Journal of Gerontology: SOCIAL SCIENCES
2002, Vol. 57B, No. 3, S187–S194

Do Elderly Medicare Recipients Contact Physicians Appropriately?

Margo-Lea Hurwicz[1] and Emil Berkanovic[2]

[1]University of Missouri–St. Louis.
[2]University of California at Los Angeles.

Objectives. This research identified characteristics of persons and their illness episodes that predict appropriate and inappropriate decisions to seek medical care.

Methods. This study analyzes 1,292 health care decisions of 885 elderly members of an HMO in Los Angeles. Illness episodes are divided into three categories based on the expertise of a panel of 22 geriatricians, using a formal mathematical analysis derived from anthropological consensus theory. These categories are physician visit not recommended, physician visit recommended, and physician visit mandatory. Physician contact is regressed on a list of variables derived from Andersen's behavioral model separately for each group of episodes.

Results. Although the variables indicating perceived seriousness and duration of the episode consistently predict the decision to contact a physician, regardless of whether that contact is considered appropriate by the geriatrician panel, the variables indicating other illness responses and predisposing personal attributes have less consistent patterns of significance.

Discussion. The category of episodes (visit recommended) for which predisposing personal attributes figure most strongly in the treatment decision is the one for which there are no clear cultural directives to action. Implications for health education and policy are drawn from the findings.

COMMUNITY-DWELLING older adults are responsible for a significant proportion of the discretionary physician visits made in the United States. Given an increasing concern over the equitable allocation of scarce medical resources, it is particularly important for health policy makers and planners to understand factors associated with decisions to seek medical care when dealing with acute symptoms or flare-ups of chronic conditions. This study presents a multidisciplinary approach to identifying predictors of appropriate and inappropriate decisions about medical care-seeking for specific illness episodes. It divides a sample of illness episodes experienced in 1986 and 1987 by Medicare recipients in an HMO into three groups based on the consensus of 22 physicians as to whether medical care is mandatory, recommended, or not recommended. It then evaluates predictors of physician contact selected from the health services use literature.

Health Service Research on Older Adults

Andersen's behavioral model of health services use (Aday & Awe, 1997; Andersen, 1968, 1995) is the theoretical framework most widely used for studying physician utilization among older adults (Aday & Awe, 1997; Wolinsky, 1994). Predictors of health services use are divided into predisposing, enabling, and need factors. Variables indicating an individual's predisposition to seek medical care include demographic traits such as age, sex, marital status, and past illness; social structural attributes such as education, occupation, race/ethnicity, and religion; and health beliefs. Individual-level enabling variables, including income, insurance coverage, type of, and access to a regular source of care, may limit an individual's ability to carry out an action to which s/he is predisposed. Need-for-care variables include perceived disability, symptoms, diagnoses, general state, and evaluated symptoms and diagnoses (Wolinsky 1994). Aday and Awe (1997), who along with Andersen (1995) remind us that this model has gone through several revisions and modifications, suggest that initially this dimension included other illness responses.

Other theoretical frameworks, such as the health belief model (Janz & Becker, 1984), have been used to study the health behavior of older adults. Krause (1990) provides a detailed discussion of both the behavioral and health belief models, and suggests that as they share many variables, they can be integrated into a life stress perspective. Others have suggested, however, that these two models already have been integrated in practice (Aday & Awe, 1997; Andersen, 1995).

Although the outcome dimension of the behavioral model includes illness episodes as units of analysis, Wolinsky (1994) notes that most utilization studies rely on contact and volume measures of physician visits. As a result, they do not identify factors associated with care-seeking for particular symptoms or illness episodes, and they provide little insight into why people decide to go to the doctor for some symptoms, but not for others.

Pescosolido (1992) draws our attention to the history in medical sociology and anthropology of the "illness career" perspective, which takes individual illness episodes as its analytic focus and seeks to discover factors and strategies

involved in decisions to seek help. She offers the Social Organization Strategy as a framework for the study of illness-related decision-making that is complementary to rational choice models. However, as applied, this approach uses the same independent variables as the behavioral model. Anthropologists have developed illness-related decision models that abstract an ordered set of rules from ethnographic data (Garro, 1986; Mathews & Hill, 1990; Young, 1981). Recently, Weller, Ruebush, and Klein (1997) compared an ethnographic decision model to a health service approach and concluded that, although the approaches lead to similar substantive conclusions, the health services approach, exemplified by Andersen's behavioral model, made it easier to select predictor variables.

Measuring the Appropriateness of Treatments

Although the behavioral model includes "evaluated need" (Aday & Awe, 1997; Andersen, 1995; Wolinsky, 1994), its applications do not often take into account professional opinion on whether particular symptoms actually require medical attention. The few papers that address this issue have problems involving units of analysis, small numbers of both symptoms and expert raters, and perhaps most importantly, inability to evaluate the expertise of the experts, that limit their generalizability.

