Public Policy Impact

How State-Funded Home Care Programs Respond to Changes in Medicare Home Health Care: Resource Allocation Decisions on the Front Line

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Objective. To examine how case managers in a state-funded home care program allocate home care services in response to information about a client's Medicare home health care status, with particular attention to the influence of work environment.

Data Sources/Study Setting. Primary data collected on 355 case managers and 26 agency directors employed in June 1999 by 26 of the 27 regional agencies administering the Massachusetts Home Care Program for low-income elders.

Study Design. Data were collected in a cross-sectional survey study design. A case manager survey included measures of work environment, demographics, and factorial survey vignette clients ($N = 2,054$), for which case managers assessed service eligibility levels. An agency director survey included measures of management practices.

Data Collection/Extraction Methods. Hierarchical linear models estimated the effects of work environment on the relationship between client receipt of Medicare home health care and care plan levels while controlling for case-mix differences in agencies' clients.

Principal Findings. Case managers did not supplement extant Medicare home health services, but did allocate more generous service plans to clients who have had Medicare home health care services recently terminated. This finding persisted when controlling for case mix and did not vary by work environment. Work environment affected overall care plan levels.

Conclusions. Study findings indicate systematic patterns of frontline resource allocation shaping the relationships among community-based long-term care payment sources. Further, results illustrate how nonuniform implementation of upper-level initiatives may be partially attributed to work environment characteristics.

Key Words. Home health care, case management, work environment

During the last decade, Medicare home health expenditures rapidly increased at a rate deemed unsustainable by federal-level policymakers (Goldberg and Schmitz 1994). Between 1988 and 1996, the average annual growth rate in overall home health care expenditures in the United States was 18.9 percent (Heffler et al. 2001). The home care portion of Medicare's total budget increased from 3.6 percent in 1990 to 9.2 percent in 1997 (Langa et al. 2001).

Cohen and Tumlinson (1997) point out that the increase in Medicare home health expenditures is the result of an increase in the number of individuals receiving services, an increase in the average number of visits an individual receives, and an increase in the average cost of a visit. Fiscal concerns are contrasted with research demonstrating the critical importance of adequate home health care services for frail elders (Proctor et al. 2000; Hadley et al. 2000).

Federal-level response to reduce expenditures has been multifold, including the introduction of a prospective payment system for home health care legislated by the Balanced Budget Act of 1997. An interim payment system was introduced before implementing the full prospective payment system, dramatically reducing Medicare home health care expenditures (Heffler et al. 2001) and bringing into sharp relief difficult questions about the relative responsibilities for the provision of adequate home care services across the diverse set of providers and payers: from out-of-pocket expenditures borne by the elder or the elder's family, to state-funded personal assistance programs, to Medicaid-funded home care programs. Kenney and Rajan (2000) caution us against substituting services from nonequivalent payment sources. Yet, previous research indicates measurable, significant relationships between sources of home care services. Cohen and Tumlinson (1997), for example, demonstrate that not having a personal care aide program at the state level was predictive of increased Medicare home health expenditures.

THE IMPERATIVE FOR CONSIDERING FRONTLINE WORKER RESOURCE ALLOCATION DECISIONS

Without a cohesive policy at the state or federal level to establish parameters for meeting compensatory and therapeutic care needs of elders (see Kane 1999) from among the various sources of home care services, decisions are made at the local level with one-on-one interactions between the elderly

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individual and frontline workers who allocate services. Examples include the discharge planner in a hospital, the nurse case manager in a home health agency, or the case manager in a state-funded home care program.

This study applies Lipsky's (1980) theory of street-level bureaucracy to examine the decision making of one set of frontline workers responsible for operationalizing home health funding policy into individual patient-level resource allocation decisions. Specifically, this study measures how case managers in a state-funded home care program consider information about clients' receipt of Medicare-funded home health care when devising service packages.

Lipsky's (1980) theory of street-level bureaucracy asserts that frontline workers respond to ambiguous and contradictory program goals by developing resource allocation patterns that may not be in accordance with upper-level policy intent. Home care case managers experience ambiguity and contradiction in work goals arising from program client-centered goals to assist elders to manage in the community, and program budget-centered goals to serve as gatekeepers for a limited source of funding (Kane 1999). Case managers responding primarily to client need would likely demonstrate increased willingness to supplement reduced Medicare home health resources with state home care resources. Work environments promoting adherence to external reference groups with client-centered professional codes (i.e., social work) often shift worker decision-making incentives toward more client-centered activities (Lipsky 1980). By contrast, state home care case managers responding primarily to budget-centered goals would likely demonstrate decreased willingness to supplement Medicare home health resources with state home care resources. Work environments characterized by high caseloads, increased work pressure, and high staff turnover create incentives for rapid client processing, conflicting with client-centered agency goals (Lipsky 1980), and increasing adherence to budget-centered goals. Consequently, patterns of resource allocation result from individual and joint effects of elderly client, case manager, and home care agency work environment characteristics that shift a case manager toward a more client-centered or more budget-centered orientation during the assessment process.

