

Final Report

Tools for Continuous Quality Improvement in Detroit Nursing Homes

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EXECUTIVE SUMMARY

I. Context

This report summarizes a partnership between the Institute for Aging Research (IFAR) of Hebrew SeniorLife (HSL) and the University of Michigan (UM). The purpose was to develop tools to be used by the Detroit Area Agency on Aging to improve the quality of nursing home care. The goals are achieved by providing nursing home administrators and staff information to build an understanding of how they are performing on nursing home quality indicators (QIs) and means to improve quality of care.

II. Background

The tools developed were reports on trends among quality indicators (QIs) constructed from the Minimum Data Set (MDS) Resident Assessment Instrument (RAI). MDS data are routinely collected by facilities and submitted to the US Centers for Medicare & Medicaid Services. The RAI/MDS is used to collect/provide basic information regarding the clinical and personal characteristics of recipients of care in nursing homes.

In order to generate reports, raw MDS data must be (1) collected, (2) preprocessed (data cleaning), (3) used to compute quality indicators using published standards for numerator, denominator, exclusions, covariate adjustment, risk stratification, (4) aggregated to the facility level, (5) and transposed into meaningful reports to be brief and accessible to busy administrators and clinicians.

III. Approach

To accomplish this activity, HSL/IFAR data managers and analysts provided service and training to data managers and analysts at the University of Michigan (UM) in the data management

activities necessary to pre-process MDS data for the purposes of developing time-trend facility QI reports. UM staff are now equipped to generate their own databases of QI Scores and nursing home facility reports.

IV. Results

The UM team produced one report for each Detroit area nursing home (**Appendix B**). These reports included (a) time-trended reports of nursing home QI scores for each facility, relative to a state of Michigan benchmark; (b) brief written summaries of QI reports with helpful interpretative information; and (c) a description of options for care giving or other intervention strategies for improving quality indicator performance (**Main Report, Section I**). We have also prepared a summary report with recommendations for improving quality of care in Detroit nursing homes (**Main Report, Section II**).

V. Potential Future Directions

Detailed training on quality improvement activities is available from HSL/IFAR staff but not included in this project. We have implemented such training activities in previous research projects funded by various State and Federal agencies. Currently we are evaluating quality improvement activities in our own institution (the Hebrew Rehabilitation Center) and in more than 20 other facilities in Massachusetts via a National Institutes of Health National Institute for Nursing Research grant. The clinical areas in which we are prepared to deliver training on quality improvement are listed in **Appendix A**.

Key Findings

- Based on an assessment of Quality Indicators, Detroit has a higher proportion of better performing nursing facilities than the rest of the State of Michigan
- Without exception, Detroit facilities are performing better than the cross national reference standard and Michigan facilities as a whole on the functional decline QIs (see **Figure 4**)
- With the exception of the Communication QI, Detroit facilities are performing worse than the cross national reference standard and/or Michigan facilities as a whole on the functional improvement QIs (see **Figure 5**) indicating that a focus on these areas might be a good area for improvement and an opportunity for facilities to improve their overall Quality score
- With the exception of the Feeding Tube, Pressure Ulcers and Restraints QIs, Detroit facilities are performing better than the cross national reference standard and/or Michigan facilities as a whole (see **Figure 6**); these three areas represent possible opportunities for improvement
- Detroit's nursing facilities tend to be more average than facilities in the State of Michigan; there are no facilities that rank very low (0 or 1) or very high (9 or 10) on Nursing Home Composite Score (see **Figure 9**)
- After reviewing their own, facility-specific QI report, each facility should select one or two areas of improvement as part of a Continuous Quality Improvement program; this will result in improvement of the facility's Overall Quality Score

Final Report

Description of Options for Caregiving and Other Intervention Strategies in

Individual Detroit Nursing Homes

How can we improve the lives of persons residing in nursing facilities? This report details an initial step towards accomplishing that goal in Detroit area nursing homes. A partnership between the Institute for Aging Research (IFAR) of Hebrew SeniorLife (HSL) and the University of Michigan (UM) was established to develop tools to be used by the Detroit Area Agency on Aging. The strategy involved providing nursing home administrators and staff reports that compared their facility to a Michigan and an international benchmark to illustrate how they are performing on nursing home quality indicators (QIs), with future access to information about means to improve quality of care in specific topic areas.

I. Quality in Nursing Homes

The process involves first defining and measuring “quality”. This step includes an articulation of the values of care, the identification of clinical outcomes that are relevant to those values, and defining the operations that are intended to measure those clinical outcomes. Once defined, and with operational measures available from data collected in nursing homes, quality in specific care areas can be measured and facilities ranked.

A. Defining Nursing Home Quality

Our view is there are four components of nursing home quality. The first is ***process standards***. Process standards reflect the way care is provided. Ideally, care is provided in a safe and effective and home-like manner. This dimension includes ***adherence to standards of care, best practices, or specified care protocols***. Care that is not consistent with current standards cannot be of high quality. However, good quality care may represent an extension or improvement

upon current standards. The second component is **environmental standards**, which has two facets. One facet is related to the quality of life within the facility, encompassing the cleanliness of a facility, the quality of food, adequacy of clothing and protection from the elements: basic hygiene, safety, and physical environment factors that are not normally considered within the realm of clinical standards of care. A second facet of environmental standards is caregiver credentials and staffing levels. A third component is the **person's satisfaction**. This component is evolved out of other aspects of high quality care. The fourth component is **clinical outcomes**. This dimension refers to the person's status and how it changes over time, as reflected in nursing home Quality Indicators (QIs).

All these dimensions of nursing home quality are important. Unfortunately, it is difficult to measure them all well. Moreover, when measures are attempted, experience has shown that the correlation among these measures is low¹⁻². Other researchers have shown this is true for state survey results,³ and our experience shows it holds for resident satisfaction surveys, staffing levels, and resident change measures based on QIs. This low correlation signals the limited validity of the Center for Medicare and Medicaid Services (CMS) proposed Five-Star System for ranking nursing facilities

(http://www.cms.hhs.gov/Certificationandcompliance/13_FSQRS.asp). We propose an alternative composite, as discussed below.

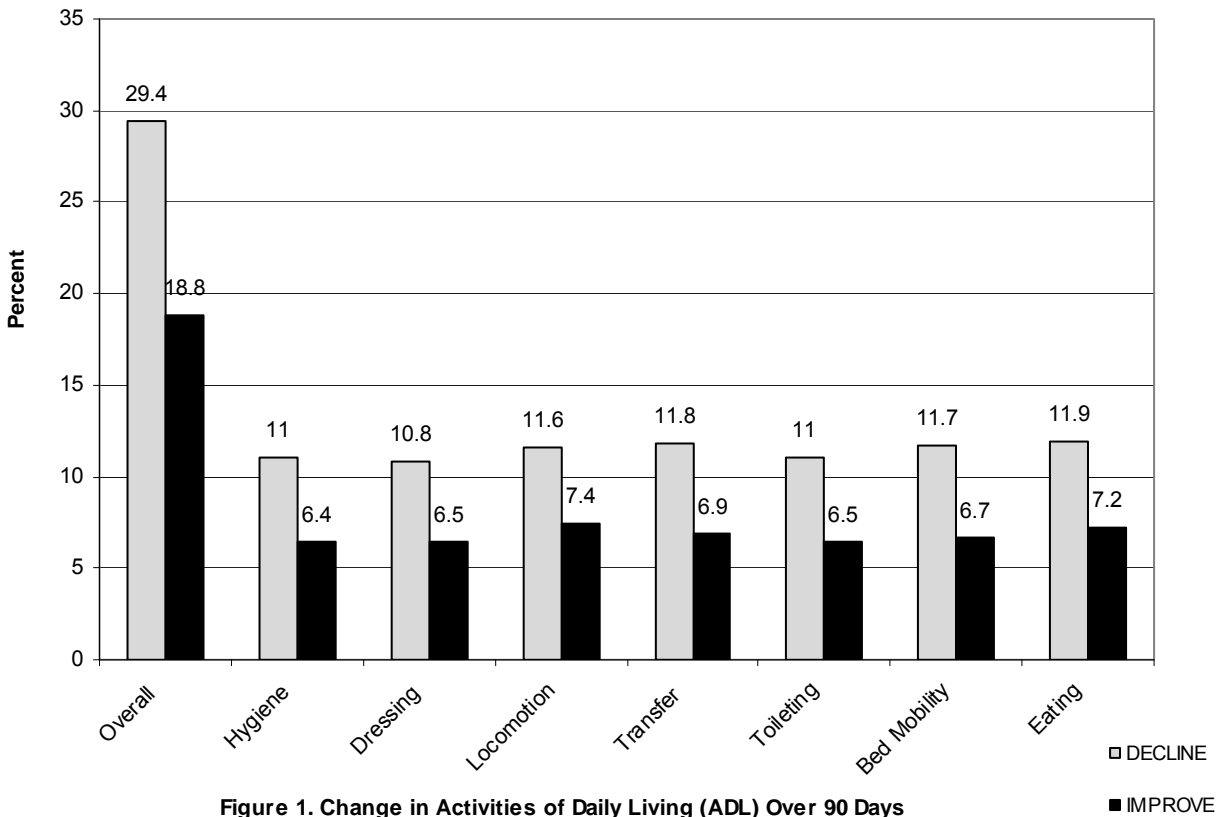
Our view is hard choices have to be made regarding how quality is assessed. In 1990 The Institute of Medicine (IOM) defined quality as "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge."⁴ Therefore, what matters most is the clinical

