could be scored between 4 and 1, with higher scores reflecting



higher QOL. Facility-level scores varied from 2.70 (meaningful activity) to 3.67 (dignity). The extent of between-facility variation in the scores is reflected in the standard deviations, which varies over 100% (from 0.101 for dignity to 0.212 for spiritual well-being).

Table 6.2 QOL Domain Alpha Values and Facility Scores

Domain	Domain Scores		Facility Scores	
	Alpha	No. Items	Mean	Standard Deviation
Comfort	.62	6	3.0210	.1525
Functional Competence	.65	5	3.2463	.1577
Privacy	.52	5	3.3326	.1682
Dignity	.64	5	3.6667	.1011
Meaningful Activity	.77	5	2.6975	.1766
Food Enjoyment	.71	3	3.2176	.1923
Relationships	.70	5	3.0639	.1902
Security	.76	5	3.3939	.1363
Spiritual well-being	.59	4	3.1503	.2120
Autonomy	.64	4	3.2981	.1497

Table 6.3 is designed to show the overall patterns of performance for each facility, by displaying the results arrayed by facility according to whether the facility mean score was above or below the sample average on each domain. To make the distinctions more visible, the facilities are arranged in order of the size of the deviation. The facilities are ranked from best to worse. Each + or - sign represents a standard deviation; the more + or - signs, the greater the facility average deviates from the mean for that domain. The results show that facilities do indeed differ in their average QOL on these domains. In 23 facilities two or more domains were consistently positive or negative by at least one standard deviation. Ten facilities showed a consistently positive pattern and 13 a consistently negative pattern.

Table 6.3. Facility-Level Deviations in Resident-Report QOL (Risk-Adjusted)

NF	Comfort	Functional Competence	Privacy	Dignity	Meaningful Activity	Enjoyment	Relationships	Security	Spiritual well-being	Autonomy
11	+		+		+	+	++		+	
13	+	+				+	+	+		+
28	+		+		+	+		+		+
5		+	+	+					+	
34	+		+	+	+					
6	+			+			+	+		
2		+			+	+				
31		+						+		+
26						+	+			+
1		+			+					
18			+							+
35							+			
32						+				
8								+		--
10			+	-						+
38		+			-	+			+	+
3			+			-	-		-	
4	-			+						
15						+			+	-
36	+	++	-		--	--	-			+
40	+			-	-		-		+	
19	-			+						
20	-	-			+					
30	-						+		+	+
33										
25		-								
37		-								
29		-		-						
7							-		-	
9			-			-			-	
27		-					-			-
23					--	-		---		
24	-		--	---						
16		-				-		-	-	
14					-		-	-	-	
21	-					-	-		-	-
22	-	-		-		-		-		
17	-		-	-				-	-	
39	-		-		-		-		-	--
12	-	-		-				-	-	-

Note: The adjustment is for ADL, cognition, age, gender and length of stay.

The differences in facility QOL scores can be due to differences in facility performance, but they can also be attributed to resident case mix and the differences in the way interviewers performed. Table 6.4 presents a comparison of the ability of various components of QOL to discriminate among facilities using raw, non-adjusted measures and adjusted measures. The numbers in the table represent relative variance and p-values associated with a corresponding random factor. Higher relative variance and lower p-values indicate better chances to discriminate the analyzed entities (i.e., facilities, interviewers). When comparing p-values, correction for multiple comparisons has to be applied and the threshold p-value of 0.005 instead of 0.05 should be used. Prior to risk-adjustment six domains out often show a p-value less than 0.005, which corresponds to a relative variance greater than 3%. In one case (Spiritual Well-being) this value is close to 6%. Two more domains (Meaningful Activity, Autonomy) fall in the range of p-values from 0.005 to 0.05. When risk-adjustment was applied for patients' characteristics (covariates included into the model), no dramatic changes were found. After adjustment, the relative variance of the Facility factor increased in five cases and decreased in five cases. Six domains demonstrated p-values less than 0.005 and three between 0.005 and 0.05. Two domains did not show any significant contribution of the Facility factor. As a result of risk-adjustment, the overall level of significance associated with the same relative variance dropped because of the degrees of freedom consumed by risk-adjustment. For example, the factor Facility prior to adjustment was able to explain 2.2% of total variance of autonomy with  $p=0.007$ . After adjustment the relative variance increased to 2.4% but the corresponding significance became slightly worse ( $p=0.009$ ).

Table 6.4. Ability of Various Components of QOL to Differentiate Facilities  
(Non-adjusted and Adjusted for Residents' Characteristics)

	Non-adjusted		Adjusted for residents' characteristics	
	% total variance explained by Facility	P value	% total variance explained by Facility	P value
Comfort	3.1	0.0001	5.1	0.0001
Functional Competence	1.1	0.103	0.7	0.245
Privacy	3.2	0.001	3.8	0.0001
Dignity	1.0	0.053	0.9	0.075
Meaningful Activity	2.5	0.008	2.7	0.008
Enjoyment	3.5	0.001	3.9	0.001
Relationships	4.1	0.0001	3.6	0.001
Security	3.0	0.002	1.7	0.046
Spiritual Well Being	5.9	0.0001	5.2	0.0001
Autonomy	2.2	0.007	2.4	0.009

The study design did not specify how interviewers were distributed across facilities. Consequently, some interviewers visited as few as two facilities and some visited as many as seven facilities. All interviewers were trained and demonstrated acceptable inter-rater reliability. Nevertheless, that fact does not exclude the possibility that observed differences between facilities might be partially related to differences among interviewers. To test this assumption an additional correction for the random Interviewer factor was applied (Table 6.5). Eight domains demonstrated a loss of relative variance; only two domains did not show any change. In four cases variance associated with Interviewers was even greater than variance associated with Facilities (comfort, privacy, meaningful activity, security). This trend was combined with the fewer degrees of freedom; therefore, just one Facility p value (domain, dignity) fell in the range 0.005 to 0.05 and no one domain had a significant p-value ( $P < 0.005$ ).

Table 6.5. Ability of Various Components of QOL to Differentiate Facilities  
(Adjusted for Residents' Characteristics and Allocation of Interviewers)

	% total variance explained by Facility	P value	% total variance explained by Interviewer	P value
Comfort	2.9	0.034	5.1	0.001
Functional Competency	0.7	0.301	0.0	0.725
Privacy	2.1	0.232	2.8	0.195
Dignity	0.9	0.049	0.5	0.220
Meaningful Activities	1.6	0.173	2.7	0.059
Enjoyment	2.8	0.145	1.7	0.161
Relationships	2.8	0.155	1.1	0.685
Security	0.3	0.724	2.0	0.422
Spiritual Well Being	3.5	0.070	1.5	0.496
Autonomy	2.4	0.073	0.0	0.600

The effect of losing degrees of freedom can be illustrated by comparing models for autonomy (Tables 6.4 and 6.5). Table 6.4 shows that the model adjusted for patient characteristics explains 2.4% of total variance and the Facility factor has p-value equal to 0.009. Table 6.5 shows that the model with added Interviewer factor has the same relative variance of 2.4% associated with the Facility factor and zero variance explained by the Interviewer factor. Nevertheless significance of the Facility factor became much worse (0.073 instead of 0.009).

To explore whether QOL changes as residents stay longer, we compared the various domains scores by length of stay. As shown in Table 6.6, there is no substantial change in the domain scores over time.

Table 6.6. Effect of Length of NH Stay on Domain Scores at Wave 1

Domain	Length of Stay (months)							
	< 1 month	1-2	2- 3	3- 6	6-12	12-18	18-24	> 24 months
Comfort	3.04	3	2.9	3.06	2.96	3.03	3.14	3.03
Functional Competence	3.1	3.29	3.24	3.34	3.25	3.25	3.28	3.22
Privacy	3.35	3.38	3.37	3.36	3.38	3.28	3.27	3.35
Dignity	3.73	3.79	3.68	3.71	3.68	3.67	3.7	3.63
Meaningful Activity	2.74	2.65	2.45	2.72	2.73	2.62	2.75	2.72
Enjoyment	3.39	3.09	3.09	3.34	3.11	3.27	3.22	3.24
Individuality	2.87	2.6	2.67	2.81	2.87	2.83	2.7	2.87
Spiritual Well-being	3.12	3.07	3.01	3.08	3.09	3.13	3.15	3.23
Security	3.61	3.58	3.47	3.43	3.39	3.4	3.4	3.33
Autonomy	3.53	3.38	3.2	3.38	3.34	3.23	3.27	3.28
Relationships	3.19	2.95	2.9	3.02	3.09	3.07	3.01	3.12
# of res.	40	108	93	200	290	214	174	867

## Wave 2 Findings

Table 6.7 shows the characteristics of facilities in Wave 2. Because a different sampling scheme was employed, the characteristics differ from those of Wave 1. The facilities are generally larger and have many fewer single rooms. The staffing levels are generally comparable. Fewer facilities are proprietary and the proportion of Medicaid patients is slightly less. Many more residents are cognitively impaired.

Table 6.7 Wave 2 Facility Characteristics

Characteristics	Sample facility rates	N	Data Source
	Mean (range)		
No. of licensed beds	156.79 (67-559)	56	mailed survey
% of private rooms	14.24% (0-100%)	57	mailed survey
Staff/resident ratio	0.66 (0.41-.21)	61	OSCAR
% Proprietary	57.40%	57	mailed survey
% of Medicaid	63% (0-98%)	55	mailed survey
% of more cognitively impaired residents (MDS score of 3-5)	68% (38-91%)	60	MDS

The same pattern of variation in performance across QOL domains was seen as that in Wave 1 As Table 6.8 shows. there were fewer extreme cases; but, in general, facilities tended to be primarily positive or negative.

Table 6.8. Facility Risk-adjusted Performance Summary at Wave 2

NF	Domain										
	Comfort	Functional Competence	Privacy	Dignity	Meaningful Activities	Enjoyment	Individuality	Relationships	Security	Spiritual Well-being	Autonomy
1-01	+	-									+
1-02			+								
1-03	+		+	+		++	+	+			+
1-04		+	+	+		+	++	+	+	+	
1-05					+			++			
1-06		-					-				
1-07	-									-	--
1-08				+	+					+	-
1-09			-	-					-	+	-
1-10	-	+		+							
1-11				--	-		--	-	--		-
1-12		+							-	+	
2-13	-			--		-	-	-	-		
2-14	-	-		--	+		-		--		
2-15									-		
2-16		-			++			+			
2-17				+		+	+	+	++	+	
2-18							+			-	+
2-19	-			-						+	
2-20			-		+		-				
2-21	+	+		+				-	+	-	++
2-22	+			+	+		++	++			+
2-23		+								-	
2-24	-			-				-	-	-	
2-25			+				-	-		-	
3-31	-	-		-	-	--			-		
3-32	+	-			--	-					
3-33											
3-34	+							-		-	
3-35					+				+		+
3-36	+									+	+
3-37											
3-38	++	++	+	+	+		+		+		
3-39				+					-		

Table 6.8, cont'd											
	Comfort	Functional Competence	Privacy	Dignity	Meaningful Activities	Enjoyment	Individuality	Relationships	Security	Spiritual Well-being	Autonomy
3-40		-				--	-	-		-	
3-41									+	-	
3-42	++	+	+		-	--		-		--	
4-70			+			-		+			
4-71	-					-			-		
4-72	-				-					-	+
4-73		--	--			-	-	-			--
4-74	+				+	+		++		+	
4-75								++			
4-76				-		+				+	
4-77				+			+				
4-78					-						
4-79	+		+			+			-	+	
4-80		+	+								+
4-81						+					
6-50	+				+	++	+	+	+	-	
6-51					+						
6-52											-
6-53								-	+	+	
6-54					-	-	-	-			
6-55											-
6-56			-			-		-			
6-57	-	+	-		-						
6-58	-		-		-			+			--
6-59						+					
6-60			---		-						-
6-61	+	-								+	--

The sample in Wave 2 included more short-stay residents and permitted closer inspection of the effects of lengths of stay. The same pattern of domain scores over time seen in Wave 1 is found in Wave 2. As shown in Table 6.9, residents' domain scores did not change appreciably with their length of stay.



Table 6.9 Effect of Length of NH Stay on Domain Scores—Wave 2

Domain	Length of Stay (months)							
	< 1 month	1 ~ 2	2 ~ 3	3 ~ 6	6 ~ 12	12 ~ 18	18 ~ 24	> 24 months
Comfort	2.93	2.93	2.85	2.99	2.99	3.06	2.95	2.98
Functional Competence	3.07	2.95	2.89	3.19	3.1	3.18	3.16	3.04
Privacy	3.16	3.26	3.15	3.17	3.16	3.24	3.18	3.09
Dignity	3.57	3.56	3.5	3.59	3.65	3.64	3.58	3.58
Meaningful Activity	2.36	2.49	2.59	2.78	2.71	2.83	2.82	2.76
Enjoyment	2.98	3.02	3.03	3.18	3.04	3.17	3.02	3.14
Individuality	2.9	3.05	3.06	3.07	3.09	3.21	3.08	3.12
Spiritual Well-being	2.84	2.75	3.06	2.99	3.08	3.11	3.05	3.12
Security	3.45	3.4	3.4	3.38	3.32	3.36	3.29	3.32
Autonomy	3.17	3.23	3.12	3.21	3.2	3.25	3.22	3.22
Relationships	2.82	2.89	2.91	2.9	3.01	2.99	3.01	3.02
# of residents (1662)	145	104	86	202	255	185	153	532

### Facility Effect Size

An important question is the sample size needed to produce significantly different facility scores. To estimate the effect of different sample sizes, we used a method described by Dupont and Plummer (Dupont & Plummer, 1990). This method, which produces results that are in close agreement with those of Pearson and Hartley, uses the relationship of the between-group difference and the within-group difference (Pearson & Hartley, 1970). Because these data could be used to describe facility performance, special care must be taken to assure that false positives (Type II errors) are avoided. Hence a conservative alpha value should be used. Table 6.10 uses Wave 1 data to show the estimated sample sizes needed to detect differences between two facilities that exceed one within-group standard deviation, but the choice of a one standard deviation threshold difference is arbitrary. In the first case, the risk of declaring a difference due simply to chance variation in sampling (alpha) is less than 5% and the chance of declaring no difference when there really might be one (beta or 1-power) is 20%. In the second case the alpha

level is set at 1% and the beta is set at 10%. The sample size varies among the domains. For the first case, it runs from 7 (spiritual well-being) to 12 (dignity and functional competence). For the second, more stringent case, it runs from 13 to 23. Thus, a sample size of 23 per nursing home would permit a reasonable comparison across facilities. This number represents the number of nursing home residents who responded to an adequate number of the questions about QOL. Presumably a somewhat larger sample would have to be approached to net this total. If smaller units within a facility were to be compared, then the necessary sample size would increase considerably.

When the same calculations are made using Wave 2 data (Table 6.11), the sample sizes needed are comparable. For the less stringent case, it ranges from 6 to 13, and for the more stringent case from 13 to 25.

Table 6.10. Sample Size Needed to Detect A Mean Difference Across Facilities:  
Equal to Different Levels of Between-Groups Standard Deviation at Wave 1

Domain	Between Groups	Within Groups	Observed between-group SD expressed in units of within-group SD	Sample Size	
				Alpha = .05 Power = .80	Alpha = .01 Power = .90
Comfort	0.88	0.61	1.45	9	16
Functional Competence	0.86	0.73	1.18	12	23
Privacy	0.87	0.62	1.40	9	17
Dignity	0.50	0.43	1.18	12	23
Meaningful Activity	0.92	0.71	1.29	10	19
Enjoyment	1.00	0.72	1.39	9	17
Individuality	1.02	0.68	1.50	8	15
Relationships	0.73	0.55	1.33	10	18
Security	1.13	0.68	1.65	7	13
Spiritual Well being	0.82	0.64	1.28	11	20
Autonomy	0.88	0.61	1.45	9	16

Table 6.11. Sample Size Needed to Detect A Mean Difference Across Facilities:  
Equal to Different Levels of Between-Groups Standard Deviation at Wave 2

Domain	Between Groups	Within Groups	Observed between-group SD expressed in units of within-group SD	Sample Size	
				Alpha = .05 Power = .80	Alpha = .01 Power = .90
Comfort	0.84	0.61	1.37	9	17
Functional Competence	1.07	0.83	1.29	10	19
Privacy	1.23	0.68	1.81	6	11
Dignity	0.58	0.52	1.13	13	25
Meaningful Activity	0.96	0.75	1.28	11	20
Enjoyment	1.15	0.78	1.48	8	15
Individuality	0.87	0.68	1.28	11	20
Relationships	0.93	0.70	1.33	10	18
Security	0.78	0.57	1.38	9	17
Spiritual Well-being	1.15	0.73	1.58	7	13
Autonomy	0.83	0.66	1.27	11	20

## Discussion

These analyses suggest that it is possible to create facility-level scores for QOL and to compare facilities on this basis. At this point, we have used 10 separate QOL scores for each domain. A further step would be to create a weighted score to establish a single QOL score for each facility. This would render comparisons simpler, but might, in fact, obscure differences of interest, especially when the nursing home profile has both positive and negative deviations, a situation that occurred 30% of the time in our data. Moreover, from the perspective of the quality assurance requirements, nursing homes are accountable for outcomes in specific areas such as dignity, rather than the general construct QOL.

Despite the unusual configuration of the sample, the facility scores did appear to identify facilities with better and worse QOL. In general, the performance pattern showed consistency. That is, facilities that were below the mean in one area tended to show a similar pattern for other domains, which may result from correlated facility-level domain scores. The ANOVA test in

Table 6.4 revealed significant differences between facilities in eight domains out of ten, indicating that among all studied facilities there is at least one pair with significantly different QOL scores on eight domains. It makes them the preferable choice in comparing facilities in practical applications when applying the six-sigma methodology (i.e., more than two standard deviations from the mean value) to find outliers. Two domains (functional competence and dignity) failed to show any significance, indicating that all observed differences between facilities on these domains were likely to appear by chance. Although the practical value of these domains is very limited when comparing facilities, they might be useful in longitudinal studies organized to test the effects of facility-level organizational interventions. One concern with using domain averages is that if these average scores are near the upper or lower ends of the possible range, a ceiling or floor effect could result, and we would not be able to detect any positive or negative deviations. However, the results in Table 6.2 show that this potential threat did not occur. None of the average facility-level domain scores approached either end of the possible range.

The general lack of statistically significant relationships between QOL scores and nursing home characteristics may be attributed in part to the limited sample size. The sample itself is atypical of the general distribution of nursing homes in the United States. By design, a disproportionately large number of rural homes were included. The lower proportion of proprietary homes may reflect the effect of this sampling, as well as refusals to participate.

Some limitations of this study should be acknowledged. We have used z-scoring techniques to simplify the data presentation, but these transformations could create apparently large differences where the actual differences in scores are small. Care must be taken in interpreting the relative performance of any facility. However, if attention is focused on patterns

across domains, the risk of over-interpretation is minimized. The sample used for this study was not intended to be nationally representative. The emphasis here was on developing a method for aggregating resident-level QOL scores to the facility level. Further work is needed to see how well this approach can discriminate among a larger, more representative sample of facilities.

While analyzing the possibility of various QOL domains to discriminate facilities, we found that difference in patient characteristics between facilities (the most commonly used reason for adjustment) changed the resolution of the comparison very little. A much greater source of variation was attributable to the measurement process (i.e., allocation of interviewers to facilities). Because the study had not been planned to examine this effect, we had to rely on a post hoc analysis of this observational study with a very unbalanced design and a sample size that was insufficient to test this effect. Nevertheless, the importance of the measurement process was demonstrated by comparing the relative variances associated with two random factors. (Interviewer and Facility factors were found to have comparable variance.) If confirmed, this finding would affect the process of comparing QOL between facilities. Such studies should be designed to prevent confounding the Facility and Interviewer factors and to allow separating their effects.

This study shows that it is possible to distinguish resident reports of QOL among nursing facilities. Even though the amount of overall variance explain by facilities is small compared to individual-level factors, it is important. Whereas resident characteristics are critical in predicting QOL, some portion of the variance remains under the control of facilities. They thus can be held accountable for this important aspect of nursing home life, if appropriate case-mix adjustments are made in the analysis of the results. The specific pattern of strengths and weakness across the various domains may be especially informative for quality improvement efforts.

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## **Chapter 7**

### **Development of Short Quality of Life Screeners**

This chapter discusses approaches to developing short self-report quality of life (QOL) measurements that are a subset of the 11-domain, 54-item set that we created. Some of the impetus for this effort was dictated by an interest in including direct resident-reported measures in the next version of the nursing home Minimum Data Set, the draft version of which was released in the 2003.

Several approaches are feasible to create shorter QOL measures. For example, a selection of domains could be used to emphasize domains of greatest interest for particular purposes. Similarly, more analysis could be done on the structure of the relationships of the domains to identify closely overlapping domains for possible eliminations or mergers.

A key decision in shortening the battery is determining whether a multidimensional versus a uni-dimensional scale is desired. Taking the arbitrary goal of developing a tool with no more than 14 items, we examined what a 14-item uni-dimensional scale might look like, and also performed analyses to determine whether a dimensional structure might be maintained within a 14-item scale. This chapter reports on the development of both a uni-dimensional and a multidimensional 14-item scale with particular attention to possible inclusion in the MDS. It also describes approaches to other multidimensional variants that fall between 14 items and the full battery; in that regard, we also present a 34-item instrument with 9 domains.

### **Issues**

#### **Data Collection Circumstances**

Our work on resident self-report QOL measures (described in chapter 3) was developed so as to include as many resident respondents as possible, including those with cognitive

impairment. Similarly, shortened scales should have that capability. Any shortened scale would require that standardized questions be asked directly of the residents, which is a departure from the rating process used to complete many other parts of the MDS. To accurately collect a self-report QOL measure, even the short 14-item versions presented here, it would be crucial for the data collector to set the stage by seeking a private interview with the resident, establishing rapport, explaining the general purpose of the questions, and establishing an unhurried atmosphere for the administration of the questions. Residents often need to reflect and ruminate aloud on these kinds of questions before offering their responses and it is imperative that interviewers be trained in non-biasing ways of conducting the interview.

Our QOL work has also revealed that MDS-derived cognitive scores are an imperfect way of determining who is capable of providing QOL interviews. We were able to conduct direct interviews with residents whose cognitive scores suggested substantial cognitive impairment. We recommend that residents not be screened out from attempts to interview them on QOL unless they are comatose or in a vegetative state. All others should have the opportunity to try to respond. If CMS wishes, we can provide protocols for determining when a resident who has been approached is unable to be interviewed. On average across 100 facilities, 40% of nursing home residents could not complete our long QOL interviews; this percentage varied by facility; we expect a much greater number to be able to complete short 14-item or 16-item scales, particularly with binary response choices. At the end of the chapter we discuss possible protocols for applying a short tool.

### Response Formats

In our QOL work in general, we have used 4-point Likert response formats for almost all items (typically, using the choices “often, sometimes, rarely, never”), and have permitted



residents who cannot cope with that complexity because of cognitive impairment to use a binary “mostly yes” or “mostly no” response. For our original research purposes, we developed a mechanism to extrapolate binary responses into the Likert responses, using 3.8 for “mostly yes” answers and 3.5 for “mostly no” answers.

To avoid the training needed for interviewers to systematically move between the two response sets and to maximize the proportion of residents likely to respond in a nationwide administration of QOL measures, we recommend that QOL items added to the MDS be posed at the outset as dichotomous questions to be answered “mostly yes” or “mostly no.” It may be important to avoid absolute “yes” or “no” response choices because the resident’s experience is often varied and has both positive and negative elements. After a resident considers an item and discusses its pros and cons, the interviewer is taught to use a probe that repeats the question such as “taking all that into account, as far as liking the food, would you say your answer for having the kind of foods you prefer is mostly yes or mostly no?”

To explore the use of binary data for MDS applications, we reversed some of our previous steps. Whereas we previously used an empirically-identified way to interpolate dichotomous responses into the Likert formats, the current goal required us to collapse the Likert responses into dichotomous responses. Our 4-part Likert responses could be “dichotomized” in 3 ways. We tested the results of all 3 possibilities, seeking the solution that would give us variation and clear cut scores. Given the variation in our Likert responses, the most satisfactory solution was to re-code the “often” and “sometimes” responses as “mostly yes” and the “rarely” and “never” responses as “mostly no.” Any “dichotomized” version of scales used in analyses presented in Chapter 2 and Chapter 3, are based on that solution. In developing shorter scales, as described in the subsequent chapters, we began with Likert responses, tested the resulting scales with

interpolated scores that combined Likert and binary, and then redid the scales to convert all Likert responses to binary responses, creating what we allude to as “dichotomized” scales. The multidimensional scales presented in Chapter 2 maintained stable factor structure regardless of the samples used and the switch to the dichotomized format.

Although we recommend using binary response categories for an MDS application, a caveat is necessary. We have not actually administered the scales to a large sample using dichotomous items at the outset. Rather, our results are based on re-calibrating our Likert scales into binary scales. We recommend a test of the actual administration of short, dichotomous scales to see if variation on the items remains adequate and to further refine the approach to administering these instruments in a shortened version.

Note, too, that these short scales are not designed to replace the longer versions developed in Wave 1 or the 54-item battery developed in Wave 2. Longer scales and the dual administration with the Likert response pattern and the binary-response fall-back are still suitable for more in-depth examination of QOL in a facility. Moreover, we used as a strong criterion for identifying items for an MDS application the ability of items to distinguish among the 100 facilities where we collected data. Some of the items and domains not selected because they fail to differentiate facilities show a great deal of intra-facility variation that might be important for clinical and quality improvement purposes. For example, the dignity items varied more within nursing homes than across them and, thus, do not appear in either 14-item scale; they may, nevertheless, be of importance to CMS because dignity is an important aspect of quality standards for nursing homes.

## Summary of Shortened Scales

In this section, we summarize 3 shorter scales. Then we discuss the strategies used to develop each.

Beginning with a premise that CMS might want to maintain the multidimensional structure of the Q54-item QOL scales in a shorter version; we developed a 34-item instrument that will yield 9 domain scores. In this solution, the Relationship domain is dropped (because it was highly related to Individuality) and items from the Meaningful Activity and Spiritual Well-being Scales are combined into an Activity Scale.

If a shorter multidimensional scale is desired (e.g., for the MDS), we created a subset of 14-items that fell into 4 factors (QOL-MD14); these factors or domains are Security, Enjoyment, Privacy, and the new Activity domain that incorporates religious activity items). Because the form was developed using items only from the domains that discriminated among facilities during both waves of data collection, the subscales of QOL-MD14 have a strong ability to discriminate among nursing homes.

The uni-dimensional 14-item scale (QOL-14) started from a different premise with the goal of identifying a short scale to measure the overall QOL construct. Again it began by using the 7 domains that discriminated among facilities in both waves of data collection. From each of those domains, we selected the two items that varied most by facility. The results were a 14-item scale with reasonable scale consistency.

Both shortening approaches began with Likert scales, then were tested with interpolations of binary responses into the 4-point Likert scales, and finally were tested after all the Likert scales were dichotomized into binary scales. Below we provide more detail about how the shorter multidimensional and uni-dimensional scales were created.

Table 7.1 summarizes the domain structure and Table 7.2 the items for three options for shorter scales; two multidimensional options and one overall QOL measure. It is noteworthy that the two 14-item instruments have 8 items in common. The uni-dimensional QOL-14 includes 2 items from the relationship domain, whereas the Relationship domain is not retained in either the 34-item or the 14-item multidimensional scale.

Table 7.1. Domain Structure of Three Shortened Scales

34-item 9-domain scale		14-item 4-domain scale (QOL-MD14)		QOL-14
Domain	# items	Domain	# items	Confirmatory factor analysis showed a single QOL construct for these 14 items. The items themselves were drawn from 7 of the 11 a priori theoretical domains: privacy, spiritual well-being, meaningful activity, relationships, individuality, security, and enjoyment (2 items taken from each domain). Domains not represented in this uni-dimensional scale are Comfort, Functional Competence, Autonomy, and Dignity.
Privacy	4	Privacy	4	
Enjoyment	3	Enjoyment	3	
Security	3	Security	3	
Activity (SWB) <sup>a</sup>	4	Activity (SWB) <sup>a</sup>	4	
Comfort	4			
Dignity	4			
Autonomy	4			
Functional Competence	4			
Individuality	4			

<sup>a</sup>Two items from Meaningful Activity and the two activity-oriented items from Spiritual Well-Being (attending religious activities, and finding religious observances personally meaningful) factored strongly together.

Table 7.2: Comparison of Items in 3 Shortened QOL Scales

Item	34-item, 9-domain	14-item, 4-domain (QOL- MD14)	14-item, single domain (QOL-14)
CMF. How often are you too cold here?	x		
CMF. How often are you so long in the same position that it hurts?	x		
CMF. How often are you in physical pain?	x		
CMF. How often are you bothered by noise when you are in your room?	x		
FC. Is it easy for you to get around in your room by yourself?	x		
FC. Can you easily reach the things that you need?	x		
FC. Can you easily reach your toilet articles and things you want to use in your bathroom?	x		
FC. Do you do as much to take care of your own things and room as you can and want?	x		
PRI. Can you find a place to be alone when you wish?	x	x	
PRI. Can you make a private phone call?	x	x	x
PRI. When you have a visitor, can you find a place to visit in private?	x	x	x
PRI. Can you be together in private with another resident (other than your roommate)?	x	x	
DIG. Do staff here treat you politely?	x		
DIG. Do you feel that you are treated with respect here?	x		
DIG. Do staff here handle you gently while giving you care?	x		
DIG. Does staff here respect your modesty?	x		
SWB. Do you participate in religious activities here?	x	x	x
SWB. Do the religious observances here have personal meaning for you?	x	x	x
MACT. Do you enjoy the organized activities here at the nursing home?	x	x	x
MACT. Outside of religious activities, do you have enjoyable things to do at the nursing home during the weekends?	x	x	
MACT. Despite your health condition, do you give help to others, such as other residents, your family, people at this nursing home, or the outside community?			x
ENJ. Do you like the food here?	x	x	x
ENJ. Do you enjoy mealtimes here?	x	x	x
ENJ. Can you get your favorite foods here?	x	x	
AUT. Can you go to bed at the time you want?	x		
AUT. Can you get up in the morning at the time you want?	x		
AUT. Can you decide what clothes to wear?	x		
AUT. Have you been successful in making changes in things you do not like?	x		
AUT. Taking all staff together, nurses, aides, and others, does the staff know about your interests and what you like?	x		x
IND. Do staff members know you as a person?	x		
IND. Are people working here interested in your experiences and the things you have done in your life?	x		x
IND. Do residents here know you as a person?	x		
SEC. Do you feel that your possessions are safe at this nursing home?	x	x	x
SEC. Do your clothes get lost or damaged in the laundry?	x	x	
SEC. Do you feel safe and secure?	x	x	
REL. Do you feel confident that you can get help when you need it?			x
REL. Do you consider any staff member here to be your friend?			x
REL. In the last month, have people who worked here stopped just to have a friendly conversation with you?			x

## **34-item and 14-Item Multidimensional Instruments**

### Goal

The goal of the work described in this chapter was to create shorter QOL scales that preserved as much as possible the multi-dimensionality of the original longer formats.

Although we perceive merits to using Likert scales in many applications of QOL tools, we judged that this technique would be too complex for routine administration and analysis if applied to the MDS or similar comprehensive data collection efforts. Therefore, we also needed to model the best way to change the Likert data into a binary format. This chapter describes the methods and results in 5 steps.

### Step 1. Develop Brief Multidimensional Instrument using Likert and Interpolated Binary Responses.

For this analysis, we used 955 cases with no missing or “don’t know” responses for any of the 54 items used in Wave 2. An approximate “best subset” approach based on comparing several hundred “supposedly” good models was used. We tried to preserve as many original domains as possible but set the constraint that we have no fewer than 3 and no more than 4 items per domain. In cases when the original domains did not support an orthogonal structure, we attempted to combine domains. Items were selected to have highest possible loadings on the corresponding factors/domains and lowest possible loadings on other factors/domains (after varimax rotation).

The resulting varimax rotated component matrix is presented in Table 7.3. (The item numbers refer to the items in the Wave 2 Questionnaire, which is found in Appendix P.) Blank cells have loadings less than 0.2. For this and subsequent factor analyses in this chapter, the extraction method is Principal Components Analysis and the rotation method is Varimax with Kaiser Normalization.

Table 7.3. Factor analysis for 955 Wave 2 Cases for Likert Responses with No Missing Items

Item	Component								
	1	2	3	4	5	6	7	8	9
FC1. Is it easy for you to get around by yourself in your room?		<b>.762</b>							
FC2. Can you easily reach the things you need?		<b>.788</b>							
FC4. Can you easily reach your toilet articles and things you want to use in your bathroom?		<b>.771</b>							
FC5. Do you do as much to take care of your own things and room as you can and want?		<b>.743</b>		.211					
Pri1. Can you find a place to be alone when you wish?				<b>.721</b>					
Pri2. Can you make a private phone call?		.203		<b>.565</b>					
Pri3. When you have a visitor, can you find a place to visit in private?				<b>.865</b>					
Pri4. Can you be together in private with another resident (other than your roommate)?				<b>.821</b>			.251		
MA3. Do you enjoy the organized activities here?			<b>.616</b>			.239			
MA4. Outside of religious activities, do you have enjoyable things to do during the weekend?			<b>.539</b>				.218		
SWB1. Do you participate in religious activities here?			<b>.865</b>						
SWB2. Do the religious observances here have personal meaning for you?			<b>.821</b>						
Enj1. Do you like the food here?						<b>.841</b>			
Enj2. Do you enjoy meal times at NAME OF NF?						<b>.775</b>			
Enj3. Can you get your favorite foods here?						<b>.648</b>	.248		
Aut1. Can you go to bed at the time you want?							<b>.738</b>		
Aut2. Can you get up in the morning at the time you want?							<b>.743</b>		
Aut 3. Can you decide what clothes to wear?							<b>.548</b>		
Aut 4. Have you been successful in changing things you do not like?							<b>.430</b>		
Cmf1 How often are you too cold here.								<b>.579</b>	
Cmf2 How often are you so long in the same position that it hurts?								<b>.751</b>	
Cmf3. How often are you in physical pain?								<b>.718</b>	
Cmf 4. How often are you bothered by noise when you are in your room?								<b>.522</b>	.200
Ind1. Taking all staff together, . . . does the staff know about your interests & what you like?					<b>.674</b>				
Ind2. Do staff members know you as a person?					<b>.773</b>				
Ind3.Are people working here interested in your experiences and what you have done in your life?					<b>.649</b>				
Ind5.Do residents here know you as a person?					<b>.641</b>				
Dig1. Do staff here treat you politely?	<b>.796</b>								
Dig2. Do you feel that you are treated with respect here?	<b>.794</b>								
Dig3. Do staff here treat you gently while giving you care?	<b>.676</b>								
Dig4. Do staff here respect your modesty?	<b>.737</b>								.203
Sec1. Do you feel your possessions are safe at this NF?									<b>.675</b>
Sec2. Do your clothes get lost or damaged in the laundry?									<b>.774</b>
SecSum. How would you rate your QOL with respect to feeling safe and secure?	.299								<b>.412</b>

One domain (Relationships) was not used because it was highly correlated with Individuality and could not be preserved as a distinct factor. Two domains (Meaningful Activity and Spiritual Well-being) were combined into a new domain because these four questions could not be separated; they stayed together in all tested models). It is noteworthy that the two Spiritual Well-being items that joined in a factor with meaningful activity items are those dealing with religious observances, which constitute an activity. The items reflecting a more general spiritual well being did not load with the factor. Finally, one overall summary rating item on security was added to obtain the smallest acceptable security domain with three items because the remaining security items did not stay together. The result was a 9-factor/domain instrument with 34 items.

#### Step 2. Test the Local Optimality (Goodness) of the Obtained Instrument using the Same Sample

Optimality was tested from two different viewpoints.

1. We first examined whether it is possible to increase the number of domains from 9 to 10 without losing the orthogonal structure. We found that all attempts to add 3-4 items (to the 34-item instrument) that might represent the 10<sup>th</sup> domain corrupted the dimensional structure.

2. We then examined whether it would be possible to replace any one of the selected items with another item that belongs to the same domain and, thus, to improve the distribution of loadings in the 9-domain instrument. For example, Item Autonomy #4 and the Security summary item had relatively low loadings on the corresponding factors (see Table 2.1) and might have been good candidates for replacement. All 20 items that were in the original 54-item instrument and not included into 34-item version were tested one-by-one. This procedure indicated that no single item should be replaced.



### Step 3. Test the 34-item Instrument Using a Larger Sample

For this step 1219 cases with complete responses across the 34 items were used, combining Likert and interpolated binary responses across the 34 items using the point extrapolations that we had conventionally used in our previous analysis (3.8 for “mostly yes” and 1.5 for “mostly no”). Table 7.4 shows that adding 264 cases and interpolating binary responses into the Likert scales left the structure almost completely unchanged.

### Step 4. Test the Dichotomized Instrument Using the Large Sample (1219 Cases)

Here we tested the effect of turning the Likert items into dichotomous items. After we experimentally examined the effects of various ways of splitting the 4-point Likert responses, we utilized the best approach (combining “often and sometimes” as the positive response and “rarely and never” as the negative ones, with reversals as appropriate. Thus, all responses were dichotomized using the following template.

COMPUTE xxxb1 = (fxxx1<=2)\*0+(fxxx1>2)\*1.

Table 7.5 shows that dichotomization of Likert items did not change the structure.

Table 7.4. Factor Analysis of Wave 2 Data Interpolating Binary with Likert Responses for 1219 Cases

	Component								
	1	2	3	4	5	6	7	8	9
Cmf1 How often are you too cold here.								<b>.573</b>	
Cmf2 How often are you so long in the same position that it hurts?								<b>.759</b>	
CmfF3. How often are you in physical pain?								<b>.725</b>	
Cmf 4. How often are you bothered by noise when you are in your room?								<b>.493</b>	.314
FC1. Is it easy for you to get around by yourself in your room?	<b>.757</b>								
FC2. Can you easily reach the things you need?	<b>.779</b>								
FC4. Can you easily reach your toilet articles and things you want to use in your bathroom?	<b>.776</b>								
FC5. Do you do as much to take care of your own things and room as you can and want?	<b>.734</b>								
Pri1. Can you find a place to be alone when you wish?					<b>.722</b>				
Pri2. Can you make a private phone call?					<b>.605</b>				
Pri3. When you have a visitor, can you find a place to visit in private?					<b>.782</b>				
Pri4. Can you be together in private with another resident (other than your roommate)?					<b>.661</b>		.235		
Dig1. Do staff here treat you politely?		<b>.795</b>							
Dig2. Do you feel that you are treated with respect here?		<b>.791</b>							
Dig3. Do staff here treat you gently while giving you care?		<b>.673</b>							
Dig4. Do staff here respect your modesty?		<b>.711</b>							.217
SWB1. Do you participate in religious activities here?				<b>.856</b>					
SWB2. Do the religious observances here have personal meaning for you?				<b>.813</b>					.217
MA3. Do you enjoy the organized activities here?				<b>.621</b>		.213			
MA4. Outside of religious activities, do you have enjoyable things to do during the weekend?				<b>.519</b>			.205		
Enj1. Do you like the food here?						<b>.846</b>			
Enj2. Do you enjoy meal times at NAME OF NF?						<b>.785</b>			
Enj3. Can you get your favorite foods here?						<b>.650</b>	.237		
Aut1. Can you go to bed at the time you want?							<b>.751</b>		
Aut2. Can you get up in the morning at the time you want?							<b>.771</b>		
Aut 3. Can you decide what clothes to wear?							<b>.672</b>		
Aut 4. Have you been successful in changing things you do not like?			.276				<b>.642</b>		
Ind1. Taking all staff together, . . . , does the staff know about your interests & what you like?			<b>.711</b>						
Ind2. Do staff members know you as a person?			<b>.771</b>						
Ind3.Are people working here interested in your experiences & what you have done . . . ?			<b>.672</b>						
Ind5.Do residents here know you as a person?			<b>.642</b>						
Sec1. Do you feel your possessions are safe at this nursing home?		.219							<b>.675</b>
Sec2. Do your clothes get lost or damaged in the laundry?									<b>.754</b>
SecSum. How would you rate your QOL with respect to feeling safe and secure?		.250							<b>.465</b>

Table 7.5. Factor Analysis of Wave 2 Data with “Dichotomization” of Likert Items for 1219 Cases

	Component								
	1	2	3	4	5	6	7	8	9
Cmf1 How often are you too cold here.								<b>.586</b>	
Cmf2 How often are you so long in the same position that it hurts?								<b>.747</b>	
Cmf3. How often are you in physical pain?								<b>.701</b>	
Cmf 4. How often are you bothered by noise when you are in your room?								<b>.431</b>	.366
FC1. Is it easy for you to get around by yourself in your room?	<b>.736</b>								
FC2. Can you easily reach the things you need?	<b>.765</b>								
FC4. Can you easily reach your toilet articles and things you want to use in your bathroom?	<b>.754</b>								
FC5. Do you do as much to take care of your own things and room as you can and want?	<b>.700</b>								
Pri1. Can you find a place to be alone when you wish?					<b>.674</b>				
Pri2. Can you make a private phone call?	.207				<b>.544</b>				
Pri3. When you have a visitor, can you find a place to visit in private?					<b>.768</b>				
Pri4. Can you be together in private with another resident (other than your roommate)?					<b>.681</b>		.216		
Dig1. Do staff here treat you politely?		<b>.760</b>							
Dig2. Do you feel that you are treated with respect here?		<b>.763</b>							
Dig3. Do staff here treat you gently while giving you care?		<b>.638</b>							
Dig4. Do staff here respect your modesty?		<b>.708</b>							
SWB1. Do you participate in religious activities here?			<b>.840</b>						
SWB2. Do the religious observances here have personal meaning for you?			<b>.803</b>						
MA3. Do you enjoy the organized activities here?			<b>.599</b>			.204			
MA4. Outside of religious activities, do you have enjoyable things to do during the weekend?			<b>.514</b>						
Enj1. Do you like the food here?						<b>.822</b>			
Enj2. Do you enjoy meal times at NAME OF NF?						<b>.739</b>			
Enj3. Can you get your favorite foods here?			.202			<b>.601</b>	.224		
Aut1. Can you go to bed at the time you want?							<b>.751</b>		
Aut2. Can you get up in the morning at the time you want?							<b>.729</b>		
Aut 3. Can you decide what clothes to wear?					.204		<b>.466</b>		
Aut 4. Have you been successful in changing things you do not like?				.211			<b>.332</b>		
Ind1. Taking all staff together. . . does the staff know about your interests & what you like?				<b>.649</b>					
Ind2. Do staff members know you as a person?				<b>.751</b>					
Ind3.Are people working here interested in your experiences and what you have done in your life?				<b>.641</b>					
Ind5.Do residents here know you as a person?				<b>.612</b>					
Sec1. Do you feel your possessions are safe at this nursing home?						.209			<b>.618</b>
Sec2. Do your clothes get lost or damaged in the laundry?									<b>.672</b>
SecSum. How would you rate your QOL with respect to feeling safe and secure?		.279							<b>.544</b>

#### Step 5. Test Discriminative Power of the Original and Dichotomized Domain Scores

Average scores for the 9 original and dichotomized domains were computed. General linear modeling, treating “facility identifier (ID)” as a fixed and “interviewer identifier” as a random factor, was fitted to the data. Interviewer ID was used as a risk adjustor for conditions of measurement. The result is presented in Table 7.6. The domains are sorted in the descending order of their discriminative power to differentiate among nursing homes (F- and p-values and the number of homogeneous groups). The most “valuable” domains in this regard are at the top of the list and the least “valuable” ones are at the bottom. Variations of two domain scores prior to dichotomization and four domain scores after dichotomization do not depend on Interviewer ID. Generally, the dichotomization lowers the discriminative power of the measures and the effect of Interviewer\_ID somewhat but the basic structure remains. The best discriminating domains (Enjoyment, Security, Privacy, and the combined Meaningful Activity/Spiritual Well-being contain 14 variables. These 14 variables could be used as a short 4-dimension multidimensional scale (hereafter called QOL-MD14).

#### Step 6. Test the Dimensional Structure of QOL-MD14 Using the Large Sample

As Table 7.7 shows the shortened 4-factor multidimensional instrument, QOL-MD14, has a satisfactory orthogonal structure.

Table 7.6. Mixed-Effect Model

	Response Set with Interpolation of Binary Responses				N <sup>a</sup>	Response Set with Dichotomized Likert Responses				N <sup>a</sup>
	Facility		Interviewer			Facility		Interviewer		
Domain	F-ratio	P	F-ratio	P		F-ratio	P	F-ratio	P	
Meaningful activity/ Spiritual well-being	2.01	0.001	1.19	0.243	4	1.87	0.001	1.27	0.17.	3
Enjoyment	1.97	0.001	0.78	0.765	4	1.87	0.001	0.88	0.638	3
Security	1.99	0.001	1.92	0.005	4	1.74	0.001	1.23	0.201	3
Privacy	1.83	0.001	3.87	0.001	3	1.56	0.007	3.14	0.001	3
Dignity	1.38	0.037	1.75	0.015	2	1.67	0.002	1.44	0.080	1
Autonomy	1.85	0.001	2.44	0.001	2	1.58	0.005	2.37	0.001	1
Individuality	1.65	0.002	2.42	0.001	2	1.45	0.019	1.67	0.023	1
Comfort	1.35	0.048	2.65	0.001	2	1.39	0.033	2.27	0.001	1
Functional competence	1.20	0.151	2.90	0.001	1	1.08	0.327	2.74	0.001	1

<sup>a</sup>N refers to number of homogenous subgroups based on Tukey's b-test; more groups reflects a better result.