Previous research has not examined the effects of client, case manager, and agency work environment factors on home care case manager willingness to supplement reduced Medicare home health resources. However, previous research has measured how these three arenas affect resource allocation decisions such as overall service plan diversity or intensity (Caro and Leventhal Stern 1995; Challis 1993; Hagan-Hennessy 1993), respite services

(Chumbler et al. 2000), or recommendation of institutionalization (Degenholtz et al. 1999), and inform the selection of client and case manager predictors in the conceptual model. Decreased client functioning and increased severity of illness, for example, have been related to increased allocation of services (Caro and Leventhal Stern 1995; Challis 1993; Hagan-Hennessy 1993). Case manager sociodemographic characteristics and training background have been related to resource allocation decisions. Increased age, for example, has been related to more generous services plans (Yee 1990; Capitman, Haskins, and Bernstein 1986), and social work licensure has been related to both increased (Yee 1990) and decreased service plan intensity (Hagan-Hennessy 1993). Work environment dimensions measured have been limited to agency structural factors, primarily the division of core case management tasks among employees, and related to resource allocation decisions such as the likelihood of recommending institutionalization (Degenholtz et al. 1999). The paucity of research on the effects of the work environment has been noted previously (Sofaer 1998; Zinn and Mor 1998). Therefore, this study provides a preliminary examination of the relative effects of elderly client, case manager, and agency characteristics on home care case management response to Medicare home health changes.

More broadly, to reduce fragmentation occurring in our community care system for frail, older adults, we need to consider how elderly individual, worker, and agency or clinic characteristics differentially structure incentives for frontline workers to bridge service gaps resulting from fragmentation in payment sources. This study seeks to measure one aspect of this fragmentation in payment sources, Medicare versus state-funded home care services, among a subset of frontline workers: home care case managers.

METHODS

Twenty-six of the 27 regional, nonprofit agencies administering the Massachusetts Home Care Program (MHCP) participated in the study. The MHCP provides services for low-income elders in Massachusetts who have a minimum of six impairments in activities of daily living or instrumental activities of daily living, using funds obtained directly from state revenues. The program targets low-income elders but does not require Medicaid-eligibility status. While agencies follow common state-level program regulations and guidelines, they maintain considerable autonomy in the overall structuring of their case management work practices. The MCHP case managers perform

core case management tasks (Davies 1992), manage caseloads of 80 to 100 clients, and are expected to meet their clients' needs within a care plan budget of about \$200 per month. Supervisory approval is required for allocation above this amount.

The study was comprised of two components: one, a mail survey conducted of the total census of case managers employed by the agencies in June 1999 ($N = 507$); two, a mail survey conducted of the 26 agency directors. The case manager survey included questions about background and training, perceptions of the work environment, and six vignette descriptions of potential home care clients, generated in accordance with Rossi and Nock's (1982) factorial vignette survey methodology. Surveys were administered between June 1999 and July 1999 in accordance with Dillman's (1978) total design method for administering mail surveys (70 percent response rate). The agency director survey included measures of management and supervisory practices, as well as arrangements of core case management tasks (100 percent response rate). All measures included in the analytical models were constructed from survey items.

Measures

Care Plan Eligibility-Level Measure. The central component of the case manager survey instrument included factorial survey vignette clients (Rossi and Nock 1982) describing potential home care clients. Factorial survey vignettes were constructed by specifying dimensions of client case-mix and home health care status to be included in each vignette client description. Each dimension included a number of specified levels. For example, the dimension of cognitive status included two levels, impaired and unimpaired. Each case manager rated six vignettes that had been independently, randomly sampled from the entire matrix of specified client dimensions and levels. The number of permutations in vignettes, p , from sampling N dimensions is expressed by the following equation: $p = d_1 * d_2 * \dots d_n$ where d_i ($i = 1 \dots n$) is the number of levels (i.e., possibilities) for each dimension. A total of 3,042 independently, randomly sampled vignette clients were generated for the survey.

After reading the description of the vignette client, the case manager was asked to select the care plan level for which she or he felt the client was eligible. Eligibility level was operationalized as a 5-point scale ranging from the lowest eligibility level (0) to the highest eligibility level (4) as follows: not at all eligible for services, eligible for less than the average home care plan, eligible for the average home care plan, eligible for more than the average home care plan, or

eligible for much more than the average home care plan (mean = 2.07, SD = 1.01). Previous evidence indicates a typical care plan that is prescribed by case managers irrespective of actual case manager-ascribed flexibility (Kane 1995; Kent 1995). Missing vignette-rating data were not imputed; rather, unrated vignettes were deleted from the dataset. Examination of the distribution of vignette ratings indicated a normally distributed response curve.