outcome dimension; how the resident changes over time. The reason for the primacy of clinical outcomes is that all other dimensions of quality feed into or cause differences in the outcomes of residents over time. Therefore, variability in clinical outcomes is the most broad and relevant indicator of quality of care in nursing homes. It also allows for heterogeneity in how facilities address challenges posed by caring for residents. For example, a facility with low staffing levels may compensate by having a large number of highly credentialed staff. Or a facility of older construction with an awkward or otherwise unhelpful physical environment may compensate by employing more nursing assistants or volunteers to assist with transport. High quality facilities respond appropriately to challenges presented by residents and produce good clinical outcomes.

B. Measuring Nursing Home Quality

In keeping with the primacy of clinical outcomes as the signal of good quality of care, the most direct measure of nursing home quality is through QIs based on aggregate resident outcomes. But which of the innumerable QIs should be included? Which are most reflective of quality as conceived here? The answer to this question comes from considering why the person is in the facility in the first place. Without saying, the person is resident in the nursing home for care related to impairments in carrying out basic daily activities and perhaps with clinical problems that require skilled nursing oversight. The goal is to live as good a life as possible over their remaining life course. People do not come to nursing home to experience premature functional loss, confusion, loneliness, falls, and pain. Once in a nursing facility the resident should expect staff to take every step possible to maximize their functional potential and quality of life.

But how do we measure quality, what is the most appropriate yardstick? What can we reasonably expect a facility to achieve? The current set of nursing home QIs used by CMS in public reporting are overwhelmingly “bad” QIs: higher scores imply more of the facility’s residents are experiencing poorer outcomes (expressed as a percent). However, nursing home residents are heterogeneous. Some people will decline; some will improve. Figure 1 illustrates rates of improvement and decline in activities of daily living (ADL) functioning in a sample of nursing home residents. While decliners outweigh improvers, the presence of improvers highlights the danger of assuming that all nursing home residents follow an inexorable trajectory of decline in functioning. Therefore, it is important to capture a balance of improvement and declines in a nursing home.



Another important consideration is inter-facility variability. Even after statistical adjustment for differences in the characteristics of residents served across facilities, there is tremendous variability between facilities in outcome rates. This point is illustrated in the figures below (Figures 2 and 3) that depict mobility change rates.

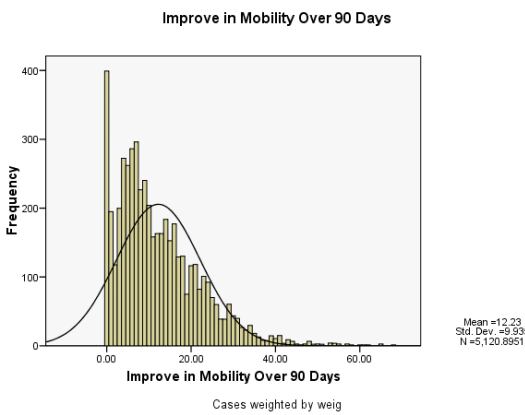


Figure 2. Improvement in mobility over 90 days

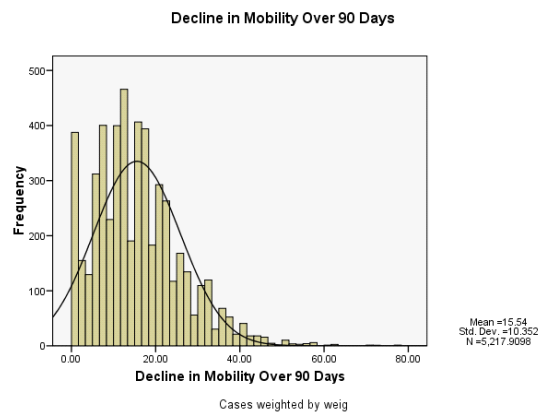


Figure 3. Decline in mobility over 90 days

Sample of nursing homes in the US and Canada

There are other important considerations in choosing quality domains. Technicians must ensure that QIs are operationalized with reliable clinical information. Experts and stakeholders must arrive at a consensus that the clinical outcome measure is relevant and measured appropriately, and is important as an indicator of quality. Most importantly, there must be some faith that facilities have some opportunity to better their relative rank on the measure due to actions or changes in environmental design.

C. Assessing Nursing Home Quality

In this section of the report, we provide a broad overview of the methods used to produce the QIs used in our analysis of Detroit nursing homes. For more detail, the reader is referred to a

recently published manuscript⁵ that describes how the quality indicators are scored and adjusted. This publication includes detailed definitions of the numerator, denominator, exclusions, risk adjustment, risk stratification, and computational details. Validation and reliability data are also provided. Because this publication is in the public domain, similar details are not repeated in this report. However, we will review the content area of selected QIs in a broad way.

The operational steps required to score nursing home quality indicators include, as a most basic step, accessing the computerized patient database made up of Resident Assessment Instrument/Minimum Data Set data. Assuming MDS data are available, the next step is to generate facility-level quality indicators from patient-level data. Some sort of risk adjustment methodology should be considered, and the QIs used to sort the “bad” and “good” facilities, and, perhaps, establish the relationship among quality indicators to create a summary quality composite. Issues associated with each of these steps are briefly discussed below.

1. Risk Adjustment

Risk Adjustment of QIs is necessary to compare “apples to apples”: to account for potential bias due to variations in facility admission practices. In general there are three practical ways to adjust QIs. We use all of the following in our computation of QIs: exclusions and regression-based adjustment for individual (patient, resident) risk factors (i.e., covariates), and stratification and direct adjustment based on facility-level aggregate statistics.

a) Non-Parametric Risk Adjustment

Non-parametric risk adjustment includes stratification, for example as applied in the context of nursing home profiling. This approach is recommended by CHSRA, advocating for stratification

without standardization ⁶. Stratification adjustment is coarse, and reliance upon this method introduces a risk of residual confounding. We will be restricting our remaining presentation to parametric approaches.

b) Parametric Risk Adjustment

Parametric approaches involve some kind of data modeling to derive an expected QI score, that is, an expected proportion of a provider's care recipients satisfying the numerator condition.

Parametric approaches include whether an external calibration sample is used or if the calibration sample is the analysis sample. The advantage of using an external calibration sample is that measures of quality can be expressed on a common metric across time and jurisdiction.

Limitations are that, as most commonly implemented, coefficients expressing the association of recipient characteristics and outcome are treated as fixed parameters. Therefore from the perspective of providers in the context of public reporting, a model based approach that does not assume fixed recipient parameters would be preferred. However, a provider's evaluation of continuous quality improvement efforts would be better served with a consistent metric, as would the deliberations of purchasers and regulatory bodies.