Table 7.7. Dimensional Structure of 14-Item 4-Factor Scale (QOL-MD14) With Dichotomized Responses

Items and Domains	Component <sup>a</sup>			
	1	2	3	4
SWB1. Do you participate in religious activities here?	<b>.855</b>			
SWB2. Do the religious observances here have personal meaning for you?	<b>.822</b>			
MA3. Do you enjoy the organized activities here?	<b>.603</b>		.282	
MA4. Outside of religious activities, do you have enjoyable things to do during the weekend?	<b>.516</b>	.201	.225	
Enj1. Do you like the food here?			<b>.838</b>	
Enj2. Do you enjoy the meal times at NAME OF NF?			<b>.781</b>	
Enj3. Can you get your favorite foods here?			<b>.626</b>	
Sec1. Do you feel your possessions are safe in this nursing home?			.212	<b>.707</b>
Sec2. Do your clothes get lost or damaged in the laundry?				<b>.671</b>
SecSum. How would you rate your QOL with respect to feeling safe and secure?				<b>.631</b>
Pri1. Can you find a place to be alone when you wish?		<b>.717</b>		
Pri2. Can you make a private phone call?		<b>.596</b>		
Pri3. When you have a visitor, can you find a place to visit in private?		<b>.750</b>		
Pri4. Can you be together in private with another resident (other than roommate)?		<b>.715</b>		

<sup>a</sup>Rotated component matrix with rotation converged in 5 iterations.

Extraction Method: Principal component Analysis.

Rotation Method: Varimax with Kaiser Normalization

To summarize, the original instrument from Wave 2 with 54 items was used for development and validation of shorter multidimensional scales. The development/validation process was implemented in several steps. Listwise deletion of missing values was applied. Factors were extracted using the principal component method based on a correlation matrix that used a combination of Likert and dichotomous responses. Loadings were calculated using Varimax rotation. A 34-item scale that yielded nine orthogonal components (from the original 11) was created. Relationships dropped out and components of Meaningful Activity and Spiritual Well-being loaded together into an activity score. The ability of these scales to discriminate facilities was tested with a general linear model. These analyses were done with Likert data alone and with the interpolation of binary data into the Likert scores (using values of 3.8 for “mostly yes” and 1.5 for “mostly no”). Results held when the models were retested.

The complex models were converted to binary responses and the models retested. The nine factors remained.

A 14-item version, comprised of four domains (enjoyment, security, privacy, and the new activity/spiritual well-being domain) produced the best discrimination among facilities.

### **Developing a Short Uni-Dimensional QOL Scale**

#### Goal

In an approach differing from that described in the previous section, we sought to identify a dramatically reduced number of items that form a global QOL scale with good properties that could be implemented as part of a revised MDS instrument or by state survey staff. The following two principles guided item selection:

1. The resultant scale should discriminate between facilities as much as possible
2. The scale should represent the breadth of the original 11 *a priori* identified QOL dimensions as much as possible.

## Approach

A multi-step process was used to derive an overall QOL measure. In Step 1, we identified from the original 11 domains, those domains that discriminated among facilities at each Wave of data collection. This was done by using one-way ANOVA followed by Tukey's B post hoc test for homogenous subgroups. The overall findings are summarized in Table 7.8.

At Wave 1, Functional Competence, Autonomy and Comfort produced only 1 homogeneous subgroup, implying that those domain scores did not discriminate among facilities. At Wave 2, Dignity also failed to discriminate among facilities. We computed the Intra Class Correlation (ICC) for each scale, and the results were generally consistent with the one-way ANOVA. To ensure that the final scale would maximize our ability to discriminate between facilities, we ruled out sub-scales if either statistic had a null finding. Thus, four domains (dignity, functional competence, autonomy, and comfort) were eliminated from the effort to develop a short uni-dimensional scale.



Table 7.8. Number of Homogeneous Subgroups for Each Domain at Each Wave

Domain	Wave 1		Wave 2	
	Subgroups	ICC	Subgroups	ICC
Dignity	2	0	1	0
Functional competence	1	0	1	.02
Privacy	2	.03	5	.08
Autonomy	1	0	1	0
Security	2	.03	4	.03
Relationships	2	.04	2	.04
Individuality	4	.06	3	.02
Meaningful activities	2	.02	2	.02
Enjoyment	2	.03	3	.04
Spiritual well-being	3	.06	2	.05
Comfort	1	.03	1	.03

Note: Subgroups based on Tukey's B post hoc test for homogenous subgroups; ICC = Intra Class Correlation.

Note that this analysis was done using the domain scores that rely on imputation of missing items at the domain score level. Cases with 25% or fewer missing items were replaced with the item mean for that value. Cases with more missing data were dropped. For the following analysis, since the items were being used to construct a new scale score, the imputed domain scores were not helpful. Therefore, a new, complete data set was built using multiple imputation procedures. Cases with missing data on all items were excluded. Then, for each group of items by domain, data were imputed for each missing value using the procedure recommended by Little and Rubin as implemented in SPSS.

In Step 2, we used Wave 2 data to identify items for a short scale, which was then tested with Wave 1 data. The 7 domains included ranged in length from 3-5 items and comprised 13 items in total; our goal was to select the best 2 items from each domain. To do so, we constructed a data set with each pair of items within each domain. We then identified the best pairs of items from each of the 7 remaining domains to combine into a summary scale by

estimating the inter-class correlation (ICC) for each of the pairs of items. Starting arbitrarily with Privacy, the pair with the highest ICC was retained. Then, the pair from Enjoyment with the highest ICC was added, and the ICC for the resulting 4 item scale was calculated. This continued until all 7 domains were represented. Because the order in which domains are added together can affect the ICC, and hence which pair of items is selected, the order of domains was rotated until 7 different candidate scales were created. (These 7 candidate scales represent a random sample from 5,040 potential combinations of pairs of items.) The ICCs for the 7 candidate scales ranged from .0337 to .05693; the version with the highest ICC was retained. See Table 7.9 for the resulting items in what we are calling QOL-14.

In Step 3, an alternative scale was created for comparison purposes using the 2 items with the highest ICC from each domain. This version (not shown) had an ICC of about .04, and was discarded.

Table 7.9. Items in the QOL-14

Domain	Item <sup>a</sup>
Privacy	1. Can you make a private phone call?
Privacy	2. When you have a visitor, can you find a place to visit in private?
Meaningful Activity	3. Despite your health condition, do you give help to others, such as other residents, your family, people in this nursing home, or in the outside community?
Meaningful Activity	4. Do you enjoy the organized activities here at the nursing home?
Enjoyment	5. Do you like the food at NAME OF NF?
Enjoyment	6. Do you enjoy meal times at NAME OF NF?
Individuality	7. Taking all staff together, nurses, aides and others, does the staff know about your interests and what you like?
Individuality	8. Are staff interested in your experiences and the things you have done in your life? <sup>b</sup>
Relationships	9. In the last month, have people who worked here stopped just to have a friendly conversation with you?
Relationships	10. Do you consider any staff member here to be your friend?
Spiritual Well-Being	11. Do you participate in religious activities here?
Spiritual Well-Being	12. Do the religious observances here have personal meaning to you?
Security	13. Do you feel that your possessions are safe at this nursing home?
Security	14. Do you feel confident that you can get help when you need it?

<sup>a</sup>Item response choices were often/sometimes/rarely/never for all items. In the dichotomized version, QOL-14d, the first two choices were combined as “mostly yes” and the last two as “mostly no.”

In Step 4, a dichotomous version of the final scale was constructed to simulate a entirely ‘yes/no’ instrument using the division described in Chapter 2 (i.e., counting “often” and “sometimes” as “mostly yes” and “rarely” and “never” as “mostly no.”). In the tables this scale is referred to as QOL-14D.

In Step 5, the same scale was computed using Wave 1 data. However, Question 8 from the Individuality domain that was retained in the final scale was new at Wave 2. Thus, the Wave 1 comparison uses only 13 items.

The properties of the QOL-14 were compared to the QOL-MD38 and the QOL-MD14 for both Waves. We also calculated an alternative summary scale from the residents' summary ratings for each QOL domain and compared to the QOL-14.

## Results

Table 7.10 presents the mean and standard deviation, alpha reliability, ICC, and the correlation among scales for each version of the scales at each wave. As would be expected, the reliability drops when moving from 33 to 14 items. However, the new QOL-14 has good reliability and the ICC is actually higher than for the 33 item scale. Also, the dichotomous version (QOL-14D) retains these properties. The high correlations suggest that the different versions capture the same information. Finally, the performance of the QOL-14 using Wave 1 data is also adequate.

An alternative summary scale was constructed by summing the 11 Domain items. The QOL-14 correlates about .61 with this 11 item scale (or with the 7 items represented in the QOL-14). The correlation between the QOL-14 and the single item "Your Life as a Whole" is .42.

Table 7.10. Properties of Scale Versions at Wave 1 and Wave 2

	Wave 1			Wave 2		
	QOL-33 <sup>a</sup>	QOL-14 <sup>a</sup>	QOL-14D <sup>a</sup>	QOL-33	QOL-14	QOL-14D <sup>c</sup>
<b>Reliability</b>	0.840	0.713	0.666	0.869	0.755	0.760
<b>ICC</b>	0.069	0.060	0.057	0.031	0.057	0.054
<b>Mean (SD)<sup>b</sup></b>	3.1 (.42)	3.15 (.45)	9.9 (2.4)	3.03 (.46)	3.0 (.51)	9.8 (2.9)
<b>Correlations</b>	<b>QOL-33</b>	<b>QOL-14<sup>a</sup></b>	<b>QOL-14D<sup>a</sup></b>	<b>QOL-33</b>	<b>QOL-14</b>	<b>QOL-14D</b>
<b>QOL-33</b>	1			1		
<b>QOL-14</b>	.897	1		.920	1	
<b>QOL-14D</b>	.834	.944	1	.869	.950	1

Notes: <sup>a</sup>The Wave 1 versions have 1 fewer item because one individuality item was not available at Wave 1.

<sup>b</sup>Scores for the Likert-type versions range from 4-1 because the points for each 4-point item are summed and divided by the number of items in the scale. Scores for the dichotomous versions range from 0 to 14 (13) and are calculated by summing all the positive responses.

<sup>c</sup>QOL-14D is the dichotomized version of the scale.

The QOL-14 was next compared to the multidimensional version (QOL-MD) described in the previous section. (See Table 7.11). The QOL-MD has a mean 3.05 (SD .5). Reliability is .746 and the ICC is .61.

Table 7.11. Correlations of QOL-14 with QOL-MD14

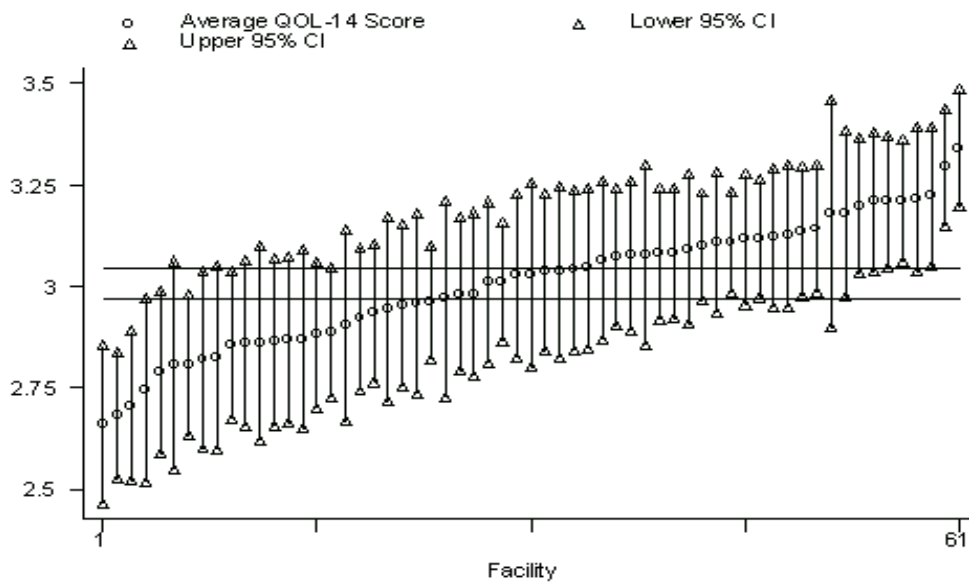
	QOL-MD14	QOL-MD14 (dichotomized)
QOL-14	.865	.832
QOL-14 (dichotomized)	.810	.848

Table 7.12 shows the correlations of the QOL-14 and each sub-scale of the QOL-MD-14 with the original 7 domain scores.

Table 7.12. Correlations of New Scales with Original Domain Scores

	QOL-14	QOL-MD	QOL-MD14 (ma/swb)	QOL-MD(enj)	QOL-MD14 (sec)	QOL-MD14 (pri)
SWB	<b>.657</b>	<b>.608</b>	<b>.817</b>	.342	.143	.129
MA	<b>.626</b>	<b>.618</b>	<b>.583</b>	.387	.218	.325
ENJ	<b>.603</b>	<b>.675</b>	.359	<b>1.00</b>	.271	.203
SEC	<b>.464</b>	<b>.540</b>	.146	.358	<b>.806</b>	.282
PRI	<b>.500</b>	<b>.654</b>	.181	.221	.215	<b>.966</b>
REL	<b>.683</b>	<b>.482</b>	.393	.313	.211	.287
IND	<b>.693</b>	<b>.478</b>	.349	.349	.260	.245

Figure 7.1 shows the distribution of Wave 2 facility means for QOL-14 and 95% confidence intervals for each facility. The horizontal lines represent the 95% confidence interval around the overall mean of 3. There is a significant number of non-overlapping facility means at both the upper and lower ends of the scale. Note, too, that it is possible to identify cut-points that define different sized subgroups of facilities, as shown in Table 7.13.



Facility Average QOL-14 Scores (Wave 2)

Table 7.13. Distribution of Facility Average QOL-14 Scores

	Range	N(%)
High QOL	Lower Bound of 95% CI>3	8 (13)
Average QOL	95% CI includes 3	47 (77)
Low QOL	Upper Bound of 95% CI<3	6 (10)

Confirmatory Factor Analysis (not presented here) shows that the items in QOL-14 form a single QOL factor.

#### Adding Dignity: QOL-16

The Dignity domain differentiated facilities in Wave 1 but not in Wave 2. Given that it had some ability to differentiate facilities and given the importance of dignity in the QOL regulations, we undertook the same analyses as already described to select the 2 dignity items with the best interclass correlation. These were “Do staff here treat you politely” and “Do staff here take time to listen to you when you have something you want to say.” When those two items are added to the 14 item scale, the alpha changes from .72 on the 14-item scale to .74 on the 16-item scale. Thus, dignity could be added without violence to the scale properties.

In conclusion, this section presents an approach to developing a single short scale for the overall construct of QOL. First, a 33-item scale was developed that included items from the 7 domains that showed any between-facility variation. Then the QOL-14 scale was developed, which reproduces the 33-item scale closely and has acceptable reliability. Significant intra-class correlation is maintained, implying that this short form has utility in identifying outlier facilities (both good and bad). The 14-item short form is moderately correlated with the summary items for QOL ratings and with “Your Life as a Whole.” Finally, the short form represents items from the 7 of the original 11 theoretically identified QOL domains that showed any between-facility variation.

## Discussion

Shorter forms of the QOL scales can be used for a variety of purposes when the 54-item battery is impractical. One approach to shortening the process is simply selecting the subscales most pertinent to the purpose. In this chapter, we presented a 34-item scale that maintains dimensionality and yields 9 domain scores, and a 14-item scale (QOL-MD14) that maintains dimensionality with 4 domains. For some purposes, users of these tools may wish to have the multidimensional capability that these tools offer.

For other purposes, such as screening on the MDS, a short tool might be desired that incorporates items from a large number of domains. The QOL-14 uses items from 7 domains and is built on domains and items within domains that discriminated among facilities in both Wave 1 and Wave 2. We reasoned that for regulatory purposes and for public information about aggregated QOL in facilities, this ability to discriminate among facilities is important. This requirement of ability to discriminate among facilities may be too stringent, however, if CMS is also interested in providing facilities with tools for quality improvement. Domains that did not discriminate across facilities, nonetheless, showed variation within facilities. In particular, the dignity items varied widely within facilities and discriminated across facilities at Wave 1. Because “dignity” is reflected in regulatory goals as well, we demonstrated that several dignity items could be added to QOL-14 without harming the scale properties.



## **Chapter 8**

### **Facility-Wide Observational Approaches**

To supplement, our individual-level quality of life (QOL) assessment and observations of the emotions of individual residents, the Task Order evolved to include development and testing of facility-wide observations of interactions that might reflect differential QOL in a nursing home. This strategy of a facility-level observation protocol would potentially provide independent information about QOL in the facility, which could be juxtaposed with self-report data from a sample of residents who could be interviewed. Moreover, some nursing units, particularly dementia care units, might house few, if any, residents capable of responding to questionnaires. The observational protocol included observations on all the units of the facility. A systematic observational protocol at the facility-level could also be a useful screening tool on QOL for regulatory and quality improvement purposes.

This chapter presents information about the development and testing of three iterations of a facility-level observational screening tool on the average QOL in the facility.

#### **Approach**

The work on the facility-wide protocols was exploratory in nature. Through literature review and discussion with practitioners, we identified observable positive and negative behaviors of staff and residents in interaction that we reasoned might be associated with better or worse QOL. We chose observable resident-resident, staff-staff, and resident-staff interactions that seemed to be reflective of one or more QOL domains. Some QOL domains had no observable analogues (e.g., spiritual well-being) where as others could relate to multiple domains. For example, observations of a staff member speaking about resident health or other private information in the hearing of others could be a negative sign for both the privacy domain

and the dignity domain. A staff member at eye level with a resident addressing a complaint or question could be a positive sign for comfort, security, relationships, and autonomy.

Observational approaches suffer the problem that many behaviors being observed are relatively rare. This is particularly true for certain important but rare negative behavior like staff shouting at or hitting a resident. Further, it is not feasible to make observations in private spaces. On the other hand, they had an advantage that they could entail observations of individuals who could not be interviewed.

We were mindful that observations need to be systematically performed using samples of time. Systematic observation is labor-intensive both in terms of elapsed time and the need to schedule for specific time periods across the day and week. We developed protocols to walk through each facility at specific time periods including weekends, and to incorporate observations of the meals less likely to be observed by the public (breakfast and dinner) and organized activities. As is discussed below, we modified the observational protocols between Wave 1 and Wave 2, and again for the smaller transferability test. In each case, our own research interviewers achieved a high standard of inter-rater reliability (.9 or better correlation on items).

### Wave 1 Protocols

Measures. Separate 1-page observation protocols were used for 4 types of observation: a 10 minute meal observation, a 10-minute activity observation, a 10-minute lobby observation, and a facility walk-through. Four different observation protocols were developed. The meal and activity protocols each contained 24 items, the lobby observation contained 32 items, and the walk-through contained 37 items. The items were chosen to include observable phenomena that were thought to be both positive and negative markers of QOL in the facility. Many observations were included in all 4 protocols, though a few items related specifically to meals

and activities, and the lobby and walk-through protocols were longer because they included elements that would not logically be observed at a meal or a fixed activity. The response metric for each item was: not observed at all, observed once, and observed more than once. The tools themselves for Wave 1 observations are found in Volume 2, Appendix F. Extensive training was conducted on how to define an occurrence and when an observation (e.g. a staff member scolding several residents simultaneously) should be counted as one or two observations.

Data collection. The research interviewers also made the facility observations after extensive training and achieving a high standard of inter-rater reliability on the protocols. Each interviewer in a facility performed two meal observations (one at a dinner, and one at a breakfast), 2 activity observations at activities with at least 6 participants, one lobby observation between the breakfast and dinner hour, and 2 facility walk-throughs. Walk-throughs were done between breakfast and 7 p.m. and at least one walk-through was done on a weekend day. Observers were instructed to walk through the front lobby and all public central space, stopping at dining rooms and activity rooms and looking in. They were to walk through all corridors of each nursing unit, passing the nursing station, looking into day rooms on the unit, and looking to the left and right into resident's rooms where the doors were open. The walk-throughs did not include observations into bedrooms with closed doors or the "backstage" areas of the facility such as staff offices, kitchens, laundries, and the like.

Each interviewer, thus, performed a set of 7 observations. The number of interviewers assigned to a facility ranged from 1 to 5, though ordinarily was 3 or 4. In each facility, we incorporated a reliability test by having two observers walk or observe together and each record the results; analysis showed that inter-rater reliability remained high. We aggregated the observations by averaging the scores of all interviewers. Because of our interest in rare events,

we also examined whether certain observations (e.g. staff member speaking harshly to a resident) were seen during any of the observation periods.

We perceived Wave 1 observations as an opportunity to learn more about the kind of items that might be included in such a tool. Therefore, each observer filled out an open-ended form at the end of each observation where they indicated anything they saw that seemed to them to be related to any of the 11 QOL domains. The simple two-column form listed domains in the first column and a place for corresponding observations that seemed to reflect positive or negative observations related to that domain. We also invited observers to use this form to provide more detail about something that was checked as observed on the first form. We analyzed the content of these forms, but did not identify any additional items to include as a result of the exercise.

The lobby observations proved ineffectual for a number of reasons. Most noteworthy, not all facilities had a distinct front-door or lobby area, and observers did not always concur even on which area should count as the lobby. Moreover, despite the stereotype that much of nursing-home life occurs in the front lobby, we found that in many facilities few or no residents were present in the lobby area during our observation times. Finally, observers reported particular difficulty in distinguishing among staff and visitors in the lobby environment. Thus, we did not incorporate the lobby observations into data analyses reported here and dropped that procedure from future refinements of the observation protocol.

#### Wave 2 Protocols.

We modified Wave 2 observations to produce a more streamlined instrument, utilizing those data elements that had proven to be associated with facility-level QOL at Wave 1. This led to an instrument with 16 items. At Wave 2, we also standardized the number of observations

to 4 per facility. Moreover, we combined activity and meal observations into the walk-through protocol. The 4 walk-throughs per facility were done on different days and each within a specified time window, namely, between 8.30 and 9.00 a.m., between 9.00 and 11.00 a.m., between 2:00 and 4.00 p.m., and between 4.00 and 6.00 p.m. It was expected that meals would take place during the first and last time slots for observation; observers paused for 5 minutes to watch a meal in progress. The other two time slots coincided with times when organized activities usually occur, and the item “a group activity is taking place” was added to the protocol to capture that phenomenon. (During Wave 1, interviewers sought out activities to observe by consulting the activity calendar, but often found the latter was inaccurate and no such activities were taking place. Thus, we thought that the mere presence of a group activity was a worthwhile item to add.) When the observer encountered an organized activity, he or she was instructed to watch it for 5 minutes.

An additional change was made in the Wave 2 protocol. Because the open-ended comments at Wave 1 suggested that we were not adequately capturing the magnitude of the positive or negative occurrences, we modified the response set to an actual count between 1 and 9 occurrences. As they walked through or observed from a stationary position, they were instructed to make a hatch mark beside each item each time they observed it. At the end, they added the marked and inserted a number from 0 to 9 for the number of times the phenomenon was observed. See Volume 2, Appendix Q for the Wave 2 instrument.

### Transferability

During our transferability test of the ability of nursing home staff to make observations that correspond to those of researchers, we had one further opportunity to amend the observation approach. Analysis of Wave 2 had shown little payoff for the laborious counts and we reverted to a simple “seen/not seen” response category. For this test, we used meal observations and

walk-throughs. We decided to add a few environmental elements to the walk through protocols. Therefore, we added noxious noise levels, unpleasant odors, and clutter in hallways to the walk-through for a total of 18 items. We included pleasant odors, unpleasant odors, noise levels, tablecloths or placemats, and centerpieces as environmental items in the resulting 16-item meal protocol. See Volume 2, Appendix U for the transferability study facility observation instruments.

### Analyses

Our first approach was to make “scales” out of the behaviors that were observed. Specifically, we counted the number of positive and negative behaviors seen by each observer to create “positive behavior count” and “negative behavior count” scales. (This technique is described in more detail where the results are presented). For many of the analyses the dependent variables were the mean score on each QOL domain for the residents who were interviewed at that facility. To study the relationship between observed positive and negative behaviors and resident-reported QOL, we also created a summary QOL variable, which we used for some of the analyses.

After Wave 1 data were analyzed, we used item-level analyses to develop a shorter scale of “best items” for Wave 2.

Given the inconsistencies we found across the three administrations at the scale level, we conducted some item-level analyses as well. The logic was that some items may behave differently by administration, which might explain the inconsistencies at the scale level. We were particularly interested in identifying whether any of these items (all of which had face validity as positive or negative in a facility) were themselves important markers of how facilities varied on QOL. Therefore, we combined information about the items from all the observational

items to explore how well these observation items varied across facilities and to identify the “best” of these observational items to use to distinguish facilities. These results are presented in the last part of the chapter.

## Scale-Level Results

### Wave 1 Frequencies

As indicated, we analyzed three separate forms in Wave 1: meal observations, activity observations, and walk-throughs. Tables 8.1, 8.2, and 8.3 show the frequencies of these observations for the meal, activity, and walkthrough protocols respectively. These tables reveal that some of the items were very frequently observed, rendering them unlikely to be useful to distinguish facilities. On the other hand, some other potentially important observations were seen very rarely.

Table 8.1. Frequency of Observed Items during Meals at Wave 1

Item # and abbreviated content	% observations where item seen
6. residents at a table sit in complete silence	97.1
11. staff pause & answer residents' questions or comments	95.6
2. staff observed offering resident a choice of food or something else	95.5
1. resident makes explicit choice of food or refuses a food offered	88.9
5. residents at a table talking or laughing	88.1
9. staff talk to each other over resident's head while helping resident	72.8
14. residents spontaneous expressions of pleasure overheard	70.4
22. staff inquire about a resident's physical comfort	68.1
24. staff shows specific knowledge of a resident's food preferences	62.2
16. staff overheard comforting a resident in distress or discomfort	60.0
15. residents' spontaneous expressions of displeasure or distress overheard	55.6
12. residents seen being fed slowly with requests for feedback about pace etc.	51.9
18. resident observed helping other residents	50.0
23. staff shows specific knowledge of a resident's interests or background	43.7
8. staff move resident without explaining or asking if ready	43.3
13. residents fed in a way that creates messy dribbles/ or inattention to wiping dribbles	27.2
4. staff discuss residents' health or private business in dining room	26.5
21. residents observed calling out in distress or crying without getting attention	25.0
19. staff observed explaining reason for a rule or policy to resident	24.3
7. staff talk to residents in baby talk	22.2
20. staff observed speaking roughly to resident &/or threatening him/her	11.8
17. quarrels observed among residents	9.6
3. private dining room actually in use by resident and guest	6.7
10. staff ask residents about weight, bowel movements, continence etc. during meal.	4.4

Note: Based on all pairs of meal observations performed at Wave 1 in 40 facilities. Interviewers per facility ranged from 1 to 5. Each item was scored as seen/not seen and the two observations. The table is based on 135 pairs of meal observations.

Table 8.2. Frequency of Observed Items during Activities at Wave 1

Item # and abbreviated content	% observations where items seen
5. resident visibly enjoying activity	99.3
13. resident's spontaneous expression of pleasure or distress overheard	97.1
11. staff pause & answer residents' questions or comments	92.0
6. resident completely disengaged in activity	89.1
2. staff offers resident a choice about anything	88.5
1. resident makes explicit choice of food or refuses a food offered	86.0
3. staff agree to implement a resident request	75.5
22. staff inquire about a resident's physical comfort	57.2
17. staff comforting or assisting a resident in distress or discomfort	54.7
18. resident observed helping other residents	52.2
23. staff shows specific knowledge of a resident's interests or background	47.4
14. residents spontaneous expressions of pleasure or boredom	34.3
12. staff engaged in own discussion during activity	30.7
8. staff move resident without explaining or asking if ready	29.9
16. resident expression of pain /discomfort	25.5
19. staff observed explaining reason for a rule or policy to resident	25.4
9. staff talk to each other over resident's head while helping resident	22.1
24. staff shows specific knowledge of a resident's food preferences	18.1
15. quarrels observed among residents. Displeasure or distress overheard	11.8
4. staff discuss residents' health or private business in dining room	11.6
21. residents observed calling out in distress or crying without getting attention	11.6
7. staff talk to residents in baby talk	8.0
20. staff observed speaking roughly to resident &/or threatening him/her	5.1
10. staff ask residents about weight, bowel movements, continence etc. in public	1.5

Note: Based on all pairs of activity observations performed at Wave 1 in 40 facilities. Interviewers per facility ranged from 1 to 5. Each item was scored as seen/not seen and the two observations. The table is based on 135 pairs of activity observations.



### 8.3. Frequency of Observed Items during Walk-throughs at Wave 1

Item # and abbreviated content	% observations where item seen
27. resident sitting at nursing stations or day rooms appear to be doing nothing at all	95.4
17. staff in conversation with residents about topics other than care	87.0
15. staff pause to answer resident question	85.5
25. residents sitting in rows or small groups apparently interacting with each other	84.7
20. resident observed in common place engaged in solitary activity- e.g. reading, doing puzzles, really watching TV.	80.3
1. resident makes explicit request	72.0
23. resident heard expressing happiness or positive emotion	71.8
3. staff agreeing or implementing resident request	68.7
24. resident heard expressing displeasure or negative emotion	66.9
28. resident calling out in distress, pain, or anxiety and not getting attention	66.2
2. staff observed offering resident explicit choice	65.6
32. staff observed assisting or encouraging resident in walking or doing an independent Task	59.5
37. resident appears to be enjoying a group activity	56.1
16. staff get down at wheelchair resident's eye level	50.8
26. staff observed assisting residents with pain & discomfort or inquiring about it	49.6
33. resident seen tidying room, sewing, doing her laundry, arranging/discarding flowers or some such productive task	47.0
13. staff talk to each other over resident while giving care or transporting resident	42.7
4. staff knock, announce selves, & wait before entering resident's room	41.7
5. private meeting or dining rooms actually used by residents and their guests	40.9
8. resident's body uncovered where resident can be seen	40.9
6. staff discuss resident's private information in public place	39.7
7. care routines done in public view (e.g. with bedroom or bathroom doors open)	37.9
18. staff shows specific knowledge of a resident's interest or background	36.6
11. staff move resident in wheelchair without explaining or asking if ready	30.8
22. resident interacting with a child/children	30.5
21. resident interacting with animals	30.3
14. residents lined up in public place for baths, medications, etc.	25.8
31. staff explain a rule or policy to a resident	22.7
19. a highly individualized resident activity-e.g. piano, maintaining a garden	15.4
34. staff observed assisting family to take resident or find a place to visit	15.3
30. staff speak harshly or roughly to a resident	13.0
29. resident in productive community role, e.g. working in store, delivering mail	8.3
9. staff interrupt residents who are talking to other resident (s) or family	7.7
10. staff talk in baby talk to residents	7.6
12. staff ask residents about weight, bowel movements, continence etc in public places	7.6
36. staff observed helping resident make or receive a private phone call	4.5

Note: Based on all pairs of activity observations performed at Wave 1 in 40 facilities. Interviewers per facility ranged from 1 to 5. Each item was scored as seen/not seen and the two observations. The table is based on 135 pairs of walk-through observations.

### Wave 1 Scale-Level Analysis

As indicated on the forms themselves, the scoring system for each item went from 0 (not seen) to 2 (seen more than once). We consolidated the 1 and 2 scores into a binary score for each item as seen/not seen on a particular administration. We then developed a 3-level metric: not seen at all, seen on one administration, seen on both administrations. The scores for multiple administrations at a facility were added and averaged by the number of observers who completed the paired observations. We then created separate additive scores for the observations thought to reflect negatively and those thought to reflect positively on QOL.

Table 8.4 shows the relationships between counts of negative observations and QOL scores by domain for each observation context. Table 8.5 present the same analyses for counts of positive observations. Alpha reliabilities for the behavior counts are above .7. The dependent variable for these analyses is the mean QOL score for each domain, adjusted by resident characteristics (age, cognition, and ADL ability).

Table 8.4. Relationship between Negative Observations and QOL by Domain in Wave 1

Domain	Context		
	Activity	Meal	Walk-through
Comfort	-0.36**	-0.39**	-0.33**
Functional Competence	-0.18*	-0.23**	-0.35**
Privacy	-0.52**	-0.14*	-0.20**
Dignity	-0.45**	-0.27*	-0.22**
Meaningful Activity	0.07	-0.04	-0.10
Enjoyment	-0.20**	-0.31**	-0.25**
Individuality	-0.22**	-0.18*	-0.25**
Relationship	-0.17*	-0.28**	-0.22**
Security	-0.19*	-0.45**	-0.43**
Spiritual Well-Being	-0.27**	-0.50**	-0.38**
Autonomy	-0.15**	0.06	-0.05

\*p<.05, \*\* p<.01. QOL scores are adjusted for age, cognitive status, and ADL status

Table 8.5. Relationship between Positive Observations and QOL by Domain in Wave 1

Domain	Context		
	Activity	Meal	Walkthrough
Comfort	<b>-0.20*</b>	-0.01	<b>-0.30**</b>
Functional Competence	-0.13	-0.11	-0.06
Privacy	-0.12	-0.05	0.00
Dignity	0.08	0.11	0.19*
Meaningful Activity	0.06	0.01	0.01
Enjoyment	0.04	-0.02	-0.08
Individuality	0.13	0.14	0.25**
Relationship	0.17*	0.17*	0.21**
Security	0.03	0.04	-0.01
Spiritual Well-being	0.05	0.12	0.03
Autonomy	<b>-0.28**</b>	-0.34**	<b>-0.13</b>

\*p <0.05, \*\*<0.01. Correlations that are not in the expected direction are bolded.

Tables 8.4 and 8.5 shows only a few significant associations between QOL domain scores for interviewed residents and facility-level observations made in the facility at the same time. Given the large number of possible comparisons, these data are not meaningful. Therefore, the next procedure combined those observations in a facility across the 3 different contexts (meal, activity, and walk-through) to see if stronger associations would then be revealed. Table 8.6 shows these results. The alpha reliabilities of the composite behavioral scores were good.

Table 8.6. Correlation between Overall Behavior Counts and QOL Scores for 11 Domains

QOL Domain	Overall Negative Behavior Count	Overall Positive Behavior Count
Comfort	-0.41**	<b>-0.24**</b>
Functional Competence	-0.31**	-0.09
Privacy	-0.32**	-0.05
Dignity	-0.35**	0.15*
Meaningful Activity	-0.04	0.03
Enjoyment	-0.29**	-0.04
Individuality	-0.26**	0.21**
Relationship	-0.26**	0.21**
Security	-0.42**	0.09
Spiritual Well-being	-0.44**	0.05
Autonomy	-0.05	<b>-0.22**</b>

\* <0.05, \*\* <0.01. Correlations that were not in the expected direction are bolded.

Table 8.6 shows a large number of statistically significant correlations, with the instrument largely behaving as we expected it would. For the negative behaviors on the instrument, the more often these behaviors were seen, the lower the QOL scores at that facility for 9 of the 11

domains of QOL. Two domains (Meaningful Activity and Autonomy) were not associated with the negative behavior counts. The pattern of relationships with positive behavior counts was not as clear cut. For example, the more the positive behaviors were seen, the higher the scores at that facility for Dignity, Individuality, and Relationships. However, the opposite pattern emerged for Comfort and Autonomy, with higher levels of positive behaviors predicting lower levels of QOL. Thus, when aggregated across settings, the negative behaviors in the observation instruments were useful in distinguishing among facilities. At this stage in the work, we were, therefore, encouraged about the potentiality of a streamlined facility level observational tool.

When comparing the results of Wave 1 to the other administrations, it is important to remember that the Wave 1 observation instrument contained many more items than the Wave 2 and Transferability instruments. In total, across the three different settings 85 different behaviors were observed in Wave 1 (some of these behaviors were assessed in all three settings). This should be compared to approximately 16 behaviors in the Wave 2 and the transferability study. Given this discrepancy, we would expect stronger results in Wave 1 than in our subsequent data collection.

### Streamlining the Tool for Wave 2

Revisions to the observation protocol were undertaken with two goals in mind. Given the length of the instrument and complexity of data collection in Wave 1, the first goal of the revision was to develop a shorter instrument with more streamlined data collection. The second goal was to simplify the instrument by consolidating the context (meal, activity, and walk-through). For Wave 1, the observers used different behavior checklists for each of the settings. Although some of the behaviors were similar across all settings, there were a number of behaviors that were specific to the setting that was observed. To make the instrument easier to

administer, our second goal was to generate a list of items that could be assessed in all contexts.

Two kinds of analyses were undertaken to accomplish these two goals. The first analysis examined each context separately: we call this our *item-level analyses*. For the second set of analyses, we combined items across contexts; we call this our *combined items analyses*.

Item-level analyses. We used a strategy designed to identify the items that worked best in each setting. Specifically, an iterative process using stepwise regression was conducted for each setting, using all of the behaviors observed in that context to predict overall QOL (combining all domains into an overall score). Figure 8.1 shows which items emerged as predictors of over-all QOL for each of the setting-specific observations at Wave 1 (unit-weighted average of QOL, aggregated across all residents to the facility-level). The following items from the Walk-through instrument emerged as predictors of overall QOL at the facility-level.

Meal QOL predictors	Activity QOL predictors	Walk-through QOL predictors
06 residents at a table in silence	06 All residents silent	11 staff moved resident' s wheelchair w/o asking or discussion
08 staff move resident	09 Staff talk with each other over resident' s head	13 staff talk to each other over resident' s head
09 staff talk to each other over resident' s head	12 Staff pursuing own discussion during resident activity	24 resident expresses displeasure
13 residents fed in a messy way		28 resident calls out in distress
15 residents expression of displeasure		34 staff seen assisting family
21 residents observed calling out in distress		

Figure 8.1. Items correlated with Overall QOL in Each Wave 1 Observation Context

Combined-items analyses. Even though the observers used different instruments for each of the three settings, numerous behaviors were assessed in more than one setting. For example, “staff talks over head of resident” was assessed in the Activity, Meal, and Walkthrough settings. We identified all items that appeared multiple times, and averaged them together. The item “resident is disengaged” was expressed differently in the different contexts: no resident talking at a meal table, resident disengaged during activity, and resident seen disengaged at nursing station.

Next, we used these combined-item variables to predict overall QOL at the facility level in a series of stepwise regressions.

The following 5 items emerged from these analyses as important predictors of overall QOL at the facility level.

- Staff talks over head of resident
- Staff moves resident's wheelchair without asking or explaining.
- Resident expresses displeasure
- Resident calls in distress and is ignored
- Resident is disengaged

We concluded that we should definitely retain the 5 items that were associated with overall QOL in all 5 contexts as well as some that worked well in one of the other contexts.

We consolidated the meal and activity observations into a single walk-through protocol. We did 4 walk-throughs at a facility, each in prescribed time windows. Two time periods were during normal meal hours and two during normal activity times. The protocol was reduced to 16 items, using those items that had been fruitful in Wave 1. We adjusted one item “staff member explains a rule to a resident.” We had conceptualized this as a positive, resident-enabling occurrence that could be linked to the “security” or “autonomy” domains. According to our interviewer's notes, however, when they observed this item, it was almost entirely in the context of restricting a resident—i.e., explaining to a resident or family member that something they were doing was against the rules or that they were in forbidden areas. Reasoning that this might have accounted for the negative relationship between that element and some of the QOL domains, we modified the item to explicitly be defined as an observation of a staff member imposing a restriction on a resident's behavior. We retained the observation of staff speaking harshly or threateningly to residents simply because of its importance whenever it is observed; its frequency was too rare to be useful in a scale.

In Wave 2, we also attempted to improve sensitivity by allowing for an actual count of each behavior seen during the walk-through to a maximum of 9 occurrences per item.

### Wave 2 Frequencies

In Wave 2, observations were completed 4 times per facility; they were assigned to the regular interviewers according to convenience in the schedule. We had 61 facilities available for this analysis (one facility dropped from other analyses because the N of responding residents was less than 28) for this part of the study. Thus, we had 244 walk-throughs available for Wave 2, performed in 61 facilities. Although we had received exact counts of the occurrences of each item at Wave 2 our first descriptive look at the data revealed that very few items were observed more than once. The exception was residents being disengaged at the nursing station where, if it was seen, it tended to be seen for the maximum number of occurrences.

Table 8.7 shows the frequencies for Wave 2. To make the data comparable to Wave 1, we dichotomized the information into a “seen/not seen” variable, taking into account all four opportunities to observe at the facility. As with Wave 1, we later averaged the 4 times of observation to create scores.

Table 8.7. Frequency of Items Observed at Wave 2

Item # and abbreviated content	% NH's where item seen
w10 Resident solo activity	77.5
w04 Staff answer questions or fulfill requests	61.5
w11 Resident disengaged at nursing station	52.5
w15 Group activity w3 + residents (organized or spontaneous)	47.5
w02 Resident in distress	44.3
w06 Resident's body uncovered	36.1
w16 Disengaged during organized activity	28.7
w12 Resident not talking at meals	28.3
w01 Negative resident expression	23.8
w05 Staff talk with each other over resident's head	21.7
w14 Staff assisting resident or family member.	21.7
w03 Staff move resident wheelchairs without asking or discussing	14.3
w08 Staff impose restriction on resident	13.1
w07 Staff discuss resident's private business in public	9.8
w09 Staff speak roughly or threatening	4.1
w13 Resident fed messily	4.1

### Results of Scale-Level Analyses, Wave 2

As with Wave 1, we calculated negative and positive behavior counts and compared these scales to the average adjusted QOL scales of the residents who were interviewed. Table 8.8 shows these results. As the table shows, the observation instrument was unrelated to facility QOL in the Wave 2 administration. One potential reason for this is that the items that were used to create the Positive and Negative behavior counts were not highly related to each other. This meant that the scale reliability of the Positive and Negative behavior count scales were very low, which limited our ability to detect significant relationships. Another possible explanation for the lack of findings at Wave 2 was that the effort to create a more sensitive score by using behavior counts may have “overloaded” our observers. For example, they needed to be alert for all behaviors during the entire walk-through, whereas in Wave 1 they no longer needed to watch for behaviors during an observation period after they were seen more than once.



Table 8.8. Correlations between Behavior Counts and Adjusted QOL Scores

Scale	Negative Behavior	Positive Behavior
Comfort	0.058	0.027
Functional Competence	0.008	-0.009
Privacy	-0.161	0.329**
Dignity	-0.094	0.083
Meaningful Activity	0.102	0.142
Enjoyment	-0.095	0.083
Relationship	-0.015	-0.008
Individuality	-0.063	-0.053
Security	-0.113	0.024
Spiritual Well-being	0.06	0.074
Autonomy	0.111	0.057

\*\*Correlation is significant at the  $p < 0.01$  level (2-tailed)

### Transferability Study Changes

The purpose of the transferability study (which is described in Chapter 11) was to determine whether NH staff could be trained to complete the interview and observation instruments. This was a smaller-scale study, involving personnel from eight NFs; in each NF, we had 24 pairs of interviews completed by research staff and facility staff. We also used this as an opportunity to look further at the ability to create an observation scale correlated with overall facility QOL. We used the researcher observations and the researcher resident interviews for this analysis because presumably these would be the more accurate data, if the data in the paired assessments diverged.

For this protocol, we used the simplest response rubric: seen/not seen. We also added some environmental elements that might be associated with QOL and that could readily be observed during a walk-through. Also, in the transferability study, each participating staff member (4 per facility or 32) was asked to make 2 meal observations and perform 2 walk-throughs. The research observer accompanied the staff members on these walk-throughs and meal observations and independently completed the form.

For the design of the transferability study, it was not necessary to secure MDS or demographic data and, therefore, no adjustment of QOL scores was done.

### Transferability Study Frequencies

Table 8.9 presents the frequencies for meal observations for researcher protocols performed in the transferability study, and Table 8.10 presents the frequencies for the walk-throughs.

Table 8.9. Frequency of Researcher Observations in Transferability Study

Item # and abbreviated content	% seen in 8 facilities
3. staff answer questions or fulfill requests	91.9
14. Pleasant odors	73.4
9. Resident not talking at meals	62.9
8. Resident heard laughing	62.1
1. Negative resident expression	46.8
12. Tablecloths or placemats	40.3
11. Staff feeding more than one resident at a time	22.6
13. Centerpiece on each table	20.2
4. Staff talk over resident's head	18.5
2. Staff move resident's wheelchair without asking or discussing	16.1
6. Staff impose restriction	6.5
10. Resident fed messily	5.6
7. Staff speak roughly or threatening	4.9
5. Staff discuss resident's private business in public	4.8
15. Noxious noise levels	3.2
16. Unpleasant odors	0

Note: In 7 of 8 facilities 16 research observations were available for pairs of meals, but in the 8<sup>th</sup> facility some staff members failed to complete their protocols and we have only 12 pairs of meal observations made by researchers. This table is based on 124 pairs of meal observations. The occurrence is counted if it was seen at either meal.