Home Care Client Measures. Client characteristics are presented in Table 1. Medicare-funded home health care status was operationalized as currently having home health care services, having had services recently terminated due to client noncompliance with the care plan recommendations, or having had services recently terminated due to classification as no longer having a skilled need. Noncompliance is defined as the client or primary caregiver's failure to adhere to treatment regimens established by the home health care provider (Boyer and Wade 1998). Demographic measures included age, sex, ethnicity, and marital status. Activities of daily living (ADL) self-care deficits were operationalized by personal hygiene and nutritional status. The ADL mobility deficits were described by mobility during the assessment. Instrumental activities of daily living (IADL) deficits were operationalized by a single measure of the cleanliness of the home. Cognitive status was defined as whether or not the client was alert and oriented during the assessment. Primary medical diagnosis was defined as undergoing rehabilitation, having a terminal illness, or having a chronic illness.

Case Manager Measures. Case manager measures are presented in Table 1 and include demographic measures of age, sex, ethnicity, and education level, work background characteristics of length of employment in the current agency, previous work as a case manager, and job satisfaction. The job satisfaction scale score included one item asking the case manager to rate his or her job satisfaction on a 4-point scale ranging from "very unsatisfied" to "very satisfied." Missing data were imputed using linear regression models of case manager data.

Agency Measures. Agency measures are presented in Table 1 and included the staff turnover rate (ratio of total number of case managers leaving the agency to total number of case managers employed during the previous twelve months), the proportion of case managers licensed as social workers within an agency, the mean agency caseload, and the mean level of case manager reported work pressure. These final three items were aggregated to the level of the agency to operationalize the work environment in congruence with characteristics of the work environment derived from Lipsky

Table 1: Descriptive Statistics and Coding for Dependent and Independent Variables

<i>Variable</i>	<i>M</i>	<i>SD</i>	<i>Coding</i>
<i>Client-level characteristics (N = 2,054 rated vignette clients)</i>			
Medicare home health use			
Has weekly home health nursing visits	.21	.41	1 = yes; 0 = no
Has had home health aide visits just terminated due to noncompliance	.18	.38	1 = yes; 0 = no
Has had home health aide visits just terminated due to no longer having a skilled need	.19	.39	1 = yes; 0 = no
No history of home health use provided	.42	.49	reference category
Age			
62 years old	.23	.42	1 = yes; 0 = no
70 years old	.24	.43	1 = yes; 0 = no
79 years old	.26	.44	1 = yes; 0 = no
90 years old	.27	.44	reference category
Ethnicity			
White	.27	.44	reference category
Black	.26	.44	1 = yes; 0 = no
Asian	.23	.42	1 = yes; 0 = no
Hispanic	.25	.43	1 = yes; 0 = no
Sex			
Female	.48	.50	1 = yes; 0 = no
Marital Status			
Married, with spouse in good health	.25	.43	reference category
Married, with spouse in poor health	.24	.43	1 = yes; 0 = no
Widowed	.26	.44	1 = yes; 0 = no
Never married	.26	.44	1 = yes; 0 = no
Cleanliness of house			
Neat and tidy	.29	.43	reference category
Cluttered, but reasonably clean	.35	.43	1 = yes; 0 = no
Filthy—trash everywhere, dirty dishes, rotten food	.36	.44	1 = yes; 0 = no
Personal hygiene			
Clean, well-groomed	.33	.47	reference category
Untidy with rumpled clothing, but no unpleasant body odors	.33	.47	1 = yes; 0 = no
Wearing clothing stained with dirt and food, and there is a distinct odor of urine	.34	.47	1 = yes; 0 = no

Table 1: Continued

<i>Variable</i>	<i>M</i>	<i>SD</i>	<i>Coding</i>
Nutritional status			
Plump. The refrigerator is well-stocked with a variety of nutritious foods	.34	.47	reference category
Thin. The refrigerator is filled mostly with t.v. dinners	.34	.47	1 = yes; 0 = no
Malnourished. The refrigerator is almost empty	.33	.47	1 = yes; 0 = no
Mobility during assessment			
Elder gets up out of chair to fix a cup of coffee	.26	.44	reference category
Does not get up from chair	.25	.43	1 = yes; 0 = no
Does not get up and you spot a walker nearby	.24	.42	1 = yes; 0 = no
Elder is propped up in bed, and does not move	.26	.44	1 = yes; 0 = no
Cognitive status			
Fully alert and oriented	.33	.47	reference category
Somewhat confused and not able to respond appropriately to all questions	.67	.47	1 = yes; 0 = no
Primary medical diagnoses			
Is undergoing rehabilitation from a medical event	.25	.25	1 = yes; 0 = no
Has a terminal illness	.22	.22	1 = yes; 0 = no
Has at least one chronic illness	.52	.50	reference category
<i>Case manager-level characteristics</i> (<i>N</i> = 355 case managers)			
Age	38.54	13.05	age in years
Sex	.11	.31	0 = female 1 = male
Nonwhite	.11	.31	0 = non-Hispanic white 1 = other ethnicity
Previously worked as a case manager	.37	.48	0 = no 1 = yes
Length of employment	.50	.50	0 = worked 3 years or less for agency 1 = worker for more than 3 years for agency
Graduate education	.25	.66	0 = completed a 4-year college degree or less 1 = completed more than a 4-year college degree
Job satisfaction	2.30	.64	0 = very unsatisfied 1 = somewhat unsatisfied