Whereas the Symptoms-Response Ratio (Taylor, Aday, & Andersen, 1975) assesses the extent to which populations or subgroups obtain services judged medically necessary by a panel of physicians, it does not evaluate the behavior of specific individuals. Haug (1981) classified individual utilization as appropriate or not based on an expert panel's evaluation of a set of 10 common ailments. She did not, however, report the ailments, the number of experts, or how agreement among the panel was assessed. Wilkinson, Darby, and Mant (1987) and Stoller, Pollnow, and Forster (1994) both used panels of three physicians to evaluate, respectively, actions taken for symptoms deemed not serious by respondents and actions *recommended* by respondents for 15 common symptoms.

A Consensus Analysis Approach to Episode Classification

Consensus analysis, a technique developed by cognitive anthropologists, provides a way to assess the expertise of informants and keep the less knowledgeable from influencing conclusions about cultural domains where there is no external standard for truth (Romney, Weller, & Batchelder, 1986). Here, the domain of interest is the appropriate treatment of symptoms, and the experts are physicians chosen for their training and experience. The procedure applies factor analytic techniques to a question-by-informant matrix, assigns a coefficient to each informant indicating level of expertise in the domain, and evaluates the overall fit of the consensus model. Given adequate fit, it provides an answer key, using Bayesian techniques to estimate the correct answer for each question. (See Romney et al., 1986, for a more detailed description of consensus analysis.)

Hurwicz (1995) used Consensus Analysis software (Borgatti, 1992) to analyze data from 22 physicians who were asked to rate 106 National Ambulatory Symptom Classification (NASC) codes using three categories: (a) physician visit not recommended—reasonable probability of no treatable underlying disease; (b) physician visit recommended—reasonable probability of treatable underlying disease; and (c) physician visit mandatory—reasonable probability of serious underlying disease. The consensus among physicians made it possible to assign 2,395 illness episodes reported during a multiwave longitudinal study to the correct category with confidence. What people actually did was compared to the physicians' a priori assessment of what they should have done.

Study Objective and Hypotheses

The analyses in the present study are based on methodology developed in the research discussed previously (Hurwicz, 1995) and two earlier studies. Berkanovic and Hurwicz (1989) developed regression models for both physician visit volume and contact during illness episodes, using predictor variables derived from the utilization literature. Variables measured as attributes of the individual were blocked separately from variables measured as characteristics of specific illness episodes, to allow for isolation of their effects. Hurwicz and Berkanovic (1991) analyzed separately episodes of musculoskeletal illness, musculoskeletal injury, and respiratory illness, using a similar set of predictors, and found unique patterns in the correlates of care-seeking for each.

The contribution of this study is to analyze separately person-episodes classified by the physician panel as "visit not recommended," "visit recommended," and "visit mandatory." This analysis permits the isolation both of episodes involving physician contact that has been judged medically unnecessary and of episodes involving the failure to contact a physician when this has been judged medically necessary. It asks if there are attributes of either the illness or the person that help us to understand inappropriate physician contacts or failure to make appropriate contacts.

There are three hypotheses: (a) Need, measured as perceived seriousness and duration of the episode, is significantly related to physician contact for all episode types (Hurwicz & Berkanovic, 1991); (b) Different combinations of other illness responses are significantly associated with physician contact within each of the three episode types (following Pescosolido, 1992). Bed days and lay consultation are positively associated with physician contact, and nonprescription medication use is negatively associated (Berkanovic & Hurwicz, 1989; Hurwicz & Berkanovic, 1991); and (c) Different combinations of predisposing personal attributes are associated with physician contact within each of the three episode types. Variables were selected from previously reported analytic models tested on these data (Berkanovic & Hurwicz, 1989; Hurwicz & Berkanovic, 1991). They include sex, age, education, work status, dissatisfaction with past care, and past experience with a chronic condition. Two other predisposing variables, race/ethnicity and immigration status, were added. Because only Medicare recipients enrolled in an HMO were interviewed, both insurance status and the structural aspects of the providing system were considered constant.

Methods

Data Source

The study population.—Data are from a 1-year, seven-wave longitudinal study conducted in 1986–1987 with 1,034 Medicare recipients who were enrolled in a network model HMO in Los Angeles, CA. The baseline interview established the sociodemographic attributes of the population. Sixty percent were women; in 1986, the mean age was 72 (SD = 5.9). Eighty-nine percent were non-Hispanic White, 5% were Hispanic, and 4% were African American. Eighteen percent were born elsewhere and immigrated to the United States. Seventy-four percent were retired, and 26% were still working or keeping house at the time of the study. The mean education level was 12 years (SD = 3.4), but more than one third (38%) had been to college. More detailed descriptions of the study population and comparisons with other populations can be found elsewhere (Berkanovic & Hurwicz, 1989, 1992).