Table 8.10 Frequency of Research Observations during Transferability Study Walk-Throughs

Item # and abbreviated content	% seen in 8 facilities
12. resident is in a solo activity	93.5
18. clutter in hallways	72.6
4. staff answer questions or fulfill requests	67.7
11. resident disengaged at nursing station	66.1
14. organized activity	62.9
10. resident heard laughing	62.3
13. spontaneous activity	56.5
15. disengaged during organized activity	40.3
1. negative resident expression	38.7
17. unpleasant odors	22.6
16. noxious noise levels	19.4
2. resident in distress	17.7
6. resident's body uncovered	9.7
3. staff move resident's wheelchair without asking or discussing	8.1
5. staff talk over resident's head	1.6
8. staff impose restriction	1.6
7. staff discuss resident's private business in public	0.0
9. staff speak roughly or threatening	0.0

Note: at 7 of the facilities, 8 walkthrough instruments were completed by research observers, whereas at the remaining facility only 7 walk-throughs were completed by researcher observers. Although each of 4 staff members in each facility was expected to complete 2 walk-throughs, for efficiency research staff were allowed to accompany two NF staff members on a walk-through with each independently completing the protocol.

### Transferability Study Scale Results

Once again behavior count scores were created. Pairs of meal observations or walk-throughs were averaged for that purpose. Table 8.11 describes the results. There were many more significant correlations in the Transferability study than in Wave 2. Unfortunately, many of the significant relationships were in directions that were contrary to expectations. It is possible that the circumstances of these walk-throughs—e.g., the fact that the researcher was accompanied by a staff member, changed the phenomenon that was being observed.

Table 8.11 Correlation between Behavior Counts and Un-adjusted QOL Scores

Domain	Meal Negative Behavior Count	Meal Positive Behavior Count	Walkthrough Negative Behavior Count	Walkthrough Positive Behavior Count
Comfort	-0.429**	0.244*	-0.609**	<b>-0.363**</b>
Functional Competence	-0.277*	-0.161	-0.474**	<b>-0.703**</b>
Privacy	<b>0.454**</b>	0.389**	-0.039	-0.183
Dignity	-0.161	0.123	-0.244*	-0.191
Meaningful Activity	-0.169	0.618**	0.056	0.306**
Enjoyment	<b>0.401**</b>	-0.152	<b>0.569**</b>	0.352**
Individuality	-0.129	0.474**	0.059	0.402**
Relationship	-0.097	0.205	<b>0.286*</b>	0.373**
Security	-0.136	0.144	-0.281*	<b>-0.250*</b>
Spiritual Well-being	-0.575**	0.448**	-0.408**	0.007
Autonomy	<b>0.547**</b>	0.338**	<b>0.235*</b>	-0.008

\*\* Correlation is significant at the  $p < 0.01$  level (2-tailed).

\* Correlation is significant at the  $p < 0.05$  level (2-tailed).

Correlations that were not in the expected direction are bolded.

### Cross Administration Item Analysis

The scale-level analysis showed an ability to predict QOL domain scores at Wave 1, but did not work for the other two administrations. The changes made in Wave 2 and the transferability study had a negative impact on the usefulness of the measure.

Given the inconsistencies across the three administrations (Wave 1, Wave 2, and Transferability) we conducted further comparative item-level analyses to examine how well each item worked in terms of relating to specific QOL domain scores or an overall summary QOL measure. The multiple tables involved in this analysis are not presented here, but Table 8.12 summarizes conclusions on utility of the item to predict resident QOL reports.

Table 8.12. Summary of Item Behavior in Predicting QOL Across Assessments

Item	Item behavior across 3 administrations	Overall Evaluation
w01 Negative resident expression	with 2 exceptions, correlations with domain scores are either negative or non-significant	useful item
w02 Resident in distress	with 3 exceptions, correlations are non-significant or negative (the exceptions – IND, MA, SEC -- all occurred in the Wave 1 Activity observation)	useful item
w03 Staff move resident wheelchairs without asking or discussing	numerous correlations, mostly negative. Exception is that in the transferability study, this variable correlated positively with 7 QOL domains in the MEAL observation; the only significant positive correlations were in this condition. In Wave 1 meal observation, correlations with this item are negative	potentially useful item if not used in meal observation
w04 Staff answer questions or fulfill requests	pattern of relationships differs by QOL domain; correlations are uniformly positive for MA, SEC, REL, IND, SWB; the significant correlations are negative for AUT; for the remaining QOL domains, the correlations within domain include both positive and negative correlations	because item varies by QOL domain, not useful to predict overall score; potentially useful for various domains, or overall QOL if AUT is not included in summary measure
w05 Staff talk over resident's heads	most of the correlations are negative; in 4 domains – PRI, CMF, AUT, ENJ – the correlation in the transferability study is positive	inconsistencies in direction of correlations suggests that this is not a useful item
w06 Resident's body uncovered	few significant correlations in confusing pattern – negative relationships with MA – positive relationship with DIG in transferability study	small number of significant correlations and mix of positive and negative relationships suggest this is not a useful item
w07 Staff discuss resident's private business in public	negatively related to FC, positively associated with ENJ	small number of significant correlations and mix of positive and negative relationships suggests this is not a useful item
w08 Staff impose restriction	for 6 domains (CMF, MA, SEC, DIG, FC, SWB), the transferability data yielded a confusing pattern (i.e., negatively correlated with QOL during the meal and positively correlated with QOL during the walk-through)	in the transferability study, the effect differed in the meal and walk-through – this inconsistency suggests that this is not a useful item

Table 8.12. Summary of Item Behavior in Predicting QOL Across Assessments Cont'd

Item	Item behavior in 3 administrations	Conclusion
w09 Staff speak roughly or threatening	strong negative correlations with multiple domains, but only in the transferability study; seems positively correlated to autonomy	most significant correlations in the expected direction come from the transferability study – suggests that this item will not be useful in general
w10 Resident solo activity	Few and inconsistent correlations	not a useful item
w11 Resident disengaged at nursing station	seems negatively related to SWB, DIG, FC, SEC, COM in walk-through only	potentially a useful item
w12 Resident not talking at meals	negatively related to ENJ, REL, CMF, SEC, FC, SWB, DIG when assessed during meal; positively correlated with PRI and AUT in transferability study	potentially useful because most correlations negative
w13 Resident fed messily	significantly negatively correlated with many QOL domain; however, positively correlated with SWB and ENJ in Wave 2 data	potentially useful because most correlations negative
w14 Staff assist family	there are very few significant correlations; all of the significant correlations (PRI, DIG, FC, SEC, REL) were from the Wave 1 walkthrough	not a very useful item
W15 Group activity	very confusing pattern of correlations; some positive correlations in transferability for REL, SWB, DIG; for 3 domains (ENJ, IND, SEC) the correlations across the data collections included a mixture of positive and negative correlations	inconsistent patterns suggests this is not a useful item
w16 Disengaged during organized activity	inconsistent pattern of correlations; for SWB, DIG, ENJ, SEC the correlations were negative for the Wave 1 Activity and positive in the transferability study walkthrough; for REL and IND, the correlations in the transferability walk-through were positive and very strong .822 and .704	inconsistent pattern suggests this is not a useful item

## Discrimination of Observation Items Across Facilities

In this part of the report, we examine whether the items in the observation instruments discriminated among the facilities. Because there were so few facilities in the transferability study, we used Wave 1 and Wave 2 facilities for these analyses. Tables 8.13, 8.14, and 8.15 show the results for the three observation contexts in Wave 1. The F-values in the tables are from one-way ANOVAs, with facility as the independent variable. Table 8.13 shows that 7 of the 24 items observed during meals distinguished the 40 Wave 1 facilities. Table 8.14 shows that 8 of the 24 items observed during activities distinguished among the 40 Wave 1 facilities. Table 8.15 shows that of the 37 items observed during the walk-throughs at Wave 1, 6 distinguished the 40 facilities.

Table 8.13. Results of One-Way ANOVAs for the Meal Observation in Wave 1

Items	F Value	Significance
1. resident makes explicit choice of food or refuses food offered	0.793	0.782
2. staff observed offering resident a choice of food or something else	0.738	0.848
3. private dining room actually in use by resident and guest	0.699	0.887
4. staff discuss residents' health or private business in dining room	0.800	0.773
5. residents at a table talking or laughing	1.265	0.182
<b>6. residents at a table sit in complete silence</b>	1.720	0.019
<b>7. staff talk to residents in baby talk</b>	1.536	0.050
8. staff move resident without asking if ready	0.854	0.698
9. staff talk to each other over resident's head while helping resident	1.366	0.116
<b>10. staff ask residents about weight, bowel movements, continence, etc.</b>	1.912	0.006
11. staff pause and answer residents' questions or comments	1.116	0.329
12. residents seen being fed slowly with requests for feedback about pace etc.	0.896	0.638
13. residents fed creating messy dribbles &/or inattention to wiping dribbles	1.155	0.284
14. residents spontaneous expressions of pleasure overheard	1.531	0.052
<b>15. residents' spontaneous expressions of displeasure or distress overheard</b>	2.469	0.000
16. staff overheard comforting a resident in distress or discomfort	1.137	0.305
<b>17. quarrels observed among residents</b>	2.026	0.003
18. resident observed helping other residents	1.060	0.399
<b>19. Staff observed explaining reason for a rule or policy to resident</b>	1.628	0.031
20. staff observed speaking roughly to resident &/or threatening him/her	1.347	0.126
<b>21. residents observed calling out in distress or crying without getting attention</b>	1.838	0.010
22. staff inquire about a resident's physical comfort	0.806	0.765
23. staff shows specific knowledge of a resident's interests or background	0.845	0.712
24. staff shows specific knowledge of a resident's food preferences	1.003	0.479

Note: The bolded areas indicate items with significant levels (  $p \leq 0.05$  ).

Table 8.14. Results of One-Way ANOVAs for the Activity Observation in Wave 1

Items	F Value	Significance
1. resident makes explicit choice of food or refuses a food offered	1.454	0.076
2. staff offers resident a specific choice about anything	1.239	0.202
3. staff agree to implement a resident request	1.444	0.080
4. staff discuss residents' health or private business in dining room	1.508	0.057
<b>5. a resident visibly enjoying activity</b>	2.983	0.001
6. a resident completely disengaged in activity	1.427	0.086
7. staff talk to a resident in baby talk	1.393	0.101
<b>8. staff move resident without asking if ready</b>	1.661	0.026
<b>9. staff talk to each other over resident's head while helping resident</b>	1.972	0.004
10. staff ask residents about weight, bowel movements, continence etc. during meal	0.955	0.549
11. staff pause and answer residents' questions or comments	1.438	0.082
12. staff engaged in own discussion during activity	1.218	0.221
<b>13. a resident's spontaneous expression of pleasure or enjoyment overheard</b>	2.019	0.003
<b>14. residents spontaneous expressions of displeasure or boredom</b>	2.070	0.002
15. quarrels observed among resident; displeasure or distress overheard	1.043	0.422
<b>16. resident expression of pain/ discomfort</b>	1.579	0.040
17. staff comforting or assisting a resident in distress or discomfort	1.121	0.323
18. resident observed helping other residents	1.214	0.224
19. staff observed explaining reason for a rule or policy to resident	0.860	0.690
<b>20. staff observed speaking roughly to resident &amp;/or threatening him/her</b>	1.698	0.021
<b>21. residents observed called out in distress or crying without getting attention</b>	2.999	0.001
22. staff inquire about a resident's physical comfort	0.738	0.849
23. staff shows specific knowledge of a resident's interests or background	0.898	0.634
24. staff shows specific knowledge of a resident's food preferences	1.256	0.188

Items that are bolded indicate significance level ( $p \leq 0.05$ )



Table 8.15. Results of One-Way ANOVAs for the Walk-through Observation in Wave 1

Items	F Value	Significance
1. resident makes explicit request	1.461	0.075
2. staff observed offering resident explicit choice	1.017	0.459
3. staff agreeing or implementing resident request	1.371	0.115
4. staff knock, announce selves, & wait before entering resident's room	1.324	0.142
5. private meeting or dining rooms actually used by residents and their guests	1.479	0.068
6. staff discuss residents in public places	1.391	0.105
<b>7. care routines done in public view (e.g. with bedroom or bathroom door open)</b>	1.668	0.026
8. a resident's body uncovered where resident can be seen	1.492	0.064
9. staff interrupt residents talking to other resident (s) or family	1.172	0.269
10. staff talk in baby talk to residents	0.919	0.603
11. staff wheel residents w/o asking or explaining	1.239	0.206
12. staff asks about weight, bowel movement, continence etc.	1.004	0.478
13. staff talk to each other over resident while giving care or transporting resident	1.371	0.115
14. residents lined up in public place for baths, medications, etc.	1.396	0.102
15. staff pause to answer resident question	1.536	0.052
16. staff get at eye level with resident in wheelchair	1.029	0.443
17. staff in conversation with residents about things other than care	0.988	0.501
<b>18. staff shows specific knowledge of a resident's interest or background</b>	1.750	0.017
19. a highly individualized resident activity- e.g. piano, maintaining a garden	1.231	0.213
20. resident observed in common place engaged in solitary activity- e.g., reading, doing, puzzle, really watching TV	1.457	0.076
21. residents seen interacting with animals	1.465	0.073
22. resident interacting with a child/children	1.455	0.077
23. resident heard expressing happiness or positive emotion	1.158	0.283
24. resident heard expressing displeasure or negative emotion	0.684	0.900
25. residents sitting in twos or small groups apparently interacting with each other	1.331	0.138
26. staff observed assisting residents with pain & discomfort or inquiring about it	1.536	0.052
27. resident at nursing stations or day rooms appear to be doing nothing at all	1.218	0.224
<b>28. resident calling out in distress, pain, or anxiety and not getting attention</b>	1.852	0.010
<b>29. resident in productive community role, e.g. working in store, delivering mail</b>	1.584	0.040
<b>30. staff speak harshly or roughly to a resident</b>	2.163	0.002
31. staff explain a rule or policy to a resident	1.206	0.234
32. staff observed assisting or encouraging resident in walking or doing an independent task	1.019	0.456
33. resident seen tidying room, sewing, doing her laundry, arranging/ discarding flowers or some such productive task	1.439	0.083
<b>35. staff observed assisting family to take resident out or find a place to visit</b>	1.580	0.046
36. staff observed helping resident make or receive a private phone call	1.018	0.458
37. resident appears to be enjoying a group activity	1.180	0.260

Items that are bolded indicate significance level ( $p \leq 0.05$ ).

Looking across the three assessment contexts in Wave 1, we note that three items were useful in discriminating among the facilities in more than one assessment context. These were: “residents observed calling out in distress or crying without getting attention” (significant in activity, meal, and walk-through), “staff observed speaking roughly to resident &/or threatening him/her” (significant in activity and walk-through), and “residents’ spontaneous expressions of displeasure or boredom” (significant in meal and activity).

Six items were significant in only one of the three settings, suggesting that these items are more limited but still useful in distinguishing among facilities. Additional meal observations discriminating among facilities were: staff talks to residents in baby talk; staff asks residents about weight, bowel movements, continence, and other private information in hearing of others; and staff observed explaining reason for a rule or policy to resident (the item we reworded as staff restricting resident in Wave 2). Additional activity observations that discriminated across facilities were: staff move residents in wheelchairs without discussion; staff talk to each other over resident’s head while helping resident; and resident’s spontaneous expression of pleasure or enjoyment overheard (significant in activity only). An additional walk-through item that distinguished among facilities was the observation of staff showing specific knowledge of a resident's interest or background.

The same procedure to examine discrimination across facilities was performed with the Wave 2 data collected in 61 facilities. Table 8.16 shows the results of those one-way ANOVAs. The table shows that 11 of the 16 items selected for observation at Wave 2 did discriminate across facilities; these items are bolded in the table.

Table 8.16. Results of One-Way ANOVAs for Facility Observations in Wave 2

Item	F Value	Significance
<b>w01 Negative resident expression</b>	1.870	0.001
<b>w02 Resident calling out in distress and not getting attention</b>	2.414	0.001
w03 Staff move resident wheelchairs without asking or discussing	1.355	0.058
<b>w04 Staff answer questions or fulfill requests</b>	2.069	0.001
w05 Staff talk over resident's head	0.767	0.890
<b>w06 Resident's body uncovered</b>	3.428	0.001
<b>w07 Staff discuss resident's private business in public</b>	2.575	0.001
<b>w08 Staff impose restriction</b>	1.540	0.012
w09 Staff speak roughly or threatening	0.998	0.488
<b>w10 Resident solo activity</b>	4.613	0.001
<b>w11 Resident disengaged at nursing station</b>	6.091	0.001
w12 Resident not talking at meals	0.978	0.527
w13 Resident fed messily	1.054	0.383
<b>w14 Resident assist family</b>	1.494	0.019
<b>w15 Group activity</b>	3.160	0.001
<b>w16 Disengaged during organized activity</b>	1.505	0.017

Items that are bolded indicate significance level ( $p \leq 0.05$ ).

Having identified that the items do discriminate among facilities, the next question we asked was whether the differences among the facilities fell into a meaningful pattern. To answer this question, we created a profile for each facility across all of the items within each observation instrument. For the sake of illustration, we present the data for Wave 1 meal observations in Table 8. 17 with positive items listed first and then negative items following. Item #1, a positive item, for example, is “resident makes explicit choice of food or refuses a food offered”), which is followed by 2 other positive items. Item, #4 “staff discusses residents’ health or private business in dining room” begins the negative items. The +/- signs underneath the item numbers indicate whether the facility scored higher or lower than the other facilities on that item (a blank indicates that the facility scored around average for that item). Thus, the NF with a code of 1 (first line), scored higher than average on 3 of the positive items (3, 5, and 14) and lower than average on two of the negative items (4 and 9). Using this approach, the facility with the most positive profile across the meal observations is #28, with 6 high scores on positive items and 4 low scores on the negative items. Using this procedure for the Activity and Walk-through items in Wave 1,

and for the Wave 2 items, we similarly were able to identify patterns of positive and negative observations in specific facilities that would suggest possible QOL problems. Because these tables are lengthy and difficult to interpret unless read with the items, the rest of the tables are not presented.

## **Conclusions**

This chapter has provided considerable detail on an approach to making facility-level observations of staff-resident interactions deemed positive or negative in relation to resident QOL. We had some success in identifying individual items that are associated with QOL domains (particularly at Wave 2), but only at Wave 1 could we successfully construct summary scales of positive and negative behaviors that were correlated with resident-reported QOL for those residents who were interviewed in the same time period.

If we view the observations as providing intrinsically useful information to supplement QOL, then we need to know that facilities are differentiated on the items. Here we were able to demonstrate that many of the items, including half the items fielded at Wave 2, did distinguish among facilities and that these distinctions form meaningful patterns of positive and negative findings that characterize the outlier facilities.

Table 8.17. Deviation Scores Across All Items for the Meal Observation in Wave 1

Positive Items														Negative Items											
NF	1	2	3	5	11	12	14	16	18	19	22	23	24	4	6	7	8	9	10	13	15	17	20	21	
1			+		+		++							-				-							
2	+			+				-	-	++	+			+			++								
3													-				+				+				
5									-					-									+		
6			+++					-	+		+	-	+	-				-							
7	-					-						-							+		-				
8	--	--						+						-				+				+	++		
9				++	+	+																			
10	-	-			-							++	+				+	+		+	+			++	
11				+	-		-		+				-								+				
12	+		++	+			+					+								+	-		+		
13				-	-	-	-						-	-											
14				-	+	-		+	-		+			-				-							
15	-	-	++							++		+	++							+					
16				+		++		-			-	-	-	-			-	-			-				
17					+		+			++		+									-		++		
18			+																	++	+	++		+++	
19	-		+					-	++					-											
20					+	+					+														
21				-			-				-			+		+								+	
22	+			+	++				-		-	-	-	-				++			+				
23																		-		+					
24									+								++	+							
25		-					+													++	+	+		+	
26				-				++		++	++							+							
27			+												--			-					+		
28	+	+		+	+		+						++	+	--		-	-			-				
29	-	-		-	-									-	---		-	-							
30		+		-		+		+			+						+			+	+				
31				+		-								++		+++	-					++	++		
32						+	-	+	+		-		-	+				+	++		++			+	
33	+	+							+							-	+				+	+	+	+	
35	+			-	-								+	-					+						
36		+		-				+	-		+	+													

Table 8.17. Deviation Scores Across All Items for the Meal Observation in Wave 1

37	+						-		-		-	-	-	-							-			
40					-			+	-		+				+									
41							-				+	-			-			--			-			



## **Chapter 9**

### **Potential QOL Indicators from On-Site Data Collection**

The next chapter described how extant data available from the MDS and from OSCAR were associated with QOL. Utilizing such data to target nursing homes for regulatory attention and to help inform inspection surveys could be an efficient strategy for CMS. As part of the project, we also collected other detailed data about the programs, policies, and staff deployment at each NF with the intent of exploring the possibility of other indicators related to QOL. We refer to these elements as “on-site indicators.” An “on-site indicator” could potentially be converted to an off site indicator if CMS were to request that additional data be reported by facilities, either as part of the Census related to the survey and certification inspections or in some other manner.

Because no established methods were available to collect most of the information that we explored as possibly related to QOL, this chapter describes the challenges of the data collection effort in some detail with an emphasis on those variables potentially related to QOL that proved difficult to specify and record. CMS may glean useful information from failures as well as successes in the data collection effort. The chapter also describes relationships between descriptors of the facilities and QOL in those facilities.

### **Methods**

#### **Data Collection**

Wave 1. At Wave 1, data were collected through personal visits of the project director to the 40 NFs in the study. During those visits, when possible, she interviewed administrators, directors of nursing (DONs), directors of social services (DSSs), and Activity Directors or their designees, as well as other key figures in a particular facility (e.g., staff developers, chaplains, MDS coordinators). The focus was on the conditions in effect during the time period when the



QOL data were collected from residents. She also gathered archival information about nurse staffing patterns by unit for two week windows contemporaneous with our QOL data collection and three and six months prior to data collection. This information allowed us to extrapolate staffing ratios by shift and by day of the week.

Semi-structured interview guides were used for the interviews with key personnel, supplemented by open-ended questions and extensive note-taking. Part of the objective in this phase was to learn how meaningfully to pose questions about phenomena thought to be relevant to one or more QOL domain. The labor intensive personal interview format was used. Senior personnel (largely the project director) did the data collection because of uncertainty about how best to collect the data, and our goal of reaching some conclusions about the wording of the questions. Telephone follow-up was done to interview individuals who were not available during the site visits or to clarify or round out the information collected on site. We collected archival information when possible, such as activity calendars, mission statements, continuing education schedules, resident and family council records, and care planning conference records.

As the study evolved, we became more aware of sources of possible information and began to ask routinely for materials related to care planning and staff development. We tried to collect such materials retroactively for the facilities visited earlier, but with limited success due to personnel and ownership changes. The semi-structured interview guides are found in Volume 2, Appendices J-M. The strategy involved gathering information from whoever could provide it. In some facilities, DONs provided information that was provided by administrators in other facilities. Similarly, social workers or activities personnel were often interchangeable in the information they could provide. For example, we sought information on topics such as resident participation in facility governance, or quality assurance related to QOL and identified primary

informants (in those examples the social worker and DON, respectively), but ended up receiving the information from a variety of different informants. Appendix N contains a summary sheet on which we entered indicator information related to facility policies and procedures regardless of the identity of the initial informant.

Wave 2. Having conducted the procedures described above in Wave 1, we developed a more streamlined facility-self-report data collection approach for Wave 2, through which we attempted to gather information that Wave 1 suggested could be collected accurately. For this purpose, we used a four-page questionnaire in the 60 Wave 2 facilities. The on-site data collector presented it to the administrator at the beginning of data collection, and was available to answer any questions about it. The form was completed by the administrators or their designees and, for the most part, personally collected by a research interviewer when the team completed the 3 to 5 days of data collection entailed at Wave 2. The form for collection of administrative data is in Volume 2, Appendix R.

### Data Elements

Wave 1. The research team undertook a cognitive process of identifying elements of program, policy, and staff deployment that might be relevant to one or more of the QOL domains. We also considered the most likely source(s) for the information and ways the information could be collected. Some of the items deal with the resources that might be available to enhance QOL, whereas others deal with actual practices. For example, we looked at dollars spent on activity budgets per resident, volunteer-to-resident ratios, training of activity personnel, and ownership of a van as resources for activities, but we also looked at the actual scheduling and variety in the activities program. Similarly, we explored the various committee structures for resident participation (a resource), but we also tried to ascertain how well meetings

of resident councils were attended and whether elected officers controlled the agenda (actual practice). We asked about policies related to respecting resident preferences on matters such as bed time, waking times, bathing and showering circumstances, and the like. But recognizing the likelihood of a socially desirable answer to those kinds of questions, we also asked the informants about whether in the last 3 months one or more residents, to their knowledge, went to bed after 10 p.m. or got up after 10 a.m., or had baths or showers more than twice a week.

The facility-level information that we collected fell into broad categories, such as: *organizational information*, including program scale, ownership; vertical and horizontal integration of the organization, and specialization within the organization; *tenure of key leadership personnel* (administrator, DON, DSS, activities director) in their leadership roles and general tenure of employment at any capacity at the facility; *educational qualifications of key personnel*; *quality assurance efforts* (especially as they regarded QOL); *educational programs*, including staff orientation and training (again especially on content related to QOL); *turnover and stability of nursing personnel*, including RNs, LPNs, and CNAs; *organization of nursing services* wages, including working conditions, and incentives for nursing staff, type of nursing leadership positions and specialized aide positions, structure of shifts, use of registries, unit management, and permanent assignment of nursing staff to units and to residents. We also tried to characterize care planning practices, end-of-life planning, and discussions of advance directives; and resident autonomy and resident control in care routines. The questions asked to identify policies for resident control were put to the DON respondents because they largely related to nursing functions.

We tried to identify nurse staff levels (ratio to residents) by shift and day of week and by payroll versus registry or agency for various time windows: 2 weeks during the time of our visit;

3 months earlier, and 6 months earlier. This was designed to allow us to examine patterns on weekends and evening and night shift. To gather this information in real time we used actual staffing sheets on each of the units, which showed whether individuals assigned to the unit did not come to work and were replaced by others, or were reassigned because they were needed elsewhere. We also calculated the ratio of psychosocial personnel to resident s allocation (separately for social work personnel, activities personnel, and spiritual director or pastor).

Other areas covered included dining provisions, activities programs (scope, scale, emphasis, degree of individualization, budgetary and other resources (including van) for activities); religious programming; governance and resident participation; complaint policies; practices around resident personal possessions and their security; resources and practices related to medical care; and resources and practices for rehabilitation or restoration.

We also used the opportunity of these site visits to explore the viability of using a variety of archival sources as unobtrusive indicator information related to QOL. For example, we explored using the visitor sign-in register for information about visits, and the care plan records for information about resident and family attendance at care plan sessions. For the most part, we determined that such logs would not be sources of accurate or reliable information on the phenomenon we were attempting to observe. We also attempted to develop a rate of involuntary intra-facility room transfer (i.e., room changes other than those requested by the resident to secure a single room, a more desired room, or a different roommate). Social workers tend to keep a record of those transfers, but the information proved somewhat difficult to interpret.

We asked about the planned staffing patterns for each unit, but also, as indicated above, we collected detailed information about staffing levels on the individual units, using payroll or actual scheduling sheets. Often the reality of how many people worked a unit differed from the

ideal staffing pattern because of absences without replacements.<sup>1</sup> We attempted to examine continuity of staff on a particular nursing unit by determining what fraction of persons named as serving on the unit at Time 0 were also there at Time 0-3 months and Time 0-6 months.

Wave 2. At Wave 2, we chose data elements that our experience at Wave 1 suggested could be collected accurately by report of administrative staff. Some of our data elements were informed by our observations at Wave 1; for example, we learned about a plethora of different specialized ways of handling food and dining, which we incorporated into the Wave 2 data set. We removed the more subjective data elements (e.g., the items pertaining to resident autonomy on daily routines). Some elements were removed because they had no variation. The Wave 1 experience helped us define other variables we wished to retain, for example, permanent assignment of CNA is one such example.

### Analyses

Besides compiling descriptive statistics, the analysis sought to examine the relationship between various indicators and the QOL domains. For this latter purpose, we combined Wave 1 and 2 for those items that were available in both Waves, thereby having a potential of 97 facilities for many variables. We also looked separately at the performance of those items available for Wave 1 only and those available for Wave 2 only. We did univariate analyses of these indicators with and without adjusting the QOL scores by resident characteristics. These procedures yielded a huge number of ANOVAs. In this report, we, therefore, counted how many domains were predicted by each of the potential predictor variables and used the count as a

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<sup>1</sup>We also had available staffing information as reported in OSCAR on the 2-week window provided at the time of the survey. (We used these OSCAR data as off-site indicators in Chapter 10.) The OSCAR data had several disadvantages: they tend to be based on an idealized estimate of staff rather than actual staff worked as reconciled by payroll and contract information; they are not available at the unit level; they do not permit detail about weekend and evening and night shift staffing ratios; and they were not matched exactly to the time of our data collection.

dependent variable. In the future, we plan to conduct cluster analyses to reduce the on-site indicator data into a smaller number of topical categories.

### **Data Collection and Sample**

Most, but not all, Wave 1 facilities cooperated with the on-site data collection. In a few exceptions, a facility refused to have its personnel interviewed, refused or failed to follow through with providing the detailed staffing data, or both. Two facilities that were very cooperative simply lacked detailed staffing records going back 3 or 6 months; one was a facility close to decertification and under new management, and the other was simply disorganized in its personnel records. (It is possible, of course, that inability to produce contemporaneous or historical data on staffing should, itself, be a negative indicator.) In Wave 1, the N varied per item, fluctuating around 35 of the 40 NFs where we had data for each item.

Detailed staffing data by unit for one or more of the 3 desired time periods were collected from 94 units, representing 35 facilities. One small facility of 49 beds comprised just one unit. Another facility was unable to separate staff according to its 2 units and was, therefore, treated as a unit in the analyses. The facility that was close to decertification was divided into units for the purpose of nurse assignments but these units had little logical physical integrity and the management was planning to redesign the unit structure to have more functional relationship to the floor plan and the kinds of residents in each unit.

Three administrators of the 60 Wave 2 administrators failed to complete their questionnaire. Thus the maximum number of responses available per item if no data were missing for Wave 2 was 57.

### **Descriptive Findings**

Table 9.1 and 9.2 shows the distribution on items gathered at Wave 1 and at Wave 2, and

comments on issues involved in collecting the data to use as indicators.<sup>2</sup> At Wave 1, we collected much more extensive data to determine how feasible various kinds of data collection would be in nursing homes. As the comments indicate, we noted many problems in our efforts to collect consistent, reliable data, even on items that we had expected to be more straightforward. We learned a great deal about the 40 nursing homes in Wave 1, and the more we learned the less confident we felt about the ability to easily collect indicator data tapping QOL. This was particularly a concern because we could not envisage an operational data collection system that would use visits and multiple informants such as we used at Wave 1. We realized that self-reported data would be necessary.

For Wave 2, we consolidated items that had proved amenable to collection at Wave 1 into a self-completed instrument to be filled out by the administrator or his or her designee. Table 9.2 shows the data collected with that form. Although administrators were largely cooperative, later inspection of the data suggests that many of the items were poorly understood without a data collector to provide additional information. We believe some errors are present in the information provided by Wave 2 facilities about tenure of the occupants of key positions (both in the position and in the nursing home) and experience in that particular leadership role in any nursing home. Some respondents also could not calculate CNA retention rates and left them blank, a problem we attribute to their not understanding the item. Because we noted enormous variation in dining practices not formally captured in Wave 1, we surveyed the administrators for those practices, but are unsatisfied that they provided accurate data. A self-completed tool will need more detailed instructions than we provided.

Table 9.3 displays the variables we had available at both Waves 1 and 2 in their consolidated form. Commentaries on data collection relate to the experience collecting these data elements at

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<sup>2</sup> In this chapter, tables are very long and, therefore, are placed at the end of the chapter.

Wave 1 when we were on site.

We present pairs of identically prepared tables for Wave 1 potential indicators, Wave 2 potential indicators, and the common indicators for both waves. Table 9.4, for example, displays information about statistically significant relationships between QOL domain scores and each indicator variable. The potential N for Wave 1 was 40; the actual N on the table suggests those variables that could not be completely collected. Our N is poor for items concerning staff development because we decided to give it attention after some of the site visits were complete, and, despite attempts, we had difficulty getting the missing data when we were not on site. No marks appear in the columns for the counts of significant relationships when none were identified. Considerable blank space appears in Table 9.4. Ordinarily, more significant relationships appear when we do not adjust the QOL results for gender, age, cognition, and ADL. Table 9.5 presents the data with the actual domains listed and pluses for positive and minuses for negative relationships between the potential indicator and the domains. Looking down the columns, one can see that we found few associations with Meaningful Activity, Enjoyment, or Autonomy, but found more with Comfort, Privacy, and Spiritual Well-being, which includes items that are rather general. Room changes were associated with several negative QOL domains; unfortunately, room changes were a hard item to complete.

Tables 9.6 and 9.7 present the same information for data unique to the 57 facilities that reported process and structure data at Wave 2. Some of the relationships found significant make little sense, especially those that run in the opposite direction than expected. A facility having restorative nurses' aide, for example, was negatively associated with a number of QOL domains.

Table 9.8 and 9.9 present these data for the indicators we have in common across 97



facilities in Wave 1 and Wave 2. A higher percent of Medicaid residents was associated with poorer QOL, and the percent of the sample in private rooms was associated with better QOL. Having 50 or more volunteers was associated with positive QOL. Private non profit ownership status was also associated with good QOL in 6 domains without adjustment and 7 with adjustment. Having assisted living and housing programs on campus, tenure of the administrator, and tenure of the social work director appeared to be promising indicators.

CMS was interested in whether any of the indicator data collected on site would be correlated with overall excellent or poor QOL on multiple domains. To examine the relationship between individual putative indicators and an overall QOL score, we created three tiers of summary QOL scores at the facility level. Using the results previously shown for the 40 Wave 1 facilities in Tables 6.3 and for the 60 Wave 2 facilities in Table 6.8 , we counted the numbers of standard deviations across all domains for each facility. We, thus, created an arithmetic sum with positive and negative values. We then arrayed this distribution and created three tiers of approximately equal size. “High” facilities are those with the best overall QOL scores; “low” facilities have the poorest overall QOL scores.

Group means were compared using ANOVA. Because of the exploratory nature of this analysis, we chose a very generous level of statistical significance. Any differences at 0.1 or less are shown; all those left blank were not significant at even this level.

In sum, there were few significant differences, certainly no more than might be expected by chance alone. Some observers will be tempted to see some trends that support their hunches, but overall great caution should be used in interpreting these results. They do not point to administrative variables that might be used with any confidence in identifying good or bad QOL.

Table 9.1. Frequencies for On-Site Indicators and Comments, Wave 1

Wave 1 Item (Maximum N = 40)	Prevalence	Comments
Field/discipline of activity director ✓ Therapeutic recreation/recreation ✓ Music-related ✓ Art-related ✓ LPN/CNA ✓ Certified Occupational Therapy Aide ✓ Education/Teaching ✓ None—high school only ✓ Other	21.1% 18.4% 7.9% 15.8% 5.3% 5.3% 23.7% 2.6%	Hard to interpret. Discussions with activities directors show they tailor their programs according to their backgrounds and interests. One of the most vigorous and well-organized activity programs was run by a former teacher. Those approaching the job from an art or music background tend to use those skills. All activities directors had become certified as expected to be an activities director.
Education of other activities personnel ✓ 2 or more have college degrees ✓ 1 other has a college degree ✓ all others have high school only or less	15% 20% 55%	10% had 1-person departments, so % adds to less than 100%. Some departments tried to complement the director's interests with other staff. Some used part-time high school and college students heavily. Overall, 30% of all activities staff had education relevant to activities (i.e. therapeutic recreation, music, art, OT, adult education.)
Activity director sent for outside training in past year	57%	We had 35% missing on this variable.
Activity department has no dedicated budget	5%	This item referred to budget excluding salary of personnel (e.g., equipment, refreshments, instructors/entertainers).
Activity department has budget but director is not aware of the total sum	17.5%	
Activity department annual budget	Median \$4800	27 of the 40 have missing data on this variable. Range among those who replied went from \$600 a year to \$16,080.
Trips/outings at least monthly	80.2%	87.5% had trips at least quarterly. It was difficult to ascertain what proportion of the residents availed themselves of such opportunities.
Activity department enables resident to pursue own interest beyond the regular programs.	55%	We required an example of this before counting it as a yes.
Activity department is aware of which residents have no visitors and develops compensatory efforts.	35%	Activity department records vary enormously. It would be hard to get consistent data on attendance at activities, enjoyment of activities, efforts to target people without outside stimulation, or records of one-to-one activities. Some activity programs did keep extremely detailed records, beginning with individualized activity assessments, but record formats varied greatly.
Beauty shop opened 3 days or more.	65%	
Beauty shop opened on Thurs, Fri, or Sat	62.5%	
Evidence of house pets (not fish)	52.5%	
Formal Eden alternative participant	17.5%	
Regular animal visitation	70%	Includes places where staff brings their dogs.
At least one resident has brought their <u>own</u> pet (bird, cat, dog)	10%	4 of the 40 NFs permitted this. Many are concerned about behavior problems and territoriality of animals that are owned by a resident rather than trained for group.
A separate admission director is social worker or part of social work department.	5%	
Social worker has access to psychiatrist or psychologist for mental health consultation.	55%	
Therapeutic or support groups for family		Could be led by social worker or leader comes in from community, e.g. Alzheimer's Association. .
Residents actively discouraged from bringing valuables to NF.	77.5%	We saw this as a negative indicator related to QOL.

<b>Table 9.1, cont'd, Item</b>	<b>Prevalence</b>	<b>Comments</b>
Facility policy is to replace lost items after reasonable search.	40%	The social worker is most often in charge of lost property. Another 25% NFs replace items if NF is clearly at fault.
Complaint policy includes visible forms and places to make anonymous complaints.	65%	
# of residents changing room or bed in last two weeks. ✓ none ✓ 1 resident. ✓ 2 to 4 residents ✓ 5 or more ✓ no record maintained/missing	35.0% 10.0% 7.5% 12.5% 35.0%	The largest # of changes in the 2 week period was 12. Social workers typically dealt with room changes as they relate to roommate disputes, though nurses typically make original roommate assignment. Some social workers kept careful records of all room changes and reasons (involuntary versus requested), but we were missing this information in more than 1/3 of the NFs.
# room changes due to resident request in last 2 weeks. ✓ 0 ✓ 1 ✓ 2-4 ✓ Missing	30.0% 10.0% 7.5% 52.5%	We saw room changes in general as negative for QOL but room changes because of a resident request as positive responsiveness. The missing data is higher here than for the room changes in general because not all NFs tracked the reason.
Rate of room changes per resident in 2 week period.		We made an effort to introduce a denominator to room changes. We could calculate this for only 20 of the 40 homes. The range was from 0 to 3.
GNP or Physician Assistant in NF 8 hours per week.	50%	This includes GNPs or PAs employed by medical director, an arrangement more frequent than employed by NF.
Highest DON education in nursing: ✓ Hospital based diploma. ✓ AA degree. ✓ BSN ✓ MSN	20.6% 41.2% 35.3% 2.9%	
ADON employed	55%	
CNA training occurs on-site	41.9%	
25+% of care conferences attended by at least 1 resident.	48.1%	48.1% is from an N of 27 homes that had this information. 32.5% of the homes could not provide the record. We calculated this by looking at care conference records for the year and noting whether 1 of the residents on the agenda attended. More than 1 could have attended.
50%+ of care conferences attended by at least 1 family member.	46.4%	The 46.4% is from an N of 28 homes that had the information; 30% could not provide it. We calculated it as for the resident attendance. Some informants pointed out that their family members were so involved with the NF and so well informed about care changes that it was artificial for them to attend the conference. We counted attendance by telephone. Some facilities make great efforts to schedule care conferences so family can attend.
At least 50% time staff developer designated with no other role	52.9%	Other arrangements included administrators or clinical nurses in role. During site visits we heard arguments that the staff developer should not be in a direct authority line with personnel
Staff developer hours per resident per week	Median is .5	The range is 0 to 4 staff developer hours per resident per week.
Orientation for new staff of at least a week before counting on shifts	53.8%	
Staff development deals explicitly with QOL and goes beyond mandatory topics	36%	This may be too subjective an indicator to apply widely. We looked at curriculum to make judgments.
High frequency staff development—at least every 2 weeks	36%	

<b>Table 9.1, cont'd, Item</b>	<b>Prevalence</b>	<b>Comments</b>
Highly individualized staff development	25%	Evidence included example of how the staff developer observed staff on all shifts to identify their needs, developed education tailored to particular residents in the census, and helped staff achieve outside educational goals.
MDS nursing component completed by charge nurses or unit supervisors.	32.5%	We saw this as positive as opposed to having the MDS nurse complete the assessments.
Care planning meetings attended by line nurses.	5%	
Baths or showers routinely offered 2 times a week or more.	65.7%	Homes divided into once a week or twice a week bathing for routine practices.
Baths and showers occur on multiple shifts.	88.2%	
Example given of a resident who has more than usual bathing because of preference.	45%	
An example given of a resident who routinely gets up after 10 a.m.	62.5%	
An example given of a resident who routinely goes to bed after 10 p.m.	65%	
Refrigerators are permitted in resident rooms and at least 1 resident has one.	32.5%	
Strong management at nursing unit level	50%	This was a rather subjective indicator. Strong meant unit coordinators had responsibility for hiring and if other personnel were assigned as part of unit teams.
PT hours per resident per week.		Only 14 homes could calculate this. Instructions were to count both contract and employed PTs and use a convenient time period. Range for those reporting was 6 to 120; 5 homes had 80 or more PT hours per resident per week.
OT hours per resident per week.		Only 15 homes could calculate this, using the same guidelines as for PT. The range was 3 to 120; 4 homes had 80 or more OT hours per resident per week.
Speech therapy hours per resident per week.		Only 7 could calculate this. The range was 1 to 40 hours.
NF employs a director of rehabilitation or a clinical nurse specialist.	25%	
NF employs restorative nurse's aides.	70%	
All therapy (PT, OT, ST) hours per resident per week.		21 homes could calculate this; some could give total that could not disaggregate by type of therapist. The range was from .10 to 192 hours. Median was slightly under an hour.
All therapist time plus all therapy aide time per resident per week.		21 homes could calculate this. The median was 1 hour and the range from .12 to 600 hours.
Medical director present 8 or more hours a week	30%	50% reported medical director present 4 or more hours a week. It is hard to distinguish their presence for medical director activities from care of their own patients.
Number of residents using medical director for primary care.		Median was 31 and the range from 0 to 115. A few NFs prohibited the medical director from being PCP.
Number of physicians practicing as PCPs in NF (including medical director).		The range was 1-50 and the median 6. We tried to look at whether criteria for attending privileges were applied but could not get good information on this.
Dental clinics at least quarterly.	60%	
Podiatry clinics at least quarterly.	65%	
Eye clinics at least quarterly.	45%	
Dermatology clinics at least quarterly.	17.5%	

Table 9.2. Frequencies for On-Site Indicators and Comments, Wave 2

Wave 2 Item (Maximum N = 57)	Prevalence	Comments
% Medicaid days in 2000	Median 65%	Range 0 to 95%
% Medicare days in 2000	Median 7.4%	Range 0 to 59%
Occupancy rate in 2000	Median 92%	Range 58% to 99.32%
Same owner for last 2 years	82.5%	
Facility operated by a hospital	10.5%	
Facility operates Assisted Living	19.3%	
Facility operates senior housing	14.0%	
Facility operates adult day care	14.0%	
Hours per week of staff developer(s)		Respondents had difficulty calculating. Range was from 10 hours to 130 hours per week.
NF employs paid clergy/chaplain	35%	
Hours per week of paid chaplain or clergy	Median 34 hrs	Range for those who had paid clergy, chaplains, or spiritual directors was 4 to 200 hours. If we remove 3 outliers, none had more than 4 hours a week clergy. It appears some respondents did not understand these questions.
NH employs MDS/PPS coordinator(s)	98.2%	
Hours per week of PPS coordination	Median 40 hours	All but 5 Wave 2 respondents had at least 2 FTEs for MDS/PPS coordination.
NH employs QI manager	67%	
Hours per week of QI manager		24 of 57 failed to complete this item.
CNAs assigned permanently to unit	75.5%	
CNAs assigned permanently to residents on day and evening shifts	57.9%	By specifying day and evening shift, we made this questions easier for administrators to complete
CNA turnover rate in 2000	Median 50%	Range from 3% to 154%
RN turnover rate in 2000	Median was 35%	Range from 1% to 192%
Registries used for CNAs	41%	
Hours of CAN registry use in 2000	Median 5589	Range from 45 to 60,000 hours. When top and bottom outliers are removed, range is from 383 to 29, 124 hours.
Registries used for licensed personnel	48%	
Hours RN/LPN registry use in 2000	Median 3000	Range 160 to 60,000. The high one may be an error; the next highest use is 23, 552. With our qualitative work at Wave 1, we found that some facilities used registry nurses for long periods of time in key positions. There was one instance of the DON coming from a registry.
Total weekly hours for all activities personnel	Median 140 hours	Range from 55 hours to 32, 142
Total weekly hours for all social work personnel	Median 40 hours.	Range from 38 to 564.
Administrator months tenure at this NF	Median 26 months.	Range from 2 months to 318 months.
Administrator experience in any other NF	Median 42 months.	Range from 0 to 285 months.
Administrator mos at this NF in any role	Median 38 months	Range from 0 to 264. Question was not sufficiently clear. The 11 who said 0 did not count the administrator's position as administrator in total.
# of administrators in last 2 years	54.4 had only 1; 10.6 % had 3 +	
DON months tenure at this NF	Median 24 months.	Range is 1 to 213 months.