Table 1: Continued

<i>Variable</i>	<i>M</i>	<i>SD</i>	<i>Coding</i>
			2 = somewhat satisfied 3 = very satisfied
<i>Agency-level Characteristics (N = 26 agencies)</i>			
Social workers	.22	.15	mean proportion of social worker case managers
Caseload	90.50	6.59	mean number of clients served per case manager
Work pressure*	.25	1.10	mean work pressure scale score
Staff turnover	.61	.17	mean turnover rate

*Scale of four items: "There is constant pressure to keep working," "People cannot afford to relax," "You can take it easy and still get your work done," "It is very hard to keep up with your workload" ($\alpha = .64$).

(1980). The proportion of case managers licensed as social workers was included as a measure of the professional milieu of the agency. Mean agency caseload was included as a measure of the overall agency's work volume affecting agency work-flow systems. Mean agency work pressure was included as a measure of the overall agency's quality of work life. The work pressure scale was constructed from four items adapted from the work pressure subscale of the Moos (1994) Work Environment Scale, with a minimally acceptable Chronbach's alpha of .64 at the level of the individual case manager. Turnover data were received from all agency directors; aggregated measures were constructed using complete data received from case managers.

Analyses

Model Specification. Hierarchical linear modeling (HLM) or multilevel modeling techniques were chosen to exploit the nested structure of the dataset. As each case manager rated eligibility care plan levels for six clients randomly sampled from 3,042 clients, variability in care plan eligibility level between clients may be attributed in part to home health care status and case-mix status, and in part to characteristics of the case manager rating them. Clients rated by the same case manager may receive eligibility levels similar to one another and case managers may also differentially respond to particular client characteristics. Thus, estimating both the average care plan (or intercept) and response to home health care status (or slope) as outcomes of case manager characteristics may improve our ability to explain variability in client

care plan. Case managers are also grouped within agencies. In this case, 26 agencies employed a mean of 12 case managers. Effects of agency-level predictors may be estimated of both the client-level characteristics and the case manager-level characteristics. Multilevel modeling techniques allow for this modeling of direct and interactive effects across levels, where lower-order slopes and intercepts are estimated as outcomes of high-order levels. This modeling approach is particularly relevant to research in health services, to explicitly model the effects of the context within which care is provided (Rice and Leyland 1996); in this case, to understand how case management response to home health care status is shaped by both the case manager as well as the home care agencies within which the case managers work. Specifically, the HLM 4 program (Bryk, Raudenbush, and Congdon 1999) was used to estimate the effects of client home health care status on care plan eligibility level, the effects of case manager characteristics on client characteristics, and the effects of agency characteristics on both case manager and client characteristics. The HLM 4 program estimates multilevel models by employing an empirical Bayes estimation of random effects, and a weighted least squares method to estimate fixed effects, thus appropriately weighting parameters on available information, and not requiring compound symmetry (Wu 1996).

Due to the complexity of multilevel modeling estimation techniques, the analysis is conducted in a progression from unconditional to conditional modeling with a focus on developing the most parsimonious model (Crystal and Sambamoorthi 1996). The first, unconditional, model estimates the proportion of variance in care plan eligibility level attributed to each of the respective levels: client characteristics, case manager characteristics, and agency work environment characteristics. No predictors are included in the model and each higher-order level simply estimates the lower-order level intercept as outcome. Next, predictors are entered at the client, case manager, and agency levels.

Each set of predictors was entered as a block. Two approaches were taken to modify the client-level block of predictors, however, to develop the most parsimonious model. First, measures of age, cleanliness of house, hygiene, nutritional status, and mobility were collapsed into single-item measures. Second, a backward, stepwise, robust regression (STATA 1999) model was estimated of eligibility level on client characteristics. Further, final results were compared with a similarly conducted ordinal logistic model of care plan eligibility level on client characteristics to refute concerns regarding the treatment of the dependent variable as having an underlying continuum.

The overall pattern of significant results regarding significant client-level predictors was comparable. The block of case manager-level characteristics included all originally specified predictors with the exception of sex and ethnicity, which demonstrated inadequate variability (almost 90 percent of the sample was non-Hispanic white and female), and age, which had a nonnormal, bimodal distribution.