2. Choosing Quality Indicators to Report

There are scores of quality indicators. It is no easy task to identify a small number of QIs to follow in a continuous quality improvement or quality monitoring project. We recommend a set of QIs, making it easier to identify a group of QIs of reasonable size to follow, with good measurement properties, and clinical relevance.

Our deliberations are assisted by grouping QIs in three broad content areas. These three areas we refer to as function, clinical, and utilization. Functional QIs capture how a resident is

managing in daily tasks and in living effectively (getting around, communication) in their environment. Clinical QIs capture medical and physiological problems a resident may be facing that a facility is helping the resident manage. Utilization QIs reflect aspects of care that indicate an undesirable state of affairs has been reached: the resident has had a catheter or feeding tube placed or has been placed in restraints. Typical QIs in these content areas are shown in Table 1.

Table 1. Broad Content Area of Selected Quality Indicators

<u>Functional</u>	<u>Clinical</u>	<u>Utilization</u>
ADLs	Behavior	Catheter
Cognition	Infection	Feeding Tube
Communication	Mood	Restraints
Falls	Pain	
Locomotion	Pressure Ulcer	
<u>Continence</u>		

Note: ADLs = Activities of Daily Living

II. Generating Nursing Home Facility QIs in Detroit

The main part of this contract activity involved technology transfer between Hebrew SeniorLife Institute for Aging Research and the University of Michigan to provide the expertise to generate facility level nursing home quality indicator reports. This activity presumes that raw MDS data have been collected and available in an electronic format. Key activities for generating reports are preprocessing of data (i.e., data cleaning), calculation (the application of published standards for numerator, denominator, exclusions, covariate adjustment, risk stratification), aggregating the QIs to the facility level, and transposing them into meaningful reports to be brief and accessible to busy administrators and clinicians.

To accomplish this activity, HSL/IFAR data managers and analysts provided service and training to data managers and analysts at the University of Michigan (UM) in the data management

activities necessary to pre-process MDS data for the purposes of developing time-trend facility QI reports. UM staff are now equipped to generate their own databases of QI scores and nursing home facility reports.

The UM team produced one report for each Detroit nursing home (**Appendix B**). These reports included (a) time-trended reports of nursing home QI scores for each facility, relative to a state of Michigan benchmark; (b) brief written summaries of QI reports with helpful interpretative information; and (c) a description of options for care giving or other intervention strategies for improving quality indicator performance.

The remainder of this report describes the calculation of a single summary composite for nursing home quality ranking, and recommendations for improving quality of care in Detroit nursing homes. Detailed training on quality improvement activities is available from HSL/IFAR staff but not included in this proposal. We have implemented such training activities in previous research projects funded by various State and Federal agencies. Currently we are evaluating quality improvement activities in our own institution (the Hebrew Rehabilitation Center) and in more than 20 other facilities in Massachusetts via a National Institutes of Health National Institute for Nursing Research grant.

A. The State of Nursing Home Quality in Detroit

In this section, we examine the rates of change in all Michigan nursing facilities, and compare these to an international reference standard created by interRAI.

Figure 4. Functional Decline QIs.

Note. a high score implies poorer performance.

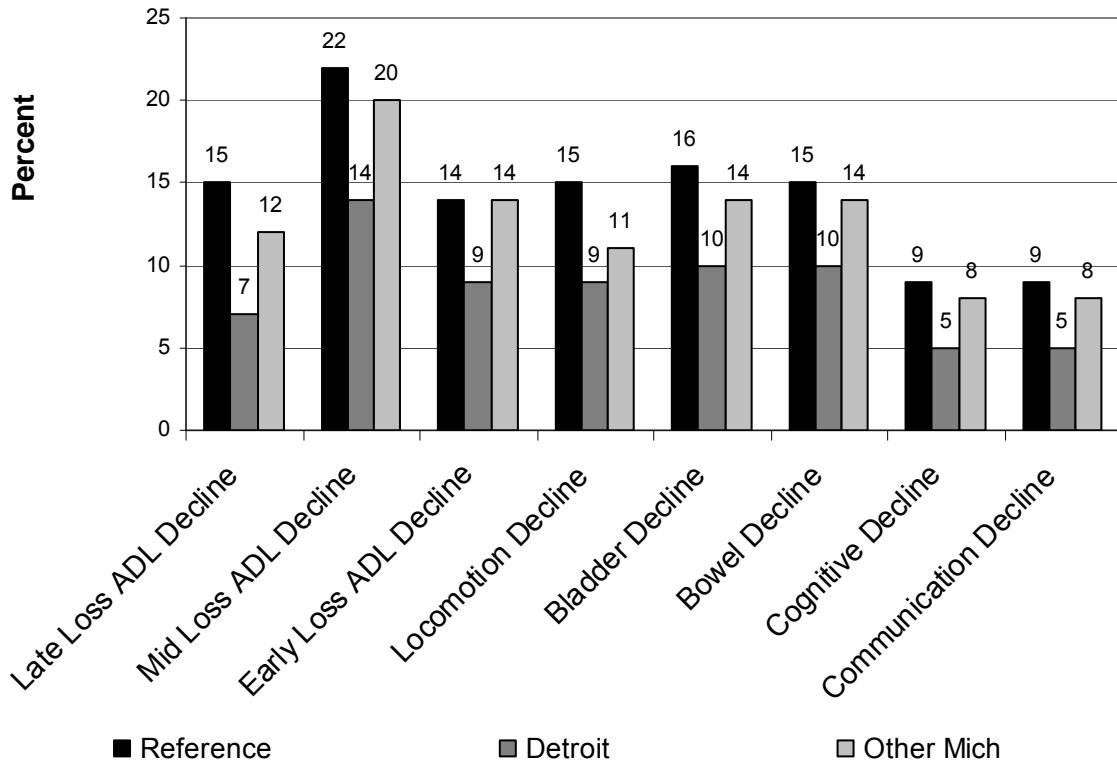


Figure 4 shows selected functional decline QIs. In these QIs, higher values imply more residents are experiencing a decline in function. A higher score implies worse quality of care, in that, given adequate risk adjustment, more residents are experiencing a decline in function than what would be expected given their risk factors for decline and the facility mix of persons at different functional levels. Without exception, Detroit facilities are performing better than the cross national reference standard and Michigan facilities as a whole.

Figure 5. Functional Improvement QIs.
 Note. A higher score implies better quality of care.

