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# Research Briefs

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## Resource Dependence and Institutional Elements in Nursing Home TQM Adoption

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**Objective.** To examine the contextual attributes that influence nursing home TQM adoption, as informed by resource dependence and institutional theories.

**Data Sources.** A survey of licensed nursing home administrators in the Commonwealth of Pennsylvania during 1994–1995, the Medicare and Medicaid Annual Certification Survey (MMACS) data file, and the Area Resource File (ARF).

**Study Design.** Because the dependent variable (TQM adoption vs. non-adoption) is dichotomous, the model was estimated using logistic regression.

**Data Collection.** Of the 615 facilities that were mailed surveys, 241 (39.2%) returned completed questionnaires. No significant differences were observed between respondents and nonrespondents in size, for-profit status, system membership, registered nurse staffing, cited licensure deficiencies, Medicare census, or Medicaid census.

**Principal Findings.** Perceived competition, Medicare's share of total hospital discharges in the market, and facility Medicare census were significant predictors of TQM adoption.

**Conclusions.** Our results provide limited support for the association between some rational adaptive and institutional factors and TQM adoption in nursing homes. Perceived competition and the influence of the Medicare program both at the facility and the market level are associated with TQM adoption. However, other factors associated with TQM adoption in other industries, such as size, are not associated with TQM adoption in the nursing homes in this study.

**Key Words.** Nursing home facilities, total quality management (TQM), institutional theory, resource dependency theory

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Total Quality Management (TQM) refers to “a structured system for creating organization-wide participation in planning and implementing a continuous improvement process that meets and exceeds customer needs” (Wilson 1992: 227). As defined by Kimberly (1981), TQM qualifies as an administrative innovation in that it signifies “a new program or technique that represents a significant departure from the state of the art at the time it first appears

affecting the location, quality, or quantity of information that is available in the decision-making process". Kaluzny, McLaughlin, and Jaeger (1993) described TQM as "a managerial innovation that is likely to have profound consequences on the delivery of health care services." Within the context of the nursing home industry, this study attempts to advance knowledge of this important process innovation by examining the organizational and environmental factors associated with TQM adoption.

Prior research indicates that the adoption of innovations is a complex process, influenced by both technical (rational) and nontechnical (institutional) factors (Kimberly 1981; Burns and Wholey 1993). We use two complementary theoretical perspectives, resource dependence and institutional theories, to identify rational adaptive and institutional contextual factors associated with TQM adoption. These theories have been used in combination in prior organizational studies of change and innovation in healthcare and other industrial contexts (Ginsberg and Buchholtz 1990; Greening and Gray 1994; Oliver 1991; Tolbert 1985).

Much of the current literature on TQM in hospitals focuses on the realities of implementation rather than adoption, suggesting a maturation of the innovation in this health care industrial sector (Boerstler, Foster, O'Connell, et al. 1996; Carman, Shortell, Foster, et al. 1996; Arndt and Bigelow 1995; Motwani, Sower, and Brashiar 1996). Unlike hospitals, nursing homes have historically operated in a relatively stable environment. Lacking an external imperative, these facilities have historically tended to lag behind hospitals in innovation adoption. In more recent years, the industry has been faced with a barrage of regulatory reforms and increased competition. These developments signal the rapid environmental changes that are challenging the nursing home to redefine its role within the healthcare system. Passage of the Nursing Home Reform Act as a title of the Omnibus Budget Reconciliation Act of 1987 resulted in greater regulatory emphasis on the clinical outcomes of nursing home care in addition to the capacity or capability to provide care. The Health Care Financing Administration (HCFA) is exploring whether nursing homes can be paid on the basis of the quality, as well as the quantity

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of services provided (Health Care Financing Administration 1991; Aaronson, Zinn, and Rosko 1994). Finally, nursing home facilities are facing increasing competition from both hospital- and community-based substitutes with claims of higher quality and lower costs (Zinn, Aaronson, and Rosko 1992). These environmental developments signal a new emphasis on the improvement of processes contributing to the quality of nursing home care. Because increased regulatory and competitive pressures suggest that nursing care facilities must be more responsive to the demands of both internal (residents, nursing staff, physicians) and external customers (families, regulators, and payers), TQM holds particular promise as a means for implementing process improvement in this setting (Zinn, Aaronson, and Rosko 1992; Zinn, Brannon, and Weech 1997).