Survey procedures.—Seven waves of telephone interviews were conducted at 2-month intervals. At the beginning of each interview after the baseline, the participants were asked first to list all injuries or accidents, and then to list separately all episodes of illness or flare-ups of chronic conditions they had experienced since the previous interview. If more than one episode was reported during the 2-month interval, the respondents were asked to select the one they felt was the most severe. If the most severe episode was composed of more than one symptom, the major symptom/condition indicated by the respondent was used as its label. They were asked to provide detailed information regarding how they had treated this episode. All respondents had been provided "memory aids" (health diaries) in which they were asked to record these responses as they occurred.

Of 1,034 individuals age 65 and older who were interviewed at baseline, 1,009 (98%) completed an additional interview. Of these, 885 (88%) reported at least one episode of illness; 2,493 "most severe" episodes (2.8 per person) were recorded over the study year. All illness episodes reported in this study were classified according to the NASC codes (Berkanovic & Hurwicz, 1989; National Center for Health Statistics, 1974).

Although these data were collected over a decade ago, the HMO model they represent is still viable. Furthermore, this is the most complete data set available for the analysis of individual episodes of illness among older adults of which we know. Unlike the data sets used by Fleming, Giachello, and Andersen (1984) and Pescosolido (1992), it includes nonserious as well as serious episodes. We believe the advantages of this data set outweigh its limitations.

Data Preparation

Using the illness episode as the unit of analysis is attractive because theoretically it is possible for a given individual to behave appropriately at times and inappropriately at others. Of the 2,493 illness episodes collected, 2,395 (96%) could be given 1 of the 106 NASC codes rated by the physicians, and thereby classified into 1 of the 3 categories based on consensus analysis (Hurwicz, 1995). To prepare the data for analysis, the database containing the 2,395 illness episodes was divided into three separate analysis files: (a) episodes coded "visit not recommended," (b) episodes coded "visit recommended," and (c) episodes coded "visit mandatory."

To ensure statistical independence, the first episode reported in each category by each respondent was selected for analysis. Thus, a given individual respondent could have an episode in each of the 3 analysis files, in 2 of the 3 analysis files, or in 1 of the 3 analysis files. This procedure yielded a total of 1,292 person-episodes that had all the data necessary for the planned multivariate analyses. Three hundred eighty-five respondents reported at least one episode in the "visit not recommended" category, 646 respondents reported at least one "visit recommended" episode, and 261 reported at least one "visit mandatory" episode.

Table 1 indicates (for person-episodes used in the multivariate analyses) the proportion seeking medical care for symptoms/conditions with more than five self-reports, by episode category. Symptoms/conditions with five or fewer mentions are aggregated and listed as "Other" within each category. Most of the episodes in the "visit not recommended" category are colds; only 18% of these episodes were brought to the attention of physicians. Fifty-five percent of the episodes in the "visit recommended" category were brought to the attention of physicians. These are predominantly musculoskeletal symptoms and the flu, as well as other respiratory, digestive, general body, and skin symptoms. Many of the "visit mandatory" episodes are serious respiratory and cardiovascular symptoms, along with face, neck, and abdominal pain; physicians were contacted for 72% of the episodes in this category. The distribution of the reduced sample of 1,292 episodes is very similar to the distribution of the 2,394 episodes. In the aggregate, the proportion brought to medical attention in each group is within 2% of being the same as the proportion of the full set of episodes analyzed previously (Hurwicz, 1995).

Measurement

Independent variables.—Table 2 contains the coding of variables used in the multivariate analyses and their means for each of the data analysis files. Six variables measure predisposing demographic and social structural characteristics of the individual. Four of them—sex, race/ethnicity, immigration status, and employment status—are coded as dichotomous measures, following the advice of Hosmer and Lemeshow (1989) for the development of models using logistic regression. The coding of sex and immigration status is straightforward. African American identity is contrasted to a category that includes non-Hispanic Whites, Hispanics, and "others." "Working" includes full-time, part-time, and housekeeping, contrasted to "retired." Age and education are coded as the number of years reported by the study participant.