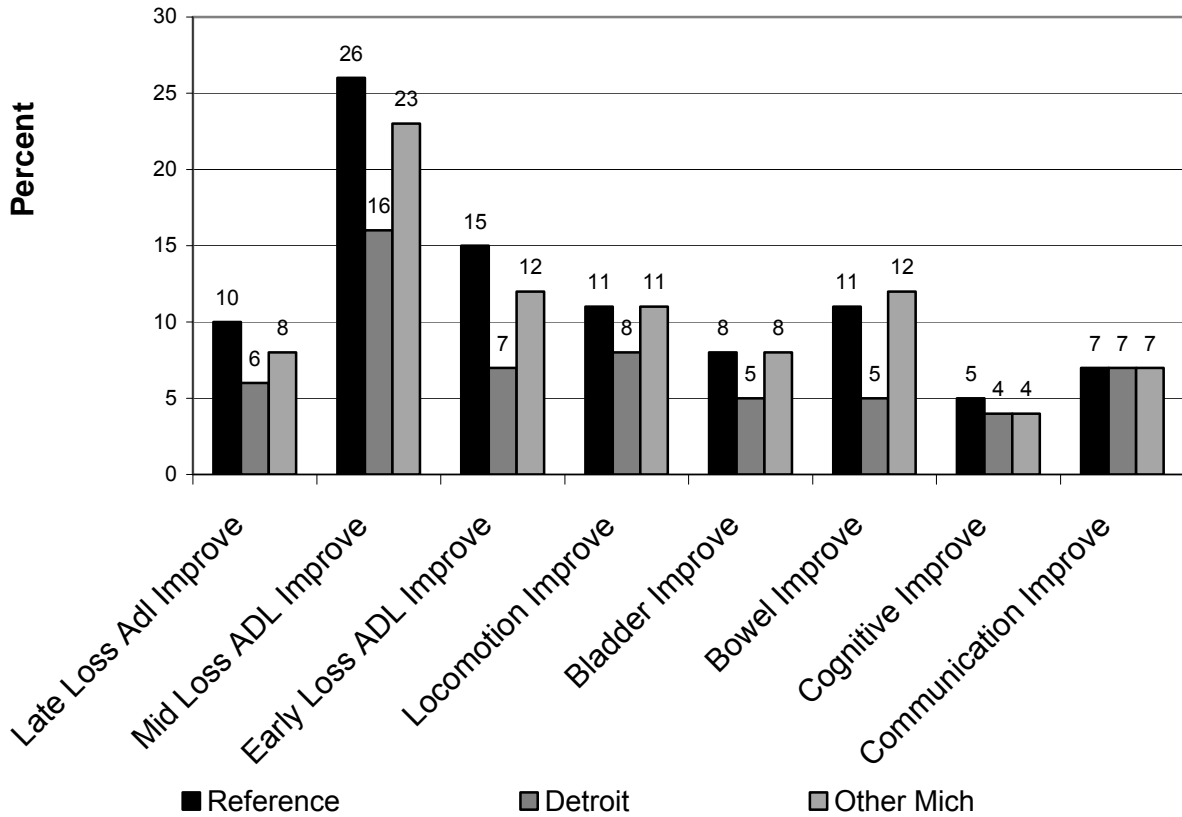


Figure 5 shows functional improvement QIs. These are QIs where higher values imply more residents are experiencing an improvement in function. A higher score therefore implies *better* quality of care, in that, given adequate risk adjustment, more residents are experiencing an improvement in function than what would be expected given their risk factors for improvement and the facility mix of persons at different functional levels. With the exception of *Communication*, Detroit facilities are performing worse than the cross national reference standard and/or Michigan facilities as a whole. Thus, we begin to see that increasing the frequency that Detroit area nursing home residents achieve improvements in function is a good area for improvement.

Figure 6. Clinical Decline QIs.

Note: higher scores imply worse quality of care.

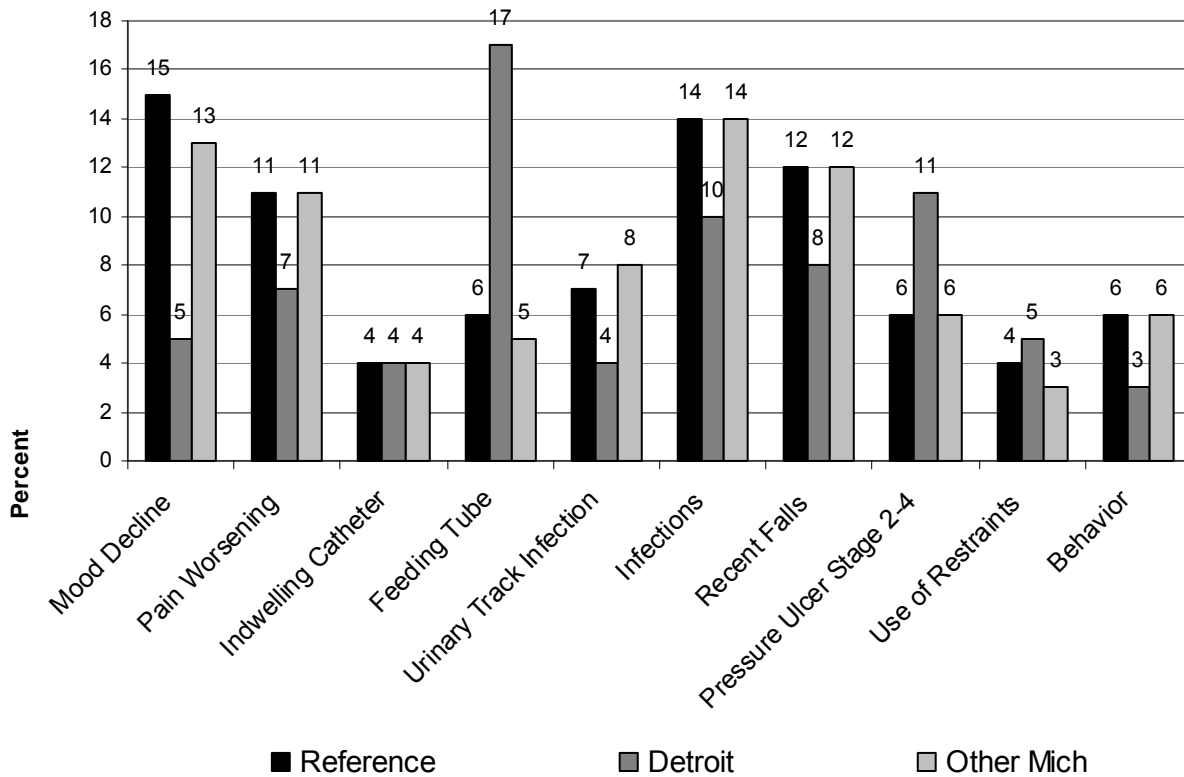


Figure 6 shows clinical QIs. These are QIs where higher values imply more residents are experiencing an unfavorable clinical outcome. A higher score therefore implies *worse* quality of care. That is, given adequate risk adjustment, more residents are experiencing an unfavorable clinical outcome given their risk factors for improvement and the facility mix of persons at different functional or levels of clinical complexity. With the exception of *Feeding Tube*, *Pressure Ulcers* and *Restraints*, Detroit facilities are performing better than the cross national reference standard and/or Michigan facilities as a whole. Thus, we see three target clinical areas for possible intervention.

B. Multi-Dimensionality of Quality Indicators and Composite Quality

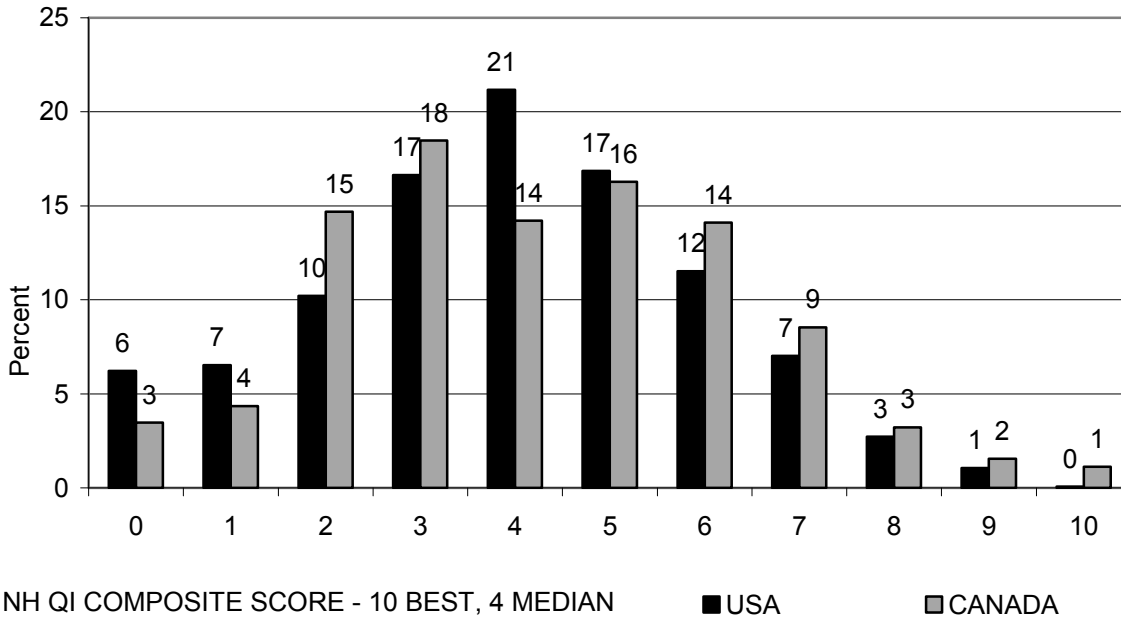
Our experience has shown that nursing home QIs tend to show low correlation with each other. That is, a facility that performs in a “poor” area on one QI may be “average” or “good” on other QIs. This makes it challenging to make blanket statements about the quality of an individual facility that encompasses many areas of care important to residents, their families, and other stakeholders. It also makes it difficult to identify the “best” facilities. As implied by our previous presentation, our approach to composite ranking of facilities is to generate three higher order dimensions of quality based on “bundles” of quality indicators: functional improvement, functional decline, and clinical complexity.