## CONCEPTUAL FRAMEWORK AND HYPOTHESES

This study conceptualizes TQM as an administrative innovation, utilizing the variance perspective on innovation adoption by considering the explanation for adoption at a particular point in time (Kaluzny, McLaughlin, and Jaeger 1993; Shortell, O'Brien, Carman, et al. 1995). This perspective argues that organizational and environmental factors predict TQM adoption. Two complementary theoretical perspectives, resource dependence and institutional theory, are used to articulate specific organizational and environmental factors motivating TQM adoption.

Resource dependence theory is premised on the rational adaptation to exogenous changes in the environment. Under this premise, organizational transformation is viewed as an intentional strategy designed to enhance survival in the face of changing economic or technological circumstances (Ginsburg and Buchholtz 1990). Institutional theory, on the other hand, is premised on the need to establish organizational legitimacy. Under this premise, an organization is viewed as linked in a network that constitutes the institutional environment (Tolbert 1985). Both theories view organizational actions as a response to environmental pressures, but differ with respect to their views on environmental determinism and the source of environmental pressure (Oliver 1991). Resource dependence theory emphasizes rational adaptation in the face of external dependence and is more explicit about managerial choice in the context of constraints. However, the degree of managerial choice is related to the sufficiency of the organization's own resources.

Institutional theory is more deterministic in arguing for the causal primacy of the environment in organizational innovation. Despite this difference, a growing number of studies emphasize the complementarity of the two theories as an explanation of responses to organizational pressures (Ginsberg and Buchholtz 1990; Greening and Gray 1994; Oliver 1991; Tolbert 1985; Judge and Zeithmal 1992). The essence of the integrative perspective is that organizations exercise strategic choice, but do so within the constraints posed by organizational capabilities and institutional environments. Since TQM adoption in nursing homes is an administrative innovation with both rational adaptive and institutional aspects, both perspectives are used in the formation of hypotheses.

*The Influence of Competition on TQM Adoption.* According to resource dependence theory, an important environmental factor mediating environmental change is the intensity of market competition. The ability to respond to the needs of key resource-providing constituents is critical in more competitive environments because of the greater demands on a shared pool of limited resources (Pfeffer and Salancik 1978; Ulrich and Barney 1984). The presence of a formalized TQM program, with its strong customer focus, is a visible indicator of the facility's efforts to accommodate to the needs of both external and internal constituents. This in turn provides competitive advantage in securing the flow of resources from these constituencies.

**Hypothesis 1.** Facilities located in more competitive markets are more likely to adopt TQM.

*The Influence of Size on TQM Adoption.* Organizations vary in their ability to respond to environment conditions. For example, population ecologists argue that large organizations develop a structural inertia that impedes innovation (Hannan and Freeman 1984). On the other hand, resource dependence theorists argue that large organizations command greater internal resources, including larger administrative staffs, that may facilitate accommodation to environment demands through internal restructuring (Greening and Gray 1994). Slack resources may also provide the organization with the flexibility to experiment with new strategies and organizational routines by lowering the risk of failure during change (Kaluzny, McLaughlin, and Jaeger 1993). Supporting this position, adoption of TQM was found to be most widespread among hospitals with 400 or more beds (Barness, Shortell, Gillies, et al. 1993).

**Hypothesis 2.** Larger facilities are more likely to adopt TQM.

*The Influence of Medicare and Managed Care Market Penetration on TQM Adoption.* Hospitals provide nursing homes with a key resource in the form

of resident admission referrals. Implementation of Medicare's prospective payment system (PPS) for hospitals created incentives to shorten hospital stays and increased demand for post-discharge treatment alternatives capable of caring for patients of higher acuity. However, shorter lengths of stay leave hospitals vulnerable to the charge, rightly or wrongly, of discharging patients "quicker and sicker." In order to protect their own reputations, hospitals will direct referrals to nursing homes that project an image of quality. TQM may contribute to this image by demonstrating a commitment to quality improvement. As the proportion of Medicare patients in the hospitalized population increases, it becomes more important for nursing homes to demonstrate the ability to respond to the need for quality post-discharge care required by referring hospitals.