Two health-related predisposing variables were measured at the individual level. Dissatisfaction with past medical services was measured using a reliable (alpha = .85) index. The participants were asked to use a Likert-type response set to answer five questions about the nature and results of

Table 1. Summary of Estimated Answer Key for Physician-Rated Symptoms/Conditions, and Decisions of Study Participants Experiencing Them

Symptom Classification	*n*	% with Physician Contact
Visit Not Recommended		
Nasal congestion	15	13
Cold	359	17
Others	11	73
Total	385	18
Visit Recommended		
Fever	7	57
Fatigue	6	50
Headache	15	47
Vertigo/dizziness	13	92
Allergic skin reaction	14	79
Skin irritation	11	73
Skin bump or swelling	10	80
Sinus problem	22	45
Sneezing	12	17
Cough	8	50
Flu[a]	111	36
Congestion in chest	36	81
Pain/injury of lower extremities	75	63
Pain/injury of upper extremities	42	64
Back pain/injury	68	62
Arthritis	76	50
Throat soreness	31	32
Diarrhea	12	50
Anal or rectal symptom	8	88
Heartburn or upset stomach	13	31
Nausea and vomiting	7	43
Earache	10	60
Others	39	64
Total	646	55
Visit Mandatory		
Pulsations/palpitations	10	90
High blood pressure	23	74
"Bad" or "weak" heart	17	100
Shortness of breath	20	65
Pain in chest	43	72
Asthma	17	71
Face/neck pain/injury[b]	23	52
Abdominal pain[b]	44	55
Pain in male genitalia	9	89
Eye pain and irritation	16	88
Others	39	64
Total	261	72

[a]The majority of the physician panel classified this symptom as "visit not recommended," but the weighted consensus is "visit recommended."

[b]The majority of the physician panel classified this symptom as "visit recommended," but the weighted consensus is "visit mandatory."

their interactions with doctors during the last 10 years. The responses were summed with a higher score indicating greater dissatisfaction.

Measures indicating numbers or presence of chronic conditions usually represent need in analyses based on Andersen's (1968) model of health service utilization. In this analysis, however, the presence of a chronic condition at baseline is used as a proxy for probable past experience with illness and medical care, and resulting knowledge about disease. It does *not* indicate that the person-episode being analyzed is a first occurrence or flare-up of a chronic condition.

Two variables measure perceived need at the episode level. Perceived seriousness of the episode was determined by asking participants directly how serious they thought the episode was, offering them the alternatives of very serious, somewhat serious, not too serious, and not serious at all. Duration of the episode was the number of days the episode lasted reported by the participant. Although physician contact may occur before an illness episode is considered to be over, we include the entire duration of the episode as a proxy for severity.

Three dichotomous variables indicate the presence or absence of other illness response strategies used during the episode. They include: (a) whether the person spent at least 1 day in bed; (b) whether they talked to someone who was not a medical doctor about the illness (such as a friend or family member); and (c) whether they took nonprescription medications. Because these responses could occur at any time during the episode, we take these variables as indicators of co-occurring strategies rather than antecedents during an episode.

Dependent variable.—The dichotomous dependent variable is the answer, for each episode, to the question: "Did you contact a doctor for this problem?" We did not reverse code the responses for the "visit not recommended" category; therefore, a positive response indicates an inappropriate decision for "visit not recommended" episodes and an appropriate decision for "visit recommended" and "visit mandatory" episodes.

Statistical Analyses

Logistic regression, using the person-episode as the unit of analysis, makes it possible to assess the conditional odds of each variable being associated significantly with whether a physician was consulted for an episode. The independent variables were blocked in two groups, following the procedures established in our earlier studies (Berkanovic & Hurwicz, 1989; Hurwicz & Berkanovic, 1991). These are (a) predisposing-personal attributes, measured at the level of the individual, and (b) need-related episode characteristics, measured for each illness. Other illness responses are included in the second block. The −2 log likelihood, the receiver-operating characteristic, and the Hosmer-Lemeshow chi-square are used to test the goodness of fit for each step.

It was important to apply the same model to each of the three episode categories, so that the results could be compared substantively. Techniques suggested by Hosmer and Lemeshow (1989, 82ff.) were used to develop a full logistic regression model. Variables that were statistically useful in any one of the categories were retained. An a priori decision to retain sex and age in the models because of their importance in the modeling of health behavior resulted in sex being the only retained variable that is not significant in any equation. Variables that were considered, but dropped from the model, include marital status, living arrangements, religious affiliation, a frailty (susceptibility) index, subjective self-rated health, number of symptoms reported for the episode, number of other unrelated illness episodes reported for the interval, and the restricted activity illness response.

Table 2. Variables, Coding, and Means by Episode Category

Variable (Coding)	Episode Category: Visit Not Recommended *M*	Visit Recommended *M*	Visit Mandatory *M*
Predisposing/Person Attributes			
Female (1 = yes, 0 = no)	.56	.62	.60
Age (reported number of years)	72	72	72
African American (1 = yes, 0 = no)	.04	.03	.04
Foreign born (1 = yes, 0 = no)	.17	.16	.14
Education (reported number of years)	12	12	12
Working, includes housework (1 = yes, 0 = no)	.28	.23	.23
Dissatisfaction with care (sum of 5 items[a] coded 0–3,[b] range 0–15)[c]	3.4	3.5	3.8
Chronic condition (1 = yes, 0 = no)	.53	.63	.70
Need/Episode Characteristics			
Perceived seriousness (1 = not at all, 2 = not too, 3 = somewhat, 4 = very)	1.8	2.5	2.9
Duration (reported number of days)	10	20	21
Spent a day in bed (1 = yes, 0 = no)	.17	.21	.24
Lay consultation (1 = yes, 0 = no)	.52	.63	.61
Used nonprescription medications (1 = yes, 0 = no)	.56	.33	.13
Dependent Variable			
Contacted physician (1 = yes, 0 = no)	.18	.55	.72
Number of physician contacts	71	353	187
Number of cases	385	646	261