1. A QI Composite

Our composite quality indicator includes 8 functional change QIs including both decline and improvement variants and 11 clinical complexity QIs (e.g., incontinence, pain). We weight the composite so that the most influential component reflects functional measures (80%) and the remainder (20%) reflects clinical complexity measures. We call this the “NH QI Composite”.

The distributional properties of the NH QI Composite are shown in Figure 7. This figure displays the distribution from a cross national data base of nursing home and long term care facilities (including 2 Canadian provinces and 5 US states). The purpose for the cross national reference distribution is to calibrate quality against a true international standard. Given the cross-country relative equivalency in rates, interRAI has adopted this North American distribution as its international standard.

Figure 7. NH QI Composite: USA and Canada Facilities.



As can be seen in Figure 7, the distribution is normal (the skewness coefficient is 0 for US and Canada samples). The US sample has more facilities at the lowest level of quality, the Canadian sample more facilities at the highest level of quality. Most facilities are average performing facilities, with scores around the overall (pooled) sample median of 4.

With the cross national distribution as a reference, it is now instructive to consider how the distribution of the composite falls across multiple US states. In Figure 8, we examine how Michigan compares with two other US states (Massachusetts, Illinois) and the international standard.

Figure 8. NH QI Composite Score in 3 US States

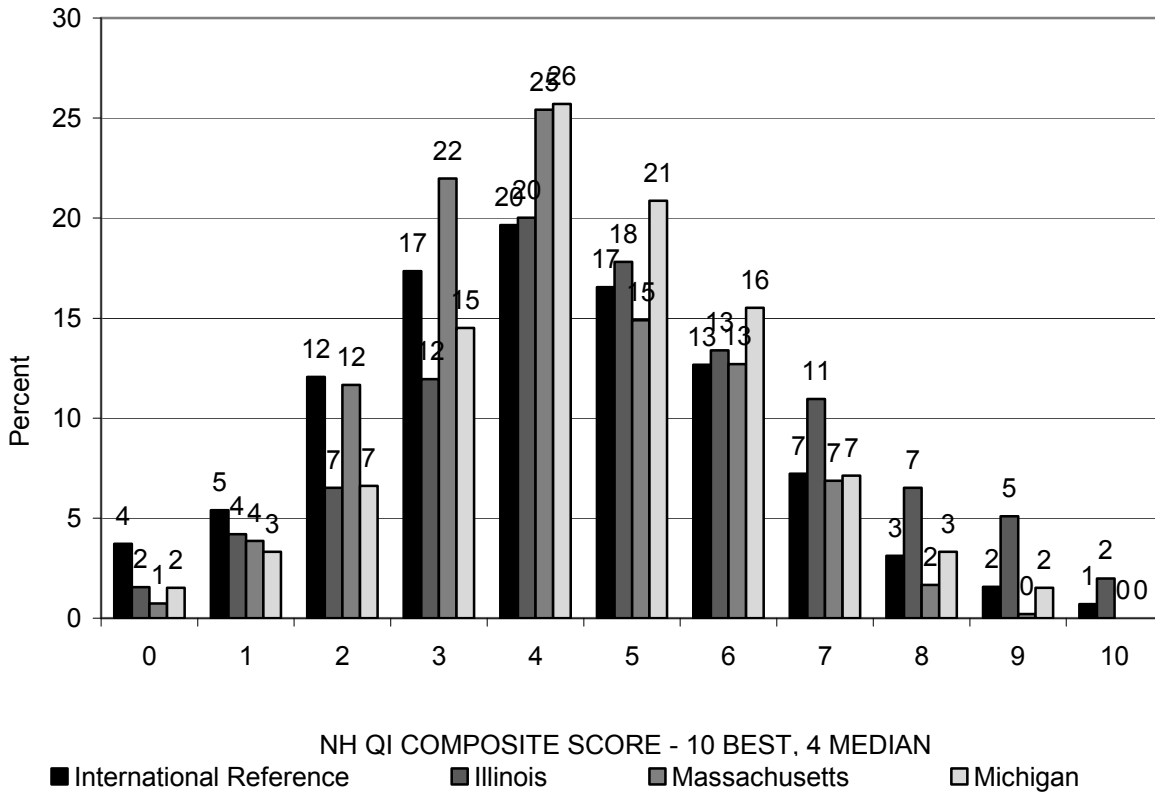
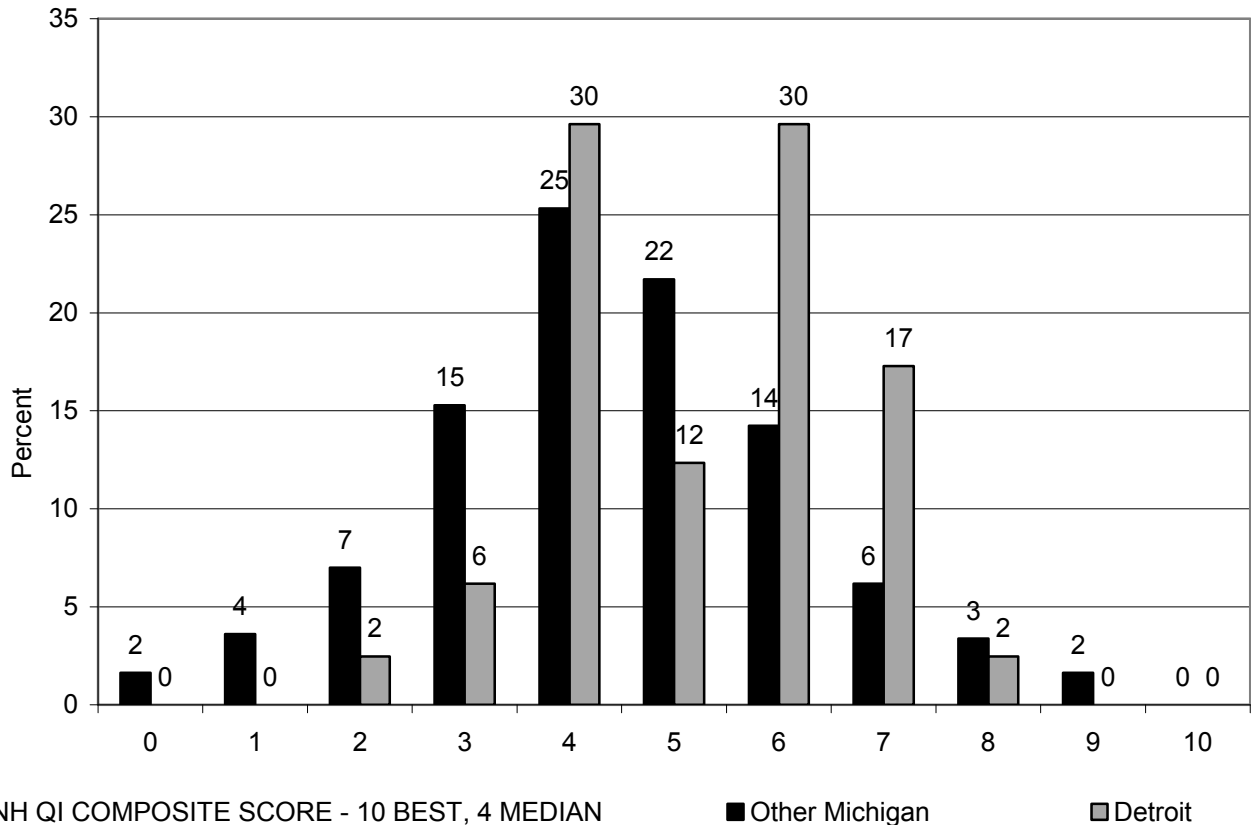


Figure 8 shows that Michigan tends to have a preponderance of “slightly above average” performing homes relative to Illinois, Massachusetts and the international standard. Fewer Michigan facilities rank at the tails of the distribution, and more rank in the middle-high range of the distribution. In Figure 9, we drill down on Michigan facilities, pulling out Detroit area nursing facilities.