HMOs, in looking for less costly alternatives to hospitals for beneficiaries with specific conditions such as AIDS or brain injuries, now enter into contracts directly with nursing homes and represent an alternative source for resident admissions. As managed care assumes a major market presence, the importance of securing managed care contracts as a source of financially attractive admissions increases. Evidence of ongoing quality improvement, such as the presence of a formal TQM program, may become a criterion for provider selection.

**Hypothesis 3.** Facilities located in areas with a higher proportion of Medicare hospital discharges are more likely to adopt TQM.

**Hypothesis 4.** Facilities located in areas with greater HMO market penetration are more likely to adopt TQM.

*Experience with the Medicare Program and TQM Adoption.* Zinn and colleagues (1997) have speculated that nursing homes with a high proportion of Medicare recipients in total resident census have stronger ties to hospitals because Medicare-eligible admissions to nursing homes are usually discharged from hospitals. Frequent commercial transactions allow organizations to exchange information about managerial practices and expectations. One such managerial practice is TQM, which is more widely used in hospitals than in nursing homes. Hospitals are an important component of the institutional environment for nursing homes that transact frequently with hospitals. Institutional theory would predict that these nursing homes will adopt the formalized TQM programs typical of hospitals.

**Hypothesis 5.** Facilities with a greater proportion of Medicare recipients in total resident census are more likely to adopt TQM.

## METHODS

*Sources of Data.* The data for this study were obtained primarily from a survey on quality improvement conducted among administrators of licensed nursing care facilities in the Commonwealth of Pennsylvania during 1994–1995. Of the 615 facilities that were mailed surveys, 241 (39.2 percent) returned completed questionnaires. By comparison, recent published studies based on mail surveys of nursing home administrative staff report widely varying response rates, from 27 percent in Florida (Kisor 1996) to 73 percent in Maine (Coburn et al. 1996). To determine the potential for response bias, *t*-tests were performed comparing the mean characteristics of respondents with those of all Medicare/Medicaid–certified facilities in Pennsylvania. No significant response bias was found related to size (number of beds), for-profit status, system membership, average Medicare census, average Medicaid census, registered nurse staffing, or the number of licensure survey cited deficiencies. Thus, we conclude that the characteristics of responding facilities did not depart from those of the general population of Pennsylvania nursing facilities. Of the 241 respondents, 184 facilities (76 percent) indicated practicing quality improvement activities.

Facilities had to meet all of the following five criteria to be classified as TQM adopters: (1) a written statement of philosophy or commitment to TQM; (2) use of a structured problem-solving approach incorporating statistical methods and measurement to identify quality problems and monitor improvements; (3) use of teams involving employees from multiple departments and from different organizational levels as the major mechanism for analyzing and improving processes; (4) systematic assessment of satisfaction data from residents; and (5) empowerment of employees to identify and take action on quality improvement problems and opportunities. The five characteristics defining a formal TQM program were chosen for their relevance in the context of the nursing home industry and for their consistency with criteria used in other industrial contexts, including the hospital industry (Nohria and Green 1996; Shortell, O'Brien, Carman, et al. 1995; Barness, Shortell, Gillies, et al. 1993). Consistency of criteria facilitates comparison with different healthcare providers as well as across industries. Of those 184 facilities employing a quality improvement strategy, 66 facilities (36 percent) met all five criteria and were categorized as TQM adopters.

Data on other nursing home characteristics were obtained from the Medicare and Medicaid Annual Certification Survey (MMACS) data file. The information contained in the MMACS is routinely collected through the

Medicare and Medicaid certification process conducted by state licensure and certification agencies. The MMACS data were then merged with local market area data from the Area Resource File. Consistent with previous nursing home industry studies, the county was used to approximate the market for nursing home services (Nyman 1987).

*Operationalization of Variables.* Table 1 presents the sources and definitions for all the variables included in the analytical model. The dependent variable, TQM adoption, was entered as a binary variable (0,1) with a value of 1 signifying that the facility is a TQM adopter, and 0 a non-adopter.