<b>Table 9.2, cont'd. Wave 2 Item (Maximum N = 57)</b>	<b>Prevalence</b>	<b>Comments</b>
DON months at this NF in any role	Median 27 months.	Question was not sufficiently clear. The 10 who said 0 did not count the DONs position as DON as part of the total.
# of DONs in last 2 years	52.6 had same DON; 11% had 3 or more DONs	The greatest number of DON changes in 2 years was 8.
Activity Director (AD) mos. tenure at NF	Median about 3 years	Range from 1 to 182 months.
AD experience as AD at any NF	Median 8 to 216 months	47% were in first job as AD.
AD months at this NF in any role	Median 3 years	22.8% began employment as AD; question misunderstood because some respondents did not include months as AD in the total
# of ADs in last 2 years	61% had same AD for 2 years	
Director of SW (DSW) mos tenure at NF	Median 2 years	Range 3 to 168 months
DSW experience as DSW at any NF	50% had not been DSW elsewhere	
DSW months at this NF in any role	24.6% had only been DSW at the NF	
# of DSWs in last 2 years	49.2% had same DSW for 2 years	12.2% had 3 or 4 people in role in 2 years.
Activity Director field	30% had therapeutic recreation degrees	29.8% did not have an activity-related degree such as art therapy, music therapy, adult education, OT
1 or more others in Activity Dept have activity-related degree	42%	
Activity personnel work on Saturday	98%	
Activity personnel work on Sunday	81%	
Activities after dinner at least 2 days per wk	71.9%	
Activity van as least ½ time serving 8 + res.	38.6%	
NF keeps count of its volunteers	43.9%	
Number of volunteers	Median 32	Range 2 to 1126. The 1126 is an outlier, with the next highest number being 223. In Wave 1, we found some administrators count all members of auxiliary.
NF keeps count of its volunteer hours	50.9%	
Number of volunteer hours	Median is 2112	Range is 50 to 40,095 hours. After dropping high outlier, the range is 50 to 23,000 hours.
Employ restorative aides	77.2%	
Hours of restorative aides per week		Range from 1 to 208 hours per week/
Employ GNP or physician assistant	47.4%	
Number of dining rooms	19.3 % had 1; 42.1% had 4 or more	1 NF had 10 dining rooms, 4 had 7, and 4 had 6.
Wait staff (not CNAs) serve meals ✓ In entire NF ✓ Part of NF ✓ No wait staff	9.1% 23.6% 65.5%	
Plates removed from trays for service	70%	33% removed food from trays in only part of NF
Food served family style in serving bowls on table	14.5%	1 NF used family style service in entire NF, and the rest did so selectively
Restorative dining occurs		This question was misunderstood and results not useful.

Table 9.3. Frequencies for On-Site Indicators and Comments, Waves 1 and 2 Combined

Item (Maximum N is 97)	Prevalence	Comments
Mean % private rooms	19.51%	Range 100% to 0
Mean % Medicaid payer mix in year before.	64.33%	Range 0 to 98%; 9 could not calculate so Item N is 88.
Mean % Medicare payer mix in year before.	8.59%	Range 0 to 59%
Mean number administrator changes in last 2 yrs	1.24	<p>✓ These items on tenure of leadership were meant to tap both experience with the facility and with the various roles, that is, both capability and continuity in the NF. The responses ranged enormously. Administrator changes in last 2 years ranged from 0 to 6 and DON changes in last 2 years ranged from 0 to 8.</p> <p>✓ Future analyses might combine the tenure and experience variables in a variety of ways and develop an index of change.</p> <p>✓ Our qualitative interviews made it clear that the data on tenure in a role and change needs to be interpreted collectively. We visited a NFs where administrators and DONs were both new in role but the administrator was the previous long-time DON and the DON was the staff developer. The former administrator was also on site running the campus. Despite all the role changes, this NF obviously showed substantial stability of leadership personnel.</p>
Mean months tenure of administrator at NF	62.71	
Mean months experience of administrator as administrator of any NF	95.29	
Mean months administrator employed at NF in any capacity	78.83	
Number of DON changes in last 2 years	1.34	
Mean months DON tenure at NF	46.64	
Mean months DON has been a DON at any NF	52.25	
Mean months DON has been employed at this facility in any capacity	81.14	
Mean months tenure of director of activities	62.43	
Mean months activity director experience in position at any NF	68.27	
Mean months activity director employed at NF in any capacity	86.45	
Mean months tenure of director of social wk	55.47	
Mean months DSW experience as DSW at any NF	55.25	
Mean months DSW employed at NF in any capacity	57.80	
Staff developer hours per resident per week	23.73	Range 0 to 130.
% CNAs employed for 1 year or more at NF	56.19	This was defined as % of CNAs currently employed who were also on payroll the previous year. Only 71 of 97 NFs could calculate this. The standard deviation for the item was 25.09%.
% CNAs employed for 5 years or more at NF	30.83	This was defined as % of CNAs currently employed who were also on payroll 5 years before. Only 66 of the 97 NFs could calculate this. The standard deviation for the item was 23.4%.
Mean number of paid total activity staff hours per week	163.50	The range here was from 4 to 873. Even when calculated as a rate per resident to take into account NF size, the range is great. Some activity programs have 7 or 8 FTEs and use many part-time individuals on the staff.
Total social work hours per week in NF	80.63	This ranged from 0 (in a NF where the administrator served as social service designee) to 564. Sometimes a licensed SW served as admissions director or volunteer coordinator. Which social work personnel to count requires definition.
Mean # of dining rooms/areas in NF	3.65	Range from 1 to 20.
Dementia special care unit	43.8%	
Occupancy of 90% or more in last year	65.3%	
Occupancy of 80-89% in last year	23.7%	
Occupancy below 80% in last year	10.6%	
Ownership: public ✓ Proprietary ✓ Private non profit ✓ Public (e.g. county)	51.5% 42.3% 6.2%	

<b>Table 9.3, cont'd, Item</b>	<b>Prevalence</b>	<b>Comments</b>
Owned & managed by hospital	15.2%	We expected hospital-based programs to be less homelike, with negative QOL results. In Wave 1, however, we saw examples that cast doubt on that hypothesis because physical plants and policies were conducive to QOL. In one, the menus were determined by preferences of NH residents not hospital patients. Two hospital-based programs argued that economies of scale with kitchens, laundries, volunteer programs, therapies, etc. allowed them to generate a higher QOL for their residents, though our sample is too small to explore this.
Assisted living on campus	26.0%	
Retirement housing on campus	17.2%	
Operates adult day center	22.9%	
Same owner for 2 years or more	84.4%	
Employs staff developer (not DON or Adm)	84.6%	
Employs clergy/pastor or spiritual dir. 50%+	34.7%	Sometimes hard to tell time commitment if clergy serves hospital or campus
1 or more staff dedicated as MDS/PPS coordinator	83.9	The 15 that did not use an MDS coordinator tended to be small and to have no Medicare program
Staff member (not DON or admin) does QI	52.4%	
✓ Employed at 50% time or more for QI	30.9%	
Permanent assignment of CNAs to units	73.2%	We were told this changes with RN shortages and desire to distribute payroll employees across units
Permanent assignment of CNAs to residents	56.4%	Although 53 DONs stated that they used permanent assignment, they qualified it in many ways. Some used it for part of the facility only. Some used it for some shifts only. Almost all who used permanent assignment maintained a pool of floaters who moved among units. Although an attractive indicator for QOL, a yes/no answer did not seem an appropriate way to approach that question.
Registry/ pool for CNAs in last 3 most	35.6%	Some NFs had a policy never to use pools even with nursing shortages. Such NFs often asked staff to work extra shifts, ran with short shifts, or maintained in-house pools or rosters. Using pool use as a negative indicator may be a problem because working double or understaffed shifts may be worse than using pools.
Registry/pool for licensed staff last 3 months	47.3%	
Restorative CNAs employed	78.3%	
50+ active volunteers in resident programs	46.0%	These numbers are hard to obtain. It seems important not to count those who visit occasionally with youth groups and the like. Some facilities keep poor records of this.
Educational level of Activities Director		In Wave 1, 12 of 40 activities programs were headed by former CNAs, typically people who started as activity staffers.
✓ high school only or plus CNA or LPN	51.6	
✓ college or graduate school	48.4	
Paid activity staff on duty on Saturdays	96.8	
Paid activity staff on duty on Sundays	84.2	
Activities after dinner at least 2 days a wk	70.7	
Van can transport 8+ residents for non-medical events	44.7	NFs with adult day care tended to have vans available with drivers in the middle of the day
PT in house (not contracted)	56%	
OT in house (not contracted)	52%	
Speech therapy in house (not contracted)	48.8%	



Table 9.4. Variables Studied at Wave 1 and their Significant Relationship to QOL

	N	# significant QOL domains		Variable type
		Adjusted	Unadjusted	
Size: i.e., Licensed capacity of NH beds	39			Continuous
Number of residents in house	38			Continuous
Location: Urban or rural	40			Dichotomous
Chain status	39			Dichotomous
If nonprofit, it is: nonsectarian,. Protestant, or Catholic or Jewish	20	3	1	Categorical.
Facility has a home care program	33			Dichotomous
Unionized – paraprofessionals only	35			Dichotomous
Unionized - licensed staff(RN/LPN with/without paraprofessionals	35			Dichotomous
Starting CNA wage in \$	32			Continuous
Top CAN hourly wage in \$	28	1	0	Continuous
Administrator at facility in role for at least 2 years	38	0	1	Dichotomous
Administrator has Nursing Credential by type of RN education	33	1	1	Categorical
Administrator has Nursing Credential: yes/no	32	0	1	Dichotomous
QI process in place clearly includes quality of life	34			Dichotomous
Resident satisfaction data are routinely collected	35			Dichotomous
Family satisfaction data are routinely collected	35	0	1	Dichotomous
Designated QI leader by role	36			Categorical
CNA training on site	31	1	1	Dichotomous
Practicum site for CAN training	28	0	1	Dichotomous
Practicum site for RN training	29	1	0	Dichotomous
Teaching affiliations other than nursing	29	1	5	Dichotomous
Designated staff developer other than administrator	34			Categorical
Orientation for new staff a week or more before working floors.	26			Dichotomous
Staff development deals explicitly with QOL (beyond mandatory)	25	0	2	Dichotomous
Staff development at high frequency - at least every 2 weeks	25	1	4	Dichotomous
Highly individualized staff development	25	0	2	Dichotomous
Mechanism to identify staffs' educational needs	25	1	1	Dichotomous
Activities director has been in job for 2 years or more	38	2	1	Dichotomous
Number of months of Act. Director at NF in any capacity	33	1	0	Continuous
Number of months experience as an Act. Director at any NF	34	0	1	Continuous
Educational level of other activities personnel	36	1	0	Categorical
Activities Director has gone to educational program in last year	26			Dichotomous
Activity staff hours per resident per week	34	3	3	Continuous
Activity department annual budget excluding salaries.	27	0	2	Continuous
Separate activity schedule for more than 1 unit (e.g. dementia unit)	36	3	1	Dichotomous
Activity calendars on weekly basis	35	1	2	Dichotomous
Paid volunteer coordinator at 50% or more time	38			Dichotomous
Van with capacity to transport 6 resident for non-medical trips	40	1	1	Dichotomous
Trips/outings at least monthly	38	0	2	Dichotomous
Trips/outings at least quarterly	38	0	1	Dichotomous
Television, radios, record players are available for loan	21			Dichotomous
Activity department aware of which residents have no visitors	36			Dichotomous
Beauty shop opened 15+ hours per week	37	1	1	Dichotomous
Beauty shop opened 3 separate days or more	38	1	1	Dichotomous
Beauty shop opened on Thursday, Friday, or Saturday.	37	1	1	Dichotomous
Activities department enables a resident to pursue outside interest	37			Dichotomous
Evidence of house pets other than fish	35	2	2	Dichotomous
A resident has brought own pet	33			Dichotomous
Eden Alternative consciously attempted	35	3	1	Dichotomous
Regular animal visitation	34	1	2	Dichotomous
Exercise programs	38			Categorical
Discussion groups programmed	38	1	0	
Arts/crafts regularly programmed	36	2	2	Categorical
Movies regularly programmed	36	1	2	Categorical
Bingo/games regularly programmed	38			
				Categorical

**Table 9.4 cont'd, Wave 1**

	N	NFs	# significant QOL domains		
			Adjusted	Unadjusted	
Socials/parties regularly programmed	35				Categorical
Resident council meets monthly with at least 10 residents attending	39		1	1	Dichotomous
Active food committee apart from resident council	39				Dichotomous
A family council exists	37		2	2	Dichotomous
A family council meets quarterly with at least 5 attending	36				Dichotomous
A resident's handbook has been developed	33				Dichotomous
Resident rooms cable ready	28		0	1	Dichotomous
Resident rooms have phone jacks	28		0	2	Dichotomous
Intergenerational programming with preschool on site	37		0	3	Dichotomous
Affiliation with elementary or secondary school	35				Dichotomous
Affiliation with 4-H, scouting or other youth connections	32				Dichotomous
Children regularly volunteer	28				Dichotomous
Residents have opportunity to volunteer (1 or more resident does)	36		5	3	Dichotomous
Clergy/pastoral counseling/spiritual well-being employed	38		1	1	Categorical
Social worker director's education	39		1	1	Categorical
Social work director employed in role for 2 years or more	36		1	1	Dichotomous
SW consultation at least 1/2 a day per month	37				Dichotomous
Other mental health consultation available - e.g., psychologist.	35				Dichotomous
Admissions director is BSW or MSW or related field	39		1	0	Dichotomous
Therapeutic resident group(s) take place	38		9	5	Dichotomous
Therapeutic or support groups for family take place	39		6	6	Dichotomous
Facility discourages residents to bring valuables to facility	38				Dichotomous
Facility policy to replace lost articles after reasonable search time	37		0	1	Categorical
Complaint policy transparent & easy to use.	36				Dichotomous
Number of people changing room in NF in last 2 weeks	26		1	3	Continuous
Number of room changes made that were sought by resident	19				Continuous
Rate of room changes per resident in 2 weeks	20		0	1	Continuous
Highest nursing education level of DON	34				Categorical
DON in place in role for 2 years or more	36		0	1	Categorical
50%+ of care conferences attended by a family member	28				Dichotomous
25%+ of care conferences attended by a resident	27				Dichotomous
MDS nursing component is completed by charge nurses	36				Dichotomous
Care planning meetings are attended by line nurses	31				Dichotomous
Strong unit management	37		0	2	Dichotomous
Baths/or showers routinely offered twice a week +	35				Dichotomous
Baths and showers occur on more than one shift	34		3	4	Dichotomous
One or more residents bath more than twice a week by choice.	35		2	1	Dichotomous
One or more resident routinely sleeps past 10 a.m.	34		1	0	Dichotomous
One or more resident routinely goes to bed after 10 p.m.	35		0	3	Dichotomous
Refrigerators permitted in resident rooms (a resident has one)	35		1	1	Dichotomous
Facility employs an ADON	37		1		Dichotomous
Physical therapy hours per week	14				Continuous
Occupational therapy hours per week	15				Continuous
Speech therapy hours per week	7				Continuous
A director of rehab or clinical nurse employed	30				Dichotomous
Therapy hours (OT, PT, ST + rehab aides) per resident per wk	21				Continuous
MD present 4 hours+ per week	37				Dichotomous
MD present 8 hours+ per week	37				Dichotomous
Number residents using medical director as primary care provider	35				Continuous
Number of MDs who practice in NF as primary care provider	36				Continuous
GNP, PA or equivalent present 8 hours per week	37				Dichotomous
Dental clinics in facility at least quarterly	35			1	Dichotomous
Podiatry clinics in facility at least quarterly	34				Dichotomous
Eye clinics in facility at least quarterly	33				Dichotomous
Hearing clinics in facility at least quarterly	33		1	0	Dichotomous
Dermatology clinics in facility at least quarterly	32		1	0	Dichotomous

Table 9.5 Indicators Significantly Related to Individual Domains with Wave 1 Data Only

		Domains											# sig.
		cmf	Fc	pri	dig	ma	enj	rel	sec	swb	aut	ind	
Private nonprofit-	adj.			+						+		+	3
	unadj.									+			1
Top CNA hourly wage	adj.									+			1
	unadj.												
Administrator there 2 yrs or more	adj.												
	unadj.								+				1
Administrator is nurse.	adj.	+											1
	unadj.	+											1
Type of nurse credential.	adj.												
	unadj.	+											1
Family satisfaction collected	adj.												
	unadj.			+									1
CNA training on site	adj.						+						1
	unadj.						+						1
Practicum site for CNAs	adj.												
	unadj.				+								1
Practicum site for RNs	adj.			-									1
	unadj.												
Other trainees (non-nursing).	adj.				+								1
	unadj.	+		+	++				+			++	5
Staff development on QOL	adj.												
	unadj.				+							+	2
Staff development frequency	adj.				+								1
	unadj.			+	+			+				++	4
Individualized staff develop	adj.												
	unadj.	+						+					2
Mechanism for outside education for staff seeking career ladder	adj.						+						1
	unadj.	+											1
Activity director there 2 yrs	adj.			+							+		2
	unadj.										+		1
# months Activity Director in NH in any capacity	adj.	+											1
	unadj.												
# months Activity Director in role in any NH	adj.												
	unadj.		+										1
Educational level of activity personnel	adj.			+									1
	unadj.												
Activity staff hours per resident	adj.	+							++	+			3
	unadj.	++							++		+		3
Activity department budget	adj.												
	unadj.	+		++									2
Multiple activity schedules	adj.	+	+								+		3
	unadj.										+		1
Activity calendar put out weekly basis	adj.			+									1
	unadj.	+		+									2

Table 9.5, page 2

Variable		Domains											# sig domains
		cmf	fc	pri	dig	ma	enj	Rel	sec	swb	aut	ind	
Van that holds at least 6	adj.								+				1
	unadj.								++				1
Trips/outings at least monthly	adj.												
	unadj.			++					+				2
Trips/outings at least quarterly	adj.												
	unadj.			+									1
Beauty shop open. 15+ hrs/wk	adj.									+			1
	unadj.									++			1
Beauty 3 separate days	adj.									+			1
	unadj.									+			1
Beauty Thurs. Fri. or Sat.	adj.				+								1
	unadj.				+								1
Evidence of house pets	adj.	+							+				2
	unadj.	+							+				2
Claims to be Eden Alternative NF	adj.		+							+	+		3
	unadj.									+			1
Regular animal visits	adj.				++								1
	unadj.		+		++								2
Activities include discussion groups	adj.											++	1
	unadj.												
Activities include music groups	adj.										++		1
	unadj.										+		1
Activities include arts and crafts	adj.					++		+					2
	unadj.					++		+					2
Activities include movies	adj.											+	1
	unadj.	+										+	2
Resident council meets monthly with at least 10 present	adj.		++										1
	unadj.		++										1
Family council in existence	adj.							+		+			2
	unadj.							+		+			2
Resident rooms have cable TV	adj.												
	unadj.			+									1
Resident rooms have phone jacks	adj.												
	unadj.			+	+								2
Preschool on site	adj.												
	unadj.				+				+			+	3
1 or more resident volunteers	adj.			+	+			+	+	++			5
	unadj.							+	+	++			3
Clergy/pastor employed 50%+	adj.									+			1
	unadj.									+			1
Social Work Director education	adj.					+							1
	unadj.					+							1

Table 9.5., page 3

Variable		Domain											# sig domains
		# sig.											
		cmf	fc	pri	dig	ma	enj	rel	sec	swb	aut	ind	
Social Director there for 2yrs	adj.									+++			1
	unadj.									+++			1
Admissions Director has BSW or MSW	adj.							+					1
	unadj.												
Therapeutic resident groups	adj.	+	+	++	+			++	++	++	+	++	9
	unadj.	+						++	+	++		++	5
Therapeutic family groups	adj.		+	+			++		++	++		++	6
	unadj.		++				+++		++	++	+	++	6
# changing room or bed	adj.				-								1
	unadj.	-		-	-								3
Rate of room change per resident in 2 week period	adj.												
	unadj.		-		+								1
Strong unit management	adj.												
	unadj.			+	+								2
Baths routinely 2x a week	adj.												
	unadj.												
Baths on more than one shift	adj.	+		+	+								3
	unadj.	+		+	+						+		4
Example of a resident having baths more than 2 times a week	adj.					+						+	2
	unadj.											+	1
Rising time is individualized	adj.		+										1
	unadj.												
Bed time is individualized	adj.												
	unadj.	+						+				+	3
Refrigerator in resident's room	adj.					+							1
	unadj.					+							1
Employ ADON	adj.											++	1
	unadj.												
Therapy hrs for therapy aides	adj.										+		1
	unadj.										+		1
Quarterly dental clinic	adj.												
	unadj.									+			1
Quarterly hearing clinic	adj.									+			1
	unadj.												
Quarterly dermatology clinic	adj.									+			1
	unadj.												
<b>Significant relationship counts</b>		21	9	24	20	3	2	10	16	24	11	17	

Table 9.6. Variables Studied at Wave 2 and their Significant Relationship to QOL Domains

Potential Indicator	N	# significant QOL domains		Variable type
		Adjusted	Unadjusted	
Size: i.e., Licensed capacity of NH beds	56			Continuous
Having an SCU	56			Dichotomous
% private rooms	57	1	2	Continuous
% Medicaid	55	3	3	Continuous
% Medicare	54			Continuous
% occupancy	55			Categorical
Ownership	57	2	5	Categorical
Run by hospital	57	1	1	Dichotomous
Owns an Assisted Living Facility	57	1	2	Dichotomous
Owns senior housing	57	2	4	Dichotomous
Runs adult day care	57			Dichotomous
Administrator months in role at facility	57			Dichotomous
Administrator months as administrator in any facility	56			Continuous
Administrator has Nursing Credential: yes/no	51			Continuous
Administrator change in last 2 years	57			Continuous
Director of Nursing months at NH	55			Continuous
Director of Nursing months at other NH	50			Continuous
Director of Nursing months in NH any position	55	1	1	Continuous
Direct of Nursing change in last 2 years	55			Continuous
Activities Director at NH	54	1	1	Continuous
Activities Director position at other NH	52			Continuous
Activities Directory any position in NH	52			Continuous
Director of Social Work months in NH	55			Continuous
Director of Social Work months at other NH	50			Continuous
Director of Social Work months in NH any position	55	1	0	Continuous
Staff Developer	57			Dichotomous
Staff Developer # of hours per week	45	2	1	Continuous
Clergy or Chaplin	57	1	1	Dichotomous
MDS/ PPS Coordinator	57			Dichotomous
QI Manager	55			Dichotomous
NF has QI manager for 50% +	33			Dichotomous
NF has QI manager for 25% +	33			Dichotomous
CNA assigned to nursing unit	57	1	2	Dichotomous
CNA assigned to specific resident	57			Dichotomous
CNA 1 year + experience	51			Continuous
CNA 5 year + experience	47			Continuous
CNA registries	56	2	4	Dichotomous
Licensed personnel registries	56	4	6	Dichotomous
Rehab aides	57	2	4	Dichotomous
Activities personnel hours per week	54			Continuous
Social Work personnel hours per week	56	1	1	Continuous
Volunteer hours 50+	25	3	5	Dichotomous
Activities Director highest level of education	54	4	4	Categorical
Activities Director education	54			Dichotomous
Activities Director degree if college educated	36			Categorical
Activities Director work on Saturday	56			Dichotomous
Activities Director work on Sunday	56	4	5	Dichotomous
Activities Director works after dinner	53			Dichotomous
Van for use by Social Worker for transporting up to 8 residents	56			Dichotomous
Physical Therapy offered in house by NF	56			Dichotomous

**Table 9.6, continued**

	N NFs	# significant QOL domains		Variable type
		Adjusted	Unadjusted	
Occupational Therapy offered in house by NF	56			Dichotomous
Speech Therapy offered in house by NF	57			Dichotomous
# of dinning rooms available	56			Continuous
# of dinning rooms per licensed beds	55			Continuous
# of private rooms	57	1	1	Continuous
# of beds with 3 + residents	57	0	1	Continuous
% of NF Occupied	55	1	1	Continuous
# of hours per week of paid clergy or chaplain	18			Continuous
# of hours per week for coordinator	51			Continuous
# of hours per week for manager	33			Continuous
% of CAN turnover for NF	53			Continuous
% of RN turnover for NF	53			Continuous
# of CNAs in NF in 2000	53			Continuous
# of RN + LPN	53	1	1	Continuous
# of CAN for 1 year	53			Continuous
# of RN + LPN for 1 year	52			Continuous
# of CAN for 5 years	49			Continuous
# of RN + LPN for 5 years	48			Continuous
# of CAN hours	19	1	1	Continuous
# of licensed personnel hours	21	1	0	Continuous
# of Activities Director in NH for 2 years	55			Continuous
# of Director of Social Work in NH for 2 years	55			Continuous
NF keeps account of volunteer	56			Dichotomous
# of volunteers	25	2	2	Continuous
NF has account of volunteer hours	57			Dichotomous
# of volunteer hours	33	3	2	Continuous
NF has estimate of volunteer hours	33			Continuous
# of hours for rehab aides	44			Continuous
Geriatric NP or PA for NF	57	1	1	Dichotomous
Staff serve meals for all of NF	55			Dichotomous
Staff serve meals for part of NF	55			Dichotomous
Staff serve no meals for NF	55	0	1	Dichotomous
Food on table for all of NF	54			Dichotomous
Food on table for part of NF	54	2	4	Dichotomous
Food on table for none of NF	54	2	3	Dichotomous
Family style food service for all of NF	55			Dichotomous
Family style food service for part of NF	55	3	2	Dichotomous
Family style food service for none of NF	55	1	1	Dichotomous
Restorative dining for all of NF	54	1	1	Dichotomous
Restorative dinning for part of NF	54	2	2	Dichotomous
Restorative dinning for none of NF	54			Dichotomous
Fine dinning for all of NF	54			Dichotomous
Fine dinning for part of NF	54	1	1	Dichotomous
Fine dinning for none of NF	54	1	1	Dichotomous

Table 9.7. Indicators that Significantly Influence Individual Domains at Wave 2

Variable label		cmf	fc	priv	dig	act	enj	Rel	sec	swb	aut	ind	# sig. Dom
% private rooms	adj.			++									1
	unadj.		+	++									2
%Medicaid	adj.			-	-				---				3
	unadj.			--	-				---				3
Ownership	adj.			+			+						2
	unadj.			+	+		++		+	+			5
part of a hospital	adj.							+					1
	unadj.							++					1
runs assisted living.	adj.			++									1
	unadj.			+			+						2
runs senior housing	adj.			+			+						2
	unadj.	+		+			+		+				4
months.DON at NH in any position	adj.					--							1
	unadj.					--							1
months activity director in role at NH	adj.									++			1
	unadj.									+			1
months Social Work at NH in any position	adj.					--							1
	unadj.												
# hrs/wk of SD	adj.		-									-	2
	unadj.		-										1
paid clergy or pastor or spiritual director	adj.			++									1
	unadj.			++									1
	unadj.												
CNAs permanent to nursing unit	adj.										+		1
	unadj.						+				+		2
Used registries for CNA	adj.						+	+					2
	unadj.		+				+	+		+			4
Used registry for licensed nurses	adj.						++	++		+++		+	4
	unadj.	+	+				+++	+++		+++		+	6
rehab aides	adj.							--		--			2
	unadj.						-	--		---		-	4
wkly hrs SW personnel	adj.											-	1
	unadj.											-	1
50+ hrs volunteers	adj.						+++	++		+			3
	unadj.				+		+++	++		+		+	5
Act Dir highest education	adj.		+	+	+				+				4
	unadj.		+++	+	++				+				4
Activities staff work on Sundays	adj.				-	-	-	-					4
	unadj.		-		-	-	-	-					5
% occupancy	adj.									+			1
	unadj.									+			1
	adj.											-	1



Variable label		cmf	fc	priv	dig	act	enj	Rel	sec	swb	aut	ind	# sig. Dom
	unadj.											--	1
# of CNA 1 yr	adj.												
	unadj.												
# of hrs CNA	adj.				-								1
	unadj.				-								1
# of hrs licensed nursing personnel	adj.				-								1
	unadj.												
# of volunteers	adj.									+	++		2
	unadj.									+	++		2
NF counts volunteer hours	adj.												
	unadj.												
# of volunteer hours	adj.		-							+	-		3
	unadj.									+	-		2
geriatric NP or PA	adj.										--		1
	unadj.										--		1
food on table not trays, entire NF	adj.												
	unadj.												
Food on table not trays part of NF	adj.			++					++				2
	unadj.		++	+		+			+				4
Food always on trays	adj.			-		--							2
	unadj.			-		---					-		3
Food dished out family style in part of NF	adj.	-			-							-	3
	unadj.				-							-	2
Food never served family style	adj.	++											1
	unadj.	++											1
Restorative dining in entire NF	adj.		--										1
	unadj.		--										1
Restorative dining in part of NF	adj.							-		--			2
	unadj.							--		--			2
Fine dining in part of NF	adj.							-					1
	unadj.							--					1
No fine dining	adj.							+					1
	unadj.							+					1
<b>QOL findings count</b>		5	11	18	8	13	15	18	8	18	9	11	

Table 9.8. Variables Combined at Both Waves and their Relationships to QOL Domains

Variable	Number significant domains			
		Unadjusted	Adjusted	Type of variable
# of licensed beds	96	0	0	Continuous
Has a dementia special care unit	96	4	0	Dichotomous
% of private rooms	94	5	0	Continuous
% of Medicaid days in 2000	88	7	2	Continuous
% of Medicare days in 2000	87	5	0	Continuous
Occupancy rate (categorical)	97	2	1	Categorical
Ownership (for-profit, non-profit, public)	97	6	5	Categorical
NF operated by hospital	92	1	0	Dichotomous
NF operates assisted living	96	6	5	Dichotomous
NF operates senior housing	93	6	3	Dichotomous
NF operates adult day care	96	7	1	Dichotomous
NF same owner for 2 years	96	0	0	Dichotomous
# of months administrator in NF in role	92	4	1	Continuous
# of months administrator in role at any NH	83	0	0	Continuous
# of months administrator at this NF	87	6	4	Continuous
# of administrators in last years	94	3	2	Continuous
# months of DON in this NF as DON	90	0	0	Continuous
# months of DON as a DON in any NF	77	2	1	Continuous
# months of DON at this NF in any role	83	2	0	Continuous
# of DONs in last 2 years	92	2	1	Continuous
# months activity director at NF in role	93	1	1	Continuous
# months AD as AD in any NF	86	2	0	Continuous
# months of AD at this NF in any role	86	3	0	Continuous
# months of Director of SW in NF in role	89	6	4	Continuous
# months of DSW as a DSW in any NF	78	6	2	Continuous
# months of DSW at NF in any role	88	1	0	Continuous
NF employs staff developer	91	0	0	Dichotomous
# of hours a week of staff developer	71	3	0	Continuous
NF employs clergy, chaplain	95	3	3	Dichotomous
NF employs MDS/PPS coordinator	93	3	0	Dichotomous
NF employs QI manager	84	2	0	Dichotomous
NF employs QI manager at least 50% time	65	2	0	Dichotomous
NH employs QI manager at least 25% time	62	1	0	Dichotomous
CAN assigned permanently to residents	94	1	1	Dichotomous
% CNAs working 1 year or more	71	0	0	Continuous
% CNAs working 5 years or more	66	0	0	Continuous
registries used for CAN	90	0	0	Dichotomous
registries used for licensed personnel	91	2	2	Dichotomous
NF employs rehabilitation aides	92	3	3	Dichotomous
weekly hours for all activities personnel	93	0	2	Continuous
weekly hours for social work person	95	0	0	Continuous
50 or more volunteers in year	63	7	6	Dichotomous
activities director's highest education	93	3	0	Categorical
activities director's has degree in relevant field	93	4	3	Dichotomous
activities director's actual field	74			Categorical
activities staff work on Saturday	95	0	0	Dichotomous
activities staff work on Sunday	95	2	1	Dichotomous
act. staff after dinner twice a week or more	92	0	1	Dichotomous
van for social travel for 8 residents or more	94	3	1	Dichotomous
PT in house or contracted	84	0	0	Dichotomous
OT in house or contracted	84	0	0	Dichotomous
speech therapist in house or contracted	84	0	1	Dichotomous
number of dining rooms	91	0	0	Continuous
number dining room per licensed beds	89	6	0	Continuous

Table 9.9. Indicators that Significantly Influence Individual Domains (Wave 1 and 2 Combined)

Variables:		cmf	f c	pri	dig	ma	enj	ind	rel	sec	swb	aut	# sig. dom.
Has dementia SCU	unadj.	+		++						+	+		4
	adj.												
% sample in private rooms in NF	unadj.	++	+	+++	++		+						5
	adj.												
% Medicaid	unadj.	-	---	---	--		-	---		-			7
	adj.				--					-			2
% Medicare	unadj.		++	++			+	+++	+				5
	adj.												
% occupancy rate in year prior to interviews	unadj.						+				++		2
	adj.										++		1
Tax status	unadj.			+++	+++		+++		+	++	+++		6
	adj.			+	+		+			+	++		5
Owned by hospital	unadj.								+				1
	adj.												
NF has assisted living on campus	unadj.	++	++	++			++			++		+	6
	adj.	+	+	+			+			++			5
Retirement housing on campus	unadj.	+++		++	+		++			++	+		6
	adj.	++					++			++			3
Has adult day care	unadj.			+	+		++		+	+	+	+	7
	adj.						+						1
# Mos, tenure administrator	unadj.	+			+					+	+		4
	adj.	+											1
# Mos. as administrator at any NF	unadj.												
	adj.												
# Months administrator at this NH in any capacity	unadj.	++		+	+		+		++	++			6
	adj.	++					++		++	++			4
# changes in administrator in last 2 years	unadj.	-			-						--		3
	adj.										--		2
	adj.											-	1
# mos DON tenure at this NF in any capacity	unadj.							-	+				2
	adj.												
# mos activity director's tenure	unadj.										+		1
	adj.				+								1
# mos. Activity director at any NF	unadj.		+		+								2
	adj.												
# mos activity director's tenure at this NF in any capacity	unadj.		+		+				+				3
	adj.												
# mos. enure of Social Work Director (SWD)	unadj.	++		+			+++		+++	++	+		6
	adj.					+	+++		++	+			4
Months of SWD experience as SWD in any NF	unadj.	+			++		+		+	+	++		6
	adj.							+			+		2

<b>Table 9.9, page 2</b> <b>Variables:</b>		<b>cmf</b>	<b>f.c.</b>	<b>pri</b>	<b>dig</b>	<b>ma</b>	<b>enj</b>	<b>ind</b>	<b>rel</b>	<b>sec</b>	<b>swb</b>	<b>aut</b>	<b># sig. dom.</b>
Staff developer hrs per resident per wk	unadj.		- - -	-				- -					3
	adj.												
NH employs clergy person	unadj.			++			+				++		3
	adj.			++			++				++		3
1 or more FTEs for MDS and/or PPS coordination	unadj.		- -	-	-								3
	adj.												
NH employs QI director (not admin. or DON)	unadj.			-				+					2
	adj.												
QI director 50% or more time	unadj.			-	-								2
	adj.												
QI director 25% or more time	unadj.										-		1
	adj.												
Permanent assignment of aides to units	unadj.											+	1
	adj.											+	1
Permanent assignment of aides to residents	unadj.											+	1
	adj.											+	1
	adj.												
Registry used for licensed personnel	unadj.						++				++		2
	adj.						+				++		2
Restorative Nursing Aids (RNAs) employed	unadj.						- -		- -		- -		3
	adj.						- -		- -		- -		3
Number of paid activity staff hours per resident per wk	unadj.												
	adj.						+			+			2
50 or more active volunteers in the activities program	unadj.	+		+	+		++		++	+	++		7
	adj.	+		+			+++		++	+	+++		6
Educational level of activities director	unadj.							+			+	+	3
	adj.												
Activity director's field	unadj.			+		+	++				++		4
	adj.			+			++				+		3
Paid activities staff are on duty on Sundays	unadj.		-		-								2
	adj.				-								1
Activities after dinner on at least 2 days per wk	unadj.												
	adj.						+						1
Van with capacity for 8+residents for non-medical trips	unadj.	+		++						+			3
	adj.			+									1
Speech therapists are on staff	Unadj												
	adj.								-				1
Number of dining rooms per licensed beds	Unadj	+	+	+	+		+			+			6
	adj.												
<b>Findings count</b>		18	11	25	20	21	31	7	15	21	26	8	

Table 9.10: Relationship of Indicators to Facility Overall QOL: Wave 1 Data Only

Potential indicators available at Wave 1	Values			P value
	Low QOL	Medium QOL	High QOL	
Private nonprofit For profit =1, nonprofit =2, public=3	1.53	2.0	1.77	
Top CNA hourly wage	\$10.71	\$10.88	\$11.90	
Administrator there 2 yrs or more	53%	64%	73%	
Family satisfaction collected	31%	64%	64%	
CNA training on site	58%	67%	70%	
Practicum site for CNAs	58%	42%	40%	
Practicum site for RNs	.58	43%	40%	
Other trainees (non-nursing).	.50%	43%	70%	
Staff development on QOL (beyond mandatory)	10%	62%	43%	.064
Staff development frequency	1.89	1.50	1.50	
Staff development oriented to individual staff needs	22%	37%	64%	
Mechanism to identify staff educational needs	22%	37%	75%	.086
Activity director there 2 yrs	79%	75%	83%	
# months Activity Director in NH in any capacity	130	164	108	
# months Activity Director was an AD at any NH	91	121	115	
Educational level of activity director High school =1, College = 2, Graduate degree = 3, CAN = 4, LPN = 5	3.36	2.50	2.38	.054
Activity staff hours per resident	0.99	1.26	1.66	.027
Activity department budget	\$4160	\$5348	\$8008	
Multiple activity schedules	29%	30%	59%	
Activity calendar put out weekly basis	15%	10%	33%	
Van that holds at least 6	40%	44%	58%	.075
Trips/outings at least monthly	73%	91%	92%	
Trips/outings at least quarterly	86%	91%	92%	
Beauty shop open. 15+ hrs/wk	57%	73%	83%	
Beauty 3 separate days	60%	82%	75%	
Beauty Thurs. Fri. or Sat.	50%	82%	75%	
Evidence of house pets	40%	77%	82%	.092
Claims to be Eden Alternative NF	7%	10%	45%	.037
Regular animal visits	69%	80%	50%	
Activities include discussion groups: >weekly =1, weekly =2, >monthly=3, monthly=4, <monthly=5	1.27	2.0	1.25	
Activities include music groups	1.67	1.64	1.25	
Activities include arts and crafts	2.33	2.40	1.82	
Activities include movies	1.50	2.18	2.18	
Resident council meets monthly with at least 10 present	1.07	1.0	1.08	
Family council in existence	1.33	1.42	1.50	
Resident rooms have cable TV	1.36	1.13	1.33	
Resident rooms have phone jacks	1.45	1.25	1.22	
Preschool on site	1.86	1.73	1.75	
1 or more residents volunteers	1.14	1.30	1.42	
Clergy/pastor employed 1+FTE=1, .5-1=2, <.5=3, none=4	3.57	3.17	2.75	
Social Work Director education HS=1, CAN=2, AA=3, BSW=4, BS=5, MSW=6, MS=7	5.79	4.75	4.46	

N varies by indicator but is never more than 40.

Table 9.11: Relationship of Indicators to Overall Facility QOL with Wave 2 Data Only

Potential indicators available at Wave 2	Mean Values			p value
	Low QOL	Medium QOL	High QOL	
% private rooms	21.4	17.7	22.8	
%Medicaid	67.7	56.3	66.2	
Ownership	1.44	1.61	2.31	
Part of/owned by a hospital	0%	4%	39%	
NF runs assisted living.	11%	26%	19%	
NF runs senior housing	6%	17%	19%	
Months.DON at NH in any position	59.6	67.3	66.4	
Months activity director months in role at	43.8	48.4	72.7	
Months social work director at NH in any position	48.0	24.0	50.9	
# hrs/wk of staff development		1.38	1.57	
paid clergy or pastor or spiritual director	28%	35%	44%	
CNAs permanent to nursing unit	22%	37%	42%	
Used registries for CNAs	28%	43%	53%	
Used registry for licensed nurses mos	33%	48%	77%	
Employees rehabilitation aides	91%	70%	75%	
wkly hrs SW personnel				
Volunteer hours	3358	7182	4973	
Act Dir highest education HS=1, CNA=2, LPN=3, AA=4, college=5, grad school-6	3.50	3.81	4.13	
Activities staff work on Sundays	94%	91%	73%	
% occupancy	91.4	89.0	90.9	
# of RN+ LPN	48.19	40.95	1.67	
# of CNA 1 yr	62.9	40.4	52.2	
# of hrs CAN	17275	20767	3886	.074
# of hrs licensed nursing personnel	6705	6797	2804	
# of volunteers	44.1	133.6	83.9	
NF counts volunteer hours	7.0	1.48	1.38	
# of volunteer hours	3358	7182	4973	
geriatric NP or PA employed	41%	43%	37%	
food on table not trays in entire NF	0%	5%	0%	
Food on table, not trays, in part of NF	22%	41%	30%	
Food dishd out family style in part of NF	17%	9%	13%	
Food never served family style	83%	86%	87%	
Restorative dining in entire NF	33%	33%	40%	
Fine dining in part of NF	28%	24%	20%	
No fine dining	56%	62%	60%	

Note: N varies by indicator as shown on other tables but is never more than 57.

Table 9.12: Relationship of Indicators to Overall Facility QOL with Waves 1 and 2 Data

Potential Indicators available for both Waves	Mean Values			P value
	Low QOL	Medium QOL	High QOL	
Has a dementia SCU	36%	50%	55%	
% private rooms	14.1%	21.2%	23.6%	
% Medicaid	66.3	61.6	65.6	
% Medicare	9.5	8.1	8.2	
% occupancy rate				
Tax status For profit=1, not for profit=2, public=3	1.36	1.54	1.76	.039
Owned by hospital	6%	15%	28%	.071
NF operates assisted living	21%	23%	36%	
NF operates retirement housing	9%	4%	31%	.086
NF operates adult day care	16%	20%	34%	
# Mos tenure of administrator	44.9	73.9	70.1	
# Mos. As administrator at any NF	102.8	102.8	78.8	
# Months administrator at this NH in any capacity	58.6	75.2	103.6	
# changes in administrator in last 2 years	1.30	1.29	1.11	
# mos DON tenure at this NF in any capacity	91.9	67.5	97.4	
# mos activity director's tenure	51.2	68.7	66.8	
# mos. activity director at any NF	68.2	67.6	68.0	
# mos activity director's tenure at this NF in any capacity	95.2	86.0	75.9	
# mos. tenure of Social Work Director (SWD)	38.1	48.1	78.3	.053
Months of SWD experience as SWD in any NF	25.9	54.1	90.9	.030
Staff developer hrs per wk	23.1	22.9	25.8	
NH employs clergyperson	22%	37%	46%	
MDS and/or PPS coordinator does care planning	79%	91%	81%	
NH employs QI director (not admin or DON)	59%	43%	56%	
QI director 50% or more time	50%	36%	63%	
QI director 25% or more time	27%	19%	26%	
Permanent assignment of aides to units	1.31	1.20	1.22	
Permanent assignment of aides to residents	47%	69%	52%	
Registry used for licensed personnel in last 6 mos	41%	47%	56%	
Restorative Nursing Aids (RNAs) employed	87%	76%	69%	
Number of paid activity staff hours per wk	145.7	162.9	183.9	
Table 9.12, continued.	Value			
Potential indicators available for both Waves				

	Low QOL	Medium QOL	High QOL	P value
Educational level of activities director HS=1, CNA=2, LPN=3, AA=4, college=5, grad school=6	3.44	3.33	3.32	
Activity director's field Ther rec=1, Rec=2, music or artr=3, OT=5, educ=6, other=7	5.28	6.40	4.21	
Paid activities staff are on duty on Sundays	84%	86%	88%	
Activities after dinner on at least 2 days per wk	72%	68%	85%	
Van with capacity for 8+residents for non-medical trips	1.64	1.56	1.44	
Speech therapists are on staff	41%	45%	40%	
Number of dining rooms per licensed beds	.026	.028	.029	

N varies by indicator as shown on previous tables, but is never more than 97.



## **Chapter 10**

### **Relationship of Quality of Life and Indicators from Extant Data**

The goal of this chapter is to evaluate whether quality of life (QOL) is associated with indicators that can be derived from extant data sources. Specifically, we linked the data from the QOL interviews with data files from the two national data reporting systems for nursing homes: the Minimum Data Set (MDS) and the Online Survey and Certification Automated Record (OSCAR). The MDS was used to construct two sets of measures: (1) indicators of resident factors that may be associated with QOL and (2) indicators of facility level quality of care. Data for all the residents in the study facilities were provided by CMS. For each resident in the sample, the most proximate MDS assessment record to the interview was extracted and linked to the interview data. The OSCAR was used to construct measures of various categories of nursing home personnel and to get a count of citations for QOL related problems on the state survey. The most proximate OSCAR record to the data collection window for each facility was used for analysis.

### **Variables**

#### **Resident Factors from MDS Data.**

Resident factors thought to be associated with QOL were identified. An index of physical function based on level of independence in eating, dressing, toileting, transferring, and walking was computed using magnitude estimation weights (Finch, Kane, & Philp, 1995). A cognitive function scale was computed based on short and long-term memory and cognitive skills for daily decision making items from the MDS. This scale correlates very highly with the Cognitive Performance Scale (Morris et al., 1994); however, it does not confound physical function (i.e. eating) with cognitive function. Indicators were constructed for diagnoses of depression and hip

fracture. Variables for age in years, gender, and length of stay (greater or less than 90 days) were also computed. Measures of visual acuity, bladder and bowel continence, and daily use of physical restraints (trunk, limb or chair that prevents rising) were also taken from the MDS.