Figure 9. NH QI Composite. Michigan and Detroit area Nursing Homes.



In Figure 9 we see that the inter-state variance pattern seen in Figure 8 is replicated within Michigan. That is, Detroit has a relative preponderance of “average” quality nursing homes. The composite score distribution implies the Detroit area nursing homes are slightly skewed towards the higher (better) end of the NH QI Composite distribution.

2. Uses of NH QI Composite

A composite or overall quality measure can be defined. Once so ranked, facilities can be profiled that fit the quality distribution from poor to superior. Steps to follow include determining how best to intervene to turn around poor facilities by introducing best-practice programs to increase the number of average and superior facilities. The composite can be used by facilities for Continuous Quality Improvement (CQI) activities. The composite can be used by

purchasers and other regulatory bodies for regulatory monitoring and oversight. For example, the composite can be used to acknowledge good care when it is observed and to target facilities to work with to stimulate improvement.

For example, a good strategy is a Best-Practice Facility Improvement Program. This involves the introduction of a QI-based quality assurance program. A facility would select one, and later a second, problem QI area. In these targeted areas, the facility would introduce a best-practice protocol improvement program.

Best-Practice Protocols are step-by-step approaches to continuous quality improvement (CQI).

The strategy involves the training of administrative, licensed and non licensed staff on selected best-practice protocols. We (HSL/IFAR) have developed protocols in the following areas:

resident self-care, mobility, pain, depression, delirium, bowel incontinence, and falls (see

Appendix A). There are two options for selecting target areas for improvement. The first is to

identify the care area that is most problematic. This might be ADLs, bladder, mood, and

restraint use, for example. The second is to identify the care area where improvement would

most quickly improve the facility's overall QI Composite score ranking. This might be a different

list. The conceptual difference is that in the second strategy, the goal is to identify those care

areas where performance is "just on the brink" of moving from a "poor" to "average" level of

performance. There are two reasons for choosing this latter strategy. First, a facility can

improve their overall ranking quickly. Second, this reinforces positive CQI behavior and can

have a cascading effect on future CQI efforts. The target areas identified under the two decision

algorithms may be different, so it is worth considering the two from the perspective of resident

safety and rights and the goals and objectives of the facility. Once target QI areas are selected,

the next step is to identify target residents for intervention and to implement care strategies identified in the best practice protocols.

Given that QI performance thresholds are then met for targeted areas, for example, the rate of ADL decline decreases to a specified level, the facility may consider introducing additional best-practice protocols. It is also worth re-assessing aggregate level of quality performance, as it is likely that transference of effects has occurred (i.e., good care practices “spill-over” into other areas of care or resident outcomes).

III. Summary and Next Steps

In this project a partnership between the Institute for Aging Research (IFAR) of Hebrew SeniorLife (HSL) and the University of Michigan (UM) was formed to transfer technology from HSL/IFAR to UM staff for the purposes of developing time-trended facility QI reports. The reports (Appendix B) provide time-trended reports of nursing home QI scores for each facility, relative to a state of Michigan benchmark and brief written summaries of QI reports with helpful interpretative information. This final report includes a description of options for care giving or other intervention strategies for improving quality indicator performance with recommendations for improving quality of care in Detroit nursing homes.

Detailed training on best practice protocol quality improvement activities is available from HSL/IFAR staff (**Appendix A**). We have implemented such training activities in previous research projects funded by various State and Federal agencies. Currently we are evaluating quality improvement activities in our own institution (the Hebrew Rehabilitation Center) and in more than 20 other facilities in Massachusetts via a National Institutes of Health National Institute for Nursing Research grant.

Literature Cited

1. Arling G, Kane RL, Lewis T, Mueller C. Future development of nursing home quality indicators. *The Gerontologist*. 2005;45(2):147-156.
2. Mor V, Angelelli J, Gifford D, Morris J, Moore T. Benchmarking and quality in residential and nursing homes: lessons from the US. *International Journal of Geriatric Psychiatry*. Mar 2003;18(3):258-266.
3. Phillips C. Measuring and assuring quality care in nursing homes. In: Noelker L, Harel Z, eds. *Linking quality of long-term care and quality of life*. New York: Springer Publishing Company, Inc; 2001:162–184.
4. Lohr K. *Medicare: a strategy for quality assurance*: National Academies Press; 1990.
5. Jones R, Hirdes J, Poss J, et al. Adjustment of nursing home quality indicators. *BMC Health Services Research*. 2009;in press.
6. CHSRA. PIP/ORYX: QI Definitions. web page]. June 06, 2001; http://www.chsra.wisc.edu/CHSRA/PIP_ORYX_LTC/QI_Matrix/qi_matrix_6.3_2_page_quarterly_without_section_u.pdf. Accessed March 8, 2002.

Appendix A: Strategies for the Detroit Area an Aging to Improve Care in Detroit Nursing

Homes: Best Practice Care Protocols Delivered by HSL/IFAR

SAVE Project: Best Practice Protocols (BPP)

SAVE BPP	Available Materials	Original BPP	Available Materials	Alternative BPP	Available Materials
Bowel Continence	Powerpoint Presentation Handouts				
Delirium	Powerpoint Presentation Screener	√ Dementia and Delirium	Powerpoint Presentation Handout Screener Assessment	√	Powerpoint Presentation Handouts
Depression	Powerpoint Presentation Handouts Screener Assessment	√	Powerpoint Presentation Handout Screener Assessment	√	Powerpoint Presentation Handouts
Pain	Powerpoint Presentation Handouts	√	Powerpoint Presentation Handout Screener Assessment	√	Powerpoint Presentation Handouts Screener
Self Care for Seniors Mobility	Powerpoint Presentation Handouts Screener	√	Powerpoint Presentation Handout Screener Assessment	ADL Improvement: Walking	Powerpoint Presentation Handouts
		Self Care for Seniors: Dressing	Powerpoint Presentation Handout Screener Assessment		
		Self Care for Seniors: Eating	Powerpoint Presentation Handout Screener Assessment		

SAVE BPP	Available Materials	Original BPP	Available Materials	Alternative BPP	Available Materials
Urinary Incontinence	Powerpoint Presentation Screeener Assessment Tool	√	Powerpoint Presentation Handouts Screeener Assessment	√	Powerpoint Presentation Handouts Screeener Patterning History Assessment
		Pressure Ulcers	Powerpoint Presentation Handouts Screeener Assessment		
		Falls Prevention	Powerpoint Presentation Handouts		
		Dehydration	Powerpoint Presentation Handouts		

Note: This table lists the three types of Best Practice Protocols developed at HSL

1.- SAVE BPP — These BPP developed as part of the SAVE NINR funded project.

Some are updated versions of the original BPP, others are newly developed for the SAVE Project
Column #2 lists available educational materials

2. Original BPP — BPP developed as part of funded projects with DPH in Ohio and Pennsylvania
Column #4 lists available educational materials

3. Alternative BPP — Developed using sources such as American Medical Directors Guidelines, interRAI Clinical Assessment Protocols, Pain Institute, etc.
Column #6 lists available educational materials

SAVE refers to the “Sustaining Achievable Vitality and Effectiveness” project. The overall goal of the project is to increase the number of high quality nursing homes in Massachusetts. We have recently completed our enrollment of nursing homes and are in the process of helping facilities develop organizational continuous quality improvement systems together with best practices targeted to specific functional and clinical care treatment areas. This research project is supported by the National Institutes of Health, National Institute on Nursing Research, John Morris, PhD, Principal Investigator.

Appendix B: Detroit Nursing Home Time Trended Quality Indicator Reports

Preamble: Interpreting QI Reports

Below is an example of a report for a single QI in a single nursing home.