Competition among facilities (hypothesis 1) was operationalized by both subjective and objective measures. Perceived intensity of competition was measured by a questionnaire item asking respondents to rate (on a 10-point Likert-like scale) the degree of competition in their local market. The degree of market share concentration was measured by a Herfindahl index constructed on the basis of bed capacity. The index varies from 0 to 1 with higher values signifying greater concentration and hence less competition. Excess capacity was measured by the average number of unoccupied beds per facility in a given market (Nyman 1987). The availability of hospital-based substitutes for

Table 1: Definitions and Sources of Variables

<i>Variable</i>	<i>Definitions</i>	<i>Sources</i>
<i>Dependent Variable</i>		
TQM Adoption	Nursing home has adopted TQM (0, 1)	TQM Survey
<i>Independent Variables</i>		
Perceived competition	Administrator's perception of intensity of market competition (scale 1-10)	TQM Survey
Herfindahl index	Index of nursing home market concentration	MMACS
Excess capacity	Average number of empty beds per facility in the county	MMACS
Hospital-based substitutes	Number of hospital units in the county providing inpatient or outpatient long-term care services	ARF
Nursing home size	Number of beds in the facility	MMACS
Medicare market penetration	Proportion of hospital discharges in county covered by Medicare	ARF
HMO membership	Proportion of county residents who are HMO members	ARF
Proportion Medicare	Proportion of nursing home residents with Medicare coverage	MMACS
Per capita income (log)	Average per capita income in county	ARF

nursing facility care was measured by the number of hospitals in the county offering long-term care services on an outpatient or inpatient basis. Greater excess capacity and availability of hospital-based substitutes in a given market should increase competition among nursing home facilities.

Other factors hypothesized to be associated with TQM adoption included the number of beds in the facility (hypothesis 2), the proportion of Medicare hospital discharges in the county (hypothesis 3), the proportion of county residents who are HMO members (hypothesis 4), and the proportion of Medicare recipients in total facility resident census (hypothesis 5). The log of per capita income was included to control for differences in economic conditions across markets that may influence nursing home behavior.

*Statistical Analysis.* Because the dependent variable (TQM adoption versus non-adoption) is categorical, the model was estimated using logistic regression (Greene 1993). While comparable to ordinary least squares regression, the coefficients in a logistic regression model are interpreted as the logarithm of the odds of an event occurring given the independent variables specified in the model.

## RESULTS

Table 2 presents means and standard deviations for the independent variables. Examination of the correlation matrix indicated that all of the correlation coefficients are less than .8 in absolute value, a threshold commonly used for the detection of multicollinearity (Kennedy 1992). Table 3 presents the logistic regression results. The model fit the data reasonably well (Chi-square = 22.34,  $p = .008$ ), with about 70.4 percent of cases correctly predicted.

Table 2: Descriptive Statistics for Independent Variables Used in Logistic Regression

<i>Variable</i>	<i>Mean</i>	<i>s.d.</i>
Perceived competition	7.120	2.497
Herfindahl index	.332	.198
Excess capacity	11.324	4.826
Hospital-based substitutes	21.781	23.730
Facility size	137.080	102.137
Medicare market penetration	.407	.052
HMO membership	.183	.573
Proportion Medicare	0.110	0.175
Per capita income (log)	17477.00	3566.19



Partial support was found for hypothesis 1. TQM adoption was positively and significantly related to the level of perceived competition. It was not related, however, to other measures of competition. There was also support for hypothesis 3. A nursing home located in a market with higher Medicare market penetration is more likely to adopt TQM. Finally, supporting hypothesis 4, TQM adoption was significantly and positively related to the facility's Medicare census. However, the remaining hypotheses were not supported. TQM adoption was related neither to facility size nor to HMO market penetration.