#### Nursing Home Quality Indicators from MDS Data.

Indicators of quality of care were computed for each facility based on the cohort of residents living in that facility at the time of the survey using standard definitions developed by Zimmerman and colleagues (1995). These indicators, computed using data from the MDS, are in use across the country as part of the state and Federal regulatory processes and as a focus for internal quality improvement efforts. All QIs are expressed as the percentage of residents in a facility with the given condition. Several QIs (e.g., QI 8: Prevalence of Incontinence) are computed for high and low risk strata. In these cases, we selected the indicator for low risk group to avoid multicollinearity.

#### Facility Factors from OSCAR Data.

The ratio of staff to residents was computed for several key categories thought to be related to QOL: certified nursing aides, registered nurses, licensed practical nurses, occupational therapists, physical therapists, social workers, dietary, housekeeping, and administrative staff. Activity staff and recreational therapists were combined because facilities used these personnel categories somewhat interchangeably. Staffing ratios were based on the sum of all full-time, part-time and contract FTEs reported on the most recent OSCAR file for each facility. The number of FTEs per 100 residents was computed by dividing the sum by the number of residents living in the facility and multiplying by 100.

Staffing data reported by facilities are notoriously error prone, containing both implausibly high and low (zero) values. In keeping with previous work using these data (Harrington, et al.,

2000), we removed any values that implied a staff to resident ratio of 1 to 1 or higher and also eliminated the top 2%. In order to retain all 101 facilities in our sample we had to replace these values with plausible figures. Where possible, we used data from the previous or subsequent OSCAR record. If this was not available, we used the median value for facilities in the same state, stratified by whether the facility is for-profit or non-profit and whether it is certified as a Medicare Skilled Nursing Facility. Data were imputed for a total of 8 cases. The mean and range was not affected by this procedure. All analyses were conducted on both the complete data set and a restricted data set without imputed data. There was no significant difference in the magnitude or pattern of inferences between these two sets of analysis; results are based on the full data set. There were no significant differences between the staffing levels of the sampled facilities and the median for all other facilities in the 6 study states.

#### Deficiencies Related to QOL from Survey.

The number of deficiencies in areas related to QOL (see Figure 10.1) received in the most proximate state survey to the data collection window were computed for each facility. To adjust for differences between states in the way deficiencies are assigned, we standardized the number of deficiencies by dividing by the standard deviation and subtracting the mean number of deficiencies within each state.

Telephone Transfer and discharge Physical restraints Abuse Staff treatment of residents Resident rooms Room space Exits Privacy Dignity Self-determination/ participation Accommodate needs Notice before room change Activities program	Social services Environment Housekeeping Clean linens Private closet Adequate lighting Comfortable temperatures Access to records Informed of condition Limit on charges to funds Privacy and confidentiality Voice grievances Resolve grievances
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Figure 10.1. Citations Related to Quality of Life

## Analysis

The goal of this analysis was to determine if the QOL of a sample of nursing home residents was associated with resident factors and characteristics of the facilities in which they live. The dependent variables, dimensions of self-reported QOL, are measured at the individual level, whereas the main facility level independent variables are measured at a higher level of aggregation. In addition, since the main hypothesis we are testing is that nursing home residents in the same facility will have similar QOL, we need to explicitly take this intercorrelation into account. An appropriate technique for this type of data is to use hierarchical linear modeling (HLM), which takes into account the nested nature of the data and provides correct estimates of the standard errors (Bryk & Raudenbush, 1992; Goldstein, 1995). SAS Proc Mixed was used for all analyses (Singer, 1998).

Four sets of models were estimated: (1) we used HLM to examine the association between resident factors derived from the MDS and QOL; (2) we used HLM to examine the association between facility quality of care indicators (QIs) and resident QOL, adjusting for resident factors;

(3) we used HLM to examine the association between facility personnel and resident QOL, adjusting for resident factors; and (4) we used HLM to examine the association between the number of citations received and resident QOL, adjusting for resident factors. The analysis was repeated for each of the 11 QOL scales.

All continuous independent variables were standardized such that the grand mean for all facilities was zero. This facilitates comparison of effect sizes between variables measured on different scales. Thus the coefficients for continuous variables represent the effect of a one standard deviation change on the dependent variable (a 1-4 scale). The coefficients for discrete variables represent the effect of changing from zero to one on the dependent variable.

## **Findings**

Table 10.1 shows the associations between resident factors and QOL. Residents who are older generally have lower QOL (Functional Competence, Relationships, Individuality, and Meaningful Activity) with the exception of Security, which is slightly higher for older residents. Women generally have higher QOL than men (Privacy, Autonomy, Dignity, Individuality, and Spiritual Well-being). Residents with greater cognitive impairment report higher QOL with respect to Comfort, Functional Competence, Enjoyment, and Meaningful Activity, but lower QOL with respect to Privacy, Dignity, Individuality, and Relationships. Residents who are more physically impaired report lower QOL on all domains but Individuality and Dignity. Long-stay residents generally report higher QOL (e.g., Privacy, Functional Competence, Relationships, Individuality, Meaningful Activity, and Spiritual Well-being), but report lower QOL on the Security domain. Residents with visual impairment report lower QOL on 6 domains (Privacy, Functional Competence, Autonomy, Relationships, Individuality, and Meaningful Activity), and those with depression report lower QOL on 9 domains (all but Individuality and Relationships).

Table 10.2 shows the association between QIs and QOL. We find a mixed set of results. For some QIs we find consistent association between a higher prevalence of the problem and *lower* QOL. Depression without therapy, incontinence without a plan, weight loss, decline in late loss ADLs, use of antianxiety or hypnotic drugs, restraints, and little or no activity all are associated with reduced QOL. For other QIs, we find the opposite pattern, where a higher prevalence of the problem is associated with *better* QOL. This pattern is seen, for example, with incidence of fractures, falls, behavioral symptoms affecting others, polypharmacy, incontinence, and dehydration.

Table 10.3 shows the association between personnel and QOL. Few consistent findings are found. Ratios of activities staff to residents are associated with better QOL in the Privacy and Meaningful Activity domains. Ratios for administrative staff are associated with higher QOL on the Functional Competence domain. Ratios of Licensed Practical Nurses are associated with lower QOL in the Dignity domain. .

Table 10.4 shows the association between citations and QOL. In general, facilities with greater numbers of citations have lower QOL. However, this trend was only statistically significant for the Privacy and Autonomy domains.

Table 10.1. Association between Quality of Life and Resident Characteristics

	Comfort		Privacy		Functional Competence		Autonomy		Dignity		Security		Relationships		Individuality		Meaningful Activity		Enjoyment		Spiritual Well Being	
	Coef.	p	Coef.	p	Coef.	p	Coef.	p	Coef.	p	Coef.	p	Coef.	p	Coef.	p	Coef.	p	Coef.	p	Coef.	p
Age	-0.01	0.60	-0.01	0.26	<b>-0.04</b>	<b>0.01</b>	0.00	0.86	0.00	0.61	<b>0.02</b>	<b>0.04</b>	<b>-0.05</b>	<b>0.001</b>	<b>-0.03</b>	<b>0.03</b>	<b>-0.03</b>	<b>0.03</b>	0.02	0.22	0.00	0.98
Gender (Female)	-0.02	0.55	<b>0.06</b>	<b>0.05</b>	-0.02	0.56	<b>0.06</b>	<b>0.03</b>	<b>0.06</b>	<b>0.01</b>	<b>0.05</b>	<b>0.05</b>	0.01	0.71	<b>0.09</b>	<b>0.001</b>	0.00	0.93	0.02	0.46	<b>0.14</b>	<b>0.001</b>
Race (White)	0.06	0.10	<b>0.14</b>	<b>0.001</b>	0.01	0.76	-0.01	0.82	-0.04	0.21	0.07	0.07	-0.07	0.15	-0.09	0.08	-0.01	0.81	0.03	0.56	<b>-0.27</b>	<b>0.001</b>
Cognitive Function	<b>0.07</b>	<b>0.001</b>	<b>-0.05</b>	<b>0.001</b>	<b>0.11</b>	<b>0.001</b>	-0.01	0.50	<b>-0.03</b>	<b>0.01</b>	0.00	0.76	<b>-0.04</b>	<b>0.001</b>	<b>-0.04</b>	<b>0.01</b>	<b>0.07</b>	<b>0.001</b>	<b>0.11</b>	<b>0.001</b>	-0.01	0.41
Physical Function	<b>-0.06</b>	<b>0.001</b>	<b>-0.06</b>	<b>0.001</b>	<b>-0.33</b>	<b>0.001</b>	<b>-0.15</b>	<b>0.001</b>	<b>-0.05</b>	<b>0.001</b>	<b>-0.06</b>	<b>0.001</b>	-0.03	0.13	-0.03	0.12	<b>-0.10</b>	<b>0.001</b>	<b>-0.08</b>	<b>0.001</b>	<b>-0.04</b>	<b>0.04</b>
Long Stay (>90 days)	<b>0.10</b>	<b>0.001</b>	0.01	0.67	<b>0.09</b>	<b>0.01</b>	0.05	0.10	0.04	0.14	<b>-0.11</b>	<b>0.001</b>	<b>0.14</b>	<b>0.001</b>	<b>0.14</b>	<b>0.001</b>	<b>0.25</b>	<b>0.001</b>	0.09	0.02	<b>0.16</b>	<b>0.001</b>
Vision Impairment	-0.01	0.37	<b>-0.03</b>	<b>0.03</b>	<b>-0.06</b>	<b>0.001</b>	<b>-0.06</b>	<b>0.001</b>	-0.01	0.31	-0.01	0.41	<b>-0.04</b>	<b>0.01</b>	<b>-0.03</b>	<b>0.03</b>	<b>-0.06</b>	<b>0.001</b>	-0.02	0.12	-0.01	0.37
Bladder Incontinence	0.00	0.63	-0.02	0.12	-0.01	0.39	<b>-0.04</b>	<b>0.001</b>	-0.01	0.11	-0.01	0.33	-0.01	0.36	0.00	0.85	0.01	0.43	0.00	0.80	0.02	0.14
Depression	<b>-0.15</b>	<b>0.001</b>	-0.05	0.07	<b>-0.09</b>	<b>0.001</b>	<b>-0.08</b>	<b>0.001</b>	<b>-0.04</b>	<b>0.04</b>	<b>-0.08</b>	<b>0.001</b>	<b>-0.08</b>	<b>0.01</b>	-0.03	0.32	<b>-0.08</b>	<b>0.01</b>	<b>-0.11</b>	<b>0.001</b>	<b>-0.09</b>	<b>0.001</b>
Bowel Incontinence	0.00	0.98	-0.02	0.06	<b>-0.04</b>	<b>0.001</b>	0.01	0.16	-0.01	0.14	0.01	0.56	0.00	0.73	0.00	0.89	-0.02	0.22	-0.01	0.54	-0.02	0.13
Hip Fracture	0.06	0.20	0.04	0.45	0.01	0.83	0.01	0.88	0.06	0.10	0.04	0.32	0.01	0.92	-0.08	0.12	0.07	0.21	-0.07	0.22	-0.07	0.22
Daily Restraints	0.03	0.62	-0.09	0.16	-0.01	0.82	0.04	0.50	-0.08	0.08	0.04	0.39	-0.06	0.36	-0.10	0.13	0.03	0.61	0.03	0.65	-0.06	0.33

Table 10.2. Association between Quality of Life and Quality of Care Indicators

Indicator (QI)	Comfort		Privacy		Functional Competence		Autonomy		Dignity		Security		Relationships		Individuality		Meaningful Activity		Enjoyment		Spiritual Well Being	
	Coef.	p	Coef	p	Coef.	p	Coef.	p	Coef	p	Coef	p	Coef	p	Coef	p	Coef	p	Coef.	p	Coef	p
Incidence New Fractures	0.03	0.10	0.01	0.47	<b>0.06</b>	<b>0.001</b>	<b>0.04</b>	<b>0.04</b>	0.02	0.06	0.03	0.08	0.02	0.35	0.03	0.27	0.01	0.57	0.01	0.53	0.03	0.23
Prevalence Falls	-0.02	0.23	0.03	0.22	-0.01	0.68	-0.02	0.42	0.00	0.98	0.00	0.82	0.02	0.48	0.01	0.66	<b>0.05</b>	<b>0.04</b>	0.04	0.16	0.00	0.98
Prevalence Symptoms Affecting Others	<b>0.04</b>	<b>0.04</b>	0.02	0.48	0.02	0.35	0.02	0.43	0.01	0.63	0.01	0.44	0.01	0.53	-0.03	0.38	-0.01	0.78	0.05	0.08	0.06	0.03
Prevalence Depression	0.01	0.75	0.08	0.09	-0.04	0.41	0.00	0.97	-0.02	0.38	0.02	0.55	0.07	0.15	0.04	0.50	0.07	0.17	0.04	0.47	0.03	0.62
Prevalence Depression w/o Therapy	-0.03	0.32	<b>-0.11</b>	<b>0.01</b>	-0.02	0.69	-0.03	0.48	0.01	0.78	-0.04	0.17	-0.05	0.23	-0.02	0.70	-0.06	0.17	-0.07	0.13	0.00	0.99
Uses 9 or More Medications	0.02	0.14	<b>0.04</b>	<b>0.04</b>	0.01	0.49	0.02	0.15	0.04	0.00	<b>0.03</b>	<b>0.01</b>	<b>0.06</b>	<b>0.00</b>	<b>0.06</b>	<b>0.01</b>	<b>0.04</b>	<b>0.05</b>	0.01	0.69	0.04	0.06
Incidence Cognitive Impairment	<b>-0.03</b>	<b>0.03</b>	-0.01	0.49	0.02	0.34	-0.01	0.59	0.00	0.81	0.01	0.36	<b>0.05</b>	<b>0.01</b>	<b>0.05</b>	<b>0.03</b>	<b>0.05</b>	<b>0.01</b>	0.02	0.29	0.02	0.43
Prevalence Incontinence - Low Risk	0.00	0.91	0.03	0.08	0.02	0.19	0.01	0.42	<b>0.02</b>	<b>0.05</b>	-0.02	0.21	<b>0.05</b>	<b>0.01</b>	0.03	0.24	0.00	0.98	0.01	0.67	0.01	0.53
Prevalence of Incontinence without a Plan	0.03	0.06	0.02	0.41	0.01	0.54	0.00	0.98	0.00	0.95	0.02	0.19	-0.01	0.67	0.01	0.74	<b>-0.05</b>	<b>0.01</b>	0.00	0.86	-0.03	0.15
Prevalence of Indwelling Catheters	0.00	0.95	-0.01	0.65	0.00	0.89	0.00	0.98	-0.01	0.35	0.01	0.39	-0.03	0.26	0.00	0.99	-0.01	0.55	0.04	0.12	-0.03	0.33
Prevalence of Fecal Impaction	0.01	0.48	-0.01	0.54	0.00	0.97	0.00	0.92	0.00	0.90	0.02	0.07	0.02	0.19	-0.01	0.60	0.01	0.44	0.02	0.23	0.03	0.14
Prevalence Urinary Tract Infection	-0.01	0.70	-0.01	0.72	-0.01	0.46	0.00	0.83	0.00	0.77	0.00	0.92	-0.03	0.09	-0.02	0.44	-0.01	0.54	-0.01	0.58	0.04	0.11
Prevalence Weight Loss	0.02	0.13	0.00	0.85	0.02	0.28	0.01	0.41	0.01	0.41	0.02	0.13	<b>-0.04</b>	<b>0.04</b>	-0.03	0.29	-0.03	0.11	-0.01	0.64	-0.04	0.08
Prevalence tube feeding	0.03	0.13	-0.01	0.84	-0.01	0.71	0.00	0.85	-0.02	0.20	0.01	0.76	-0.01	0.61	0.00	0.92	0.00	0.86	0.01	0.79	0.01	0.82
Prevalence dehydration	<b>0.04</b>	<b>0.001</b>	0.02	0.25	0.02	0.22	0.01	0.72	0.01	0.55	<b>0.03</b>	<b>0.03</b>	0.01	0.49	0.02	0.46	0.00	0.85	-0.01	0.76	-0.01	0.80



Table 10.2, Continued

Indicator (QI)	Comfort		Privacy		Functional Competence		Autonomy		Dignity		Security		Relationship		Individuality		Meaningful Activity		Enjoyment		Spiritual Well- being	
	Coef.	p	Coef.	p	Coef.	p	Coef.	p	Coef.	p	Coef.	p	Coef.	p	Coef.	p	Coef.	p	Coef.	p	Coef.	p
Prevalence bedfast residents	-0.02	0.22	-0.01	0.57	-0.02	0.28	-0.01	0.53	0.01	0.53	-0.03	0.10	0.01	0.68	0.00	0.90	0.02	0.48	-0.03	0.24	-0.02	0.50
<b>Incidence Decline in Late Loss ADLs</b>	0.00	0.76	0.00	0.82	-0.01	0.55	-0.02	0.28	0.01	0.44	<b>-0.03 0.03</b>		-0.02	0.32	-0.01	0.69	-0.02	0.28	0.00	0.98	0.00	0.80
Incidence of Decline in ROM	0.00	0.81	-0.01	0.69	-0.01	0.51	-0.02	0.29	0.01	0.45	-0.02	0.19	0.02	0.16	0.01	0.55	0.02	0.39	0.02	0.41	0.01	0.78
<b>Prevalence Antipsychotics - Low Risk</b>	0.02	0.25	0.00	0.87	<b>0.04 0.02</b>		0.01	0.50	0.00	0.93	-0.02	0.19	0.00	0.87	-0.01	0.64	-0.02	0.21	-0.01	0.63	0.01	0.63
<b>Prevalence of Antianxiety- Hypnotics</b>	<b>-0.06 0.001</b>		<b>-0.07 0.01</b>		-0.03	0.26	-0.03	0.24	-0.03	0.07	-0.03	0.09	<b>-0.06 0.03</b>		-0.02	0.56	<b>-0.06 0.02</b>		-0.06	0.06	0.00	0.91
<b>Prevalence of hypnotic use</b>	<b>0.05 0.03</b>		<b>0.07 0.02</b>		-0.01	0.72	0.02	0.44	0.01	0.41	0.03	0.17	0.03	0.32	-0.01	0.85	<b>0.07 0.02</b>		0.04	0.21	0.00	0.95
<b>Prevalence of Restraints</b>	<b>-0.08 0.001</b>		-0.01	0.71	-0.02	0.32	0.00	0.85	-0.02	0.18	<b>-0.03 0.02</b>		0.01	0.63	-0.02	0.54	0.03	0.15	<b>-0.05 0.04</b>		-0.02	0.51
<b>Prevalence of little or no activity</b>	<b>-0.03 0.03</b>		0.00	0.86	0.01	0.46	-0.01	0.61	-0.01	0.41	0.00	0.90	-0.03	0.11	0.00	0.94	-0.04	0.06	-0.01	0.71	-0.02	0.37
Prevalence of Stage 1-4 Pressure Ulcers - Low Risk	0.00	0.78	0.00	0.91	0.01	0.51	0.00	0.82	0.00	0.81	0.01	0.55	0.01	0.60	0.00	0.89	0.00	0.93	-0.01	0.69	-0.02	0.31

Table 10.3. Association between Quality Life and Nursing Home Personnel

	Comfort		Privacy		Functional Competence		Autonomy		Dignity		Security		Relationships		Individuality		Meaningful Activity		Enjoyment		Spiritual Well Being	
	Coef	p	Coef	p	Coef	p	Coef	p	Coef	P	Coef	p	Coef	p	Coef	p	Coef	p	Coef	p	Coef	p
<b>Activities Staff</b>	0.00	0.78	<b>0.05</b>	<b>0.02</b>	0.02	0.34	0.02	0.30	0.00	0.75	0.02	0.22	0.02	0.46	0.02	0.54	<b>0.06</b>	<b>0.001</b>	0.04	0.09	0.03	0.23
Social Work Staff	0.02	0.39	0.00	0.93	-0.01	0.78	0.00	0.79	-0.01	0.33	0.00	0.89	0.03	0.23	-0.02	0.58	-0.01	0.70	0.04	0.07	0.03	0.27
Registered Nurses	0.02	0.24	0.02	0.27	-0.02	0.23	0.02	0.31	0.01	0.20	0.02	0.19	0.01	0.79	0.02	0.43	0.01	0.76	0.03	0.23	0.01	0.58
<b>Licensed Practical Nurses</b>	0.00	0.80	-0.01	0.79	-0.01	0.54	-0.01	0.79	<b>-0.02</b>	<b>0.05</b>	-0.02	0.19	-0.01	0.57	0.01	0.87	-0.03	0.15	-0.03	0.19	<b>-0.05</b>	<b>0.05</b>
<b>Nursing Assistants</b>	0.00	0.88	0.00	0.89	-0.01	0.42	-0.01	0.78	0.01	0.39	0.00	0.99	-0.02	0.47	0.01	0.86	-0.01	0.53	0.00	0.96	0.00	0.95
Occupational Therapists	-0.01	0.56	-0.01	0.83	0.00	0.89	-0.01	0.69	0.00	0.90	-0.01	0.56	-0.02	0.41	0.02	0.64	0.02	0.48	0.00	0.93	-0.02	0.43
Physical Therapists	0.03	0.23	-0.01	0.59	0.00	0.82	0.00	0.83	0.01	0.69	0.03	0.08	0.02	0.55	-0.03	0.36	0.00	0.99	0.00	0.87	0.04	0.14
<b>Administrative Staff</b>	0.02	0.34	0.03	0.13	<b>0.03</b>	<b>0.05</b>	0.01	0.61	0.01	0.17	0.00	0.85	-0.02	0.34	0.01	0.79	0.01	0.72	-0.01	0.53	0.00	0.83
Dietary Staff	0.00	0.95	-0.02	0.42	0.02	0.34	-0.01	0.40	-0.01	0.35	0.01	0.46	-0.03	0.11	0.00	0.99	-0.02	0.34	-0.04	0.05	0.01	0.52
Housekeeping Staff	-0.01	0.47	-0.03	0.12	0.01	0.61	0.02	0.27	-0.01	0.26	0.00	0.99	-0.01	0.46	-0.02	0.47	0.00	0.80	-0.02	0.24	-0.02	0.23

Table 10.4. Association between Quality Life and Number of Citations

	Comfort		Privacy		Functional Competence		Autonomy		Dignity		Security		Relationships		Individuality		Meaningful Activity		Enjoyment		Spiritual Well Being	
	Coef	p	Coef	p	Coef	p	Coef	p	Coef	P	Coef	P	Coef	p	Coef	p	Coef	p	Coef	p	Coef	p
<b>Number of Citations</b>	-0.02	0.14	<b>-0.04</b>	<b>0.03</b>	-0.01	0.57	<b>-0.03</b>	<b>0.05</b>	-0.02	0.06	-0.01	0.50	0.01	0.62	-0.03	0.28	0.00	0.96	-0.02	0.26	-0.02	0.39

## Conclusions

We found a number of associations between data available from extant sources and resident self-reported QOL. In general, however, resident level data provide the most consistent pattern of associations. Resident characteristics such as physical function, visual impairment, incontinence, and depression are associated with quality of life in the expected direction. People with greater levels of impairment report lower levels of QOL.

When we turn to facility level factors, such as staffing levels and quality of care; however, the patterns are less clear. It might be expected that higher ratios of staff to residents would be associated with better QOL. Staffing ratios are considered low by most experts, and higher ratios are associated with better QOL. However, staffing ratios are not clearly associated with better QOL in our sample. The exception is that there is some evidence for the value of activities staff. Nursing and other categories, however, do not show any statistically significant pattern. Indeed, higher ratios of licensed practical nurses seem to be associated with lower QOL.

Quality of care at the facility level offers the most confusing set of results. For example, the positive association between fractures and falls and QOL may be due to greater freedom and autonomy. Residents are given the opportunity to do as much as they can for themselves (FC), but this comes at the risk of falling and experiencing a fracture. Higher prevalence of restraint use and bedfast residents are associated with lower QOL, which is consistent with conventional wisdom. However, it is unclear why the prevalence of incontinence and incontinence without a plan should go in opposite directions. Similarly, it is tempting to conclude that higher prevalence of polypharmacy and hypnotics make it more likely for residents who respond to the survey (who may not be using those drugs) to experience higher QOL. However, further analysis is needed to address this point. The overall sense from this set of analyses is that few of

the QIs are associated with QOL.

Finally, citations in the state survey system are associated with lower QOL. This is in the expected direction. However, the finding is statistically significant in only 2 out of the 11 dimensions (and marginally significant in one more). Further analysis of this issue is warranted. For example, we plan to explore other citations and other methods of adjusting for state variation in the survey process.

In summary, extant data are rich source of information for understanding resident and facility level differences in QOL. However, the mostly null findings with regard to staffing and mixed findings with respect to QIs make it unlikely that strong predictive models can be derived from these sources.

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## **Chapter 11**

### **Transferability of Quality of Life Data Collection**

If quality of life (QOL) measures based on interviews with residents are to be used to inform quality improvement and quality assurance practices, the collection of data needs to be moved from research interviewers to other professionals in long-term care. The most likely interviewers would be nursing home staff members and long-term care surveyors; the former would either do such interviews as part of their own Continuous Quality Improvement or do them to provide cumulative data as a regulatory requirement for public reporting or to aide in the survey process. It was also thought plausible that staff could do systematic QOL interviews that would be incorporated into resident specific MDS data. Similarly, surveyors might conduct such resident interviews as random spot-checking of data provided by the facility (especially if there were a regulatory requirement for facility personnel to collect the QOL data), as a screening effort in a two-step survey process, or for in-depth focus in facilities where problems seemed to exist. It would also be possible, if designated programmatically, that long-term care ombudsmen might use these tools, though that would call for re-casting the ombudsman program's purpose, which currently is focused on complaint resolution and advocacy at an individual level and a system level. For all these purposes, it was necessary to investigate the process and results of moving data collection from research contexts to practice contexts.

The original contract with University of Minnesota to develop QOL measures called for an empirical test to determine whether facility or surveyor staff applying the tools could achieve comparable results to those gleaned by research interviewers. We conducted such a study in the summer of 2002. We examined the transferability of both the interview protocols and the facility-wide observational protocols. This chapter reports those results.

## **Transferability to Facility Staff**

### Theoretical Considerations

Several factors could lead to different experience when application of these tools moves beyond the research context to practitioners on the facility staffs. Some discrepancies between research and non-research applications might be the result of unclear transfer of instructions on how to do the interviews or observations. Some discrepancies might be related to roles and role performance. For example, a structured interview with a resident might be inimical to the usual way the professionals in nursing homes go about their daily work, including their assessments. Staff does not typically spend uninterrupted periods of time talking to residents about their lives, nor do they use a structured tool to do so. They would be more likely to respond to a negative comment by attempting to solve the problem on the spot rather than proceed with interview questions that yield scores.

Another source of discrepancy might relate to the circumstances experienced by both the interviewer and the residents with the switch to facility personnel. For staff members, the change might mean that the staff member was previously acquainted with the resident and already had a point of view about the quality of that resident's life. Staff members might also have had past history communicating with particular residents that would make them better, more sensitive interviewers or, conversely, worse interviewers than a stranger. From a resident's perspective, being interviewed by a staff member (assuming he or she recognized the particular interviewer or generally understood that the interviewer was a staff member) could either lead to a better rapport or, conversely, could lead the resident to censor negative feedback out of courtesy or out of a feeling of intimidation.

CMS built into the scope of work a test of whether nursing personnel differed systematically from psychosocial personnel (such as social workers or activities staff) in their willingness to collect QOL data and their results, compared to research interviewers. The speculation was that perhaps the training or role expectations of the psychosocial personnel might make them better at doing QOL interviews. Besides incorporating disciplinary background into our test, we also varied the training intensity to try to determine whether in-person training was necessary for facility staff to achieve results comparable to those of researchers.

To test the feasibility of having nursing home staff and/or surveyors collect the QOL data we conducted two studies, one where the results of QOL interviews and walk-through observations done by staff were compared to those done by researchers, and a smaller study where the results of QOL interviews and facility observations done by surveyors were compared to those done by researchers. Each used basically the same design, except the variations in the nursing home staff study were greater. The nursing home staff study was designed to answer several questions.

We recognized that some instability over time is inherent in any measure. Some such instability could be due to real change in perceived QOL even between interviews that were held within a week of each other, and some could be due to inherent instability in the tools. We built in a protocol to inquire of respondents whether they perceived their QOL as better, worse, or about the same as a few days ago. We also measured the stability of results when research interviewers did test-retest interviews. Conceptually, the differences between research interviewers and facility personnel should be no greater than the differences found when research personnel do both interviews.

## Methods



Research questions. The research questions were as follows:

1. Can nursing home staff reliably collect interview and observational data on their residents?
2. Does nursing staff perform differently from social activity staff?
3. Does in-person training compared to training from materials only affect the performance?
4. How do the interviewers and observers from facility staff react to the experience of doing the interviews?

Sample. We recruited a purposive sample of 8 nursing homes in the Minneapolis-St. Paul area that agreed to participate in the study. Each participating nursing home was asked to identify two nurses and two staff members from social work or activities staff to be directly involved. We randomly assigned the 8 facilities to a training condition. All facility participants were provided with a manual covering interviewing and observational techniques, and detailed discussion of the two tools (the interview and the observation protocol). They also received an audio taped sample of an actual interview with a resident and a correctly completed form based on this sample interview. They were provided with phone numbers where other questions could be answered or confusion clarified. In addition, the personnel from 4 facilities received a 2-day in-person training where the questionnaire was discussed in detail and role-playing took place; the last half-day of the training was designed for the trainees to conduct interviews under observation in a facility. Two dates were established for the in-person training, which was conducted by experienced trainers who were not the research interviewers against whom their performance would be tested.

The sample of residents was drawn randomly from the census of the participating staff. To facilitate the procedures that required multiple interviews of the same resident in randomized order, a University of Minnesota researcher visited the facilities and obtained informed consent from residents to participate in the study.

Procedures. Each nursing home staff member was assigned to interview 6 residents in his or her facility. A researcher interviewed the same resident; interviews were conducted 2-5 days apart, with the order of the interviewer randomly determined. The research interviewers were all experienced interviewers who had participated in Wave 2 data collection for the main study. The interview protocols were identical, and each included a series of questions geared to examine the stability of QOL measures: “If you had been asked these questions a few days ago, would your answers have been likely to be the same or different?” If the response was “different,” they were asked whether their QOL would have been better or worse, and why. Additionally, the staff interviewers were asked to indicate how well they knew the respondent and whether they thought the respondent recognized them to enable us to see whether that familiarity influenced the results. (See Volume 2, Appendix T for questionnaire.)

For observations, a research interviewer accompanied each observer. Facility observers performed two walk-throughs and 2 meal observations, one at breakfast and one at another meal. The route of the walk-through was determined in advance and the pace set by the researcher. The paired observers each completed their own protocol without discussion of their findings. (See Volume 2, Appendix U for observation protocols and Appendix V for related training.)

The questionnaires for the staff participants included open-ended questions about their reactions to performing the interview or the observations (questions that tended to be left blank). We also scheduled debriefing meetings at each of the 8 facilities to discuss with the participants

how they reacted to the experiences of collecting the QOL data. This qualitative component of the study used a general protocol of guiding questions that dealt with any logistical issues in doing the interviews or observations, reactions to and use of training materials and in-person training, specific items that caused them difficulty, whether any of the results surprised them, and their overall reactions to the usefulness and applicability of the procedures.

Data analysis. The data were analyzed to look for both error and bias. Analyses were performed at the item and the domain level. Error was measured by consistency of reporting between the test subject and the U of M staff member. The kappa statistic was used to assess the level of agreement. Regression models were used to identify the contributions of profession and training. Bias was judged by comparing the mean values to see if one group's reports were consistently higher or lower than the U of M staff's. Because respondents could use either a Likert response format or a dichotomous format, we interpolated the dichotomous response pattern into the Likert scale using the same technique we had applied in our earlier work (see Chapter 3).

Compliance with training. In actuality, some staff assigned to the training modality participated only partly in the training sessions. Communication with administrators and between administrators and participating staff was not as effective as it should have been. Some participants were unaware of the training or even of the post-training commitment involved in the study. At the first training session, considerable time was spent informing the participants of the expectation for the 6 interviews and 4 observation sessions, and mollifying them: some had thought they were merely attending a time-limited didactic training on how to interview residents. All participants from one facility missed the entire training, and a special training was arranged for them in their own facility. Results comparing in-person training to training

materials only must be interpreted in the light of the imperfect training experience. On the other hand, the problems in mustering in-person training would probably be exacerbated in real life applications.

#### Results for QOL Interviews: Staff

We checked for order effects—that is, differences as a result of being the first or second interview. We found no differences and, therefore, merged the analyses.

Table 11.1 shows the general performance in terms of using Likert responses (compared to dichotomous responses) and the rate of missing responses. Personal training was associated with greater use of Likert responses and fewer missing items. Professional background did not affect the patterns in either regard.

Table 11.1. Use of Likert Responses and Missing Responses by Discipline and Training Mode

Interview groups	Average number of Likert responses	Average number of missed responses
Research interviews	49.34	0.56
Nursing staff interviews	44.92	1.09
Psychosocial staff interviews	45.25	1.05
Staff with materials only	45.65	0.91
Staff in-person training	48.61	0.59

To address the question of bias we compared the mean values for the interviewer groups, where a higher score reflects greater QOL. Table 11.2 compares the overall nursing home staff performance to that of the research interviewers. Of the 54 possible comparisons, 8 were significantly different at  $p < .05$ . If we set a more conservative  $p$  value ( $< .01$ ) to compensate for the number of comparisons, then only one of the comparisons was significantly different (an individuality item). The small number of items that yielded significant comparisons suggested that there was little systematic bias on the part of the staff during the interviews. Bolded areas indicate the items that showed significant differences between researcher and staff interviewers.

Table 11.2. Mean QOL Scores for Researcher and Nursing Home Staff Interviewers

Item	Mean		Paired Difference	
	Res	Staff	t	Sig. (2-tailed)
How often are you too cold here	2.707	2.784	-1.094	0.276
How often are you so long in the same position that it hurts	2.696	2.838	-1.795	0.074
How often are you in physical pain	2.541	2.632	-1.312	0.191
<b>How often are you bothered by noise when you are in your room</b>	2.942	3.122	<b>-2.517</b>	<b>0.013</b>
How often are you bothered by noise in other parts of the nursing home	3.109	3.101	0.111	0.912
Do you get a good night's sleep here	3.501	3.555	-1.116	0.266
Is it easy for you to get around in your room by yourself	3.199	3.178	0.317	0.752
Can you easily reach the things that you need	3.267	3.286	-0.085	0.932
If you are anywhere in the nursing home and need a bathroom, can you get to one quickly	3.269	3.118	1.862	0.064
Can you easily reach your toilet articles and things you want to use in your bathroom	3.343	3.430	-1.266	0.207
Can you find a place to be alone when you wish	3.390	3.481	-1.338	0.183
Can you make a private phone call	3.457	3.497	-0.517	0.606
<b>When you have a visitor, can you find a place to visit in private</b>	3.543	3.671	<b>-2.166</b>	<b>0.032</b>
Can you be together in private with another resident (other than your roommate)	3.075	3.241	-1.858	0.065
Do the people who work here knock and wait for a reply before entering your room	3.407	3.441	-0.510	0.611
Do staff here treat you politely	3.762	3.814	-1.352	0.178
Do you feel that you are treated with respect here	3.701	3.683	0.453	0.651
Do staff here handle you gently while giving you care	3.646	3.723	-1.254	0.211
Do staff here respect your modesty	3.679	3.690	-0.234	0.816
Do staff take time to listen to you when you have something you want to say	3.542	3.544	-0.042	0.966
Do you get outdoors	2.768	2.576	1.631	0.105
About how often do you get outdoors	2.272	2.194	1.206	0.230
Do you enjoy the organized activities here at the nursing home	3.343	3.280	1.022	0.308
Outside of religious activities, do you have enjoyable things to do during the weekend	2.997	2.893	1.301	0.195
Despite your health condition, do you give help to others	2.785	2.861	-1.036	0.302
<b>Do the days here seem too long to you</b>	2.424	2.574	<b>-1.996</b>	<b>0.047</b>
Is it easy to make friends at this nursing home	3.198	3.293	-1.548	0.123
Do you consider that any other resident here is your close friend	2.417	2.517	-1.061	0.290
In the last month, have people who worked here stopped just to have a friendly conversation	2.950	2.903	0.582	0.561
Do you consider any staff member here to be your friend	3.182	3.223	-0.566	0.572
Do you think that (name of the facility) tries to make this an easy and pleasant place for families and friends of residents to visit	3.733	3.713	0.439	0.661
Can you go to bed at the time you want	3.627	3.626	0.021	0.983
<b>Can get up in the morning at the time you want</b>	3.063	3.235	<b>-2.490</b>	<b>0.014</b>
Can you decide what clothes to wear	3.756	3.754	0.033	0.974
<b>Have you been successful in making changes in things you do not like</b>	2.769	2.987	<b>-2.323</b>	<b>0.021</b>
Do you like the food at (name of the facility)	3.157	3.196	-0.756	0.451
Do you enjoy mealtimes at (name of the facility)	3.375	3.444	-1.326	0.186
Can you get your favorite foods at (name of the facility)	2.791	2.962	<b>-2.184</b>	<b>0.030</b>
Do you participate in religious activities here	2.870	2.883	-0.199	0.843
Do the religious observances here have personal meaning for you	3.127	3.132	-0.078	0.938
Do you feel your life as a whole has meaning	3.301	3.312	-0.166	0.868

Table 11.2, continued				
Item	Res.	Staff	t.	Sig (2-tailed)
Do you feel at peace	3.514	3.542	-0.576	0.566
Do you feel that your possessions are safe at this nursing home	3.358	3.450	-1.654	0.100
Do your clothes get lost or damaged in the laundry	2.799	2.887	-1.206	0.229
Do you feel confident that you can get help when you need it?	3.508	3.535	-0.528	0.598
If you do not feel well, can you get a nurse or doctor quickly	3.407	3.519	-1.862	0.064
Do you ever feel afraid because of the way you or some other resident is treated	3.323	3.382	-0.794	0.428
Taking all staff together, nurses, aides, and others, does the staff know about your interests	3.135	3.214	-1.054	0.293
<b>Do staff members know you as a person</b>	<b>3.308</b>	<b>3.473</b>	<b>-2.612</b>	<b>0.010</b>
Are people working here interested in your experiences and the things you have done in your life	2.891	2.837	0.782	0.435
Do staff here take your preferences seriously	3.172	3.289	-1.791	0.075
Do residents here know you as a person	3.139	3.151	-0.147	0.884
Are your personal wishes and interests respected here	3.449	3.512	-1.087	0.278

To compare the extent of agreement between the responses obtained by nursing home staff and researchers staff we calculated correlation coefficients. Table 11.3 shows the correlation coefficients for each item. All correlations are significant at  $p < .001$ , indicating that the UM and staff ratings were significantly related to each other. Seven (7) correlations were above .60, 20 correlations were between .50 and .60, 13 correlations were between .40 and .50, and 14 correlations were between .24 and .40. On the whole, these data indicate that ratings made by research and nursing home staff on the same resident were very similar to each other. This also reflects substantial test/retest reliability.

Examining the level of agreement at the item level is a very stringent test. More typically we would worry about the effect on the domain scores. Table 11.4 shows the correlations at the domain level. The correlations are all significant and are uniformly high (all greater than .60). This indicates that at the scale level, there was a high level of agreement between UM scores and NH staff scores.

Table 11.3. Correlations of Nursing Home Staff and Researchers Interview Data

Item	N	Correlation	Sig.
How often are you too cold here	192	0.576	0.001
How often are you so long in the same position that it hurts	192	0.497	0.001
How often are you in physical pain	189	0.606	0.001
How often are you bothered by noise when you are in your room	192	0.416	0.001
How often are you bothered by noise in other parts of the nursing home	191	0.384	0.001
dcmf6- do you get a good night's sleep here	192	0.544	0.001
Is it easy for you to get around in your room by yourself	192	0.649	0.001
Can you easily reach the things that you need	190	0.463	0.001
If you are anywhere in the nursing home and need a bathroom, can you get to one quickly	176	0.439	0.001
Can you easily reach your toilet articles and things you want to use in your bathroom	187	0.509	0.001
Do you do as much to take care of your own things and your room as you can and want	192	0.438	0.001
Can you find a place to be alone when you wish	184	0.429	0.001
Can you make a private phone call	182	0.513	0.001
When you have a visitor, can you find a place to visit in private	189	0.364	0.001
Can you be together in private with another resident (other than your roommate)	174	0.313	0.001
Do the people who work here knock and wait for a reply before entering your room	192	0.397	0.001
Do staff here treat you politely	191	0.380	0.001
Do you feel that your are treated with respect here	192	0.550	0.001
Do staff here handle you gently while giving you care	188	0.414	0.001
Do staff here respect your modesty	186	0.426	0.001
Do staff take time to listen to you when you have something you want to say	190	0.566	0.001
Do you get outdoors	189	0.393	0.001
About how often do you get outdoors	184	0.650	0.001
Do you enjoy the organized activities here at the nursing home	183	0.586	0.001
Outside of religious activities, do you have enjoyable things to do during the weekend	181	0.449	0.001
Despite your health condition, do you give help to others	183	0.551	0.001
Do the days here seem too long to you	191	0.555	0.001
Is it easy to make friends at this nursing home	191	0.567	0.001
Do you consider that any other resident here is your close friend	180	0.646	0.001
In the last month, have people who worked here stopped just to have a friendly conversation	189	0.354	0.001
Do you consider any staff member here to be your friend	190	0.474	0.001
Do you think that (name of the facility) tries to make this an easy and pleasant place for families and friends of residents to visit	189	0.277	0.001
Can you go to bed at the time you want	191	0.552	0.001
Can you get up in the morning at the time you want	189	0.596	0.001
Can you decide what clothes to wear	188	0.340	0.001
Have you been successful in making changes in things you do not like	164	0.323	0.001
Do you like the food at (name of the facility)	190	0.705	0.001
Do you enjoy mealtimes at (name of the facility)	189	0.577	0.001
Can you get your favorite foods at (name of the facility)	179	0.477	0.001
Do you participate in religious activities here	191	0.678	0.001
Do the religious observances here have personal meaning for you	182	0.579	0.001
Do you feel your life as a whole has meaning	179	0.511	0.001
Do you feel at peace	187	0.571	0.001

Table 11.3., continued			
<b>Item</b>	<b>N</b>	<b>Correlation</b>	<b>Sig.</b>
Do you feel that your possessions are safe at this nursing home	189	0.616	0.001
Do your clothes get lost or damaged in the laundry	178	0.574	0.001
Do you feel confident that you can get help when you need it?	187	0.539	0.001
If you do not feel well, can you get a nurse or doctor quickly	180	0.453	0.001
Do you ever feel afraid because of the way you or some other resident is treated?	189	0.241	0.001
Taking all staff together, nurses, aides, and others, does the staff know about your interests	177	0.372	0.001
Do staff members know you as a person	188	0.479	0.001
Are people working here interested in your experiences and the things you have done in your life	187	0.573	0.001
Do staff here take your preferences seriously	180	0.523	0.001
Do residents here know you as a person	176	0.391	0.001
Are your personal wishes and interests respected here	188	0.392	0.001

Table 11.4. Correlations between Researcher and Staff Interviewers by Domain Scores

QOL Domain	T	Significance
Comfort	0.649	0.001
Functional competence	0.716	0.001
Privacy	0.554	0.001
Dignity	0.726	0.001
Meaningful activity	0.663	0.001
Relationships	0.697	0.001
Autonomy	0.619	0.001
Enjoyment	0.700	0.001
Spiritual well being	0.748	0.001
Security	0.695	0.001
Individuality	0.742	0.001

Table 11.5 returns to the question of bias and shows the mean score for the various domains by interviewer group. These findings suggest that there is some indication of bias. Of the 11 possible comparisons, 5 were significant at  $p < .05$  and 2 were significant at  $p < .01$ . All of these significant differences are in the same direction, with the nursing home staff yielding scores that reflect higher levels of well-being.



Table 11.5. Mean Differences between Interviewers by Domain Scores

	Researchers	Staff	t	Sig
Comfort	2.917	3.008	<b>-2.810</b>	<b>0.005</b>
Functional competency	3.282	3.301	-0.490	0.625
Privacy	3.372	3.463	<b>-2.365</b>	<b>0.019</b>
Dignity	3.666	3.692	-1.110	0.268
Meaningful activity	2.827	2.762	1.655	0.100
Relationships	3.088	3.131	-1.167	0.245
Autonomy	3.302	3.413	<b>-3.126</b>	<b>0.002</b>
Enjoyment	3.105	3.203	<b>-2.286</b>	<b>0.023</b>
Spiritual Well Being	3.194	3.214	-0.594	0.553
Security	3.295	3.360	<b>-2.181</b>	<b>0.030</b>
Individuality	3.166	3.232	-1.937	0.054

Table 11.6 examines the effects of training and profession on the extent of bias. It compares the mean nursing home interviewer value for each domain with the comparable U of M value. The most significant differences are between researchers and staff who received only materials rather than in-person training. For most of these differences, the staff reported a higher QOL than did the researchers (meaningful activity is the exception). This suggests that the significant differences in the previous table (comparing researchers to staff member) can be attributed to a positivity bias on the part of the staff who received training from materials only.