Entry of the predictors into each level allows the opportunity to estimate the proportion of variance at each level attributable to the respective characteristics. Additionally, we can allow the effects of case manager and agency characteristics to vary across lower-order levels by testing the effects of such characteristics on the slopes of lower-order levels. This model is referred to as a conditional model. The final model was estimated by entering lower-level predictors first, and then adding higher-level effects. Main effects were left in the model even if they were not significant, if cross-level effects of the predictors with lower-order levels were significant.

RESULTS

Table 2 summarizes the results of the fully specified, conditional model with client, case manager, and agency blocks of predictors. Before entering any blocks of predictors, examination of the unconditional model indicated that variance in elderly client care plan eligibility is accounted for by client, case manager, and agency characteristics ($p < .001$ for each level), and thus supported testing all three levels in the fully specified model. Importantly, of the total variance in care plan eligibility level, 81 percent is attributed to variability at the level of the client, or client characteristics, case manager characteristics account for 16 percent of the total variance, and differences between agencies only account for 3 percent of the variance. Comparison of the fully specified, conditional model with the unconditional model indicate that client, case manager, and agency predictors explained 21 percent of the variance in client care plan levels. Reliability estimates of the parameters suggest modest levels of parameter reliability.

The upper panel of Table 2 displays fixed effects of the client, case manager, and agency predictors across levels. The lower panel displays the random effects of the predictors across levels, including random effects of intercepts. Fixed effects results indicate that, while all three levels account for variance in care plan eligibility, only client and agency predictors entered into the model were significant. Random effects results indicate that mean care

Table 2: Three-Level Model of the Effects of Client, Case Manager, and Agency Characteristics on Care Plan Eligibility Level

<i>Fixed Effects</i>	<i>Coefficient</i>	<i>SE</i>
Intercept	1.06****	.16
Level 1 Predictors:		
(Medicare home health care status)		
Current receipt of home health care services	-.18**	.06
Termination of home health care services due to noncompliance	.24****	.06
Termination of home health care services due to no skilled need	.16**	.06
(Case mix)		
Cognitive impairment	.28****	.05
Primary diagnosis of rehabilitation	.12**	.05
Primary diagnosis of terminal illness	.21****	.05
Cleanliness of client's home	.29****	.03
Personal hygiene	.15****	.03
Nutritional status	.26****	.03
Mobility	.05****	.02
Level 2 Predictors:		
Model for case manager mean:		
Previously worked as a case manager	-.01	.07
Job satisfaction	-.04	.06
Graduate education	-.16	.11
Length of employment	.07	.07
Level 3 Predictors:		
Model for agency mean:		
Mean caseload size	.02*	.01
Case management staff turnover rate	.64*	.31
Proportion of case management staff licensed as social workers	.71**	.31
Mean case management work pressure	.07	.05
<i>Random Effects</i>	<i>Variance Component</i>	<i>SD</i>
Level 1	.64	.80
Level 2	.19****	.44
Level 3	.008**	.09

Model converged at 8 iterations; 22 parameters estimated, deviance = 3695.38.
Reliability estimates: $\pi_0 = .64$, $\beta_{00} = .29$; * $p < .10$, ** $p < .05$, *** $p < .01$ **** $p < .001$.

plan eligibility level did vary between case managers and across agencies. Random effects estimation of the slopes of home health care status across case managers and agencies, however, indicated potentially significant differences in response to home health care status between case managers ($p < .10$). However, the borderline significance combined with the unacceptably low levels of reliability (estimated reliability for the slopes were less than .10) resulted in estimating the final model with fixed slopes of the response to home

health care status at case manager and agency levels. This allowed for the inclusion of all predictors in the block of agency-level predictors.

Client-Level Characteristics

Results of the model at the level of the elderly home care client indicate significant effects of home health care status on care plan eligibility level, while controlling for case-mix indicators of impairment. All three classifications of Medicare-funded home health care status are significantly predictive of care plan eligibility level, relative to the reference category of providing the case manager with no home health care information. Clients who currently receive home health care services at the time of assessment for state-funded home care programs are determined to be eligible for less generous service plans, on average. Because of the inclusion of case-mix indicators, this finding persists even when controlling for ADL and IADL impairments, primary diagnosis, and cognitive status. By contrast, clients who have recently had Medicare-funded home health care services terminated either due to no longer having a skilled need or because of care plan noncompliance are assessed as likely to be eligible for more generous home care service plans, on average. Significant effects of case-mix indicators of impairment suggest case managers increase care plan eligibility levels in response to evidence of cognitive impairment and ADL and IADL impairments relative to those clients who do not show signs of impairment during the assessment.