## DISCUSSION

Our results provide limited support for the association between rational adaptive and institutional factors and TQM adoption in nursing homes. Perceived competition, Medicare market penetration, and the proportion of Medicare recipients in total facility resident census were significantly associated with TQM adoption. However, while perceived competition was associated with TQM adoption, other presumably more objective competition indicators (the Herfindahl index, excess capacity, and availability of substitutes) were

Table 3: Results of Logistic Regression Analysis for TQM Adoption

<i>Variable</i>	<i>Regression Coefficient</i>	<i>Std. Error</i>
Intercept	-16.493	12.662
Perceived competition	0.226**	0.082
Herfindahl index	1.556	2.420
Excess capacity	-0.054	0.040
Hospital-based substitutes	0.003	0.010
Facility size	-0.001	0.002
Medicare market share	6.980**	3.496
HMO membership	0.167	0.325
Proportion Medicare	2.363**	0.999
Per capita income (log)	1.168	1.266

-2 Log-likelihood = 233.413

Chi-square = 22.335

Significance level  $p = .008$

Association of predicted probabilities and observed responses:

Concordant = 70.4%

Discordant = 29.2%

Tied = 0.4%

\*\* Significant at  $p < .01$ ; \*significant at  $p < .05$ .

not. This suggests that regardless of the degree of actual competition, if the organization does not perceive a competitive threat, adaptive behavior will not occur. In keeping with the concept of "enacted environments," only those facilities whose managers perceive significant competition respond in ways that may improve competitive position (Weick 1979).

The influence of the Medicare program at both the market and the facility level was also associated with TQM adoption. Institutional theory provided the conceptual basis for predicting an association between TQM adoption and the extent of individual facility Medicare program participation. Nursing homes with greater involvement with the Medicare program, signifying more direct exposure to hospital practices, were predicted to be more likely to conform to hospital quality improvement standards through TQM adoption. The adoption of formalized TQM may have a rational, adaptive component as well as an institutional component. Facilities with higher Medicare census are likely to have higher resident acuity. TQM may be adopted by facilities as a means to better manage the care of residents with more complex care needs. Supporting this contention, TQM adopters were found more likely to report improvements in resident outcomes and employee relations as a motivation for quality improvement (Zinn, Brannon and Weech 1997).

The lack of significant association between nursing home size and TQM adoption found in this study is contrary to findings from studies in other settings. Barnes, Shortell, Gillies, et al. (1993) found larger hospitals more likely to adopt TQM. Larger firms (Xerox, Motorola, Eastman Kodak, etc.) are typically pioneers of TQM adoption in other industries as well (Nohria and Green 1996). However, a study of the degree of TQM implementation (as opposed to adoption) in hospitals did not find a relationship with size (Shortell, O'Brien, Carman, et al. 1995). It may be that the competing implications of size for innovation adoption (inertia versus slack) cancel each other out. The hypothesized relationship between HMO market penetration and TQM adoption was also not supported by the results. The relatively low nursing home involvement with managed care in the Pennsylvania market (about 3 percent report having HMO contracts) may partially account for this finding.

*Limitations of the Study and Future Directions.* Ideally, other factors that could influence the organization's decision to adopt a managerial innovation would have been included in the model. For example, homes that are part of a multifacility chain may be subject to corporate mandates to adopt managerial practices like TQM. However, perhaps because we lacked information on

the size of the chains represented in our sample or on the degree to which they exercise centralized control, we were unable to establish an association between for-profit status or chain membership and TQM adoption. Finally, it may be that Pennsylvania nursing homes are unique in ways that limit generalizability to those in states with different regulatory and competitive environments. For example, our study found no effect related to the proportion of Medicaid residents in individual facilities. However, states differ with respect to Medicaid reimbursement policies that affect both the type and level of reimbursement, and these differences may influence TQM adoption.

Because a nursing home may adopt formal TQM but practice it on only a limited basis, future research might consider factors influencing the extent of implementation. Case studies of TQM implementation in hospitals indicate that the dissemination of the program may not be widespread (Boerstler, Foster, O'Connor, et al. 1996). Sheridan et al. (1995) examined TQM effectiveness in 30 nursing homes and found that integrated approaches involving several functions produce better results than piecemeal approaches. As observed in the most thorough study to date of hospital quality improvement implementation (Shortell et al. 1995), organizational culture is a critical enabling variable that should be addressed in future studies.

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