Table 11.6 also shows the results from the regression at the domain level. Taking training type, staff role and interview order together, staff role and interview role do not show significance in terms of predicting domain scores reported by research interviewers. For training type, 9 of 11 domains showed no significant difference between scores of staffs who received material training and those who received in-person training. In two domains (comfort and spiritual well-being), training type played a role predicting domain scores by research interviewers. Staff with in-person training reported higher domain scores than did the staff who received training materials only in these two domains.

Table 11.6. Mean Values of Domain Scores by Nursing Home Staff Characteristics

	Staff Training							
	Researchers	Materials	Researchers	In-person	Researchers	Nurses	Researchers	Psychosocial staff
Comfort	<b>2.841**</b>	<b>3.005**</b>	2.993	3.011	2.927	2.995	<b>2.906*</b>	<b>3.023*</b>
Functional competency	3.214	3.259	3.348	3.343	3.296	3.308	3.265	3.294
Privacy	<b>3.339*</b>	<b>3.454*</b>	3.403	3.471	3.367	3.438	3.376	3.491
Dignity	3.622	3.675	3.710	3.708	3.732	3.771	3.592	3.604
Meaningful activity	<b>2.820*</b>	<b>2.708*</b>	2.834	2.815	2.870	2.776	2.779	2.745
Relationships	3.121	3.108	3.055	3.154	3.063	3.104	3.116	3.162
Autonomy	<b>3.249**</b>	<b>3.399**</b>	3.354	3.427	<b>3.282*</b>	<b>3.402*</b>	3.323	3.424
Enjoyment	<b>3.053*</b>	<b>3.195*</b>	3.152	3.212	3.140	3.252	3.062	3.145
Spiritual well being	3.133	3.220	3.252	3.208	3.173	3.186	3.217	3.245
Security	3.259	3.327	3.332	3.393	3.356	3.410	3.229	3.305
Individuality	3.209	3.292	3.124	3.174	3.195	3.246	3.131	3.215

\* indicates a pair of means that differ significantly from each other at  $p < .05$ .

\*\* indicates a pair of means that differ significantly from each other as  $p < .01$

### Results of Facility Level Observation: Staff

The observations were divided into two portions for analysis: meal observations and walkthrough observations. There were 124 simultaneous paired observations for meals, each observation containing 16 elements. Table 11.7 examines the mean reported rates for each item to look for evidence of bias. Of the 16 items, 5 yielded significant differences at the  $p < .05$  level. With this many comparisons, however, we should set a more conservative  $p$  level. If we move to  $p < .01$ , then only two of the 16 items are significant (items #11 and 15). In both cases, the staff was more likely to report seeing a negative event/behavior (staff were more likely to see staff feeding more than one resident at a time, and were more likely to reporting hearing noxious noise levels).

The potential effects of training are explored in Table 11.8, which contrasts the nursing home staff mean report scores and the U of M scores, broken down by type of training. Focusing on the last line of the table, the -.020 value indicates that staff who had only materials for training had a higher score compared to researchers by 2% when collapsing across all 16 items

than those who had more extensive training. The -.014 indicates that the staff that had in-person training had a higher score by 1% compared to researchers when collapsing across all 16 items. Neither effect is very large. When looking across all items, the amount of bias is very small. Looking at the items individually, two items were more likely to be seen by staff with materials training (2 & 15), and two items were more likely to be seen by staff who had in-person training (11&12). This pattern suggests that there is no systematic bias due to training.

Table 11.7. Mean Meal Observation Scores for Researchers and Nursing Home Staff

Meal Observation	Mean		Paired Difference	
	Researcher	Staff	T	sig
M01 Negative resident expression	0.463	0.390	1.448	0.150
<b>M02 Staff move resident's wheelchair without asking or discussing</b>	0.163	0.236	<b>-2.217</b>	<b>0.028</b>
M03 Staff answer questions or fulfill requests	0.919	0.855	1.719	0.088
M04 Staff talk over resident's head/s	0.179	0.260	-1.910	0.058
M05 Staff discuss resident's private business in public	0.049	0.065	-0.706	0.482
M06 Staff impose restriction	0.065	0.065	0.000	1.000
M07 Staff speak roughly or threatening	0.049	0.041	0.332	0.740
M08 Resident heard laughing	0.621	0.589	0.601	0.549
M09 Resident not talking at meals	0.629	0.653	-0.403	0.688
M10 Resident fed messily	0.056	0.056	0.000	1.000
<b>M11 Staff feeding more than one resident at a time</b>	0.226	0.411	<b>-4.132</b>	<b>0.001</b>
<b>M12 Tablecloths or placemats</b>	0.403	0.363	<b>2.273</b>	<b>0.025</b>
<b>M13 Centerpiece on each table</b>	0.202	0.258	<b>-2.141</b>	<b>0.034</b>
M14 Pleasant odors	0.734	0.645	1.519	0.131
<b>M15 Noxious noise levels</b>	0.032	0.153	<b>-3.604</b>	<b>0.001</b>
M16 Unpleasant odors	0.000	0.016	-1.420	0.158

Note: Bolded values are statistically significant.

Table 11.8. Mean Meal Observation Scores for Staff and Researchers by Training Mode

	Materials Training		Researcher Staff Difference	In-person Training		Researcher Staff Difference
	Researchers	Staff		Researchers	Staff	
M01 Negative resident expression	0.444	0.397	0.047	0.483	0.383	0.100
M02 Staff move resident's wheelchair without asking or discussing	<b>0.143*</b>	<b>0.238*</b>	-0.095	0.183	0.233	-0.050
M03 Staff answer questions or fulfill requests	0.906	0.859	0.047	0.933	0.850	0.083
M04 Staff talk over resident's head/s	0.111	0.190	-0.079	0.250	0.333	-0.083
M05 Staff discuss resident's private business in public	0.032	0.048	-0.016	0.067	0.083	-0.016
M06 Staff impose restriction	0.048	0.079	-0.031	0.083	0.050	0.033
M07 Staff speak roughly or threatening	0.048	0.032	0.016	0.051	0.051	0.001
M08 Resident heard laughing	0.563	0.563	0.001	0.683	0.617	0.066
M09 Resident not talking at meals	0.750	0.719	0.031	0.500	0.583	-0.083
M10 Resident fed messily	0.031	0.047	-0.016	0.083	0.067	0.016
M11 Staff feeding more than one resident at a time	0.219	0.344	-0.125	<b>0.233***</b>	<b>0.483***</b>	-0.250
M12 Tablecloths or placemats	0.453	0.453	0.001	<b>0.35*</b>	<b>0.267*</b>	0.083
M13 Centerpiece on each table	0.188	0.250	-0.062	0.217	0.267	-0.050
M14 Pleasant odors	0.734	0.578	0.156	0.733	0.717	0.016
M15 Noxious noise levels	<b>0.047**</b>	<b>0.203**</b>	-0.156	0.017	0.100	-0.083
M16 Unpleasant odors	0.000	0.031	-0.031	0.000	0.000	0.001
Average Difference Across All Items			-0.020			-0.014

\*pairs showing significant difference of the mean between two observers at  $p < .05$

\*\* pairs showing significant difference of the mean between two observers at  $p < .01$

\*\*\* pairs showing significant difference of the mean between two observers at  $p < .001$

The potential effects of profession are explored in Table 11.9, which contrasts the nursing home staff mean report scores and the researcher scores, broken down by nursing or social work. Once again, focusing on the last line of the table, the -.243 value indicates that nurses were more likely to report seeing the behaviors than the research interviewers. The significant comparisons at the item level indicate that nurses were more likely to see item #11 (staff feeding more than one resident at a time) and #15 (noxious noise levels). Interestingly, nurses were less likely to report seeing #12 (tablecloths or placemats). At the same time, the -.141 indicates that social workers were more likely to report seeing the behaviors than the research interviewers. The

significant comparisons at the item level indicate that for items 11 (staff feeding more than one resident at a time), 13 (centerpiece on each table), and 15 (noxious noise levels), the social workers were more likely to report seeing the behavior. For item #1 (negative resident expression) the pattern was reversed, with research observers reporting the behavior more frequently. Taken together, these analyses present little evidence of a systematic bias, due either to training type or role of the nursing home staff observer (psychosocial staff vs. nurse).

The extent of agreement between nursing home staff and U of M was assessed using Kappa statistics. Table 11.10 shows the level of concordance. Of the 16 possible kappas calculated, 10 were significant. No kappa could be calculated for item #16 because unpleasant odors were never observed during meals by UM or staff observers. An alternate way to evaluate kappas is that kappas that are greater than 0.75 indicate excellent agreement. Kappas ranging from 0.4 to 0.75 indicate good agreement. Kappas ranging from 0 to 0.4 indicate marginal agreement (Landis and Koch, 1977). Using this guide, 2 of our significant kappas indicate excellent agreement, 1 indicates good agreement, and 10 indicate marginal agreement.

The effects of training and profession are shown in Table 11.11. Neither training status nor profession seems to influence the level of agreement between nursing home staff and U of M ratings. The same steps were followed with the rest of the walkthrough. Table 11.12 examines possible bias. Four out of 18 items showed significant differences between researcher and staff observers during walkthrough observation. With this many comparisons, however, we should expect a few differences, and should lower our alpha level to the more conservative .01. Using this alpha-level, only one of the 18 items yielded a significant difference #13. Three of the items significant at  $\alpha = .05$  could be considered negative in nature (items 3, 5, and 7). For these items, staff members were more likely to report seeing the behavior. The remaining item was

positive in nature (item 13), and this item (spontaneous activity) was less likely to be reported by the staff. Given that only 4 of the 18 comparisons were significant at  $\alpha = .05$ , and only 1 is significant at  $\alpha = .01$ , and that the direction of the significant differences (with the UM observers giving more favorable ratings), we can tentatively conclude that the staff do not have a positivity bias.

Table 11.9. Mean Meal Observation Scores for Staff and Researchers by Staff Profession

	Researchers	Nurses	Researcher/ nurse staff differences	Researchers	Psychosocial Staff	Researcher/ psychosocial staff differences
M01 Negative resident expression	0.419	0.435	-.016	<b>0.508*</b>	<b>0.344*</b>	.164
M02 Staff move resident's wheelchair without asking or discussing	0.258	0.355	-.097	0.066	0.115	-.049
M03 Staff answer questions or fulfill requests	0.919	0.806	.113	0.919	0.903	.016
M04 Staff talk over resident's head/s	0.145	0.210	-.065	0.213	0.311	-.098
M05 Staff discuss resident's private business in public	0.048	0.081	-.033	0.049	0.049	0
M06 Staff impose restriction	0.129	0.097	.032	0.000	0.033	-.033
M07 Staff speak roughly or threatening	0.049	0.082	-.033	0.049	0.000	.049
M08 Resident heard laughing	0.581	0.597	-.016	0.661	0.581	.08
M09 Resident not talking at meals	0.661	0.661	0	0.597	0.645	-.046
M10 Resident fed messily	0.081	0.065	.016	0.032	0.048	-.016
M11 Staff feeding more than one resident at a time	<b>0.274***</b>	<b>0.516***</b>	-.242	<b>0.177*</b>	<b>0.306*</b>	-.129
M12 Tablecloths or placemats	<b>0.355*</b>	<b>0.290*</b>	.065	0.452	0.435	.017
M13 Centerpiece on each table	0.210	0.226	-.016	<b>0.194*</b>	<b>0.290*</b>	-.096
M14 Pleasant odors	0.726	0.710	.016	0.742	0.581	.161
M15 Noxious noise levels	<b>0.032*</b>	<b>0.129*</b>	-.097	<b>0.032**</b>	<b>0.177**</b>	-.145
M16 Unpleasant odors	0.000	0.016	-.016	0.000	0.016	-.016
Average Difference Across All Items			-.243			-0.141

\*pairs showing significant difference of the mean between two observers at  $p < .05$

\*\* pairs showing significant difference of the mean between two observers at  $p < .01$

\*\*\* pairs showing significant difference of the mean between two observers at  $p < .001$

Table 11.10. Extent of Agreement on Meal Observations between Researchers and Staff

Item	Kappa
m01 negative resident expression	<b>0.356***</b>
m02 Staff move resident's wheelchair without asking or discussing	<b>0.57***</b>
m03 Staff answer questions or fulfill requests	0.123
m04 Staff talk over resident's head/s	<b>0.342***</b>
m05 Staff discuss resident's private business in public	<b>0.395***</b>
m06 Staff impose restriction	<b>0.332***</b>
m07 Staff speak roughly or threatening	0.144
m08 Resident heard laughing	<b>0.258**</b>
m09 Residents not talking at meals	0.037
m10 Resident fed messily	<b>0.243**</b>
m11 Staff feeding more than one resident at a time	<b>0.375***</b>
m12 Tablecloths or placemats	<b>0.915***</b>
m13 Centerpiece on each table	<b>0.751***</b>
m14 Pleasant odors	0.011
m15 Noxious noise levels	0.127
m16 Unpleasant odors	#

# - no statistics were computed because this observation never occurred.

p<0.05, \*\* -p<0.01, \*\*\* p<0.001

Table 11.11. Effect of Training Mode and Profession on the Extent of Agreement on Meal Observations between Researchers and Staff

Item	Type of Training		Staff Discipline	
	Material	In-person	Nurse	Psychosocial
M01_1(Negative resident expression)	<b>0.318*</b>	<b>0.395**</b>	<b>0.308*</b>	<b>0.413**</b>
M02_1(Staff move resident's wheelchair without asking or discussing)	<b>0.594***</b>	<b>0.547***</b>	<b>0.625***</b>	<b>0.306*</b>
M03_1(Staff answer questions or fulfil requests)	0.174	0.068	0.137	0.103
M04_1(Staff talk over resident's head/s)	<b>0.327**</b>	<b>0.32*</b>	0.122	<b>0.498***</b>
M05_1(Staff discuss resident's private business in public)	<b>0.376**</b>	<b>0.4**</b>	<b>0.468***</b>	<b>0.299*</b>
M06_1(Staff impose restriction)	<b>0.468***</b>	0.2	<b>0.358**</b>	#
M07_1(Staff speak roughly or threatening)	-0.04	<b>0.298*</b>	0.201	#
M08_1(Resident heard laughing)	<b>0.365**</b>	0.125	0.234	0.285*
M09_1(Resident not talking at meals)	0.04	-0.033	0.064	0.009
M10_1(Resident fed messily)	<b>0.377**</b>	0.16	0.162	<b>0.376**</b>
M11_1(Staff feeding more than one resident at a time)	<b>0.242*</b>	<b>0.491***</b>	<b>0.396***</b>	<b>0.312**</b>
M12_1(Tablecloths or placemats)	<b>1***</b>	<b>0.806***</b>	<b>0.853***</b>	<b>0.967***</b>
M13_1(Centerpiece on each table)	<b>0.727***</b>	<b>0.773***</b>	<b>0.858***</b>	<b>0.653***</b>
M14_1(Pleasant odors)	-0.012	0.039	0.005	0.02
M15_1(Noxious noise levels)	0.188*	-0.029	0.156	0.105
M16_1(Unpleasant odors)	#	#	#	#

# - no statistics were computed because this observation never occurred.

p<0.05, \*\* -p<0.01, \*\*\* p<0.001

Table 11.12. Differences in Mean Ratings of Walkthrough Observations  
between Researchers and Staff

Items	Mean		1. Paired Difference	
	Researchers	Staff	T	Sig. (2-tailed)
W01 negative resident expression	0.387	0.355	0.424	0.673
W02 resident in distress	0.177	0.161	0.299	0.766
W03 staff move resident's wheelchair without asking or discussing	0.081	0.177	<b>-2.185</b>	<b>0.033</b>
W04 staff answer questions or fulfill requests	0.677	0.645	0.424	0.673
W05 staff talk over resident's head(s)	0.016	0.081	<b>-2.051</b>	<b>0.045</b>
W06 resident's body uncovered	0.097	0.145	-1.761	0.083
W07 staff discuss resident's private business in public	0.000	0.065	<b>-2.051</b>	<b>0.045</b>
W08 staff impose restriction	0.016	0.000	1.000	0.321
W09 staff speak roughly or threatening	0.000	0.016	-1.000	0.321
W10 resident heard laughing	0.623	0.565	0.893	0.375
W11 resident disengaged at nursing station	0.661	0.661	0.000	1.000
W12 resident is engaged in a solo activity	0.935	0.855	1.524	0.133
W13 two or more residents in spontaneous activity	0.565	0.435	<b>2.650</b>	<b>0.010</b>
W14 organized activity observed	0.629	0.645	-0.444	0.658
W15 disengaged during organized activity	0.403	0.387	0.331	0.742
W16 noxious noise levels	0.194	0.226	-0.574	0.568
W17 unpleasant odors	0.226	0.339	-1.627	0.109
W18 clutter in hallways	0.726	0.774	-0.830	0.410

The effects of training on bias are examined in Table 11.13. As shown in earlier tables, the difference between nursing home staff and U of M ratings are shown. Focusing on the last line of the table, the .012 indicates that collapsing across all items, the U of M observers were very slightly more likely to report seeing the behaviors than staff with materials-only training. The -.026 indicates that collapsing across all items, the research observers were very slightly less likely to report seeing the behaviors than staff with in-person. Both of these numbers are very close to zero, however, suggesting that there was little bias on the part of the staff, and that the bias did not really differ according to training status.



Table 11.13: Mean Ratings of Walk-through Observations By Training

Items	Material Training			Personal Training		
	Researchers	Staff	Researcher-staff difference	Researchers	Staff	Researcher-staff difference
Negative resident expression	0.563	0.438	0.125	0.200	0.267	-0.067
Resident in distress	0.250	0.219	0.031	0.100	0.100	0.001
Staff move resident's wheelchair without asking or discussing	<b>0.125*</b>	<b>0.250*</b>	-0.125	0.033	0.100	-0.067
Staff answer questions or fulfill requests.	0.625	0.656	-0.031	0.733	0.633	0.100
Staff talk over resident's head(s)	0.000	0.063	-0.063	0.033	0.100	-0.067
Resident's body uncovered.	0.125	0.125	0.001	0.067	0.167	-0.100
Staff discuss resident's private business in public	0.000	0.031	-0.031	0.000	0.100	-0.100
Staff impose a restriction.	0.000	0.000	0.001	0.033	0.000	0.033
Staff speak roughly or threateningly.	0.000	0.000	0.001	0.000	0.033	-0.033
Resident heard laughing.	0.656	0.594	0.062	0.586	0.517	0.069
Resident disengaged at nursing station.	0.625	0.500	0.125	<b>0.700*</b>	<b>0.833*</b>	-0.133
Resident is engaged in a solo activity	<b>0.969*</b>	<b>0.781*</b>	0.188	0.900	0.933	-0.033
Two or more residents in spontaneous activity	0.594	0.375	0.219	0.533	0.500	0.033
Organized activity is observed.	0.688	0.688	0.001	0.567	0.600	-0.033
Resident disengaged during organized activity.	0.469	0.406	0.063	0.333	0.367	-0.034
Noxious noise levels.	0.125	0.219	-0.094	0.267	0.233	0.034
Unpleasant odors.	0.188	0.344	-0.156	0.267	0.333	-0.066
Clutter in the hallways.	0.625	0.719	-0.094	0.833	0.833	0.001
Average Difference Across All Items			.012			-.026

\* pairs showing significant difference of the mean between two observers.

Table 11.14 shows the same analysis for the effect of profession. Focusing on the last line of the table, the  $-.038$  indicates that collapsing across all items, the UM observers were very slightly less likely to report seeing the behaviors than nurses. The  $.028$  indicates that collapsing across all items, the UM observers were very slightly more likely to report seeing the behaviors than social workers. Both of these numbers are very close to zero, however, suggesting that there was little bias on the part of the staff, and that the bias did not really differ according to staff role. Taken together, the data reveal little evidence of bias. Training type and staff role did not seem to influence the magnitude of the bias.

The level of agreement in the walk-through observations is shown in Table 11.15. Of the 18 possible Kappas, only 15 could be calculated. For item #7 and #9, UM observers never saw staff discuss resident's private business in public or speak roughly or threatening. Thus w07 and w09 are constants and Kappas can not be calculated. For item #8, staff observers never saw restriction imposed by staff and thus sw08 is a constant and Kappa can not be calculated. Of the 15 that could be calculated, 12 items showed statistically significant agreement. Using the standard outlined proposed by Landis and Koch (1977), 2 of the 12 items showed excellent agreement, 6 items showed good agreement and 4 showed marginal agreement.

Table 11.14. Mean Ratings of Walk-through Observations by Education

	Researchers	Nurses	Research Staff Difference	Researchers	Social Worker	Research-Staff Difference
Negative resident expression	0.438	0.500	-0.062	0.333	0.200	0.133
Resident in distress	0.250	0.156	0.094	0.100	0.167	-0.067
Staff move resident's wheelchair without asking or discussing	<b>0.063*</b>	<b>0.188*</b>	-0.125	0.100	0.167	-0.067
Staff answer questions or fulfill requests.	0.719	0.719	0.001	0.633	0.567	0.066
Staff talk over resident's head(s)	0.031	0.125	-0.094	0.001	0.033	-0.033
Resident's body uncovered.	0.156	0.219	-0.063	0.033	0.067	-0.034
Staff discuss resident's private business in public	0.000	0.063	-0.063	0.001	0.067	-0.067
Staff impose a restriction.	0.031	0.000	0.031	0.001	0.001	0.001
Staff speak roughly or threateningly.	0.000	0.000	0.001	0.001	0.033	-0.033
Resident heard laughing.	0.719	0.750	-0.031	0.517	0.345	0.172
Resident disengaged at nursing station.	0.594	0.688	-0.094	0.733	0.633	0.100
Resident is engaged in a solo activity	0.969	0.906	0.063	0.900	0.800	0.100
Two or more residents in spontaneous activity	0.563	0.469	0.094	<b>0.567*</b>	<b>0.400*</b>	0.167
Organized activity is observed.	0.719	0.719	0.001	0.533	0.567	-0.034
Resident disengaged during organized activity.	0.406	0.406	0.001	0.400	0.367	0.033
Noxious noise levels.	0.219	0.281	-0.062	0.167	0.167	0.000
Unpleasant odors.	0.188	0.375	-0.187	0.267	0.300	-0.033
Clutter in the hallways.	<b>0.688*</b>	<b>0.875*</b>	-0.187	0.767	0.667	0.100
Average Difference Across All Items			-0.038			0.028

Bolded values are statistically significant.

Table 11.15. Extent of Concordance between Nursing Home Staff Observers and Research Observers for Walkthrough Observations

Item	Kappa
W01 negative resident expression	0.241
W02 resident in distress	<b>0.370**</b>
W03 staff move resident's wheelchair without asking or discussing	<b>0.438***</b>
W04 staff answer questions or fulfill requests	0.209
W05 staff talk over resident's head/s	<b>0.315**</b>
W06 resident's body uncovered	<b>0.774***</b>
W07 staff discuss resident's private business in public	#
W08 staff impose restriction	#
W09 staff speak roughly or threatening	#
W10 resident heard laughing	<b>0.325*</b>
W11 resident disengaged at nursing station	<b>0.424**</b>
W12 resident is in solo activity	0.071
W13 spontaneous activity	<b>0.683***</b>
W14 organized activity	<b>0.826***</b>
W15 disengaged during organized activity	<b>0.696***</b>
W16 noxious noise levels	<b>0.417**</b>
W17 unpleasant odors	<b>0.255*</b>
W18 clutter in hallways	<b>0.443***</b>

# Either the U of MN researchers or the staff did not observe the item at all so Kappa could not be calculated.

The effects of profession and training are examined in Table 11.16. There is no evidence that training status or staff role influences the amount of agreement between researcher observers and staff ratings. When training status, staff role and interview order were combined in a regression model that used staff scores as the dependent variable and included U of M scores as another independent variable, the only significant effect was that training was associated with differences in the comfort and spiritual well-being scores.

Table 11.16. Extent of Concordance between Nursing Home Staff Observers and research Observers for Walk-Through Observations by Training and Profession

Item	Training		Profession	
	Materials	In-Person	Nurse	SW
W01_1negative resident expression	0.138	0.259	0.125	0.333
W02_1resident in distress	<b>0.391*</b>	0.259	<b>0.333*</b>	<b>0.429*</b>
W03_1staff move resident's wheelchair without asking or discussing	<b>0.600***</b>	-0.053	<b>0.448**</b>	<b>0.429*</b>
W04_1staff answer questions or fulfill requests	0.254	0.162	-0.082	<b>0.447*</b>
W05_1staff talk over resident's head/s	#	<b>0.474**</b>	<b>0.368**</b>	#
W06_1resident's body uncovered	<b>1***</b>	<b>0.526**</b>	<b>0.796**</b>	<b>0.651***</b>
W07_1staff discuss resident's private business in public	#	#	#	#
W08_1staff impose restriction	#	#	#	#
W09_1staff speak roughly or threatening	#	#	#	#
W10_1resident heard laughing	0.203	<b>0.395*</b>	0.280	0.249
W11_1resident disengaged at nursing station	0.250	<b>0.636***</b>	0.261	<b>0.619***</b>
W12_1resident is in solo activity	-0.058	0.348	-0.049	0.103
W13_1spontaneous activity	<b>0.582***</b>	<b>0.800***</b>	<b>0.690**</b>	<b>0.675***</b>
W14_1organized activity	<b>0.709***</b>	<b>0.932***</b>	<b>0.845**</b>	<b>0.798***</b>
W15_1disengaged during organized activity	<b>0.747***</b>	<b>0.634***</b>	<b>0.611**</b>	<b>0.789***</b>
W16_1noxious noise levels	0.243	<b>0.556**</b>	<b>0.668**</b>	0.040
W17_1unpleasant odors	0.301	0.211	0.259	0.262
W18_1clutter in hallways	<b>0.368*</b>	<b>0.520**</b>	<b>0.304*</b>	<b>0.595**</b>

# Either the U of MN researchers or the staff did not observe the item at all so Kappa could not be calculated.

We found no difference in congruence with research interviewers if the staff member knew the resident well (not tabled) Few residents said that their QOL changed in the last few days; the group was too small to analyze statistically. Typically, if the resident said he/she previously had a better or worse QOL, the reason given was their health status or the departure or return of a favorite staff member.

## **Surveyors Results**

### Results on Resident Interviews: Surveyors

The same procedure was followed in analyzing the data for the surveyors. Table 11.17 examines bias by comparing the mean values for each question. Of the 54 possible comparisons, 3 were significant at  $p < .05$ . If we set a more conservative  $p$  value of less than or equal to .01 (to compensate for the number of comparisons), then only one of the comparisons was significant (item 3 in privacy). The bolded cells are statistically significant. Given the small number of items that yielded significant comparisons, we conclude that there is very little systematic bias on the part of the surveyor during the interview.

Bias is examined at the domain level in Table 11.18. Of the 11 possible comparisons, only one was significant at  $p < .05$ . We can conclude that there is no significant difference between research interviewers and surveyors. The extent of agreement between surveyors and researchers is shown in Table 11.19. Out of 54 items 41 showed significant correlations between research interviewers and surveyors. On the whole, these data indicate that ratings made by researchers and surveyors on the same resident were very similar to each other.

Table 11.17. Mean Values for Interview Questions for Researchers and Surveyors

Item	Researchers	Surveyor	t.	Sig
How often are you too cold here	2.913	3.017	-0.781	0.439
How often are you so long in the same position that it hurts	2.677	2.830	-0.869	0.389
How often are you in physical pain	2.646	2.502	1.035	0.306
How often are you bothered by noise when you are in your room	2.932	2.989	-0.374	0.710
How often are you bothered by noise in other parts of the nursing home	3.058	3.115	-0.364	0.717
Do you get a good night's sleep here	3.400	3.413	-0.108	0.914
Is it easy for you to get around in your room by yourself	3.060	3.008	0.337	0.738
Can you easily reach the things that you need	3.227	3.317	-0.823	0.415
If you are anywhere in the nursing home and need a bathroom, can you get to one quickly	2.830	3.230	-2.162	0.036
Can you easily reach your toilet articles and things you want to use in your bathroom	2.948	3.030	-0.496	0.622
Do you do as much to take care of your own things and your room as you can and want	3.367	3.183	1.254	0.216
Can you find a place to be alone when you wish	3.372	3.334	0.228	0.820
Can you make a private phone call	3.085	3.348	-1.355	0.182
When you have a visitor, can you find a place to visit in private	3.366	3.723	<b>-3.296</b>	<b>0.002</b>
Can you be together in private with another resident (other than your roommate)	2.900	3.024	-0.571	0.571
Do the people who work here knock and wait for a reply before entering your room	3.079	3.271	-1.160	0.252
Do staff here treat you politely	3.838	3.804	0.416	0.680
Do you feel that you are treated with respect here	3.740	3.779	-0.419	0.677
Do staff here handle you gently while giving you care	3.671	3.717	-0.466	0.643
Do staff here respect your modesty	3.677	3.685	-0.102	0.919
Do staff take time to listen when you have something you want to say	3.344	3.508	-1.179	0.244
Do you get outdoors	2.851	2.945	-0.423	0.674
About how often do you get outdoors	2.554	2.518	0.388	0.700
Do you enjoy the organized activities here at the nursing home	3.116	3.149	-0.228	0.821
Outside of religious activities, do you have enjoyable things to do during the weekend	3.066	3.202	-0.891	0.378
Despite your health condition, do you give help to others	2.555	2.489	0.385	0.702
Do the days here seem too long to you	2.587	2.619	-0.214	0.831
Is it easy to make friends at this nursing home	3.520	3.433	0.650	0.519
Do you consider that any other resident here is your close friend	2.630	3.152	<b>-2.429</b>	<b>0.019</b>
In the last month, have people who worked here stopped just to have a friendly conversation	3.039	3.011	0.205	0.838
Do you consider any staff member here to be your friend	3.379	3.306	0.564	0.575
Do you think that (name of the facility) tries to make this an easy and pleasant place for families and friends of residents to visit	3.698	3.760	-0.990	0.328
Can you go to bed at the time you want	3.592	3.600	-0.071	0.943
Can get up in the morning at the time you want	2.846	2.944	-0.572	0.570
Can you decide what clothes to wear	3.757	3.717	0.458	0.649
Have you been successful in making changes in things you do not like	3.030	2.822	0.998	0.325

Table 11.17 cont.	Item	Researcher	Surveyor	T	Sig.
	Do you like the food at (name of the facility)	3.135	3.165	-0.256	0.799
	Do you enjoy mealtimes at (name of the facility)	3.525	3.356	1.405	0.166
	Can you get your favorite foods at (name of the facility)	2.641	2.829	-1.248	0.219
	Do you participate in religious activities here	3.188	3.133	0.429	0.670
	Do the religious observances here have personal meaning for you	3.374	3.377	-0.014	0.989
	Do you feel your life as a whole has meaning	3.320	3.204	0.740	0.463
	Do you feel at peace	3.515	3.664	-1.036	0.306
	Do you feel that your possessions are safe at this nursing home	3.446	3.683	-1.971	0.055
	Do your clothes get lost or damaged in the laundry	3.098	3.082	0.108	0.915
	Do you feel confident that you can get help when you need it?	3.626	3.719	-0.873	0.387
	If you do not feel well, can you get a nurse or doctor quickly	3.393	3.613	-1.573	0.123
	Do you ever feel afraid because of the way you or some other resident is treated	3.587	3.557	0.239	0.812
	Taking all staff together, nurses, aides, and others, does the staff know about your interests	3.450	3.320	0.832	0.410
	Do staff members know you as a person	3.531	3.544	-0.091	0.928
	Are people working here interested in your experiences and the things you have done in your life	2.981	3.317	<b>-2.279</b>	<b>0.028</b>
	Do staff here take your preferences seriously	3.252	3.398	-0.959	0.343
	Do residents here know you as a person	3.190	2.908	1.459	0.153
	Are your personal wishes and interests respected here	3.471	3.621	-1.146	0.258

\*Bold values are statistically significant.

Table 11.18. Mean Domain Scores for Researchers and Surveyors

Domain	Researchers	Surveyor	T	Sig. (2-tailed)
Comfort	2.927	2.971	-0.669	0.506
Functional competency	3.083	3.148	-0.816	0.419
Privacy	3.165	3.350	<b>-2.283</b>	<b>0.027</b>
Dignity	3.652	3.689	-0.542	0.590
Meaningful activity	2.813	2.864	-0.581	0.564
Relationships	3.232	3.340	-1.422	0.162
Autonomy	3.316	3.301	0.191	0.849
Enjoyment	3.107	3.092	0.191	0.849
Spiritual well being	3.384	3.360	0.257	0.798
Security	3.454	3.552	-1.329	0.190
Individuality	3.339	3.369	-0.358	0.722

\*Bold values are statistically significant.



Table 11.19. Level of Agreement for QOL Questions between Research Interviewers and Surveyors

Item	N	Correlation	Sig.
How often are you too cold here	48	<b>0.607</b>	<b>0.001</b>
How often are you so long in the same position that it hurts	47	<b>0.444</b>	<b>0.002</b>
How often are you in physical pain	48	<b>0.570</b>	<b>0.001</b>
How often are you bothered by noise when you are in your room	47	<b>0.560</b>	<b>0.001</b>
How often are you bothered by noise in other parts of the nursing home	48	<b>0.453</b>	<b>0.001</b>
Do you get a good night's sleep here	47	<b>0.608</b>	<b>0.001</b>
Is it easy for you to get around in your room by yourself	48	<b>0.615</b>	<b>0.001</b>
Can you easily reach the things that you need	48	<b>0.714</b>	<b>0.001</b>
If you are anywhere in the nursing home and need a bathroom, can you get to one quickly	43	<b>0.427</b>	<b>0.004</b>
Can you easily reach your toilet articles and things you want to use in your bathroom	46	<b>0.540</b>	<b>0.001</b>
Do you do as much to take care of your own things and your room as you can and want	46	<b>0.506</b>	<b>0.001</b>
Can you find a place to be alone when you wish	47	0.279	0.058
Can you make a private phone call	48	<b>0.292</b>	<b>0.044</b>
When you have a visitor, can you find a place to visit in private	44	<b>0.460</b>	<b>0.002</b>
Can you be together in private with another resident (other than your roommate)	41	0.063	0.695
Do the people who work here knock and wait for a reply before entering your room	48	<b>0.394</b>	<b>0.006</b>
Do staff here treat you politely	48	<b>0.287</b>	<b>0.048</b>
Do you feel that you are treated with respect here	47	<b>0.353</b>	<b>0.015</b>
Do staff here handle you gently while giving you care	48	0.236	0.107
Do staff here respect your modesty	47	<b>0.423</b>	<b>0.003</b>
Do staff take time to listen to you when you have something you want to say	48	0.256	0.079
Do you get outdoors	47	<b>0.428</b>	<b>0.003</b>
About how often do you get outdoors	42	<b>0.851</b>	<b>0.001</b>
Do you enjoy the organized activities here at the nursing home	45	<b>0.594</b>	<b>0.001</b>
Outside of religious activities, do you have enjoyable things to do during the weekend	44	<b>0.430</b>	<b>0.004</b>
Despite your health condition, do you give help to others	47	<b>0.495</b>	<b>0.001</b>
Do the days here seem too long to you	47	<b>0.569</b>	<b>0.001</b>
Is it easy to make friends at this nursing home	45	<b>0.321</b>	<b>0.032</b>
Do you consider that any other resident here is your close friend	46	<b>0.491</b>	<b>0.001</b>
In the last month, have people who worked here stopped just to have a friendly conversation	46	<b>0.540</b>	<b>0.000</b>
Do you consider any staff member here to be your friend	47	<b>0.480</b>	<b>0.001</b>
Do you think that (name of the facility) tries to make this an easy and pleasant place for families and friends of residents to visit	45	<b>0.641</b>	<b>0.001</b>
Can you go to bed at the time you want	48	<b>0.413</b>	<b>0.004</b>
Can get up in the morning at the time you want	48	<b>0.398</b>	<b>0.005</b>
Can you decide what clothes to wear	47	<b>0.547</b>	<b>0.001</b>
Have you been successful in making changes in things you do not like	37	0.214	0.204
Do you like the food at (name of the facility)	48	<b>0.584</b>	<b>0.001</b>

Table 11.19, continued			
Item	N	Correlation	Sig.
Do you enjoy mealtimes at (name of the facility)	48	<b>0.328</b>	<b>0.023</b>
Can you get your favorite foods at (name of the facility)	41	<b>0.583</b>	<b>0.001</b>
Do you participate in religious activities here	48	<b>0.669</b>	<b>0.001</b>
Do the religious observances here have personal meaning for you	47	<b>0.470</b>	<b>0.001</b>
Do you feel your life as a whole has meaning	45	<b>0.314</b>	<b>0.036</b>
Do you feel at peace	47	-0.012	0.936
Do you feel that your possessions are safe at this nursing home	48	<b>0.285</b>	<b>0.049</b>
Do your clothes get lost or damaged in the laundry	45	<b>0.586</b>	<b>0.001</b>
Do you feel confident that you can get help when you need it?	47	-0.025	0.865
If you do not feel well, can you get a nurse or doctor quickly	45	0.069	0.652
Do you ever feel afraid because of the way you or some other resident is treated	47	<b>0.378</b>	<b>0.009</b>
Taking all staff together, nurses, aides, and others, does the staff know about your interests	44	0.193	0.209
Do staff members know you as a person	45	-0.043	0.781
Are people working here interested in your experiences and the things you have done in your life	42	<b>0.447</b>	<b>0.003</b>
Do staff here take your preferences seriously	44	0.136	0.379
Do residents here know you as a person	39	0.289	0.075
Are your personal wishes and interests respected here	48	-0.040	0.785

\*Bold values are statistically significant

The extent of correlations between researchers and surveyors by domain scores is shown in Table 11.20. All the correlations are significant. Correlations for 5 out of 11 domains are above 0.60.

Table 11.20. Correlations between Surveyors and Researchers by Domain Scores

Domain	N	Correlation	Sig.
Comfortably	48	0.717	0.001
Functional Competency	47	0.759	0.001
Privacy	45	0.538	0.001
Dignity	48	0.375	0.009
Meaningful activities	46	0.654	0.001
Relationships	45	0.630	0.001
Autonomy	47	0.418	0.003
Enjoyment	41	0.748	0.001
Spiritual well being	47	0.445	0.002
Security	46	0.456	0.001
Individuality	41	0.431	0.005

### Results on Observations: Surveyors

The mean values for the meal observations are shown in Table 11.21. Two of the 16 items (#6 staff impose restriction and #15 noxious noise levels) showed statistically significant difference between research and surveyor observers. In both items, surveyors were more likely to see these behaviors than U of M observers.

Table 11.21. Mean Values of Meal Observations for Surveyors and Researchers

Item	Researchers	Surveyor	t	Sig
M01-Negative resident expression	0.289	0.222	0.903	0.372
M02-Staff move resident's wheelchair without asking or discussing	0.222	0.289	-0.903	0.372
M03-Staff answer questions or fulfill requests	0.911	0.844	0.903	0.372
M04-Staff talk over resident's head(s)	0.222	0.222	0.000	1.000
M05-Staff discuss resident's private business in public	0.068	0.091	-0.443	0.660
M06-Staff impose restriction	0.045	0.205	<b>-2.464</b>	<b>0.018</b>
M07-Staff speak roughly or threatening	0.023	0.000	1.000	0.323
M08-Resident heard laughing	0.727	0.591	1.431	0.160
M09-Resident not talking at meals	0.622	0.511	1.093	0.280
M10-Resident fed messily	0.022	0.000	1.000	0.323
M11-Staff feeding more than one resident at a time	0.182	0.114	1.354	0.183
M12-Tablecloths or placemats	0.578	0.578	#	
M13-Centerpiece on each table	0.511	0.556	-1.431	0.160
M14-Pleasant odors	0.578	0.756	-1.835	0.073
M15-Noxious noise levels	0.111	0.333	<b>-2.664</b>	<b>0.011</b>
M16-Unpleasant odors	0.000	0.022	-1.000	0.323

\*Bold values are statistically significant.

# Either surveyor or researcher did not observe so Kappa could not be calculated.

The walk-through observation mean values are contrasted in Table 11.22. Only one of the 18 items (#11 residents disengaged at nursing station) showed significant difference between researchers and surveyor observers. In this case, too, surveyors were more likely to see resident disengaged at nursing station.

Table 11.22. Mean Values of Walk-through Observations for Surveyors and Researchers

Item	Researchers	Surveyor	t	Sig
W01-negative resident expression	0.125	0.208	-0.811	0.426
W02-resident in distress	0.292	0.250	0.569	0.575
W03-staff move resident's wheelchair without asking or discussing	0.250	0.167	1.446	0.162
W04-staff answer questions or fulfill requests	0.417	0.333	0.811	0.426
W05-staff talk over resident's head/s	0.083	0.208	-1.366	0.185
W06-resident's body uncovered	0.292	0.333	-0.440	0.664
W07-staff discuss resident's private business in public	0.083	0.083	#	#
W08-staff impose restriction	0.125	0.125	0.000	1.000
W09-staff speak roughly or threatening	0.042	0.042	0.000	1.000
W10-resident heard laughing	0.375	0.417	-0.327	0.747
W11-resident disengaged at nursing station	0.292	0.667	<b>-3.715</b>	<b>0.001</b>
W12-resident is in solo activity	0.875	0.875	0.000	1.000
W13-spontaneous activity	0.417	0.375	0.371	0.714
W14-organized activity	0.375	0.458	-1.000	0.328
W15-disengaged during organized activity	0.167	0.208	-0.569	0.575
W16-noxious noise levels	0.167	0.333	-1.696	0.103
W17-unpleasant odors	0.292	0.500	-1.735	0.096
W18-clutter in hallways	0.625	0.708	-1.446	0.162

Bold values are statistically significant.

# Either researcher or surveyor did not observe the item so Kappa could not be computed.

The correlations between surveyors and research staff on the meal observations are shown in Table 11.23. Of the 16 possible kappas calculated, 6 were significant. No kappa could be calculated for item #7 and #16 because the two behaviors (staff speaks roughly or threatening and unpleasant odors) were never observed during meals and walk-through observations by UM and surveyor observers. For the meal observation, 2 of the statistically significant kappas indicate excellent agreement, 2 indicate good agreement, and 2 indicate marginal agreement.

The correlations for the walkthrough observations are shown in Table 11.24; 11 of 18 kappas calculated were significant. If one used the general rule that kappas greater than 0.75 indicate excellent agreement, kappas ranging from 0.4 to 0.75 indicate good agreement, and kappas ranging from 0 to 0.4 indicate marginal agreement (Landis and Koch, 1977), For the walk-through observation, 3 statistically significant kappas showed excellent agreement, 5 showed good agreement and 2 showed marginal agreement.

Table 11.23. Correlations between Researchers and Surveyors on Meal Observations

Items	Kappa
M01-Negative resident expression	<b>0.361*</b>
M02-Staff move resident's wheelchair without asking or discussing	<b>0.361*</b>
M03-Staff answer questions or fulfill requests	-0.128
M04-Staff talk over resident's head/s	<b>0.614***</b>
M05-Staff discuss resident's private business in public	0.225
M06-Staff impose restriction	0.116
M07-Staff speak roughly or threatening	#
M08-Resident heard laughing	0.108
M09-Resident not talking at meals	0.062
M10-Resident fed messily	#
M11-Staff feeding more than one resident at a time	<b>0.553***</b>
M12-Tablecloths or placemats	<b>1***</b>
M13-Centerpiece on each table	<b>0.911***</b>
M14-Pleasant odors	0.034
M15-Noxious noise levels	0.040
M16-Unpleasant odors	#

Bold values are statistically significant. \* means  $p < .5$ ; \*\* means  $p < .01$ ; \*\*\* means  $p < .001$ .

# Either researcher or surveyor did not observe the item so Kappa could not be computed.

Table 24. Correlations between Researchers and Surveyors on Walkthrough Observations

Item	Kappa
w01-negative resident expression	0.111
w02-resident in distress	<b>0.684***</b>
w03-staff move resident's wheelchair without asking or discussing	<b>0.75***</b>
w04-staff answer questions or fulfill requests	<b>0.471*</b>
w05-staff talk over resident's head/s	0.189
w06-resident's body uncovered	<b>0.516*</b>
w07-staff discuss resident's private business in public	<b>1.000***</b>
w08-staff impose restriction	0.238
w09-staff speak roughly or threatening	-0.043
w10-resident heard laughing	<b>0.217**</b>
w11-resident disengaged at nursing station	<b>0.341*</b>
w12-resident is in solo activity	<b>0.619**</b>
w13-spontaneous activity	0.391
w14-organized activity	<b>0.660**</b>
w15-disengaged during organized activity	<b>0.591**</b>
w16-noxious noise levels	0.357
w17-unpleasant odors	0.250
w18-clutter in hallways	<b>0.814***</b>

Bold values are statistically significant. \* means  $p < .5$ ; \*\* means  $p < .01$ ; \*\*\* means  $p < .001$ .

## Qualitative Results

We sought feedback from staff that participated in the transferability study. The principal investigator and one other researcher (for note taking) went to each of the 8 participating facilities to meet with the four participants as a group. The attendance ranged from the full 4 people to 2 people: sometimes, but not always the non-attendance was attributed to an emergency. When possible, we telephoned those who did not participate in the feedback sessions. Of a possible 32 research participants, 24 took part in the formal feedback meetings. Non-attendance was evenly divided between nurses and psychosocial personnel. During those meetings, we made an effort to create a permissive climate where participants felt free to criticize the process. (See Volume 2, Appendix W for the focus group guide.)

The feedback was decidedly mixed on every parameter.