Case Manager-Level Characteristics

No case manager characteristics remain statistically significant in the final model. None of the background or job satisfaction measures explained the variance in care plan decision identified by the unconditional model. However, the significant random effect of the case manager-level intercept indicates that mean care plan level does vary significantly between case managers (within agencies). Thus, while the predictors included in the model do not identify case manager characteristics shaping this variability, the model does establish that important between-case manager differences exist.

Agency-Level Characteristics

Results at the level of the agency indicate fixed effects of agency characteristics on mean agency care plan eligibility level. The random effects summary statistics for the agency-level model indicates significant cross-level effects of agency on mean case manager care plan eligibility level. Three of the agency

characteristics entered into the model significantly predicted mean agency care plan eligibility level, including mean caseload size, the case management staff turnover rate, and the proportion of case managers licensed as social workers. Agencies with higher caseloads, higher turnover rates, and a greater proportion of social workers allocated more generous service plans. Of these effects, social work licensure appeared to have the largest effect size, and was significant at $p < .05$.

DISCUSSION

Multilevel modeling techniques to estimate the individual and joint effects of client, case manager, and home care agency characteristics on care plan eligibility levels reveal critical dynamics in home care resource allocation occurring on the front line. Variance decomposition by level revealed that approximately 80 percent of the variability in care plan decision is attributable to client characteristics. Further, we were able to account for a substantial proportion of that variance through the inclusion of home health care status and case-mix indicators of ADL and IADL deficits, cognitive impairment, and primary diagnosis. This ability indicates appropriate case management response to broadly accepted indicators of client service need (e.g., disability level and current service levels) (Kane and Kane 2000). Most importantly, additional examination of the effects of home health care status suggests that systematic frontline resource allocation patterns shape the translation of home health care policy into actual practice.

Consider the direct effects of client home health care status on care plan. Clients who are already receiving Medicare-funded home health care services are assessed as requiring fewer state-funded home health care services, on average. Thus, state-funded home care resources are not used to augment extant Medicare-funded home care resources. Of particular interest to the question of the frontline response to reductions in Medicare home health care dollars is the response of case managers to clients who have had home health care services recently terminated. Controlling for case mix, clients who have had home health care services terminated are assessed as eligible for more generous home care service packages, irrespective of the reason. Thus, frontline workers in this home care program appear to allocate state dollars to meet perceptions of increased need resulting from reductions in home health care services.

The failure of client case mix to account for the relationship between home health care status and care plan rating provides an important example of how frontline workers in the community care arena may systematically choose to bridge funding gaps in ways that may or may not match upper-level agency or clinic programmatic goals. In this example, home care case managers are allocating resources in response to knowledge about home health care service reductions, irrespective of individual client functional status. Ultimately, these frontline workers are increasing the fiscal responsibility of a state-funded program for community care services in relation to a Medicare-funded program for community care services.

Findings at the level of the case manager suggest that important variability does exist, despite methodological limitations in the research. In particular, random effects estimation of the mean case manager care plan eligibility level indicated that between-case manager variability in care plan levels was significant. Limitations possibly contributing to our failure to identify case manager-level predictors of this variance are multifold, including having no measure of case manager specialization in core case management tasks, as well as having high sampling variance at the case manager level. Moreover, the lack of significant sociodemographic predictors might have been predicted given contradictory findings of such predictors in previous research, indicating the need to explore additional case manager characteristics and to consider nonlinear effects of predictors.

Findings at the level of the agency reveal several potentially significant organizational level influences on the effects of work environment on frontline worker resource allocation decisions. However, as only 3 percent of the total variance in care plan decisions is attributable to the agency level, these findings should be interpreted as mixed support of the conceptual model emphasizing the importance of the larger agency or clinic environment within which frontline workers operate. Specifically, the findings suggest potential areas for further exploration of two divergent organizational environments in which workers bridge funding gaps by allocating more services.

The first organizational environment is an environment characterized by higher caseloads and frequent staff turnover. Our original research hypothesis derived from Lipsky (1980) predicted that such environmental characteristics would be related to more budget-centered agency goals, and therefore less-generous care plans. Findings related to overall mean level of care plan suggest that such an environment actually increases mean eligibility level. A possible explanation is that increased pressure, higher caseloads, and more staff turnover may hinder case management consideration of long-term

viability of allocating higher care plans. Rather, processing of clients in as expeditious a manner as possible becomes the primary objective. Overall higher care plan levels are less likely to be met with client and caregiver resistance and thus facilitate rapid processing.

This finding may illustrate a direction for future research beyond the study of state versus Medicare home health care funding. Because there were no significant random effects of the slopes of home health care status, there were no significant differences between agencies in the magnitude or direction of response to information about home health care status. In particular, community care agencies or clinics characterized by high caseloads or frequent staff turnover may be less effective at reducing overall mean levels of service costs, even if such agencies respond to specific client or patient information in a manner congruent with more cost-effective agencies or clinics. In this example, high-turnover and high-caseload agencies had overall higher mean levels of services, and yet still demonstrated decreased willingness to supplement extant Medicare services with state-funded services.