[a]Thinking about the health care you have received during the last 10 years:
1. When you have gone to the doctor's office, have you felt welcome?
2. Have the doctors you have seen been concerned with your feelings?
3. Have the doctors you have seen taken your medical complaints seriously?
4. When you have gone to the doctor's office, has the doctor been able to treat your problem effectively?
5. When you have gone to the doctor's office, have you been satisfied with the outcome of the visit?

[b]0 = always; 1 = most of the time; 2 = some of the time; 3 = not much of the time.
[c]Alpha = .85.

Although age and education in years, dissatisfaction index scores, and duration of episode in days were modeled as continuous, their odds ratios were later modified statistically using the "units" function in SAS (1997) to facilitate interpretation. The resulting odds ratios indicate the increase in the "risk" of physician contact for every increase in the specified number of units of the variable (5 years of age, 6 years of education, 3 index points of dissatisfaction, and 7 days of duration; Hosmer & Lemeshow, 1989).

To provide sensitivity assessments of whether the estimates are robust in reduced form, each model was rerun using only variables that were significant.

Results

Table 3 shows the results of the logistic regression analyses. All three equations have acceptable fit using the −2 log likelihood chi-square (p values ≤ .001), the receiver-operating characteristic (ranging from .78 to .85), and the Hosmer-Lemeshow goodness-of-fit statistics (p values ranging from .40 to .94). Reducing the models to include only the 5, 7, and 6 significant variables, respectively, produces substantively similar results (details available on request), suggesting the stability of the models.

Physician contact that is "not recommended" is associated significantly with both fewer years of formal education and greater dissatisfaction with past medical care. When the effect of a 6-year change in education is calculated, the odds ratio is .49 (95% confidence interval [CI] = .26, .90). When the effect of a three-unit change in the dissatisfaction index is calculated, the odds ratio is .67 (95% CI = .48, .94). The goodness-of-fit statistics are not significant when this block is entered alone.

Both perceived seriousness and reported duration of the episode are significant predictors of physician contact for "visit not recommended" episodes. For example, the odds of a person who perceives their illness to be "somewhat" serious contacting a physician are 3.5 times that of a person who feels it is "not too" serious. The odds of physician contact increase significantly with the number of days an episode lasts. When the effect of a 7-day change in duration is calculated, the odds ratio is 1.79 (95% CI = 1.45, 2.23). On the other hand, the odds of a person who uses over-the-counter remedies during the episode contacting a physician are .38 times that of a person who does not.

Four personal attributes have a significant effect on physician contact during "visit recommended" episodes. Older participants compared with younger participants are more likely to seek care. The odds ratio is 1.29 (95% CI = 1.09, 1.51) for the effect of a 5-year increase in age. African Americans, compared with a reference group of all others, are 3.79 times more likely to seek care (the wide confidence interval somewhat reduces confidence in this result). Immigrants compared with U.S.-born participants are 1.69 times more likely to seek care. However, the odds of a person who

Table 3. Logistic Regression of Physician Contact on Full Model, by Episode Category

Variable	Visit Not Recommended Odds Ratio (95% CI)	Visit Recommended Odds Ratio (95% CI)	Visit Mandatory Odds Ratio (95% CI)
Predisposing/Person Attributes			
Female	.689	.881	.756
	(.351, 1.350)	(.607, 1.279)	(.374, 1.530)
Age (years)	.994	1.052**	1.042
	(.941, 1.050)	(1.018, 1.086)	(.979, 1.118)
African American	2.665	3.788*	.530
	(.674, 10.539)	(1.105, 12.988)	(.105, 2.670)
Foreign born	1.584	1.686*	1.650
	(.691, 3.634)	(1.031, 2.757)	(.591, 4.601)
Education (years)	.887*	1.000	1.052
	(.800, .983)	(.944, 1.059)	(.950, 1.166)
Working (includes housework)	1.161	1.128	.464*
	(.550, 2.452)	(.735, 1.731)	(.222, .971)
Dissatisfaction with care	.875*	.985	1.026
	(.781, .980)	(.930, 1.044)	(.921, 1.143)
Chronic condition	1.755	.651*	1.222
	(.890, 3.460)	(.446, .950)	(.612, 2.439)
Need/Episode Characteristics			
Perceived seriousness	3.502***	2.139***	1.697**
	(2.264, 5.417)	(1.744, 2.624)	(1.145, 2.516)
Duration (days)	1.087***	1.030***	1.027**
	(1.054, 1.121)	(1.019, 1.040)	(1.008, 1.047)
Spent a day in bed	1.372	1.405	2.661*
	(.617, 3.049)	(.880, 2.242)	(1.069, 6.624)
Lay consultation	.726	1.211	2.464**
	(.372, 1.416)	(.835, 1.756)	(1.243, 4.886)
Used nonprescription medications	.383**	.616*	.106***
	(.196, .748)	(.423, .898)	(.041, .272)
−2 log likelihood chi-square (13 df)	117.394***	164.352***	77.094***
Receiver-operating characteristic	.851	.779	.814
Hosmer-Lemeshow (*p* value)	8.363 (0.399)	3.141 (0.925)	2.997 (0.935)
Number of physician contacts	71	353	187
Number of cases	385	646	261