Training. Some respondents found the training interesting and helpful, but many found it boring and unnecessary. Some found the manual interesting, but half the respondents acknowledged they “skimmed it” rather than reading it carefully. Some found the audio taped interview helpful, but again many did not listen to it. Some had no tape deck in their cars or homes. Some found they had no time, or assumed it would not be necessary. As we indicated earlier in the chapter, attendance at the in-person training was poor, and many arrived without any understanding of what they had supposedly agreed to do after the training. Some thought they were simply having an in-service on interviewing.

Reactions to doing interview. Some participants found the process interesting and illuminating. These were individuals who tended to say they had learned something new from speaking to one or more of the residents assigned to them. Several respondents volunteered that they found it poignant that “even though we try so hard,” people still respond “rarely” to a

question about the staff having a friendly conversation. They thought it was useful to hear such feedback because it stimulated trying harder. Some wanted to use the interview tools for training or for their own QI activities.

In contrast, there were others who were extremely negative about the interviews. At one facility several professed that the information was inaccurate. When asked for an example, the respondent said that the resident had said she did not find religious observances meaningful; the staff member said that this resident was a Christian in a Jewish facility, but the answer was not “true” because the facility makes religious experiences available in all denominations. The four participants from a facility tended to argue among themselves; at this point one of the other more positive individuals said, “But maybe it was not meaningful.” One respondent illustrated by describing an interview with a “joker” who likes to complain, but “we know he is just lying.”

We saw no relationship between profession and reaction to the interview. We got positive and negative comments from both nurses and psychosocial personnel. Even among those who enjoyed the process, many were concerned about CMS mandating these procedures and expressed concern the results would be used against them. None of the respondents felt it made a difference in the quality of the interview if they knew the resident quite well.

Reaction to Observations. Again we got mixed reactions. Though many found it interesting to walk through or observe their own facility, some were shocked at what they saw and felt they needed to intervene immediately rather than continue a structured observation. For example, they sometimes instructed a staff member to help a particular resident observed to be in distress, or intervene to change the way residents were being fed. Several commented that they noticed other things beside what they were supposed to be watching for; an example was a dropped piece

of paper or a bookshelf with messy volumes. Some of the participants had roles such as MDS coordinator and were alert to things they thought would negatively reflect an inspection survey.

Logistics. The participants had widely varying duties in the nursing home. Charge nurses seldom felt they had enough time for the process, and the several MDS coordinators who participated tended to be less enthusiastic. The most enthusiastic nurses were staff developers or part-time nurses; one of the former was very excited about the protocols. Some social work directors and activities personnel were enthusiastic, and others felt they did not have time and that fitting in their 6 interviews was burdensome.

## **Conclusions**

In general, the transferability studies suggest that the techniques involved in interviewing residents and making general observations can be taught to both nursing home staff and surveyors. The generally high levels of agreement on the interviews reflect both inter-rater and test/retest reliability.

It is somewhat surprising that the extent of training for the nursing home staff did not produce a greater effect on their performance. Part of this failure can be explained by the number of nursing home staff who were assigned to the active training group but missed large portions of the training because of other demands on their time. Another explanation may be that staff members were not motivated to take the training seriously for what was viewed as simply a test. If collecting this information became part of their regular duties, they may be motivated to take greater advantage of the training.

Limitations on the study include the relatively small sample, and the fact that it was a test situation. We cannot be sure that interviewers would be as accurate in a situation where the data were being used for a specific purpose such as regulatory or training purposes.



## **Chapter 12**

### **Physical Environments and Their Relationship to Quality of Life**

The second major component of the Task Order examined physical environments as they relate to Quality of Life (QOL). The bulk of the environmental work was based on data collection in the 40 facilities for Wave 1. This chapter reports on how each of the 1988 resident's physical environments were assessed at the room, nursing unit, and facility level, describes the nature of these physical environments, and provides some data on the relationship between QOL and environment and on how being in a private room affected QOL. The environment work included detailed case studies of exemplary environments, which have been sent separately to CMS.

#### **Background**

Environmental conditions have long been known to affect human growth and development and, ultimately, functioning and QOL (Lawton, 1983; Lawton, Brody, & Turner-Massey, 1978). Many physically or cognitively impaired people have limited ability to manipulate or escape their immediate physical surroundings, and, therefore, the environment of the nursing home, or perhaps the even smaller environment of the nursing unit or their own rooms, becomes their world (Rowles, 1978).

Although criticism of nursing homes as places to live is ubiquitous, little detailed information is available to describe the physical environments in nursing homes today. Even scarcer are data describing the way the environment affects outcomes of interest, including functional status and QOL for residents with various characteristics. Indeed, without the tools to measure physical environments systematically, such outcome data cannot be generated.

The first section of this chapter describes how physical environments were conceptualized for this study, how they were assessed at three levels (facility, nursing unit, and resident's room and bathroom), the development of composite measures derived from the assessment instruments to measure various attributes of the physical environment, and early descriptive results on variation within and across facilities. Physical environments were to be the independent variable and QOL the dependent variable for the resulting analyses. Quantitative and qualitative data include assessments of 1988 room and bath environments, located on 131 nursing units in 40 nursing homes.

The second section provides a brief overview of the ongoing work of developing a typology of nursing home environments using hierarchical cluster analysis, and will provide preliminary data on the relationship between private rooms and QOL.

### Theoretical Framework

Nursing homes are, most obviously, places where people live. They are also places where people work and visit. Each user has different priorities for the physical environment. Although residents are the full time users, traditionally nursing homes have been designed in typical hospital layouts of multiple-bed rooms located on long double loaded corridors where the priority is more on supporting the efficiency of nursing services than creating a home for the residents.

The physical environment has the potential to contribute to the QOL of residents by capitalizing on resident strengths while reducing demands, or conversely, environments could create obstacles to residents achieving a higher QOL. As the aging process continues, the gap between the demands of the environment and the older person's competence widens to the point where an environment that once was supportive of limitations is no longer supportive. The

ecological model developed by Lawton and Nahemow (Lawton & Nahemow, 1973) suggests behaviors are a function of the interaction of personal factors with the physical environment. In the spirit of this model, Becker and Steele state that the size, shape, layout, quality, furnishings and equipment in the physical environment “shape our lives, at the same time as our behaviors and values shape the nature of that designed environment, how it is used, and the meaning we attach to it (Becker & Steele, 1995).” Highly competent people can function in environments that are less supportive of their human limitations, whereas less competent people will have more difficulty overcoming environmental challenges.

Conversely, environments can place too little demand on residents, as in some nursing homes where sensory deprivation and lack of control results in boredom, anxiety, and depression. This is compatible with the observation that learned helplessness results from no longer perceiving one is able to make decisions or exercise discretionary behavior affecting one’s life (Langer & Rodin, 1976; Seligman, 1976). The environmental docility hypothesis, an outcome of the ecological theory, suggests that the lower the level of competence, the greater the influence of the environment on behavior, although at some point of illness and disability (for example, a vegetative state), the physical environment is unlikely to influence behavior. While studying a dementia special care unit, researchers found that residents with higher cognitive functioning benefited more from an enhanced physical environment than residents in the later stages of dementia (Cohen-Mansfield & Werner, 1998). On the other hand, the environmental docility hypothesis would suggest that people challenged by dementia as well as those challenged by physical conditions such as shortness of breath or extreme mobility difficulties would particularly benefit by a well-designed physical environment. After a review of seventy-one studies on therapeutic design of environments for people with

dementia(Day, Carreon, & Stump, 2000), the authors suggest that the study of environments in long-term care has been too focused on the goal of identifying the relationship between the physical environment and troublesome behavior rather than studying the potential of environmental design to improve general QOL.

Over a lifetime, individuals develop habits or routines in their use of space that provide a sense of “being in place”(Rowles, 1998). As people age, their reduced physical functioning requires changes and often downsizing of the environment to allow continued functioning in a routine or habitual way and continued control over “place,” albeit on a smaller scale (Rowles, 1983). Community-dwelling elders make such transitions when they limit the space that they use in their homes, or when they relocate from large homes to small apartments. In the context of the nursing home, the goal still remains for the nursing home resident to achieve a sense of his or her own place in that facility through establishing an environment adapted for his or her routines; it is obviously more challenging to manage one’s new space in a way that affords continuity when the space is located in a nursing home rather than a private home.

Attention to the physical environments of nursing homes has largely been expressed by concerns about safety, resulting in regulations mandating minimal expected environmental features on matters such as railings, corridor width, fire retardant materials, and the like. Here too there has been discordance between such environmental requirements and the needs of the users. The weakness of many codes and standards, even as guarantors of safety, is that they are seldom research based, nor do they consider multiple goals. They tend to take into account specific disabilities like cognitive impairment, vision problems and mobility problems without considering the interaction effect of a multitude of frailties common to the elderly person. For example, a code can pursue a single goal such as safety in the rare event of fire by requiring

heavy fire doors that are difficult at best for an elderly resident to maneuver, but the code does not require an automatic door opener, which would enhance functioning all the time.

Thus, we undertook this study with the assumptions that physical environments are critical in enhancing or impeding well-being, and that these physical environments must both nurture the individual's capacity for independence, autonomy, and physical functioning, and also, given that these environments aspire to be the homes of those who dwell there, afford a sense of security, enjoyment, interest, and fulfillment. We recognized the diversity of nursing-home residents and the differing requirements residents might have for their environments. Also given that some residents are extremely limited to their near environments, we required a tool to look at the most immediate physical environment as well as the larger physical environment in which it is nested.

#### Environmental Measurement in Nursing Homes

Systematic, objective, and reliable ways to characterize physical environments are needed so that they can be studied in relationship to resident outcomes. Instruments available to date have often depended on subjective, global judgments rather than data that are objective, evaluative, and discrete (Cutler, 2000). They tend, for example, to record ratings at the unit level (e.g., items such as "some rooms on the unit are personalized"), which, in turn, makes it impossible to link that observation to any given individual on the unit (who may or may not have a personalized room). Also the measures tend to depend on judgments, rendering them inherently prone to poor reliability, especially when used by persons without specific professional background in design or extensive training on the use of the particular tool.

The most comprehensive environmental evaluation instrument for use in nursing homes is really a battery of instruments; the Multiphasic Environmental Assessment Procedure (MEAP (Moos & Lemke, 1996). This 5-part protocol is designed to evaluate the physical and social

environments in residential settings; though not originally designed to be used with frail older people, it is salient for them. Most other environmental rating tools available to assess nursing homes were designed specifically to study dementia special care units (SCUs). Generally, they attempt to document presence or absence in the environment of characteristics that have been conceptually linked to a good QOL for people with dementia. As defined by Calkins & Chafetz, the major principles for crafting environments on dementia special care units are: regulated stimulation; maximizing awareness and orientation; supporting personal continuity with past; providing secure freedom, and enhancing positive social interaction (Calkins & Chafetz, 1996).

Several scales have been developed to examine the extent to which SCU environments incorporate features thought to be desirable. The Therapeutic Environment Screening Scale (TESS) (Sloane & Mathew, 1990), in its revised TESS+ form (Sloan, Mitchell, Long, & Lynn, 1995) was used in the cooperative evaluation of dementia SCUs sponsored by the National Institute on Aging in the 1990s. This observation scale assesses 8 environmental domains: general design features; maintenance; inventory of spatial amenities and seating capacity; lighting; noise; amenities; programming; and global environment. Similarly, the Professional Environmental Assessment Protocol (PEAP) is an 8-dimension instrument specific to dementia SCUs; it differentiates three levels of the physical setting (fixed or structural features, semi-fixed features and non-fixed features) as they related to the social, organizational, and policy environment. Recent work in 43 SCUs shows that the PEAP actually seems to be a single-dimension scale, which correlates highly with the TESS (Lawton et al., 2000). Although they do not assess the physical environment precisely, both these observational tools go well beyond physical environments to assess the programs and practices that are observed within the environments, and they both require some additional knowledge of policies beyond what is

acquired from the tool.

Also, the Environment Behavior Model for SCU's (E-B Model) assesses 8 environment-behavior concepts (exit control, wandering paths, individual away places, common space, outdoor freedom, residential scale, autonomy support, and sensory comprehensibility (Zeisel, Hyde, & Levkoff, 1994). The tool has the advantage of being conceptually grounded, but its use requires extensive training and ultimately rater judgments. For example, exit controls are rated for their immediacy and their unobtrusiveness, common space for quantity and variability, and wandering paths for their continuousness and their way-finding properties. Finally, the Nursing Unit Rating Scale (NURS) is a step further away from direct observation, since it gathers information about how the environment is used to create a milieu for persons with dementia through interviewing nursing staff. The NURS results in measures for 6 domains: separation, stimulation, stability, complexity, control/tolerance, and continuity (Grant, 1996). In sum, the tools in the literature for assessing nursing homes tend to focus on the nursing unit, emphasize dementia SCUs (though most nursing home residents who have dementia live outside dementia SCUs), depend heavily on ratings, and mix assessment of the environment itself and assessment of behavior observed in that environment.

Measures are needed that allow examination of the environment that any resident experiences with or without dementia on any unit in the facility. We set out to develop tools that would allow us to assess the environment of any resident, beginning with his or her own dedicated space (a bedroom or portion of one and perhaps a portion of a bathroom), the space he or she shares with others on the nursing unit, and the space he or she shares with all residents in the facility. In this study, the term environment was defined as referring to the fixed, semi-fixed, and unfixed components of the physical structure, and the furnishings, fixtures, decor, and

equipment in the building. Although we appreciate that the staff and other residents also constitute part of the overall environment that influences any particular resident, we strove to separate out the physical environment to make it possible to study how different physical environments affect programming, policy, and staff behavior, on the one hand, and resident outcomes, on the other.

## **Development of Environmental Checklists**

### Instrument Development

Through review of literature and discussion with experts, we generated a pool of items that were conceptually associated with resident QOL. We did this separately for the “private” space of the resident’s room and any bathroom or partial bathroom that the resident used as their primary toilet room; for the nursing unit, which typically contains a nurse’s station, one or more shower or tub rooms, one or more sitting or dining spaces, and corridors; and for the overall nursing home facility. Regarding the latter, we excluded “backstage” spaces such as the commercial laundry and kitchen, the staff offices, mechanical rooms and the like, since our emphasis was on the living environment experienced by the residents. The environmental items thus generated were often hypothesized to be related to more than one QOL domain. All items were observable and clearly defined; most were visual observations though we included some observations made through hearing and smell. Almost no equipment was needed, though a tape measure was used to measure the size of closets and resident’s personal space, to check heights of switches or flat surfaces if in doubt as to whether they fell in desirable ranges, and to measure walking distances from the resident’s unit to other indoor and outdoor spaces. We also developed a lighting protocol, for which a light meter was used to take specific readings of lighting levels. We excluded from our tool any environmental measures related to the minimum



regulatory requirements for nursing homes.

The room and bathroom tool developed through this procedure consists of 114 items, all of which were assessed for each of the 1988 residents in our sample. (For Room and Bath Environmental Checklist, see Volume 2, Appendix G). For example, the results for items such as having a window view, having a bedside chair, the length of the walk to the bathroom or closet, or whether the resident crossed someone else's space to get to the bathroom could differ for residents occupying the same room. Almost all the items required a yes or no answer; some required choosing from a simple multiple-choice option, providing a measurement, or a count (e.g. number of other residents using the toilet room). We used the "fist test" to assess light switches and drawer pulls; that is, if the assessor could operate those controls with a closed fist, they passed the fist test and were more likely to be able to be controlled by a resident.

The nursing unit tool, which included 229 items, tapped the environments shared by all residents on the unit. (For Unit Environmental Checklist, see Volume 2, Appendix H.) The tool took into account the nursing station, corridors, common tub/shower room, lounge and dining spaces, access to outdoors spaces, noise on the unit, and distances from the unit to the facility entrance, to the main dining room, to lounges and to the shower/tub room. Again the items are largely dichotomous—e.g., a feature or characteristic was present or absent, though a few of the items required a tape measure, or a count (e.g. number of lounges, number of shower/tub rooms). The protocol for assessing any sitting or dining areas on the unit were repeated for all such areas. Thus, we had available a simple measure of whether there were dedicated spaces for dining or recreation or a combination of both on the unit, as well as detailed information about the features of decoration and furnishings in each space.

The 243-item facility-level measure included all other indoor and outdoor spaces

potentially used by residents, family members, volunteers and visitors. (For Facility Environmental Checklist, see Volume 2, Appendix I.) This included detail about the grounds, the neighborhood, and the parking. Again, if more than one lounge or dining room was available, each was assessed separately. Special note was made of innovative or exemplary spaces, for example restaurants or “main streets” that served as community wide gathering places, contemplation rooms, and nursing units organized and designed as small households.

A separate lighting protocol was done at the same time as the unit and facility assessments to measure the amount of light in foot candles. This entailed light meter readings in a sample resident room and bathroom on each of the 131 units as well as 4 readings at each of the following unit locations; nurse’s station, shower/tub room, main activity space, dining area and corridors. In addition, facility level measurements were completed in corridors, reception/entrance area, activity lounge and dining areas where present. Detailed instructions were used for the protocol to control the circumstances of each measure. The protocols included features that were commonly expected to be present in nursing homes, less common features (fireplaces, thermostats to regulate temperature in resident rooms), and features we thought would be uncommon (e.g. bathrooms in public spaces that were accessible for residents, toilet rooms that lock from the inside, double beds, or computers in residents’ rooms).

### Data Collection

The three environmental checklists were completed for the room and bath, the unit, and the facility, respectively. The room and bath data were collected by the 40 research interviewers who also interviewed residents and staff members, and performed a variety of observational protocols during their approximately 3 weeks in each facility. Typically, the room and bath protocol was done immediately after the resident interview was completed. The research

interviewers for each state were trained to almost perfect inter-rater reliability before they went into the field. This was accomplished in phases, including: classroom training with extensive use of slides, photographs, and room diagrams that identified items in the assessment tool, and practical experience in nursing homes. In the final phase of training, the interviewers did a room and bath observation with the trainer present and independently completing the form. A condition of training was to achieve a .9 reliability with the trainer as the gold standard before going into the field. Once the interviewers were in the field, they were able to telephone the lead environmental investigator to resolve any difficulties that might arise in atypical rooms. As rulings were made in specific cases, these rules were communicated to the other interviewers.

A formal inter-observer reliability test was conducted for the assessments in 60 rooms in 30 different nursing homes (not shown). This was performed by having a second observer visit the room and bath at the same time as the assigned observer or on the same day to complete a second protocol. Kappa statistics were used to measure agreement between measurements obtained by different observers for most items (excluding dimensions). The kappas were calculated separately for single and shared rooms, since the assessments are somewhat more challenging in the latter. Of the 101 single room items tested by 24 pairs of raters, 97 items (96%) yielded significant kappas. Of the significant kappas, only 1 item was in the poor range ( $<0.4$ ); 10 items (10%) were in the range of 0.4-0.6, 29 items (30%) were in the range of 0.6-0.8, 57 items (58%) were above .8, and for 41 items (42% of the total) we achieved 100% agreement for all pairs of raters. Test results for shared rooms were slightly lower than for single rooms. Of the 110 shared room items tested with 36 pairs of raters 96 items (87%) yielded significant kappas. Of the significant kappas, 4 items (4%) fell below .4, 19 items (20%) were in the range of 0.4-0.6, 27 items (28%) were in the range of 0.6-0.8, 47 (48%) were above 0.8, and of these we achieved

100% agreement among all raters on 31 items (32% of the total) items. The few items with insignificant kappas or kappas in the poor range were flagged for deletion or revision and clarification.

The lead environmental investigator (Lois Cutler) visited all 40 facilities and completed the unit and facility level observational checklists. During that visit, she also conducted a more qualitative appraisal to identify any innovative designs that might be worthy of a more detailed evaluation study. After each visit, detailed field notes about each facility were completed to serve as a basis for identifying exemplary features.

### Analysis

To reduce the data for analytic purposes, the environmental team grouped items to develop composite measures of relevant environmental constructs using the data in the 3 assessment tools. Prior to the development of these composites, an environmental team (Cutler, Lawton, Kane, and Grant) developed a rational scheme for coding individual environment features as they relate to QOL domains. Each rater assigned each item from the assessment tools to a primary QOL domain and secondary ones, when applicable. Initial concurrence was high, and discrepancies were resolved in team discussion. After this initial step, the team combined items to develop composite measures of relevant environmental constructs. For example, items that were judged to be related to functional competence were incorporated into the composite measures of function-enhancing features at each of the 3 levels, and clutter items were incorporated into a measure of clutter at the unit level. Items related to autonomy were incorporated into the composite measure of features potentially controlled by residents, and items that we thought were related to meaningful activity, enjoyment, comfort, and relationships were incorporated into measures of “life-enriching features” at all three levels. Of the QOL

domains we studied, privacy has the clearest environmental analogue. We employed some simple measures of privacy (e.g. having a single room, number of people sharing a room, number of people sharing a bath) but also developed composite measures, including a measure of visual separation in the resident's room. In some instances, we could not relate the scales so readily to a single domain. Similarly, the distance measures and the lighting measures might impact functional competence and security most directly, but could also affect meaningful activity, enjoyment, and relationships.

The resultant scales are typically additive, created by assigning a point to each positive manifestation present without any attempt at present to weight the items according to their relative importance. Because they were designed to conceptually reflect the items that belong to a construct (e.g. clutter, function-enhancing features, life enriching features, personalization), their validity did not rest on Chronbach alpha correlation, which show how the items cluster together in a facility. We determined alpha reliability of the measures, however, because only scales with acceptable alpha reliability are likely to show relationships to QOL outcomes. For some later analytic purposes, therefore, we will need to drop items from the scales. For this presentation, items are retained to clarify which features were rare in our nursing home sample.

Using single items and scales, we then examined the extent of environmental variation within and across facilities. We also examined the narrative case study reports to characterize exemplary features and differing forms of privacy.

### **Descriptive Findings**

The 40 facilities housed from 49 to 274 residents, and the 131 nursing units in the study housed from 10 to 70 residents; 21 of these nursing units were classified by the facility as a dementia special care unit. Eighteen facilities were 1 story; 7 facilities had 2 stories, 7 had 3

storeys, another 7 had 4 stories, and 1 was 6 stories high. The number of residents in these facilities ranged from 49 to 274 with a mean of 125 residents. Total units in facilities ranged from 1 to 5 units. Consistent with our over-sample for private rooms, 580 (29%) of the residents lived in a private room: 1155 (58%) residents shared a 2-bed room, 177 (9%) a 3- bed room and 76 (4%) residents a 4-bed room. The prevalence of residents in rooms with 3 or more beds varied widely by state. In California, 35% of the sample lived in rooms with 3 or more beds, compared to 10% for Florida, 8% for New Jersey, 7% for New York and 5% for Minnesota. The square footage of space per resident in resident rooms ranged from 411 square feet per person to 75 square feet per person.

Privacy and ease of access to bathrooms is a prime consideration for residents and for staff in their care-giving duties. The number of residents with whom a resident shared a toilet room ranged from a high of 20 residents to a low of 0 for the 501 residents who had a private bathroom. All told 26% had a private bathroom (fewer than the 29% with private bedrooms), 42% shared a bathroom with 1 other person, 5% shared with 3 residents, 18% shared 4 other residents, and 11% shared with 5 to 20 other residents. The distance that residents needed to travel to use their primary toilet room ranged from 2 to 82 feet. Access to a bathroom for 250 residents required that they travel outside their immediate room to a shared bathroom down the corridor. A tub or shower was located in 498 of the resident's toilet rooms, including in those of 235 who shared toilet rooms. We have no data on whether these showers or tubs were in good working order or whether they were utilized. Many were located in bathrooms too small to accommodate both a wheelchair and an aide, and many shower stalls had a high shower lip. Several facilities were initially built as housing for a younger population and then renovated into nursing homes. These facilities did not have the level of function enhancing features commonly

found in buildings that were designed as nursing homes.

Lounge space on units varied from 20 units that lacked even a single lounge located directly on the unit to 7 units that had 4 separate lounges on the unit. One facility with 3 units and all private rooms also had 4 lounges per unit. This lounge space was infrequently used by residents as they tended to stay in their own private rooms. At the other extreme, a 152 bed facility with the majority of 3 plus person rooms (including 6 person rooms) and no private rooms also had limited shared space.

The residents on 33 units must travel to a different unit or central location for dining, whereas 83 units contained at least a single dining room and 1 unit had a total of 6 dining options. When a unit had multiple dining spaces, occasionally residents were assigned to a single option, but often they could alternate among dining rooms and seating arrangements. In a few instances, residents could choose to sit in a different dining room for each meal and the food was delivered to the resident wherever they chose to dine. At the other extreme, capacity in the dining room of one facility could only accommodate 66% of the residents so residents were required to eat from trays in their rooms. In another facility, a recently designated SCU unit lacked dining capacity so tables were placed in the corridor during meal time to accommodate diners. One of the obstacles to residents eating at times other than scheduled dining times is the lack of refrigeration and food warming capabilities directly on the unit. One or more full kitchens were located on 31 of the units, typically those that embraced cluster concepts of care. One innovative facility was organized into households with 8-10 residents. For administrative purposes, 4-6 households comprised a nursing unit, and each household had a full kitchen with refrigerator, stove, oven, dishwasher, and microwave.

Bathing is a common function that is often a source of agitation for both residents and staff

(Hoeffler, Rader, McKenzie, & Stewart, 1997; Rader, 1996). Many reasons can cause this agitation including: inadequate ventilation, low light levels, improperly used as storage areas, and possibly, it does not receive attention because it is not routinely viewed by visitors. One hundred and seventy-six tub/shower rooms were deemed functional but many were neglected in maintenance and lacked decorations. Ten units lacked a shower/tub room directly on their unit necessitating residents to travel longer distances to a shower/tub room. The distance from the farthest resident room to the shower/tub room he/she used ranged from 20 feet to 270 feet. Heat lamps were observed in only 13 percent of the rooms and not a single towel warmer was noted.

### **Composite Indices**

The data set yielded from the procedure described above contains an enormous number of individual elements. Although some discrete elements (such as being in a private room) are useful as independent variables hypothetically related to QOL, it was necessary to determine ways to combine the data into a manageable number of variables. In our first effort to accomplish this task, we developed 20 composite indices: 8 scales at the room/bathroom level included personalization, function-enhancing features, life-enriching features, environmental control, storage, maintenance, visual separation among roommates, and a hierarchical scale for privacy; 7 scales at the unit level included clutter in corridors, noxious noise, function-enhancing features, life-enriching features, unpleasant odors, pleasant odors, and maintenance; and 5 scales at the facility level included function-enhancing features, life-enriching features, outdoor space and equipment, facility-wide amenities and maintenance. In addition we developed indices for adequacy of lighting at all three levels. We also worked on summary measures of the dining and bathing experiences, respectively, but at this point are not satisfied that we have tapped agreed-upon normative features related to the wide range of dining and bathing arrangements, which



encompass all 3 levels of organization—room and bath, unit, and facility. Table 12.1 describes each index.

Table 12. 1. Composite Index Characteristics at 3 Levels

Scale (theoretical score)	# Items	Median	Mean	Standard Deviation
<b><i>Room and bath (n = 1988)</i></b>				
Visual separation	5	3	2.72	1.86
Personalization	7	2	2.27	1.55
Room function enhancing features	4	2	2.23	0.79
Bathroom function enhancing features	8	4	4.06	1.42
Life enriching features	15	5	4.82	2.15
Environmental controls	13	6	5.70	2.03
Storage	7	4	3.99	1.11
Maintenance	3	3	2.71	0.58
<b><i>Unit (n = 131)</i></b>				
Function enhancing features	7	4	3.47	1.20
Life enriching features	16	10	8.82	4.46
Clutter	10	3	3.54	2.53
Outdoor features	10	0	3.33	4.15
Bathing environment	13	8	7.22	3.47
Dining environment	9	4	3.40	2.44
Maintenance	6	6	5.3	1.19
<b><i>Facility (n = 40)</i></b>				
Function enhancing features	13	8	8.35	2.27
Life enriching features	15	7	7.68	2.72
Facility amenities and services	10	3	3.40	2.20
Outdoor amenities	10	9	8.20	1.87
Maintenance	5	5	4.83	0.45

Tables 12.2, 12.3, and 12.4 present descriptive data at the room, unit, and facility levels respectively for almost all the environmental elements collected, including those used for the composite measures.

Table 12.2. Composite Indices and Frequency of Index Items at the Room Level

Item	%	Item	%
<b><i>Personalization index</i></b>		<b><i>Bathroom function index</i></b>	
Personal photos	84.9	Grab bars next to toilet	86.8
Door personalization	38.6	Min 3' adjacent to toilet	82.8
Resident's own chair(s)	29.7	Sink has wheelchair clearance	82.4
Individual bedspread	28.6	Toilet seat 17" + from floor	62.3
Resident's own lamp(s)	18.4	Bathroom door lever style	37.5
Resident's own bureau	18.4	Sink has lever hardware	31.5
Individual drapes/curtains	8.0	Grab bars extend 4" in front of toilet	12.7
<b><i>Life enriching feature index</i></b>		Tilted wall mirror	10.0
Outdoor view from bed	91.6	<b><i>Environmental controls</i></b>	
Chair(s) in sleep area	77.0	Environmental controls	98.6
Flowers (natural or artificial)	61.3	Adjustable drapes or blinds	96.0
Resident's own TV	59.8	Call button within 18" of pillow	95.7
Hobbies/ interests	43.2	Window can be opened	75.4
Religious items in room	37.6	Bathroom door can be locked	56.7
Living plant in room	32.7	Adjustable heating in room	52.4
Resident radio, CD, tape deck	32.2	Adjustable air conditioning	45.6
Resident's telephone	28.5	Light fixture on rheostat	23.0
Desk or flat work space	12.5	Task light switch 18" from pillow	10.7
Resident bird, fish, pet	2.3	Entry door locks from inside	5.4
Refrigerator in room	1.5	Pressure or rocker type light switch	4.4
Bed larger than single	1.0	Heat lamp in bathroom	3.4
Microwave or hot plate	.7	Pressure/rocker switch in bathroom	3.0
Personal computer	.4	<b><i>Storage</i></b>	
<b><i>Visual separation</i></b>		Private closet	96.8
Closet w/o crossing other's space	71.0	Drawer type storage	93.4
Bathroom w/o crossing other's space	65.4	Night stand by bed	84.0
Entrance w/o crossing other's space	64.3	Counter space around sink	41.3
Foyer or shared entrance separate the sleeping areas	37.9	Locking storage	37.1
Decorative screens or dividers	33.4	Table or shelf by chair	37.1
<b><i>Room function index</i></b>		Enclosed storage in bathroom	9.3
Level change at threshold	91.8	<b><i>Cleanliness/maintenance</i></b>	
Min 4 ft' clearance side of bed	76.2	Floor covering well maintained	94.8
Entry door lever or push style	47.9	Wall covering well maintained	90.3
Closet rods located 3-4' from floor	6.9	Bathroom well maintained	85.7

Table 12.3. Composite Indices and Frequency of Index Items at the Unit Level

Unit Level Items	%	Unit Level Items	%
<b><i>Function enhancing features</i></b>		<b><i>Noxious stimuli</i></b>	
Handrails both sides of corridor	99.2	Auditory alarms	42.0
Handrails contrasting color	71.0	Intercom or paging	32.8
Contrast between walls & floor in corridor	62.6	Screaming by residents	19.8
Dull finish floors	60.3	Musak	16.8
Seating along corridor	48.9	Screaming by staff	9.2
Contrast between walls	3.1	Feces odor	16.0
Automatic door opener	1.5	Other unpleasant odor (beyond listed types)	8.4
<b><i>Life-enriching features</i></b>		Strong cleaning odor	5.3
Telephone for resident use	87.8	Garbage	.8
Movable chairs in lounge	81.7	Musty or moldy smell	.8
Flowers in lounge	78.6	<b><i>Pleasant Odors</i></b>	
Activity equipment (not games)	69.5	Pleasant food odors	19.8
Television in 1 lounge	76.3	Other pleasant odors	15.3
Living plants in 1 or more lounge(s)	64.9	<b><i>Bathing/showering environment</i></b>	
Large print material in 1 or more lounges	50.4	Tub/shower room on unit	92.4
Games visible in one or more lounge	53.4	2 or more tub/shower rooms on unit	38.2
Musical instrument(s)	54.2	Shower threshold < ½	82.4
Orientation boards	48.1	Main tub room door able to be locked	72.5
Arts and crafts	36.6	Sink in shower/tub room	64.1
Animal (dog, cat, bird, not fish)	22.1	Clearance below sink	58.8
Daily newspaper	30.5	Sink with lever hardware	55.7
<b><i>Clutter in corridors</i></b>		Jacuzzi or whirlpool	51.1
Hoyer lifts, commodes, medical equipment	58.0	Toilet in shower/tub room	63.4
Laundry carts	48.1	Toilet in separate enclosure	38.2
Housekeeping carts	48.1	Showers and/or tubs in separate enclosures	38.2
Other clutter (besides listed types)	46.6	Heat lamp in shower room	15.3
Clean linen carts	40.5	Sink mirror for wheelchair users	12.2
Medicine carts	32.1	<b><i>Maintenance</i></b>	
Food tray containers	26.7	Corridor floors well maintained	96.2
Incontinence product disposal	22.1	Corridor walls maintained	95.4
Trash containers	17.6	Shower room walls maintained	86.3
Weight scales	14.5	Lounge walls maintained	81.7
		Lounge floor clean	80.2
		Shower room floors clean	73.3

Table 12.3. Cont'd

<i>Outdoor features</i>		<i>Dining environment</i>	
Outdoor access off unit	44.3	Pictures on wall	72.5
Outdoor seating	39.7	Windows in dining room	69.5
Outdoor table	35.9	Contrast between dishes and table	48.9
Seating covered	33.6	Table cloth or place mats	22.9
Covered patio	33.6	Posted menu	38.2
Outdoor flower garden	33.6	Centerpieces or flowers	26.7
Outdoor area secured	33.6	Kitchen for resident use	23.7
Covered table	32.1	Room used for dining only	11.5
Hard surface walking path	26.0	Menu lettering more than ½ inch	9.9
Raised garden planter	20.6		

Table 12.4. Composite Indices and Frequency of Index Items at the Facility Level

Facility Level Items	%	Facility Level Items	%
<b><i>Function enhancing features</i></b>		<b><i>Life-enriching features</i></b>	
Floors avoid high contrast	97.5	Flowers in lounge	97.5
Handrails on both sides of corridor	77.5	Lounge with moveable chairs	95.0
Handrails contrast with wall	75.0	Lounge with window	95.0
Corridor walls contrast with corridor floors	72.5	Musical instruments	77.5
Corridor floors dull finish	70.0	Games and/or cards	60.0
Contrast between chairs and floor in lounge	85.0	Arts and crafts	50.0
Wayfinding signs present	35.0	Daily newspaper	45.0
Large lettered clock present	80.0	Dog or cats	37.5
Handrails extend around corners	50.0	Computers for resident use	30.0
Lobby toilet that may be used by residents	47.5	Orientation board	42.5
Automatic door opener	47.5	Arts and crafts	50.0
Large print material in lounge	67.0	Jigsaw puzzle in use	30.0
Covered drop-off	30.0	Exercise equipment	5.0
<b><i>Amenities and services</i></b>		Popcorn machine	20.0
Beauty shop/barber shop	97.5	Balls & other large motor skill equipment	32.0
Library, reading room, or book cart	62.5	<b><i>Outdoor amenities</i></b>	
Chapel or meditation room	40.0	Flower garden	97.5
Gift shop that is accessible to residents in w.c.	32.5	Moveable seating	95.0
Coffee shop or snack bar for residents/ family	30.0	Bird feeder or bird bath	92.5
Children's play area	30.0	Outdoor table with chairs	92.5
Cafe/restaurant for light meals	15.0	Hard surface wandering path	87.5
Children's day care on premises	15.0	Recreational activities (e.g. horseshoes)	82.5
Greenhouse/sunroom/solarium	12.5	Covered seating	82.5
<b><i>Maintenance</i></b>		Covered picnic area	82.5
Corridor floors clean	100	Raised garden planters	52.5
Corridor walls maintained	97.5	Secured outdoor area	65.0
Lounge floors clean	97.5		
Lounge walls maintained	97.5		
Facility grounds maintained	90.0		

### Room and Bath Composite Indices

Visual Separation was developed to reflect the level of privacy and territorial control afforded by the physical environment for residents in multiple bed- rooms. Only 5% of the residents in shared rooms experienced all 5 of the visual separation items for a perfect score of 5, whereas 20% scored 0 on that scale.

Bed Separation is a 5 item hierarchical index that identifies the bed arrangement on a range from the optimal private room (29.2%) to the least desirable arrangement of 3 or more beds in a room placed side by side (6%); 46% of the residents were in double rooms with beds placed side by side.

Personalization refers to the extent of personal belongings, furnishings and decorations present in the resident room. Clearly, a higher score on this index is a function of individual and familial resources as well as facility policy; we would expect the latter to be more at play if almost no residents have individualized personal items in their rooms and if the furnishings, decor, and room arrangements do not vary within the facility. Other than individualized photos (present for 85% of the 1988 residents), personalization of space was minimal. Only 18% brought their own bureau and 30% brought one or more chairs. The mean was 2 on a possible score of 7 and 10% scored 0. As expected, multi-bed rooms are less personalized than private or semi-private rooms.

Life-enriching Features identifies 15 items in a resident's room that have the potential to provide the resident with meaningful activity, comfort, relationships and/or enjoyment. Most of the residents (92 %) had a view of the natural environment. At another extreme, only 13% had a horizontal work or desk surface. Flowers, especially artificial ones were relatively common (61%), but living plants were less so (33%). Many (41.2%) of the residents did not have a

television under their control, a high number even considering that some NFs adhered to the philosophy that no televisions should be available for people on dementia units. A surprising 23% did not have even one chair for their own or a visitor's use, and only 29% had their own telephone. Among rarer instances, 3% had a pet (dog, cat, bird or fish), 1.5 % had a refrigerator, 1% had a double bed, 8 residents (.7%) had a personal compute and the same number had a microwave. Thirteen residents lacked a single life enriching item, 30 percent had less than 4 items and 6 residents (0.3%) had 11 of the 15 items.

Function-enhancing features is a 8-item index which measures how well the resident's room and bath supports the needs of frail persons using wheelchairs, walkers, or other devices. The mean score of 3.6 suggests that the rooms in the sample could be more supportive of resident functioning. Lever type hardware, was found on only 47% of the entry doors, 38% of bathroom doors, and 31% of sink faucets. Although the majority of the sample use a wheelchair, only 7% of the closet rods were located 36 to 48 inches from the floor, a height considered wheelchair accessible.

The 17 item Environmental Control index measures the degree to which the physical environment has the potential to be manipulated by the resident (recognizing that some residents will be unable to manipulate any environmental control); fifty-two (52%) had adjustable heat, and 46% had adjustable air conditioning. The call button was located within 18 inches of the bed pillow for 96% of the residents, and the on/off switch for task lighting was located within easy reach for 75%. Regarding lighting controls, 23% had potential to control the intensity of the light with a dimmer switch, 68 residents (3%) had control of a heat lamp in the bathroom, and only 3% of the residents had light wall switches of the pressure or rocker type.

Storage was measured by a 7 item index; the mean for the sample score was 4. Seven

residents had only one type of storage whereas 18 residents had all 7 items. Private closet type storage, drawer type storage and a night stand were common to most rooms. Only 37% percent of the residents had storage space that could be locked. Ample storage space in bathrooms has the potential of increasing staff efficiency by requiring fewer trips to a central storage location. Only 41% had counter space available around the bathroom sink, and only 9% had storage space in the bathroom sufficient to store a supply of incontinence products. Maintenance in resident rooms was measured by a 3 item scale that included upkeep of the floors, upkeep of walls, and cleanliness in the bathroom. Overall, maintenance was found to be good with little variation.

We performed an analysis of variance (ANOVA) to test the difference of means on the room scales between those in single rooms, double rooms, and rooms with 3 or more residents. Table 12.5 shows that in all cases the means are significantly different from each other; those in shared rooms are likely to have lower scores on the composite scales.

Table 12.5. One-Way ANOVA on Composite Scale Mean Differences between Room Types

<b>Scale</b>	<b>Mean in Private Room</b>	<b>Mean 2 Beds</b>	<b>Mean 3+ Beds</b>	<b>Overall F</b>
Personalization - 7	3.17	1.99	1.45	180.60
Life Enrichment - 15 items	6.19	4.51	3.12	261.98
Function Enhancing - 12 items	6.31	5.97	4.67	107.06
Environmental Controls - 17 items	7.70	7.19	5.71	91.95
Storage - 7 items	4.40	3.91	3.38	87.07
Maintenance - 3 items	2.80	2.71	2.47	29.79

All means are significantly different from each other according to Tukey's HSD statistic.

### Unit Composite Indices

Unit level indices were developed from data collected in individual assessments of the 131 units. Function enhancing features largely refers to corridors and items that facilitate ease of movement within and between units. Even though 99% of the units had handrails on both



sides of the corridor, they were often obscured by clutter (as shown in a separate scale). Light levels in the corridors were problematic with only 5% of the unit corridors registering an average level above 75 foot candles, a level even less than the desired minimum of 100 foot candles.

Automatic door openers to exit the unit were found on only 2 units.

Clutter is measured by presence of 10 types of clutter. No clutter was found on 12 units and all 10 types were found on 3 units. Hoyer lifts, commodes, and other medical equipment were the most common type of corridor clutter, found on 58% of the units. Incontinence product disposal containers were identified in 22% of the unit corridors, often resulting in unpleasant odors. Items such as animal cages, leg prostheses, clothes hangers, and even a game of bowling were observed in the corridors.

Noxious noise was measured by 6 different identifiable sounds. A single sound is less problematic, but when the 6 items are combined the level increases dramatically. This scale does not address the sustained high level of noise heard on some units, it simply identifies what sounds were heard during a 2-4 hour span on each unit. It does not address the consistency of the noise or the possible resident and staff response. On some units an ongoing effort was made to keep the noise levels low; on others the sound of auditory alarms was constant. For example, cuckoo clocks and Cockatiel birds announced their presence at regular intervals 24 hours a day, or Musak continued nonstop for everyone to hear. Resident screaming was heard on 20% of the units and staff yelling or screaming on 9%.

Life-enriching features included 16 items that might be potentially enjoyable in lounge or shared spaces that were available to all residents. Large print reading material was found in 40% of the units, a pet lived on 22% of the units, and residents had access to a daily newspaper on 17% of the units.

The Outdoor amenities index included 10 items that have the potential to provide an additional area for residents and family to enjoy. Direct access to outdoor amenities was available on 44% on the units but only 10% of the areas were secure either by fencing or as an enclosed courtyard. Raised garden planters were available on 21% of the units.

We developed separate short indices for pleasant odors and noxious stimuli. The former, such as smells of food or of laundry products, were identified more often than the unpleasant odors. If a washer and dryer were located directly on the unit, that unit was likely to be associated with pleasant smells.

The number of shower/tub rooms on individual units varied from 10 units without any such rooms to 5 units that had 3 such rooms. When multiple shower/tub units were found on the unit, the assessor completed the instrument for the room that staff indicated was most frequently used. (For the most part, shower/tub rooms were similar on a unit.) The distance from the furthest resident room on the unit to the shower/tub room most used ranged from 20 feet to 270 feet. Thirty-one (31%) of the units had poorly maintained shower room floors. On 80% of the units, either there was only one shower or tub in the room or the multiple showers and tubs were in separate enclosures. Toilets were present in 57% of the shower/tub rooms, 37% of them enclosed. Jacuzzi's were found in 44% of the units but heat lamps and sink mirrors were rare.

The number of dining rooms on units ranged from 33 units with 0 dining rooms to 4 units with 3 dining rooms. (Other facilities had central dining rooms, and typically eating occurred at the unit level as well as in the central dining room.) Place mats or tablecloths were used in 40% of the units and in 27% flowers or a centerpiece was placed on the tables. At the unit level, 15% of the dining rooms are devoted strictly to dining with the remainder serving the dual function of lounge and dining space. In one facility the dining/lounge space was reclassified as a day room

and residents spend most of their day in that one room. There was food refrigeration and heating capability in 23% of the unit dining rooms, affording more flexibility in eating times. There was color contrast between dishes and table tops for 49% of the units. Posted menus were located in close proximity to the dining room on 38% of units, but unfortunately the menu lettering was greater than one-half inch for only 13%.

### Facility Composite Indices

With the exception of the beauty/barbershop, the 9 items included in the Facility Amenities scale include amenities that all users (visitors, residents and staff) can use. Almost all (98%) had a beauty/barber shop, most often leased to outside vendors. (Several facilities have de-licensed the shop so volunteers can provide hair care for the residents.) Access to books, either through a library cart or a specified room, was available in 63% of the facilities. One facility located in a large Continuing Care Retirement Community had a full time librarian and 3 libraries, one for large print books, one for regular books, and a separate video and book cassette library. Separate chapels or mediation rooms were found in 40% and 15% of the facilities had a café where light meals could be purchased.

Regarding outdoor amenities, at the facility level over 90 % provided designated outdoor space, 65% of which had a secured outdoor area. (Areas were determined to be secure at unit or facility level if they were enclosed either from the location of an inside courtyard or the area was fenced.) All 10 of the items in the outdoor amenity scale were found in 50% or more of the facilities. Maintenance at the facility level achieved a higher score than the room or unit levels.

We itemized 17 Life-enriching Features and 7 Function-enhancing features at the facility level. Many of these replicate the items examined for unit scales. For example, corridor rails and way-finding devices in facility-wide space were features of the latter. Also, a common

concern expressed by residents and confirmed by data is the lack of a toilet for residents to use when they are away from their rooms. For example, 52% of the facilities did not have lavatories at the front door that were accessible and permitted for resident use.