The second type of organizational environment the model suggests is associated with a pattern of increased home care resource allocation in an environment with strong links to a professional external reference group. Having an increased proportion of case managers licensed as social workers is associated with increased mean care plan eligibility levels, in congruence with our original hypothesis of the effect of external reference groups on fostering a client-centered approach to case management through increased professionalization. Ultimately, these case managers give greater consideration to client need rather than budgetary constraints in the resource allocation process.

While multilevel modeling allowed us to explain variability in frontline decision making by client and work environment characteristics, the use of vignette clients rather than actual service data has important implications for the generalizability of these results. The key strength of employing the factorial vignette strategy relates to the random sampling strategy, allowing us to control for multicollinearity problems occurring with real-life data at both the client and case manager levels. At the client level, certain client characteristics frequently occur in nonrandom combinations or patterns. At the case manager level, case managers may specialize in working with particular types of clients, similarly resulting in nonrandom combinations or patterns of client case mix. However, sterile paper descriptions of the client cannot capture the richness of subtle cues occurring in real-life. An attempt was made to address this by

forcing respondents to deduce client functioning through descriptions of client behavior during the assessment, rather than simply listing client performance on standardized functional assessment scales. Nonetheless, respondents often readily identify manipulated dimensions, introducing bias due to social desirability, and constraining the generalizability of the results to the real-life assessment process. Future research efforts should compare these findings with findings estimated on actual service data.

Additionally, the use of vignettes has important limitations for the analytic approach selected. The nested sampling strategy of factorial vignette surveys is conducive to multilevel modeling (Hox, Kreft, and Hermkens 1991). However, respondents typically rate only several vignettes, resulting in a high sampling variance. This low within-respondent sampling is combined with a large number of vignette client characteristics. Despite data reduction strategies, such factors contributed to low reliabilities of the final estimated model parameters.

The generalizability of the results is also constrained by the sampling frame. The Massachusetts home care program presents a unique blend of centralized regulatory control and program objectives coupled with variability in implementation at the regional, agency level. This nonuniformity in work practices by agency allows for the modeling of the influence of organizational environment on case management response to home health care status. However, such uniqueness also curtails generalizability to other states, and to other resource allocation dilemmas facing frontline workers across the health and social service systems.

Study findings provide preliminary support of the critical role of the frontline worker in home health care resource allocation. In this sample of state home care program case managers, clients who were currently receiving home health care services were assessed as eligible for less-generous care plans, controlling for case-mix indicators of functional disability. On average, therefore, these frontline decision makers did not augment extant Medicare-funded home health care services with state-funded home care services. Rather, case managers chose to substitute home care services for home health services when clients had home health care services terminated. These findings illustrate how frontline workers in the community-based long-term care arena play an important role in the allocation of services across the diverse payment sources. Without reconciling home care service policy initiatives across payment sources, such decisions will continue to be made on the front line in manners that may or may not be in congruence with upper-level program goals or objectives.

