Great Lakes American Indian Elders and Service Utilization: Does Residence Matter?

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Discussions about service usage by older individuals often center around the relative importance of need and knowledge variables. The impact of these variables among minority elderly remains a matter of debate. This article examines service usage among a sample of urban, rural, and reservation-based eastern Great Lakes American Indian elders. Issues of availability, awareness, acceptability, accessibility, and need are examined through both a survey of 309 respondents and a small sample of service providers. Regression results show predictors of use vary by type of service. Reservation residence and need characteristics predict in-home and preventive health service use. Being female, older, having knowledge of services, and problems with Instrumental Activities of Daily Living (IADL) predicts in-home service use. Service providers' perceptions suggest issues of trust, past experiences, and cultural acceptability need to be explored more intensely in efforts to explain service usage among American Indians and other ethnic and racial groups.

A variety of research efforts and publications reveal inconsistent and often inadequate service usage patterns among minority elderly (Gelfand, 1994; Jackson, 1988; Manson, 1995; Skinner, 1995). Probably least is known about service usage among older American Indians. Although American Indian elders share many characteristics in common with other minority elders including poor health, lower life expectancy, disproportionate numbers in poverty, and large extended families, these indigenous elders are both unique and heterogeneous (John, 1994). As John (1994) notes, use of services by American Indian elderly is not proportional to their service needs, but the

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factors that deter adequate satisfactory usage remain unclear. The proportion of elderly American Indians grew by 52% nationwide (John, 1994) and by 72% in Michigan (Chapleski, 1992) between 1980 and 1990. With this growth pattern expected to continue, attention needs to be paid to the service needs and service usage patterns of this group of elders.

American Indians live either in urban areas, rural communities, or on reservations. Despite the increase in their numbers in urban areas, American Indians remain the most rural of all racial groups in the United States (Agree, 1988; John, 1994). The availability of services differs in the urban, rural, and reservation communities where American Indian populations reside.

This research examines the utilization patterns of older American Indians living in reservation, urban, and rural areas in order to understand the factors that predict their use of three specific types of formal services. Our focus is on the relatively unstudied older American Indian population of Michigan, the state with the 10th largest population of American Indians in the United States, although state boundaries were not strictly adhered to and we included tribal members living in contiguous areas in Indiana or Ontario. The 1990 Census reported more than 55,000 American Indians living in Michigan, and 6,091 of those were age 55 and older (Bureau of the Census, 1990).

American Indian Elders and Service Need

Data from research completed over the past 15 years clearly indicate the need among American Indian elderly for a variety of services often cited under the "continuum of care" (Manson & Callaway, 1990). These include community-based services such as nutrition programs, home health services, and a variety of health prevention and treatment programs (John, 1994; Manson & Callaway, 1990; McCabe & Cuellar, 1994; National Indian Council on Aging, 1992). Some of these needs may be related to the low income levels of American Indian elderly. As Manson (1995) notes, the per capita income of American Indians is lower than Whites in all areas of the country. However, these income levels vary by area of residence—urban American Indian elders have significantly higher incomes than their peers living in rural areas.

Furthermore, American Indian elders have higher rates of certain chronic diseases than other populations. For example, they continue to evidence higher prevalence rates for diabetes, liver and kidney disease, high blood pressure, emphysema, and gall bladder problems (Agree, 1988; Chapleski, 1990, 1992; Johnson & Taylor, 1991; National Indian Council on Aging, 1981). Although some of these higher prevalence rates may be related to poor

socioeconomic conditions, there are also biogenetic components of these diseases that are now becoming apparent. In any case, one would expect differences in cultural experiences that lead to extreme discrepancies in need would be reflected in utilization behavior (Chapleski, 1991).

American Indian Elders and Service Use

The relationship between need and use is not simple. Although current data clearly indicate the need for assistance on the part of American Indians, both nationally and among Great Lakes Indians, use is not necessarily predicted by need. Factors that impinge on service use can be viewed from a simple "4-A" model (Figure 1). The four As are Availability of services, Awareness of services, Acceptability of services, and Accessibility to services (Gelfand, 1994).

Availability of services is an obvious prerequisite for any service utilization. However, availability of services is a necessary but not sufficient condition for their use. Furthermore, availability, acceptability, and accessibility of needed services have been found to vary among American Indian elders depending on their place of residence (Chapleski & Dwyer, 1995). For example, there are health services specifically targeted for American Indians living in reservation service areas, obviously increasing their accessibility in these areas. These are implemented through the Indian Health Service (IHS) or through IHS funds to tribes who have chosen self-determination. Self-determination gives federally recognized tribes full authority over how their IHS funds are spent. Typically, IHS funds are used for a variety of health care programs that encompass primary, secondary, and tertiary efforts, and in some cases traditional as well as Western medicine. However, the National Indian Council on Aging has publicly advocated for greater attention to elders and noted the failure of IHS to address long term care needs of American Indian elders (National Indian Council on Aging, 1992).