### Lighting

Lighting in any room is critical to comfort and safety. Most elderly people require 4 to 5 times more light to distinguish a figure from the background than young people with “normal” vision (Liebrock, 1993). One hundred foot candles (100 fc) is the level of illumination recommended by the American National Standards Institute. As shown in Table 12.6 lighting was often inadequate. The lighting in the resident bathrooms was especially problematic. Attempting to use a toilet with 001 foot candle of light replicates a condition of blindness. Measurements at head of bed were taken with drapes drawn measuring all light available to a resident reclining in bed. Measurements in bathroom were taken with the door shut, turning on all available light fixtures.

Table 12.6. Light Levels

Location	Mean	Median	Standard deviation	Minimum	Maximum
Head of bed*	37 fc	35 fc	20.8 fc	4 fc	95 fc
Bathroom at sink*	25 fc	20 fc	15.6 fc	1 fc	75 fc
Bathroom above commode*	13fc	10 fc	9 fc	1 fc	48 fc
Highest tub/shower room	82.8 fc	68 fc	70.8 fc	7 fc	505 fc
Lowest tub/shower room	16.6 fc	14 fc	13.3 fc	2 fc	85 fc
Highest nurse's station	91.6 fc	84 fc	53.2 fc	10 fc	410 fc
Lowest nurse's station	33.4 fc	25 fc	24.5 fc	5 fc	140 fc
Highest unit corridor	108.7 fc	65 fc	283.8 fc	10 fc	3200 fc
Lowest unit corridor	14.5 fc	13 fc	12.5 fc	1 fc	82 fc
Highest unit lounge	292 fc	116 fc	530.3 fc	15 fc	3100 fc
Lowest unit lounge	24.8 fc	17 fc	27.4 fc	2 fc	132 fc

\* Readings taken in one room in unit.

On the units, 3 different light level readings were taken in the shower/tub room, dining room, corridors, nurse's station and lounge. The first reading was taken between the main light fixtures in room or corridor if the area was large and there were several fixtures. If only one fixture was in the area then the reading was taken to the side of the fixture. In both cases the intent was to measure the average amount of light that the users - staff and resident - had available to them as they used the room. The highest level was taken directly under the brightest fixture. The lowest level reading was often in a corner or in the shower room where it tended to be directly under the shower head. Table 12.6 illustrates not only the extent of sub-optimal lighting but also the variation. Although the lowest shower/tub room reading was only 2 foot candles, one shower/tub room had a high of 505 foot candles, an area that was excessively bright. Variation was also considerable in corridor readings, where a particular corridor could be very dark in sections without windows.

Identifying exemplary and innovative environmental features in these 40 facilities was easy; certain features tended to stand out. Although innovative features were clustered in certain

facilities (typically new ones), no facility was a “perfect environment” that was exemplary in all respects. We also found one or more exemplary features worth describing in many facilities with generally conventional or unimpressive physical environments. We found exemplary shared spaces that benefited not only users of the facility but the greater outside community as well. A main street area, complete with a café, ice cream parlor, aviary and gift shop featuring items crafted by residents, welcomed students from the nearby college and elementary school children who regularly visit the residents. A few facilities had fully equipped gymnasiums with state of the art workout equipment that were used by staff and residents. At one facility with an exemplary outdoor and porch area, a resident took great pride in greeting and activating the automatic door for visitors. We noted some unique nurse’s stations, which were configured like hotel concierge desks and another one with long horizontal work space where residents could sit alongside staff.

In the sample, 3 facilities built 30 years ago had the foresight to provide all private rooms for the residents; although one of these facilities had dormitory-style toilets and showers that were shared by large numbers. Also in the sample were 2 facilities with an extraordinary degree of privacy in their double rooms: in both cases, the corridor door opened to a vestibule area that contained a shared toilet room, but a floor to ceiling wall separated the remainder of the room. The two sides had individual temperature controls and each had its own window. There was the potential to decorate each side distinctly since neither was visible to the roommate.

The most noteworthy facility in the sample was organized in households of 8 to 10 residents. Each household contained a residential style kitchen, a great room with living and dining area, a smaller living room for more private gatherings, and a laundry room with a residential style washer and dryer. The computer for the MDS was located on a kitchen counter and the charts

were located on a shelf near the recipe books. The nurse's stations were integrated into the dining area, not separated behind a counter.

### **Developing a Typology of Nursing Home Environments**

The rich data we collected on a plethora of attributes of the physical environment at the room, unit and facility level that might be related to QOL posed an analytic challenge. Since there are potentially more attributes than observations of resident QOL, it is not computationally possible to include indicators of every attribute in the same analysis. Therefore some method of data reduction was required. One traditional approach is to use factor analysis. However, in this situation, the majority of variables were dichotomous and many were highly collinear making this method unworkable. We therefore used cluster analysis to identify a typology of physical environments that captured the different constellations of attributes that were associated with one another. This approach makes maximum use of all of the available data to develop a parsimonious set of clusters that can be used for further analysis.

#### Cluster Analysis

A hierarchical cluster analysis was used to group nursing home facilities and their associated units and rooms into clusters based on the presence or absence of environmental attributes that are hypothesized to be associated with nursing home resident QOL. We first conducted separate cluster analysis at the facility, unit and room levels. The relationship between the resulting cluster solutions revealed that there were associations between room, unit and facility types. We determined that a combined cluster model would result in a more parsimonious set of clusters, further simplifying the analysis. The prevalence of each attribute in each cluster was used to characterize the clusters.

Agglomerative clustering with complete linkage was employed using SPSS Version 11.0.

The complete linkage method was used to yield highly similar and spatially distinct clusters. Initially, nursing home facilities (n=40), units (n=131), and room and bath environments (n=1988) were combined into clusters based on the simple matching similarity measure for binary coded environmental attributes. Because the absence of an attribute may be as important as the presence with respect to nursing home QOL, simple matching was chosen over Jaccard's method to account for and equally weight the joint presence or joint absence of each given variable. The primary limitation of simple matching is potential misclassification of nursing home facilities, units or rooms as similar due to the absence of a characteristic.

Dichotomously coded variables were selected to characterize the clusters representing the presence or absence of various environmental attributes relating to stimuli, amenities and furnishings in the corridors, lounges, dining rooms, baths and personal spaces. Only attributes that were present in 15 to 85% of the facilities, units, or rooms were used in the cluster procedures to avoid attributes that had limited ability to discern different types of nursing home environments.

Facility Variables. At the facility level, 164 attributes associated with the site, entrance, lobby/reception area, lounge area, corridors, services/activities/amenities, outdoors, and noxious stimuli were considered. Using the 15-85% criterion for selection, a subset of 85 variables was selected for the cluster analysis procedure. Facilities could have more than one lounge or social space. The average number was 1.3 (range 0 to 3); 1 facility had none and 31 facilities had two or more. In facilities that had more than one lounge or social space we constructed a set of aggregate variables that captured whether each attribute was present at all at the facility level in any lounge or social space.

Unit Variables. At the unit level, a total of 156 attributes associated with baths, lounges,



corridor, noxious stimuli, and amenities were considered. A total of 89 attributes met the 15-85% criterion for selection and were used in the cluster analysis. Units could have more than one lounge or bathing room. The average number of lounges was 1.6 (range 0 to 4); 20 had no lounge, 62 had 2 or more. The average number of bathing rooms was 1.3 (range 0 to 3); 10 had no bathing room, 50 had two or more. For lounges and bathing rooms we constructed a set of aggregate variables that identified whether each attribute was present at all at the given unit.

Room Variables. At the room level, 93 attributes associated with the nursing home resident's room, its entrance, resting or sleeping space, personal and social space, lighting, furnishings, personalization, decoration, and toilet facility were considered to cluster the residents' rooms. Of those variables considered, 47 attributes were used in the room level cluster analysis.

Determination of the Number of Clusters. We combined data from the facility and unit levels for preliminary cluster analysis. The rationale is that although data were collected separately at the facility and unit levels, many facility attributes are shared across units and several facilities have only one unit. This preliminary analysis led to a 5 facility-unit cluster solution. Separate preliminary analysis was done at the room level, leading to a 6 cluster solution. Examination of the association between the two sets of clusters revealed that a number of the cells were sparsely populated. Not every room type was represented in each facility-unit type, making it impossible to examine the independent effects of each cluster type on QOL. In order to produce a solution that would allow meaningful analysis, we therefore combined variables from all three levels into a single cluster analysis. This led to a parsimonious 6 cluster solution (see Table 12.7) with only one cluster having as few as three facilities.

Table 12.7 shows the number of residents per room in each cluster (approximately 50 rooms were sampled per facility). The smallest is Cluster 1, with only 3 facilities; the largest is Cluster 3 with 11 facilities. Selected descriptive statistics for each cluster are shown on Table 12.8.

Table 12.7. Distribution of Clusters

Cluster	N	%
1	150	7.5
2	250	12.6
3	550	27.7
4	300	15.1
5	488	24.5
6	250	12.6
Total	1988	

Table 12.8. Descriptive Statistics for Clusters

	Cluster Average						Overall Average
	1	2	3	4	5	6	
Residents per Room	1.9	1.4	1.7	2.1	2.3	1.5	1.9
Personal Space in Room per Resident (Square Feet)	141	195	147	126	119	190	148
Total Number of Lounge Areas in Facility	2.7	3.4	2.4	1.8	1.7	3.0	2.4
Total Beds in Facility	148	144	136	101	105	137	125

To aid in interpreting the clusters, we calculated the prevalence of each attribute in each cluster. The overall prevalence of the different attributes varies widely, thus we used z-scores to standardize the prevalence figures. Since the standard deviation is a function of the sample size which varies for facility, unit and room, we used a different criterion for facility, unit and room attributes. Extreme values were defined as 3 SD above or below the mean for facility level attributes, 6 SD above or below the mean for unit level attributes and 9 SD above or below the mean for room level attributes. This is a conservative approach to defining differences that

focuses on strong contrasts. Facility attributes are presented on Table 12.9, unit attributes on Table 12.10, and room attributes on Table 12.11. Clusters that had a high prevalence of a given attribute are marked by a '+' and clusters marked by a low prevalence (greater than 3 SD below the mean) are marked by a '-'.' The following paragraphs describe each Cluster in terms of selected attributes found on Table 12.9- Table 12.11 (Variables not used in the cluster analysis are not included in these tables.)

Table 12.9. Internal Facility Attributes Associated With Cluster Membership

Attribute	Overall Prevalence	Cluster					
		1	2	3	4	5	6
Category: Site							
residential	0.60	—	—				
mixed use	0.40	+	+				
covered drop off	0.30	+					
Category: General							
one story	0.45	—	—			+	
facility level dining available	0.59		—		+	+	
dining alternatives	0.16						+
dining assistance available	0.42	—					
Category: Main Entrance							
automatic door opener	0.48	+	+		—	—	+
vestibule	0.63	+			—	—	+
door unlocked- no staff	0.15						
door unlocked- monitoring	0.65					—	
Category: Lobby/Reception Areas							
receptionist desk	0.78	+				—	+
directory of residents	0.33		+			—	
visitor sign-in/ sign-out	0.37	—		+			
public toilet	0.48			+	—	—	+
wayfinding	0.35	+	+	—			+
public telephone in lobby	0.77	+			—		+
Category: Lounge/ Social Space							
multipurpose room	0.63	+	+	—			
separate activity room	0.42	+					
separate sitting room/ parlor/ living room	0.40	—		+			
other	0.45		—	+	—	—	+
games and/or cards	0.60	+					—
arts and crafts	0.50	+	+				—
large motor skills equipment	0.32	+					—
musical instruments and other equipment	0.77	+					
popcorn machine/ refreshments laid out	0.20	+	+		—		—
jigsaw puzzle	0.30	+					—
kitchenette in lounge area	0.30	+	+		—		
strong color contrast between all chairs and floor	0.85	—			—		
single chair adjacent to table with lamp	0.47		—	+		—	
current daily newspaper for shared use	0.45		—			+	
choice of one, two, or multiple person seating	0.78						+
at least one piece of reading material is in large print	0.67	+					
Television	0.70	+					—
large clock with large lettering	0.80	+	+				—
orientation board that communicates day and date	0.43						
living plants in lounge area	0.85				—		

Table 12.9, page 2 Cont'd

Attribute	Overall Prevalence	Cluster					
		1	2	3	4	5	6
Category: Corridors/ Stairs							
window view in corridor	0.77						
wall finishes differ between corridors	0.20	—	+				—
floor finishes differ between corridors	0.15						
handrails on both sides	0.78		+	—			+
handrails continue around corner	0.50	—					
handrails contrasting color with walls	0.75	+					
seating along corridors	0.65		+		—	—	+
color contrast between walls & floors	0.73		+		—		
Category: Amenities							
wheelchair accessible gift shop	0.33	—	+	—		—	+
coffee or snack bar	0.30	—	+				+
volunteer lounge	0.18		+				+
café for light meals	0.15		+				+
laundry room residents can use	0.15						+
library	0.57	+		—	+		
aviary / birdcage	0.38	+	+			—	
aquarium / fish tank	0.50	+					
dog or cats that live in	0.38	—			+	—	
residents cannot be viewed in beauty shop	0.75		+				
resident access to computer	0.30	—	+			—	+
separate chapel or meditation room	0.40	+	+			—	+
religious artifacts	0.60	+	+	—			+
vigil room	0.18		+				+
intergenerational activities	0.15	+					+
provisions to entertain kids	0.30	+				—	+
electric wheelchairs	0.57						+
Category: Outdoor Access							
covered seating	0.82						
covered outdoor area	0.73	—					+
secured outdoor area	0.65	—	—			+	
raised garden planters	0.52						
outdoor recreational activities	0.82	—					
Category: Noxious Stimuli							
auditory alarms	0.18						
intercom or paging	0.38	—					
loud Speaker or musak	0.15						
pleasant food smells	0.40			—	+		+

Table 12.10. Internal Unit Attributes Associated With Cluster Membership

Attribute	Overall Prevalence	Cluster					
		1	2	3	4	5	6
Category: Shower/ Tub Room							
swing door tub	0.20						+
Jacuzzi/ whirlpool bath	0.51						
Hoyer lift available with tub	0.52						
sink located in tub/shower room	0.65				—		
clearance below sink for wheelchair access	0.60				—		
lever faucet meets the fist test	0.55			+	—		
more than one tub or shower in room	0.55			+	—		
individual enclosures for each tub or shower	0.28	—					
shelves for temporary storage of personal items	0.42						
hooks for temporary storage of personal items	0.59						
toilet located in tub/shower room	0.64						
toilet in tub/shower room is in separate enclosure	0.42	—					
vertical/horizontal grab bars in shower	0.59		+		—		—
heat lamp for heating in ceiling	0.15						
main bathing room door locks from inside	0.74				—		
threshold level change into shower is <1/2 inch	0.81				—		
Category: Lounge/Social Space							
multipurpose room	0.71	—		+			
separate activity room	0.16						+
separate sitting room/ parlor/ living room	0.17						
kitchenette in lounge area	0.24						+
games and/or cards	0.52	—				—	
arts and crafts	0.37						
large motor skills equipment	0.22						
musical instruments and other equipment	0.53			+			
floor avoids high contrasting patterns	0.82						
some moveable seating is supplied	0.82	—				—	
choice of one, two, or multiple person seating	0.49					—	+
strong color contrast between all chairs and floor	0.67	—					+
single chair adjacent to table with lamp	0.31						+
current daily newspaper for shared use	0.31	—					+
at least one piece of reading material is in large print	0.50	—				—	+
television	0.76			+		—	+
one seat in room with out TV	0.47						+
television turned off if no one is watching	0.77	—				—	+
large clock with large lettering	0.57						
window with view to outdoors	0.82						
orientation board that communicates day and date	0.52		—	+			
flowers in lounge area (natural or artificial)	0.79	—					
living plants in lounge area	0.65		+		—		

Table 12.10. Page 2 Cont'd

Attribute	Overall Prevalence	Cluster					
		1	2	3	4	5	6
Category: Corridors							
no door separating	0.65			—		+	
elevator off unit	0.31			+		—	
unit unlocked	0.83						
alarm triggered by resident wearing device	0.16			+			
elevators monitored by staff	0.26		+			—	
window with direct outside view	0.60						
handrails continue around corners	0.49						
handrails contrasting color with walls	0.72						
seating along corridors	0.47						
color contrast between walls and floors	0.63						+
Hoyer lifts/ commodes/ medical equipment	0.64				—		
other clutter	0.51						
laundry carts	0.53					+	—
housekeeping carts or equipment	0.51						
linen carts	0.44	—					
large trash containers	0.18						
incontinence product disposal	0.28		—	+			
food trays	0.29	—					
medicine cart	0.34						—
Category: Noxious Stimuli							
auditory alarms	0.46		—				
screaming or calling out by residents	0.23						
TV/radio	0.63		—				
intercom/paging	0.35	—					
musik	0.14						
feces	0.19						
food smells	0.20						+
Category: General Amenities							
staff lounge on unit	0.16						
separate examination/ treatment room on unit	0.22						
direct access to outdoor amenities	0.49				—		+
unit has a pet	0.23						
dining on unit	0.69			+		—	
special Care Unit	0.14						

Table 12.11. Internal Room Attributes Associated With Cluster Membership

Attribute	Overall Prevalence	Cluster					
		1	2	3	4	5	6
Category: Room Type							
Private room	0.29		+		—	—	+
Double room	0.58		—				
3 residents in a room	0.09		—	—		+	—
4 residents in a room	0.04	—	—		+	+	—
Category: Room Entrance							
Signage identifying resident's name 5/8" or larger.	0.35	+		—	—		
Signage identifying Resident's name in raised or recessed letters	0.15	+	—	—			
Personalized wall or door	0.39				—		+
Lever type or push release hardware that passes fist test	0.48		+	—	+	—	+
Category: Resting/ Sleeping Space							
4 feet of clearance on either side of Resident's bed	0.76		+		—		
2 walls large enough to accommodate bed in room or resident's section	0.76	—	+	+	—	—	+
Resident has night stand by bed	0.84			—		+	
Category: Personal and Social Space							
Chairs in Resident's sleeping area for own/visitor use	0.77		+			—	+
At least one of Resident's chairs has armrests	0.73		+	+		—	+
Table or shelf unit adjacent to at least one chair	0.37		+		—	—	+
Resident has own TV	0.60		+			—	+
More than one TV in room	0.19						
Resident has radio/cassette/phonograph/CD player with external speaker next to bed	0.32		+		—		+
More than one radio/cassette/phonograph/CD player in room	0.18					+	
Resident has own lockable storage in room	0.37		+	—		—	+
Resident has own telephone in room	0.29		+		—	—	+
Resident can operate heating	0.52	—	+	+	—	—	+
Resident's room is air conditioned	0.78		+		+	—	+
Air conditioner in room can be adjusted	0.46	—			+	—	+
Category: Lighting							
On/off switch for fixed task lighting within 18" of resident's pillow	0.75	+	—			+	—
Moveable task lighting provided at resident's bed	0.16		+			—	
One or more lighting fixtures on a dimmer switch	0.23	+	—				
Night light in resident's room	0.52					—	+
Category: Furnishings/Personalization/Decoration							
Resident has brought own bureau	0.18						
Resident has brought one or more chairs	0.30	+	+		—	—	+
Resident has brought lamps	0.18		+		—	—	+
Resident has individualized bedspread	0.29	+	+			—	
Wall has paintings, photos, other items individual to resident	0.85	+			—		
Signs of hobbies or interests	0.43				—		
Resident has flowers	0.61					—	+
Resident has living plants	0.33	+			—	—	+
Religious items in room	0.38					—	



Table 12.11., page 2

Table 12-11, page 2

Attribute	Overall Prevalence	Cluster					
		1	2	3	4	5	6
Category: Resident's Toilet Room							
Bathroom between 2 resident rooms	0.28		+	—			—
Bathroom door can be locked from inside	0.57	+			+		—
Bathroom door opens outward	0.83	+	—	+		+	—
Bathroom door is lever type or push release hardware that passes fist test	0.38						
Counter space surrounding or near sink for personalization	0.41					—	+
Sink has single lever faucet that meets that fist test	0.31	+	+		—		
Toilet seat about 17" high	0.62	+	+			—	
At least 3 feet adjacent or in front of toilet for transferring	0.83	—	+	+	—	—	+
Cloth towels	0.29				—	—	+
Residential fixtures	0.15						+
Room has full bath	0.25	—	+		+	—	—
Floor covered with ceramic tile	0.49	—	—	+	+	—	+

Cluster 1. Cluster 1 is characterized by a high prevalence of a receptionist desk, wayfinding and public telephones in the main lobby. There is a high prevalence of separate activity rooms with games, arts and crafts, large motor skills equipment, musical instruments, popcorn machines and other refreshments, kitchenettes, jigsaw puzzles, large print reading materials and clocks, and a television set. In the corridors, there is a low prevalence of handrails that continue around corners but a high prevalence of handrails in contrasting colors to the walls. There is a high prevalence of libraries, bird cages, aquariums, chapels, religious artifacts, and intergenerational activities, but a low prevalence of dogs and cats or wheelchair accessible gift shops. These facilities are less likely to have outdoor areas that are accessible, covered or secure. Lounges at the unit level are unlikely to have games, moveable seating, large print reading material, or flowers. Corridors are unlikely to be cluttered with linen carts or food trays and there is a low prevalence of intercom or paging sounds. Resident rooms have a high prevalence of large print signage, dimmer switches on lights, and personalization. Rooms are unlikely to have heating or air conditioning controls. Bathrooms have a high prevalence of lockable doors, clearance under the sink, high toilets and lever type faucets. They are unlikely to have space to transfer,

however. This cluster is about average in terms of the size of the facility, the number of lounges, the number of residents per room, and the amount of room space per resident.

Cluster 2. Cluster 2 is characterized by a high prevalence of resident directories, and wayfinding in the facility entrance. Facility level lounges have arts and crafts, popcorn machines or other refreshments, kitchenettes, and large clocks with large lettering. In the corridors, there is a high prevalence of handrails on both sides, seating and contrasting colors between walls and floors. There is a high prevalence of wheelchair accessible gift shops, coffee or snack bars, lounges for volunteers, aviaries, computers, chapels, religious artifacts, and pleasant aromas. Bathing rooms have a high prevalence of grab bars, and there are often living plants in lounge areas. Units in Cluster 2 have a low prevalence of incontinence disposal containers in the corridors, auditory alarms or sounds of television or radios. Resident rooms are likely to be private, with lever type releases on the doors, seating options, televisions for each resident, environmental controls, and moveable task lighting at the bedside. There is a high prevalence of personalization and living plants. Toilet rooms have a high prevalence of lever type hardware, clearance below sinks, high toilets, and space for transferring. Although this cluster is characterized by the largest facilities in terms of total beds, this cluster has the fewest residents per room, the highest amount of space per resident, and the highest number of lounges overall.

Cluster 3. Cluster 3 is characterized by visitor sign books and public toilets but a low prevalence of wayfinding. These facilities tend to have separate parlor or living rooms at the facility level, but lack handrails on both sides of corridors, wheelchair accessible gift shops, libraries, religious symbols, or pleasant odors. Bathing rooms tend to have more than one bath or shower and lever type faucets. Units tend to have multipurpose rooms for activities with musical instruments, televisions, and orientation boards. There is a high prevalence of

incontinence disposal containers along the corridors. Resident rooms have poor signage, and are unlikely to have lever type door releases or lockable storage. Rooms tend to have chairs with armrests and heating controls. The toilet rooms have adequate space for transferring. This cluster tends to have dining available on the unit. Facilities in this cluster are intermediate with regard to total number of residents, personal space in resident rooms, the number of lounges and the number of residents per room.

Cluster 4. Cluster 4 is characterized by a low prevalence of public toilets or telephones in the lobby, lounges are unlikely to have snacks, a kitchenette, or live plants. There is a low prevalence of seating along corridors. Bathing rooms at the unit level are unlikely to have sinks or lever type faucets, grab bars or lockable doors. Resident rooms are unlikely to be private, have poor signage, and a lack of personalization either on the door or in terms of furniture. There is a lack of radios and telephones in resident rooms, and low prevalence of living plants. The toilet rooms in resident rooms can be locked from the inside, but are unlikely to have lever type door releases or sinks, and there is a lack of space for transferring. This cluster has relatively small facilities in terms of total beds, but has a high number of residents per room, a low level of personal space and few lounges.

Cluster 5. Cluster 5 is characterized predominantly by low prevalence of many facility level features such as a reception desk at the main entrance, a directory of residents, birds or fish, seating options, or a chapel. At the unit level, there is a low prevalence of games or cards in the lounge, a lack of large print reading material, and seating options. There are secured outdoor areas. There is a high prevalence of laundry carts, housekeeping carts, medicine carts and weight scales in the halls as well as the sound of yelling by staff and odors from cleaning solution, urine and feces (not tabled). There is a low prevalence of private rooms and rooms are unlikely to

have accessible door releases, lockable storage, environmental controls, moveable lighting near bed, night lights, personalization, plants. The resident bathrooms have few function enhancing features. Dining is not available at the unit level, but is available at the facility level. This cluster has relatively small facilities in terms of total beds, but has the highest number of residents per room, the smallest amount of space per resident, and the smallest number of lounges.

Cluster 6. Cluster 6 is characterized by a receptionist desk at the main entrance, public phone and toilet, and wayfinding. There is a choice of seating in the lounge, handrails on both sides of the corridors, and seating in corridors. There is a high prevalence of wheelchair accessible gift shops, coffee or snack bars, laundry rooms for residents, access to computers, chapels, religious artifacts, intergenerational activities, electric wheelchairs, covered outdoor areas, and pleasant aromas. Units typically have separate activity rooms with kitchenettes, choices of seating, large print reading material, contrasting colors, and televisions are turned off when no one is watching. There are good aromas, and a low prevalence of clutter in the unit corridors. Resident rooms are likely to be private, with personalization on the door, lever type door releases, choices of seating, environmental controls, night lights, and residents often brought their own furniture. The bathrooms often had counter space, clearance below sink for a wheelchair, space near the toilet, cloth towels and residential style fixtures. This cluster has a low number of residents per room, a large amount of room space per resident, and a large number of lounges.

QOL and Cluster Membership. We used one-way ANOVA to examine whether cluster membership was associated with QOL outcomes (See Table 12.12). There was a statistically significant association with each of the 11 domains of QOL and the 14 item short form. We used Tukey's HSD statistic to examine each pair of means to identify significant differences. One

clear finding is that Cluster 5 has lower QOL scores across all domains. This is consistent with our overview, which suggests that facilities, units and rooms in this cluster have few positive attributes, low levels of privacy and space. Clusters 1 and 2 tend to have the highest levels of QOL overall. Cluster 2 has more private rooms and is higher on the Privacy domain, while Cluster 1 has more activity related features at the facility level and is higher on the Meaningful Activity domain. Cluster 6, which has a high level of personal space and a high prevalence of private rooms has the third highest Privacy score.

Table 12.12. Average QOL By Cluster

Domain	Cluster						ANOVA (p value)
	1	2	3	4	5	6	
Comfort	3.05	3.12 <sup>(5)</sup>	3.09 <sup>(5)</sup>	2.97	2.90	3.08 <sup>(5)</sup>	
Functional Competence	3.45 <sup>(5)</sup>	3.25	3.31	3.20	3.16	3.23	0.017
Privacy	3.46 <sup>(5)</sup>	3.49 <sup>(4,5)</sup>	3.35	3.29	3.20	3.42 <sup>(5)</sup>	0.001
Dignity	3.67	3.72 <sup>(5)</sup>	3.70 <sup>(5)</sup>	3.69	3.60	3.70	0.017
Meaningful Activities	2.95 <sup>(3,5)</sup>	2.69	2.65	2.75	2.63	2.69	0.010
Enjoyment	3.39 <sup>(5)</sup>	3.23	3.25	3.18	3.08	3.35 <sup>(5)</sup>	0.002
Individuality	3.09 <sup>(3,4,5)</sup>	2.95 <sup>(5)</sup>	2.79	2.75	2.68	2.90	0.008
Relationships	3.27 <sup>(5)</sup>	3.09	3.10	3.04	2.96	3.09	0.001
Security	3.45 <sup>(5)</sup>	3.44	3.44	3.40	3.25	3.49 <sup>(5)</sup>	0.001
Spiritual Well-Being	3.35 <sup>(5)</sup>	3.24 <sup>(5)</sup>	3.20	3.03	2.98	3.31 <sup>(4,5)</sup>	0.001
Autonomy	3.34	3.35 <sup>(5)</sup>	3.37	3.29	3.18	3.34	0.006
QOL-14	3.41 <sup>(3,4,5,6)</sup>	3.30 <sup>(4,5)</sup>	3.20 <sup>(5)</sup>	3.17	3.08	3.20 <sup>(5)</sup>	0.001

**Note:** Number in parenthesis indicates significant pair-wise difference  $p < .05$  based on Tukey's HSD. Differences are only listed once.

### Summary and Next Steps for Cluster Analysis

We used cluster analysis to identify 6 distinct types of nursing home environment based on facility, unit and room attributes. These 6 clusters have distinguishing characteristics, such as the amount of personal space, prevalence of private rooms and availability of activities. There is a significant association between cluster membership and resident QOL, validating our approach.

We believe that this analysis will lead to the identification of specific environmental attributes that are associated with higher levels of resident QOL.

We selected a 6 cluster solution based on the goal of retaining a large number of facilities per cluster. Only one cluster has as few as three facilities, thus assuring that each cluster has a large sample of residents. However, this may have led to heterogeneous clusters with regard to facility attributes. Even though the clusters are distinct in many ways, facilities may be grouped together in ways that obscure other differences that may be relevant to QOL.

Preliminary analysis suggests that an 11 cluster solution has no clusters with fewer than three facilities per cluster, while a 12 cluster solution results in one cluster with only one facility. Further analysis will examine the 11 cluster solution to determine if there are meaningful differences between the clusters.

As this report goes to press we have begun a different and more promising approach to cluster analysis using the composite indices rather than individual items as variables and adding some of the continuous variables such as distances. We expect this effort to generate more workable clusters.

## **Privacy**

In Wave 1, 29% of the residents were in private rooms and in Wave 2, 20% were in private rooms; 13% of the Wave 1 and 14% of the Wave 2 residents lived in rooms that housed 2 or more residents. Table 12.13 shows that distribution. We already showed that residents in private rooms were more likely to experience function enhancing and life-enriching environmental features and were more likely to be able to exercise control over their lives.

Table 12.13. Prevalence of Private Rooms and Number of Roommates

		Wave 1			Wave 2			Both Waves	
		n	%		N	%		n	%
Private room									
	No	1392	71		1338	80		2730	75
	Yes	576	29		329	20		905	25
Number of Roommates									
	0	576	29		329	20		905	25
	1	1139	58		1101	66		2240	62
	2	175	9		187	11		362	10
	3 +	78	4		50	3		128	4

Table 12.14 combines both Wave 1 and Wave 2 samples to examine how being in a private room and number of roommates affected QOL. The analyses presented control for a very large number of resident characteristics that might affect QOL. Even after those controls, being in a private room and having fewer roommates were associated with better QOL on three of the domains. More analyses are planned on this topic.

Table 12.14 Effect of Private Room and Number of Roommates on Quality of Life

Domain	Private Room			Number of Roommates	
	Coeff.	P		Coeff.	P
Comfort (n=2967)	0.04	0.13		-0.02	0.20
<b>Privacy (n = 2765)</b>	<b>0.31</b>	<b>&lt;.0001</b>		<b>-0.17</b>	<b>&lt;.0001</b>
<b>Functional Competence (n = 2844)</b>	<b>0.09</b>	<b>0.01</b>		<b>-0.05</b>	<b>0.03</b>
Autonomy (n = 2849)	0.04	0.14		-0.02	0.41
Dignity (n = 2833)	0.02	0.44		-0.02	0.14
Security (n = 2757)	0.01	0.64		-0.03	0.10
Relationships (n = 2770)	-0.03	0.44		0.01	0.78
Individuality (n = 2669)	0.00	0.90		0.00	0.95
<b>Meaningful Activities (n = 2727)</b>	<b>-0.08</b>	<b>0.03</b>		<b>0.05</b>	<b>0.05</b>
Enjoyment (n = 2675)	-0.05	0.17		0.01	0.69
Spiritual Well-Being (n = 2767)	-0.05	0.13		0.01	0.71

Note: Analyses control for age, gender, race, visual impairment, cognitive function, physical function, length of stay, bladder and bowel continence, depression, hip fracture, and restraints. Analysis was done using hierarchical modeling to adjust for unmeasured facility level random effects. Sample includes both Wave 1 and Wave 2.

## Discussion

We have described the instruments used to assess physical environments for 1988 resident room and baths in 131 units in 40 facilities, and the way the resultant data was combined into composite indices. First, the work demonstrates that it was possible for persons not expert in environmental design to reliably assess physical environments using largely objective items. This large-scale application pointed to several areas where the protocols need to be refined, especially to gather accurate information about the dining and bathing environment that can be assigned to the individual resident. Generally, however, we were able to assemble rich information about these nursing homes and to describe a given resident's environment at three levels.

Together, the descriptive findings tell of 40 varied physical environments, and of 131 units that vary within them. The caveat, of course, is that the 40 nursing homes described here cannot



be generalized back to the nursing homes in their states, not only because of the small sample size in any state but also because of the method of selection, where we deliberately over-sampled some facilities with high proportions of private rooms.

Nonetheless, the environmental deficits described in this sample are all the more discouraging because the sample was designed to capture at least some better-than-average environments. The problems include low light levels, lack of lounge space, bathrooms shared by up to 20 residents, long distances to reach some of them, corridor clutter, noise, and general absence of life-enhancing features. The findings also highlight the disparity in amenities found in a private room versus shared rooms. Yet in the same group of facilities, we also identified positive environmental features well worth further detailed study.

We also presented early cluster analysis and showed some relationships between those environmental clusters and resident QOL. Finally, we showed a relationship between private rooms and QOL.

Work is ongoing to refine the cluster analysis protocols using composite scales rather than individual items, and also adding other variables such as continuous variables measuring distances and square footage. In all this work, we will continue to take into account the nested features of the environment (rooms in units in facilities) and take advantage of hierarchical analysis tools. Also of interest is to examine how resident characteristics might interact with environmental characteristics to generate resident outcomes. For example, some residents may depend much more than others on their immediate environment and some may be able to glean little benefit from improved environments.

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## **Chapter 13**

### **Conclusions, Implications, and Recommendations**

The multi-faceted work described in this report reflects a 5-year concentration on quality of life (QOL) in nursing homes. The study was larger and more detailed than previous work on nursing-home QOL. It has yielded a number of tools and approaches, as well as suggested hypotheses and areas that might be fruitful for further research. At this writing, ideals about the “good nursing home” are undergoing considerable upheaval as the culture change movement proposes dramatically different ways to design and organize care in nursing homes and assisted living settings are serving some people who would formerly have been in nursing homes (Lustbader, 2000; Weiner & Ronch, 2003). Also, some people with nursing home levels of need are receiving care in Assisted Living settings where by design they are likely to have more autonomy and privacy than do nursing-home residents, and such innovations are expected to improve QOL. They may also increase the expectations of frail older people in group residential settings. It will be important to be able to measure QOL to track the effects of such changes.

### **Summary of Findings**

Major findings from this project are listed below:

1. It is feasible to collect information directly from nursing home residents about their own QOL. Even residents with substantial cognitive confusion can complete QOL interviews. On average, we were able to collect first-hand data from 60% of residents in a nursing home.
2. The 11 QOL domains that we identified (comfort, security, functional competence, relationships, enjoyment, meaningful activity, dignity, individuality, privacy, autonomy, and spiritual well-being) could be tapped in 54 questions. These QOL domains are

independent but relate to a latent QOL multidimensional construct. The scales had adequate scale properties in 2 large field tests.

3. Family members and staff members were poor proxies for residents themselves. When we had multiple sources of reporting, family and staff reports were statistically significantly associated with resident reports but correlations on scales were rarely better than 0.3. Family members were somewhat more congruent with residents than staff.
4. QOL average domain scores for facilities are capable of differentiating one facility from another. At both Wave 1 and Wave 2, we were able to discern patterns whereby some nursing homes fell several standard deviations above or below the mean on multiple QOL domains.
5. Although QOL varies across facilities, we also see variation across residents. Resident ADL, cognitive status, and sensory impairment are predictors of better QOL. We were able to show that personality of the resident has a small independent effect on resident QOL after controlling for functional status. Length of stay made no difference in QOL.
6. During Wave 1, facility-wide observation of resident and staff interactions identified several observable phenomena that were associated with better or worse resident QOL. When we streamlined the number of observation occasions and the number of items observed in Wave 2, we no longer found associations between our observations and resident reported QOL. At both Waves, the results of the observations distinguished facilities from each other, suggesting some promise for observational protocols as an auxiliary way of assessing facility QOL, especially as it related to those who cannot be interviewed.

7. QOL measures could be satisfactorily conducted by staff members and surveyors under research conditions. No systematic differences in accuracy, concordance between research interviewers, or attitudes to the process could be attributed to whether the staff assessor was a nurse, on the one hand, or a member of the social work or activities staff, on the other.
8. No strong pattern emerged to connect off-site indicator data from OSCAR and MDS to QOL.
9. We collected copious data describing facility structure and process but found no clear associations between these findings and QOL. We observed an enormous range in the way only 40 nursing homes arrange their nursing services, activities, and a myriad of other functions that could have an impact on the QOL domains. This variation has implications for measurement of any new indicators. Records for activities, room changes, in-service education, care planning, and other kinds of archival data varied also in both level of detail and format.
10. We developed new approaches to measuring physical environments that had high inter-rater reliability and did not require specialized knowledge or subjective judgments. We found many problems with physical environments in the 40 Wave 1 nursing homes. Private rooms are associated with better QOL. We have begun a cluster analysis approach that is promising in that the clusters seem associated with QOL. Our new approach to environmental assessment pinpoints the environment for each individual resident, enabling use of more powerful hierarchical analysis to examine the effects of the nested environments of rooms, units, and facilities.

## **Implications**

This report demonstrates the feasibility of collecting information from nursing home residents about their quality of life (QOL). Given that QOL data is collected directly from residents, such contact provides an opportunity to collect other salient information at the same time on relevant topics like affect and satisfaction. This information can be used for a variety of purposes including quality assessment and assurance, consumer information, and quality improvement. It can also be employed as a building block in a payment system that re-enforces better quality by paying more for it.

Underlying this work is the growing appreciation that QOL and satisfaction are major issues of concern to current and potential users of long-term care. The historical preoccupation with technical elements of quality of care, focused largely around nursing care issues, needs to be tempered with more attention to this important area. Plans to revise the MDS 3.0 reflect recognition of this shift in priorities.

The measure developed (in both its full form and subsequent shorter versions) was able to distinguish among NHs. Although resident characteristics explained the majority of the explained variance, the proportion accounted for by facilities was sufficient to permit discrimination and to serve as the basis for rewarding desired behavior in this area. It would be useful to field these measures in new and larger samples of nursing homes. In their further development, they also need to be tested for cross-cultural relevance.

Making QOL measurement in the nursing home context fully operational probably requires a more comprehensive list of domains than those assessed in this project. Salient elements, such as functioning, health, cognition, and affect, were specifically eliminated from this study under the terms of the contract, but measures of these domains should be included in

final efforts to field a QOL battery. M. Powell Lawton, an early pioneer in defining QOL (and an original collaborator on this project until his death), exhorts researchers to recognize that QOL must represent both subjective and objective aspect of quality (Lawton, 2001). On the other hand, Lawton summarized a desirable subjective multidimensional QOL construct with great attention to the domains studied here. Aggregating “investigators’ top-10 lists” from previous research, Lawton proposed 11 human needs that must be satisfied in nursing homes to create a better QOL: autonomy, privacy, dignity, social interaction, meaningful activity, individuality, enjoyment versus aversive stimulation, safety and security, spiritual well-being, clarity of structure and functional competence. He argues that each of these 11 needs is universal and each “can be served or frustrated by caregivers; and may be represented by its fulfillment for each individual and by its capacity to be fulfilled by the facility (Lawton, 2001, p.147).”

Our work shows that the data derived from proxy reports is not sufficiently comparable to the reports of residents themselves to allow ready substitution at the individual level, although the mean values of the proxy respondent groups were closer to the means of the residents and could therefore be used to develop NH level information. The poor performance of proxies suggests that whenever a resident can be interviewed directly, proxies should not be used in lieu of resident self-report.

Determining QOL for those who cannot express themselves verbally, even in short and simple interviews remains a problem. Many residents with substantial dementia according to the MDS could complete usable QOL responses; we, therefore, recommend against any MDS-based screening prior to conducting QOL interviews. That being said, many people who are unable to respond lack a voice, and in some instances we cannot really infer their QOL from any non-



verbal clues. One could rely on those who can respond to serve as the sentinels for those who cannot, but such a policy is uncomfortable. More work is needed to identify ways to give the resident who cannot communicate a better voice. The observational efforts at the facility level were designed to observe phenomena that have face validity for being associated with a better or worse QOL for the residents observed, particularly residents with dementia. At the same time, this study shows the dangers of arbitrarily excluding resident respondents on the basis of their cognitive performance. Although the level of participation declined with more severe cognitive impairment, even some severely impaired residents were able to participate meaningfully.

Substantial efforts went into developing a QOL tool that was psychometrically sound. As a result it had reasonable internal reliability, especially for a measure of amorphous constructs. The level of reliability was maintained in the shorter versions, which did not capture as many domains. Various tests showed that there was good inter-rater reliability and that the questionnaire could be used to good effect by both nursing home staff and surveyors. Although the performance of both types of staff under artificial test conditions may be better than in actual practice, when other factors may influence their performance, these findings are encouraging.

Whereas the QOL appears to have sufficient reliability to make it a viable tool, the issue of validity is much harder to address. There is some evidence that conceptually related domains appear to be better correlated with each other than those expected to be less related, but in the absence of an independent gold standard for QOL there is no specific way to demonstrate validity. The sample of nursing homes was designed to provide some variation, but again there was no way to create an independent measure along which to array the homes. Subsequent work might well examine how well the measure discriminates among homes believed by some independent criterion to represent better and worse QOL. For example, facilities that are making

an active effort to create a social and physical environment designed to enhance QOL might be compared to more typical facilities. During this project, we struggled with the problems, however, of using facility reputation for good QOL as a source of validation of QOL measures, and for using expert raters. There is no reason to think such criterion measures should have greater weight than the measures derived from residents themselves.

Another line of investigation might explore more carefully the correlates of better QOL scores. While the easily accessible structural measures drawn from interviews and that OSCAR did not demonstrate a strong correlation, more subtle or simply other measures than more directly reflect ambiance and personal attention might be more useful. It is intriguing that the number of activities staff was a stronger correlate with QOL than was the amount of nursing staff (professional, nonprofessional or both). More attention might be usefully devoted to understanding the implications of this observation. The strongest relationship between environmental factors and QOL was the presence of single rooms, but much more work remains to be done in exploring the effects of environment. Future work might also look at interactions and the possibility that QOL is influenced by a specific confluence of resident characteristics within specific environments.

We are also eager to see longitudinal work undertaken with QOL measures to determine their sensitivity to change. If they are to be used in before-after tests of quality improvement efforts, they will need to demonstrate that sensitivity.

The QOL score has been largely handled as a series of domain measures, but work with a variety of constituencies suggests that the values applied to the individual domains are quite similar. Hence a simple summative summary score might be more easily understood by many users. More work could be done on the advantages of creating and using such a score. There are

always tradeoffs, of course, between the detail involved in sub-scores and the efficiency of a single scale. For some purposes, the separate domains may be more conceptually useful, but in many instances a single score would likely encourage wider use of the construct. We caution again that the longer measures contain much information that might be useful for QI purposes. Similarly, short screeners, such as we developed as potential instruments for the MDS (the QOL-14 and the QOL-MD-14) and our 11-item list of summary statements in our QOL battery (which itself forms a scale and which we used to validate our domains) are examples of brief approaches.

Whether using a single score or domain score, issues arise about how various aspects of QOL should be weighted. In our developmental work, for example, we weighted all domains equally, but we recognize that such a stance is arbitrary. Once we recognize that different weighting schemes are feasible, the question arises as to whose values should inform the weighting and how, if at all, weightings can be keyed to individual preferences.

QOL measurement in nursing homes is in its infancy compared to the many decades of work on functional status and quality of care. Some individuals raise concerns about pursuing QOL too vigorously because they believe that many of the factors influencing QOL are out of facility control. They argue that if most QOL is influenced by health conditions and social circumstances, and even somewhat by personality, there is little room left for care to affect outcomes. We view such negativism as short-sighted. The very observation of variation across facilities suggests that positive efforts can affect QOL. It is well known that nursing home life can affect QOL negatively, and remedying these negative effects should itself produce positive effects. With greater knowledge and precision, professionals may be able to identify residents at

higher risk of poor QOL because of certain physical or sensory impairments or because of social isolation and lack of family. It would then be feasible to target efforts to those individuals.

Systematically collecting and reporting information on QOL is itself likely to have a profound positive effect in NH care. Using the score in more deliberate ways to report on facility performance and even to encourage better QOL outcomes by linking payment to performance would likely have an even more profound effect. The question always arises about when is an instrument ready for broad application. Almost any tool can be improved. Undoubtedly this measure will evolve over time but the fundamental building blocks are in place. It is certainly as good as many such instruments in common use. The needs for emphasizing these vital aspects of nursing home care outcomes argue strongly for active implementation, even while additional refinements are pursued.

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