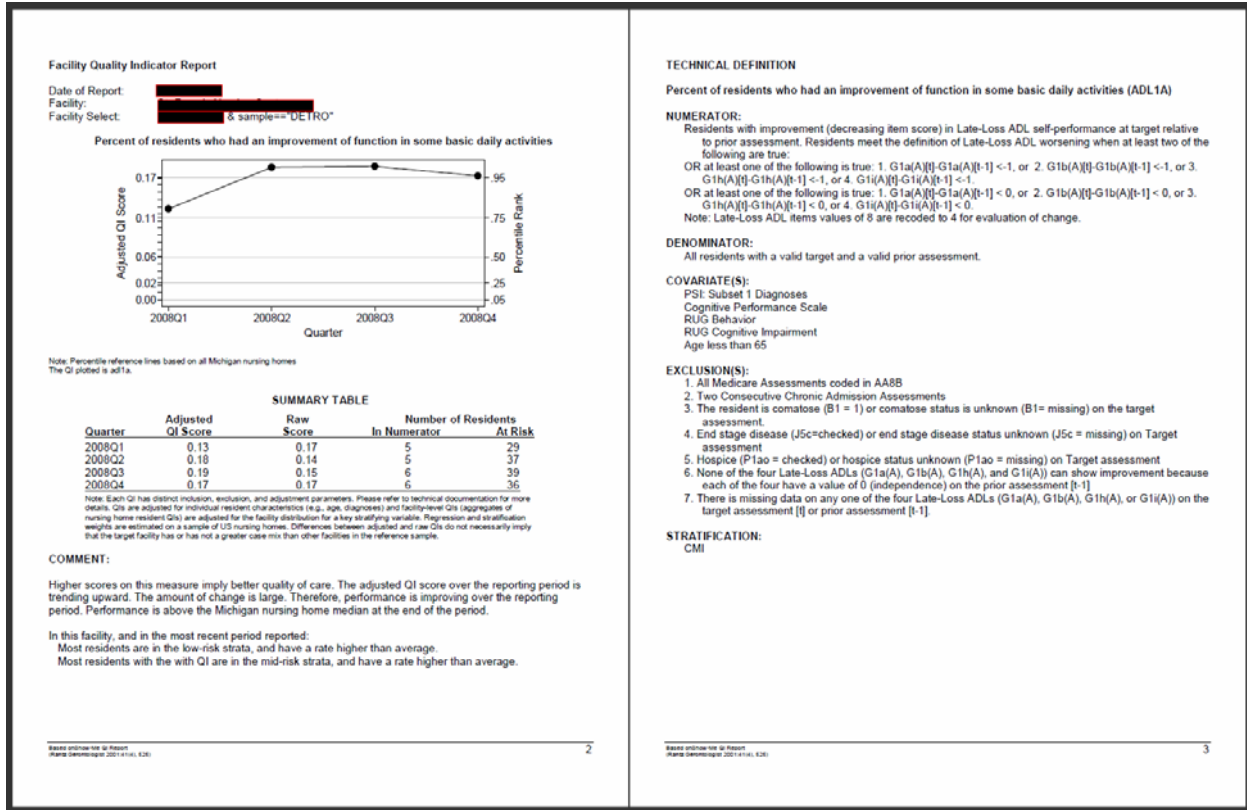


Figure B.1 Example of a QI report

Each QI is reported in a two page report. The facing page (the left panel, above) contains the numerical and time-trended results for the given facility. The right panel (reverse page) shows the technical specification of the QI. Reference to the technical specification is not needed to interpret the report. However, we often find people want to know the details of how the QI was constructed, what factors were used in risk adjustment, and how case mix stratification was operationalized at the time of inspection of the facility report. The remainder of this

preamble will cover the interpretation of the facing page, and a larger image is reproduced in Figure B.2.

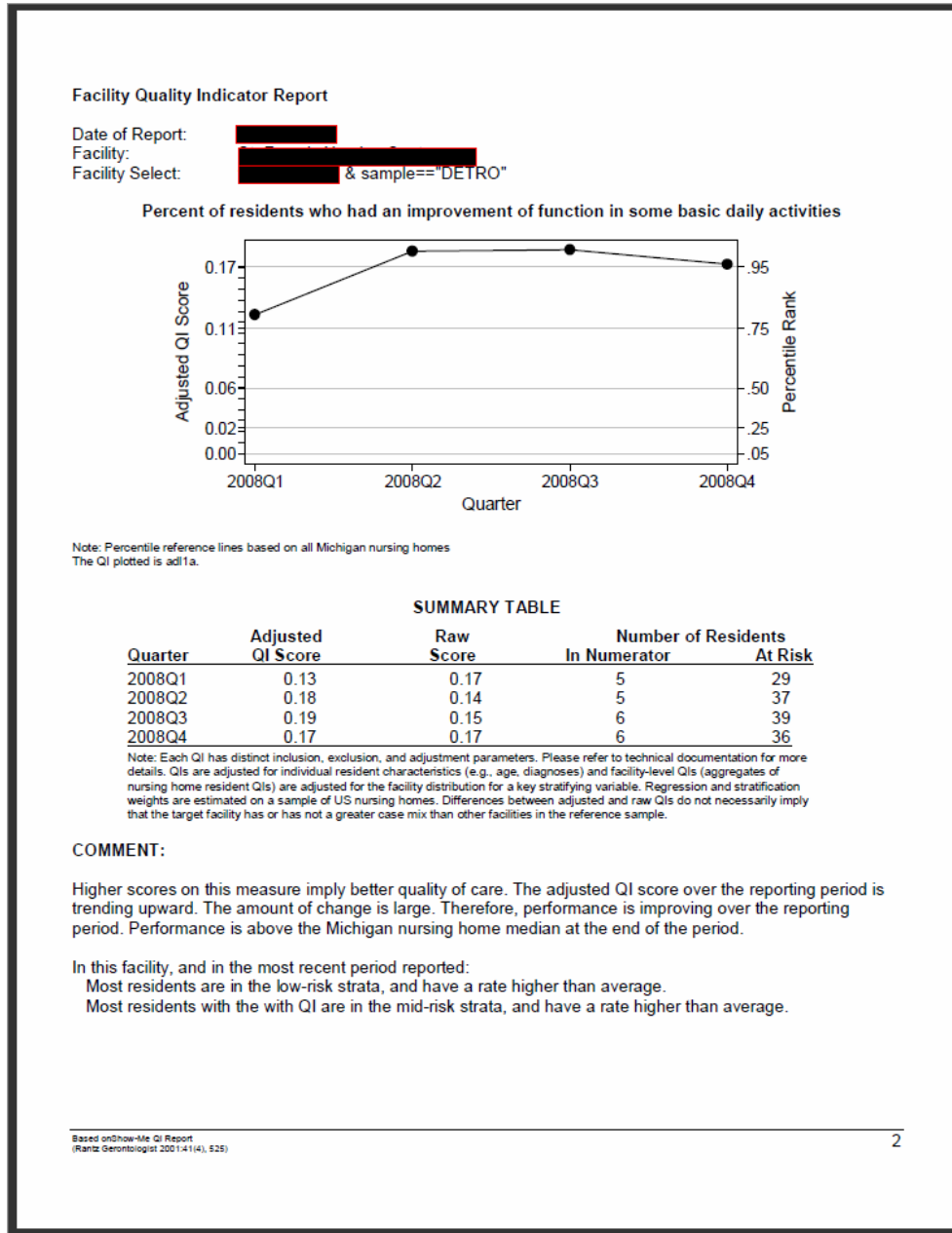


Figure B.2 Example of a QI report: Facing Page

1. Identification Information

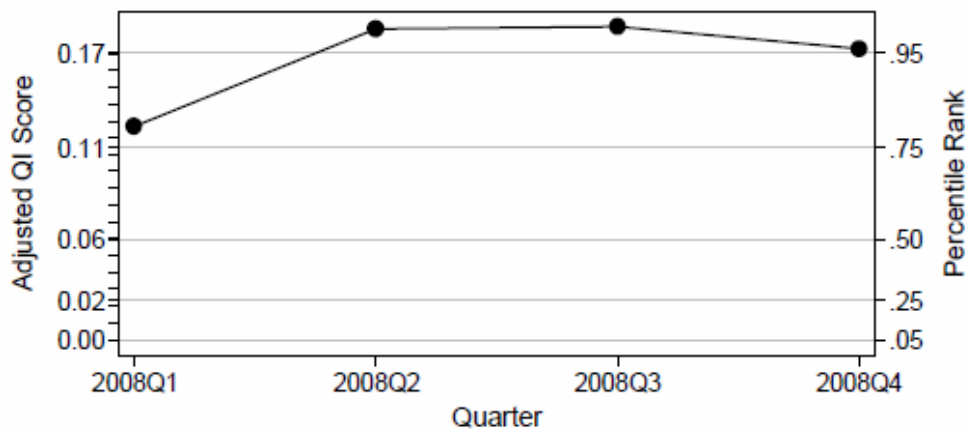
The top of the Facility Quality Indicator report provides details on the date of the report, the name of the facility, and the facility code that was used to identify the facility in the database.