Note: CI = confidence interval.
*$p \leq .05$; **$p \leq .01$; ***$p \leq .001$.

reported a chronic condition at baseline contacting a physician are only .65 times that of a person who did not. When this block of variables is entered alone, the goodness-of-fit statistics are significant.

Episode characteristics are also significant predictors of physician contact for "visit recommended" episodes. A change of one unit of perceived seriousness doubles the likelihood of physician contact. The longer the episode lasts, the greater the likelihood of physician contact. The odds ratio is 1.23 (95% CI = 1.14, 1.32) for the effect of a 7-day change in duration. The odds of a person who uses over-the-counter medications contacting a physician are .62 times that of a person who does not use them.

For "visit mandatory" episodes, only one personal attribute is significantly associated with care-seeking. People who report that they are still working full or part time, or that they are still "keeping house" are .46 times as likely to seek care as those who are retired. The block of variables indicating predisposing personal attributes when entered alone produces significant goodness-of-fit statistics.

Greater perceived seriousness and longer duration are significantly associated with seeking medical care for "visit mandatory" episodes. The odds ratio for perceived seriousness is 1.7. For the effect of a 7-day change in duration, the odds ratio is 1.21 (95% CI = 1.06, 1.38). If a person uses over-the-counter medications at some point during the episode, the odds of their seeking medical care are .11 times that of a person who does not. However, the two other illness responses are positively associated with physician contact. Bed rest more than doubles the likelihood of "mandatory" medical care-seeking. Consultation with a neighbor, friend, or family member also more than doubles the likelihood of physician contact.

Because lay consultation is likely to co-occur with appropriate physician use for this type of episode, the role-relationship of the person consulted, and what they recommended, was explored further. Forty-five percent of lay consultation was with spouses, 22% with adult children, 11% with other relatives, and 22% with friends and neighbors. Sixty-four percent suggested medical care: visiting a doctor (52%), calling a doctor (10%), or going to an emergency room (2%). Six percent suggested taking "medications," and

2% suggested over-the-counter medications specifically. Four percent suggested resting, and 17% suggested doing nothing.

Discussion

As hypothesized, physician contact is significantly associated with a different set of variables within each category of episodes. Although need factors are important in all categories, the pattern of significant other illness responses varies by episode type, as does the pattern of predisposing factors. Because it was necessary to delete each person's repeat episodes within categories to ensure statistical independence, the sample sizes are relatively small, and in the case of "visit not recommended," the marginals on the outcome variable are less than optimal. As a result, differences in the significance of certain variables observed between groups reflect both power and likelihood, with power playing a larger than desirable role. Without additional research using larger samples of episodes, interpretations of the differences must therefore remain tentative. Nonetheless, the results are provocative, and we believe that they have implications for both health education and policy.

Perceived seriousness and duration both contribute to the models' explanatory power. However, the fact that this is true for illnesses where care is "not recommended" by the expert panel raises a policy question. Should an older adult be discouraged from seeking medical care for a cold s/he perceives to be serious? It has been argued that acting on the basis of perceived need always leads to appropriate choices (Andersen, 1995). On the other hand, perceptions of the seriousness of specific symptoms may be mutable and therefore subject to the influence of health education.

The consistent negative association between nonprescription medication use and physician contact suggests that over-the-counter medications often *substitute* for medical care, as both Fleming and colleagues (1984) and Pescosolido (1992) found. Although participants may successfully treat cold, flu, and arthritis symptoms with over-the-counter remedies, self-medicating in the case of "visit mandatory" episodes, such as neck pain or abdominal pain, may mask serious symptoms. Therefore, health education identifying symptoms that should not be treated with nonprescription medications is supported by these results.