REFERENCES

- Boyer, C. L., and D. C. Wade. 1998. "The Impact of Compliance on Quality Outcomes in the Home Infusion Population." *Journal of IV Nursing* 21 (5, supplement): S161-5.
- Bryk, A. S., S. W. Raudenbush, and R. T. Congdon. 1999. *HLM: Hierarchical Linear and Nonlinear Modeling with the HLM/2L and HLM/3L Programs*. Lincolnwood, IL: Scientific Software International.
- Capitman, J. A., B. Haskins, and J. Bernstein. 1986. "Case Management Approaches in Coordinated Community-Oriented Long-Term Care Demonstrations." *Gerontologist* 26 (4): 298-404.
- Caro, F. G., and A. Leventhal Stern. 1995. "Balancing Formal and Informal Care: Meeting Needs in a Resource-Constrained Program." *Home Health Care Services Quarterly* 15 (4): 67-81.
- Challis, D. 1993. "Case Management in Social and Health Care: Lessons from a United Kingdom Perspective." *Journal of Case Management* 2 (3): 79-90.
- Chumbler, N. R., D. Dobbs-Kepper, C. J. Beverly, and C. K. Beck. 2000. "Eligibility for In-Home Respite Care: Ethnic Status and Rural Residence." *Journal of Applied Gerontology* 19: 151-69.
- Cohen, M. A., and A. Tumlinson. 1997. "Understanding the State Variation in Medicare Home Health Care: The Impact of Medicaid Program Characteristics, State Policy, and Provider Attributes." *Medical Care* 35 (6): 618-33.
- Crystal, S., and U. Sambamoorthi. 1996. "Functional Impairment Trajectories among Persons with HIV: A Hierarchical Linear Models Approach." *Health Services Research* 31 (4): 469-88.
- Davies, B. 1992. "Care Management, Equity and Efficiency: The International Experience" Canterbury, Kent: Personal Social Services Research Unit.
- Degenholtz, H., R. A. Kane, R. L. Kane, and M. D. Finch. 1999. "Long-term Care Case Managers' Out-of-Home Placement Decisions." *Research on Aging* 21 (2): 240-74.
- Dillman, D. 1978. *Mail and Telephone Surveys: The Total Design Method*. New York: Wiley.
- Douville, M. L. 1993. "Case Management: Predicting Activity Patterns." *Journal of Gerontological Social Work* 20 (3-4): 43-55.
- Goldberg, H. B., and R. J. Schmitz. 1994. "Contemplating Home Health PPS: Current Patterns of Medicare." *Health Care Financing Review* 16 (1): 109-24.
- Hadley, J. D., A. Rabin, S. Stein Epstein, and C. Rimes. 2000. "Posthospitalization Home Health Care Use and Changes in Functional Status in a Medicare Population." *Medical Care* 38 (5): 494-507.
- Hagan-Hennessy, C. 1993. "Modeling Case Management Decision-Making in a Consolidated Long-Term Care Program." *Gerontologist* 33 (3): 333-41.
- Heffler, S., K. Levit, S. Smith, C. Smith, C. Cowan, H. Lazenby, and M. Freeland. 2001. "Health Spending Growth Up in 1999: Faster Growth Expected in the Future." *Health Affairs* 20 (2): 193-203.
- Hox, J. J., I. G. G. Kreft, and P. L. J. Hermkens. 1991. "The Analysis of Factorial Surveys." *Sociological Methods and Research* 19 (4): 493-510.

- Kane, R. A. 1995. "Decision-Making, Care Plans, and Life Plans in Long-Term Care: Can Case Managers Take Account of Clients' Values and Preferences?" In *Long-Term Care Decisions: Ethical and Conceptual Dimensions*, edited by L. B. McCullough and N. L. Wilson, pp. 87-109. Baltimore, MD: Johns Hopkins University Press.
- . 1999. "Goals of Home Care: Therapeutic, Compensatory, Either, or Both?" *Journal of Aging and Health* 11 (3): 299-321.
- Kane, R. L., and R. A. Kane, eds. 2000. *Assessing Older Persons: Measures, Meanings, and Practical Applications*. New York: Oxford University Press.
- Kenney, G., and S. Rajan. 2000. "Understanding Dual Enrollees' Use of Medicare Home Health Services: The Effects of Differences in Medicaid Home Care Programs." *Medical Care* 38 (1): 90-8.
- Kent, K. 1995. *Running on Empty: Home Care Services in Massachusetts*, p. 40. Boston: Gerontology Institute, University of Massachusetts.
- Langa, K., M. E. Chernew, M. U. Kabeto, and S. J. Katz. 2001. "The Explosion in Paid Home Health Care in the 1990s: Who Received the Additional Services?" *Medical Care* 39 (2): 147-57.
- Lipsky, M. 1980. *Street-Level Bureaucracy: Dilemmas of the Individual in Public Services*. New York: Russell Sage Foundation.
- Moos, R. H. 1994. *Work Environment Scale Manual: Development, Applications, Research*, 3d ed. Palo Alto, CA: Consulting Psychologists Press.
- Proctor, E. K., N. Morrow-Howell, H. Li, and P. Dore. 2000. "Adequacy of Home Care and Hospital Readmission for Elderly Congestive Heart Failure Patients." *Health and Social Work* 25 (2): 87-96.
- Rice, N., and A. Leyland. 1996. "Multilevel Models: Applications to Health Data." *Journal of Health Services and Research Policy* 1 (3): 154-64.
- Rossi, P. H., and S. L. Nock, eds. 1982. *Measuring Social Judgments: The Factorial Survey Approach*. Beverly Hills, CA: Sage.
- Sofaer, S. 1998. "Aging and Primary Care: An Overview of Organizational and Behavioral Issues in the Delivery of Healthcare Services to Older Americans." *Health Services Research* 33 (2): 298-321.
- STATA. 1999. *STATA Reference Manuals*. College Station, TX: STATA Corporation.
- Wu, Y. B. 1996. "Focus on Quantitative Methods: An Application of Hierarchical Linear Models to Longitudinal Studies." *Research in Nursing and Health* 19 (1): 75-82.
- Yee, D. L. 1990. "Estimating Quality in Case Management." Doctoral dissertation, Brandeis University. *Dissertation Abstracts International* 4: 1481.
- Zinn, J. S., and V. Mor. 1998. "Organizational Structure and the Delivery of Primary Care to Older Americans." *Health Services Research* 33 (2): 354-80.