This last field can be a locally defined field, and may or may not map on to formal facility identifiers used by regulatory agencies.

2. Time Trend Graphic

The middle portion of the report contains a graphical time trend report. This graph displays the mean adjusted QI score over the most recent four quarters. The long name of the QI is shown above the figure. Explicit identification of the QI is given through the “QI Handle”, which in this example is “adl1a”. The handle is reported in the footnote to the graph. Each QI has a unique five character handle. Since some QIs have similar common names, it is important to always include the handle when referring to specific QIs.

Percent of residents who had an improvement of function in some basic daily activities



Note: Percentile reference lines based on all Michigan nursing homes
The QI plotted is adl1a.

Figure B.3 Example of a time-trend graphical summary

The y-axis of this graph shows the QI score. On the left y-axis, the Adjusted QI score is reported. On the right y-axis, percentile scores are marked. Percentiles are obtained by examining the distribution of the QI in a reference sample. The reference sample is defined in the footnote of the graph. In this example it is “all Michigan nursing homes.” Reference lines are drawn at the 5th, 25th, 50th, 75th and 95th percentile in the reference sample. The x-axis marks time. The most recent quarter is shown on the right.

The dots and lines mark and connect the adjusted QI scores for the given facility. A facility that is scoring at the 50th percentile has a rate of the QI outcome that is perfectly consistent with what would be expected given resident risk factors and case-mix in the nursing home. As adjusted scores deviate from the 50th percentile, a facility may be performing better or worse than expected. Whether a high score implies “good” or “bad” performance depends on the QI. Some QIs are “good” in the sense that high QIs indicate good performance, others are “bad” in that high scores imply “poor” performance. The text below the table (described below) is provided to help sort out whether the performance is “good” or “bad”.

In some cases a “dot” may be missing. This means that there was not sufficient data to compute an adjusted QI for the facility in the selected time period. Usually this is because the denominator was too low (i.e., too few residents met eligibility criteria for the QI). Insight into this can be gleaned from the summary table, which is underneath the figure.

In the example shown in Figure B3, the facility is performing very well. We know the facility is performing well because this is a “good” QI (improvement of function). We know performance is exceptional because the most recent adjusted QI scores are falling at or above the 95th

percentile. That means that the facility is performing better than 95% of all other Michigan facilities.

3. Summary Table

Below the graphical summary is a detail table that supports the graphic. This table reports the quarter, the adjusted QI score, the Raw Score, and the number of residents satisfying inclusion criteria for the numerator and denominator (At Risk) for the QI.

Quarter	Adjusted QI Score	Raw Score	Number of Residents In Numerator	At Risk
2008Q1	0.13	0.17	5	29
2008Q2	0.18	0.14	5	37
2008Q3	0.19	0.15	6	39
2008Q4	0.17	0.17	6	36

Note: Each QI has distinct inclusion, exclusion, and adjustment parameters. Please refer to technical documentation for more details. QIs are adjusted for individual resident characteristics (e.g., age, diagnoses) and facility-level QIs (aggregates of nursing home resident QIs) are adjusted for the facility distribution for a key stratifying variable. Regression and stratification weights are estimated on a sample of US nursing homes. Differences between adjusted and raw QIs do not necessarily imply that the target facility has or has not a greater case mix than other facilities in the reference sample.

Figure B.4 Example of a summary table

The footnote of the table refers to technical documentation for the QI for an explanation of the numerator, denominator, risk adjustors, and stratification variable for the QI. This is the documentation that appears on the reverse side of the facility-specific report. (Note, for all QIs, the same definition is applied to all facilities).

In the example in Figure B4, we see that the facility was of good size, and had sufficient numbers to compute an adjusted score. See the overview provided in the main project report and our published report on QI construction for details on how the adjusted score is derived.

This facility had an adjusted score that was equal to or lower than the observed score for each

QI for most of the periods in the reporting period. This implies that the raw score is in part due to a low burden of resident risk factors and case mix. Because this is a “good” QI, we interpret the result the following way: relative to the risk adjustment calibration sample, this facility had a low relative frequency of residents who were likely to experience improvement in functioning.

4. Interpretative Information

At the bottom of each QI report, some interpretative information is provided. This information includes a reminder that the QI is a so-called “good” or “bad” QI, and what high scores imply about quality. In addition, this section includes a summary of the overall trend over the reporting period (whether there is a linearly decreasing or increasing trend), and where the facility is performing in the final quarter.

COMMENT:

Higher scores on this measure imply better quality of care. The adjusted QI score over the reporting period is trending upward. The amount of change is large. Therefore, performance is improving over the reporting period. Performance is above the Michigan nursing home median at the end of the period.

In this facility, and in the most recent period reported:

Most residents are in the low-risk strata, and have a rate higher than average.

Most residents with the with QI are in the mid-risk strata, and have a rate higher than average.

Figure B.5 Example of a summary table

The interpretative information also provides information about the relative distribution of residents in the facility and in the reference sample according to risk strata. This information is provided for the most recent reporting period only.

The first element of this distribution information (in the example in Figure B5, “Most residents are in the low-risk strata, and have a rate higher than average”) provides information about the distribution of residents in the target facility. We already had some inclination that this target

facility had a relatively high frequency of residents at “low risk” of “functional improvement” from the direction of the difference in the raw and adjusted QI scores. This note confirms our inference. Most of the residents in this facility are at relatively low risk of experiencing a functional improvement. In other words, this facility has a high relative frequency of patients unlikely to improve functionally. The report also lets us know that for this facility, in this stratum (the low-risk strata), the rate of improvement is greater than average. Therefore, we now know that for most of the residents in the facility, who happen to be at very “low risk” for “functional improvement”, the outcomes for these residents are better than average. This accounts in large measure for the overall good performance of this facility on this QI.

The second element of the distribution information (in the example in Figure b5, “Most residents with the QI are in the mid-risk strata, and have a rate higher than average”) lets us know about the distribution of the residents in the facility that have the QI (i.e., who do improve functionally). Note that the first element of the distribution (previous paragraph) reports on the distribution of residents in the denominator of the QI, and this second element describes the distribution of residents in the numerator of the QI. So in this example, we know that most of the residents in the facility who do end up experiencing an improvement in function happen to be in the mid risk strata. This facility is also able to generate improvement rates in this stratum that are far above average.

5. Using the Reports in Continuous Quality Improvement

With this information, facility administrators can choose QIs to target for improvement, and drill down to the kinds of residents for whom improvement activities may be best targeted. For

example, in the example presented, this QI area would not be targeted for improvement. The facility is doing very well.

Consider an example where performance far from the 50th percentile and in a direction that implies poor quality of care. Such an example would be an indication that the QI is a good one to target. Administrators should focus on QIs that are consistently beyond the 75th or 25th percentile, or consistently trending in a “poor” direction and most recently near or above the 75th or 25th percentile, as appropriate. Then, knowing that most of the residents with the QI outcome are in the “mid” risk strata, for example, the facility administrators would know the type of residents that are most commonly displaying the QI outcome, and direct quality improvement activities towards these residents. Progress on efforts directed at improvement can be periodically evaluated as the QI reports are updated.