The co-occurrence of lay consultation and bed rest with "mandatory" physician contact supports a *linking* hypothesis. These strategies may encourage or result from medical care-seeking (Fleming et al., 1984). Hurwicz and Berkanovic (1991) found that lay consultation and restricted activity most often precede physician contact during episodes of musculoskeletal and respiratory illness. Pescosolido (1992) found for the serious episodes they studied that 66% included both physician contact *and* consultation with family, friends, and/or coworkers. Wolinsky and Johnson (1991) noted that useful advice may be given in the context of routine social interactions. These findings suggest that health education identifying symptoms that require physician visits should be targeted to the friends and family of older adults.

Predisposing variables representing individuals' location in the social structure, and by implication their lifestyles, are significant in all analyses. The association of formal education with making the appropriate choice during "visit not recommended" episodes suggests that health education about the recognition and treatment of colds should target less formally educated individuals. However, it should be noted that the relationship between education and service use has not been consistent in the literature (Calsyn & Winter, 2000).

Working is associated with failure to seek medical attention for "visit mandatory" episodes. Clearly, older adults who continue their productive economic roles of earlier life should be encouraged not to ignore symptoms of potentially serious illnesses. Furthermore, they should be encouraged to seek advice from significant others, because lay consultation is correlated with care-seeking for this type of episode. Therefore, interventions should target working older adults and their social networks; one obvious site for this would be the workplace.

Four predisposing variables are associated with a greater likelihood of care-seeking for illnesses that fall into the "visit recommended" category, in which the cultural command to seek care is less definite or urgent. Being African American, or having immigrated to the United States, serve as proxies for sociocultural attributes, including but not limited to lifestyle. Age and experience with a chronic condition are indicators of life cycle position. Without an in-depth ethnographic investigation, discussion of the reasons for these results must remain speculative.

Berkanovic and Telesky (1985) found in a general population sample that African Americans were more likely to seek care if they had a regular provider. To the extent that they lacked continuity of care before qualifying for Medicare, the finding for African Americans and immigrants might be a function of their newly acquired membership in an HMO. Because many countries of origin are represented in this group, it is unlikely that the immigrants are expressing a specific cultural bias. Perhaps something about their self-selection (Morgan, 1973) or the immigration experience itself (Pescosolido, 1986) is at work. On the other hand, the implied reference group—U.S.-born, non-African Americans—may share a "matter of fact" orientation to health and health care (Zborowski, 1969; Zola, 1973).

The tendency of the older old to seek care for these illness episodes may reflect their chronological age or social cohort membership. They may share an age-appropriate concern about their susceptibility to, and the probable consequences of, illnesses. Differences in their life course experiences may account for different expectations, definitions, or explanatory models.

The negative association between experience with a chronic condition and "recommended" care-seeking suggests several hypotheses. People may have learned from their physicians how to care for their flare-ups at home with prescription drugs and behavioral regimens. They may have learned that their physicians cannot provide alleviation and/or a cure. Or, they may have developed over time a strategy that combines physician advice with self-treatment.

When the characteristics of the illness episode itself drive care-seeking, as is the case with serious "visit mandatory" episodes, the influences of the sociocultural environment may not be strongly felt. However, when the symptoms are

less serious, and biomedicine has not provided a clear directive regarding medical care, considerations related to past experiences, life-cycle position, and/or cultural values may be more important.

In summary, techniques from cognitive anthropology have enhanced the application of a health services approach to understanding older adults' decisions about medical care. Using physicians' shared norms to categorize actual illness episodes for multivariate analyses allowed the identification of predictors for both medically unnecessary and necessary physician contacts. These predictors can be used to identify specific target groups and health education strategies for each that may result in more effective health education interventions than are found in the one-size-fits-all advice too often given the entire population.

Acknowledgments

The National Institute on Aging/National Institutes of Health supported both the original project, "Psychological Distress and the Aged's Use of Services" (R01 AG05181, Emil Berkanovic, P.I.) and the secondary analyses "Decisions About HMO Use for Symptoms of Late Life Illness" (R29 AG10887, Margo-Lea Hurwicz, P.I.). A preliminary version of this paper was presented in March 1992 at the annual meeting of the Society for Applied Anthropology in Memphis, TN.

The authors would like to thank the editor and five anonymous reviewers for their helpful advice, and Ms. Valerie W. Duffy for her technical assistance.

Address correspondence to Dr. Margo-Lea Hurwicz, Department of Anthropology, University of Missouri–St. Louis, 8001 Natural Bridge Road, St. Louis, MO 63121-4499. E-mail: hurwicz@umsl.edu

References

Aday, L. A., & Awe, W. (1997). Health services utilization models. In D. S. Gochman (Ed.), *Handbook of health behavior research I: Personal and social determinants* (pp. 153–172). New York: Plenum Press.

Andersen, R. (1968). *A behavioral model of families' use of health services.* Chicago: University of Chicago, Center for Health Administration.

Andersen, R. (1995). Revisiting the behavioral model and access to medical care: Does it matter? *Journal of Health and Social Behavior, 36*, 1–10.

Berkanovic, E., & Hurwicz, M. (1989). Psychological distress and the decision to seek medical care among a Medicare population. *Medical Care, 27*, 1058–1075.

Berkanovic, E., & Hurwicz, M. (1992). Illness episodes, physician visits, and depressive symptoms. *Journal of Aging and Health, 4*, 331–348.

Berkanovic, E., & Telesky, C. (1985). Mexican-American, Black-American, and White-American differences in reporting illness, disability, and physician visits for illness. *Social Science and Medicine, 20*, 567–577.

Borgatti, S. P. (1992). *ANTHROPAC 4.0.* Columbia, SC: Analytic Technologies.

Calsyn, R. J., & Winter, J. P. (2000). Predicting different types of service use by the elderly: The strength of the behavioral model and the value of interaction terms. *Journal of Applied Gerontology, 19*, 284–303.

Fleming, G. V., Giachello, A. L., & Andersen, R. M. (1984). Self-care: Substitute, supplement, or stimulus for formal medical care services. *Medical Care, 22*, 950–966.

Garro, L. (1986). Decision-making models of treatment choice. In S. McHugh & M. Vallis (Eds.), *Illness behavior: A multidisciplinary model* (pp. 173–188). New York: Plenum Press.

Haug, M. (1981). Age and medical care utilization patterns. *Journal of Gerontology, 36*, 103–111.

Hosmer, D. W., & Lemeshow, S. (1989). *Applied logistic regression.* New York: Wiley.

Hurwicz, M. (1995). Physicians' norms and health care decisions of elderly Medicare recipients. *Medical Anthropology Quarterly, 9*, 211–235.

Hurwicz, M., & Berkanovic, E. (1991). Care seeking for musculoskeletal and respiratory episodes in a Medicare population. *Medical Care, 29*, 1130–1145.

Janz, N. K., & Becker, M. H. (1984). The health belief model: A decade later. *Health Education Quarterly, 11*, 1–47.

Krause, N. (1990). Illness behavior in later life. In R. H. Binstock & L. K. George (Eds.), *Handbook of aging and the social sciences* (pp. 227–244). San Diego: Academic Press.

Mathews, H. F., & Hill, C. E. (1990). Applying cognitive decision theory to the study of regional patterns of illness treatment choice. *American Anthropologist, 92*, 155–170.

Morgan, R. (1973). Migration as a factor in the acceptance of medical care. *Social Science and Medicine, 7*, 865–873.

National Center for Health Statistics. (1974). *National ambulatory medical care survey: Symptom classification* [Publication No. (HRA) 74-1337]. Rockville, MD: U.S. Department of Health, Education and Welfare.

Pescosolido, B. A. (1986). Migration, medical care preferences and the lay referral system: A network theory of role assimilation. *American Sociological Review, 51*, 523–540.

Pescosolido, B. A. (1992). Beyond rational choice: The social dynamics of how people seek help. *American Journal of Sociology, 97*, 1096–1138.

Romney, A. K., Weller, S., & Batchelder, W. H. (1986). Culture as consensus: A theory of culture and informant accuracy. *American Anthropologist, 88*, 313–338.

SAS Institute, Inc. (1997). *SAS/STAT software: Changes and enhancements through release 6.12.* Cary, NC: Author.

Stoller, E. P., Pollnow, R., & Forster, L. E. (1994). Older people's recommendations for treating symptoms: Repertoires of lay knowledge about disease. *Medical Care, 32*, 847–862.

Taylor, G., Aday, L. A., & Andersen, R. (1975). A social indicator of access to medical care. *Journal of Health and Social Behavior, 16*, 39–49.

Weller, S. C., Ruebush, T. R., & Klein, R. E. (1997). Predicting treatment seeking behavior in Guatemala: A comparison of the health services and decision-theoretic approaches. *Medical Anthropology Quarterly, 11*, 224–245.

Wilkinson, I. F., Darby, O., & Mant, A. (1987). Self care and self medication: An evaluation of individual health care decisions. *Medical Care, 25*, 965–978.

Wolinsky, F. D. (1994). Health service utilization among older adults: Conceptual, measurement, and modeling issues in secondary analysis. *The Gerontologist, 34*, 470–475.

Wolinsky, F. D., & Johnson, R. J. (1991). The use of health services by older adults. *Journal of Gerontology: Social Sciences, 46*, S345–S357.

Young, J. C. (1981). *Medical choice in a Mexican village.* New Brunswick, NJ: Rutgers University Press.

Zborowski, M. (1969). *People in pain.* San Francisco: Jossey Bass.

Zola, I. (1973). Pathways to the doctor: From person to patient. *Social Science and Medicine, 7*, 677–689.

Received February 23, 1999
Accepted August 3, 2001
Decision Editor: Fredric D. Wolinsky, PhD