Next, we turn to awareness. In this research, we refer to awareness as knowledge of the existence of a service rather than awareness that one needs it. The determination of knowledge is critical in samples that include both users and nonusers of services (Chapleski & Dwyer, 1995). If individuals are going to be clients of any program, they must have an awareness of the service and its availability. Though the relationship between knowledge, need, and use is complex at best, the extant research has found knowledge of services to be one of the strongest predictors of use (Anderson & Newman, 1973; Chapleski, 1989, 1991; Coulton & Frost, 1982; McCaslin, 1988; Mindel & Wright, 1982). McCaslin (1989) in analyzing four studies found that general

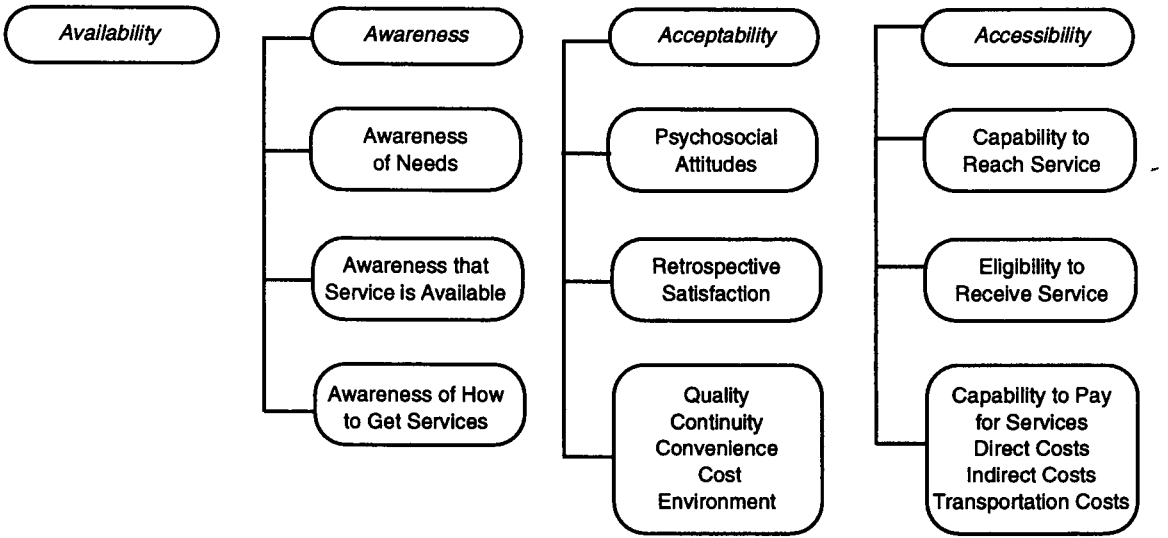

Figure 1. Factors That Influence Service Utilization.
SOURCE: Gelfand, D. E. (1994).

knowledge of formal service systems was a better predictor of use than demographic and functional capacity variables. Awareness in regards to service use, however, is a multidimensional concept that must also be matched by an awareness on the part of the older person of their need for a particular service and some knowledge about what they have to do to receive the service. Psychosocial attitudes that have their roots in strongly held cultural beliefs may affect service utilization. For example, an Indian elder may prefer to use traditional healers solely or in conjunction with mainstream health-related services.

Acceptability is multidimensional also and perhaps the least likely to be included in empirical models predicting utilization. Past history of satisfaction or dissatisfaction with services can have a major impact on the willingness of older minority group members to use services or to trust their health to a system where representatives from their own ethnic or racial background are very limited in number. There are also obvious issues related to factors such as quality of the service and its cost that affect the acceptability of a particular service among older individuals.

The fourth A, accessibility, has been viewed as a major factor in service delivery utilization rates. Accessibility is related to availability given the pattern of funding streams for programs specifically for American Indians. Title VI of the Older Americans Act (OAA) recognizes the extraordinary need of older American Indians. As Section 611 of the title argues, older American Indians are a growing population with problems of unemployment, poverty, substandard housing, lower life expectancy than the general population, and inadequate services including health care services and long term care (Administration on Aging, 1992). Although this preamble to Title VI has not been revised in many years, its general thrust is still applicable to older American Indians in many communities. For many years, Title VI remained unfunded. The 1992 reauthorization of the OAA allotted $30 million for Title VI, and 215 tribes were eligible for Title VI funds in 1993 (John, 1994). Title VI authorizes all of the Administration on Aging programs in an attempt to provide comprehensive services for older American Indians. The other major governmental source of services for American Indian elders are those provided by the IHS in designated reservation or "near reservation" areas (30 miles or less from a reservation) and to 31 urban clinics across the United States. In addition to the Title VI programs and IHS, older American Indians may also use services available through Title III of the OAA, although they must compete with all other seniors for these services. These include the panoply of programs and services that include senior centers, employment programs, congregate meals, and meals on wheels.

The 4-A model is not incompatible conceptually with the widely used model proposed by Anderson and Newman (1973) whose inclusion of enabling measures are comparable to awareness, acceptability, and accessibility. Enabling measures are related to ability to access services, including rural-urban nature, family or network aid, and costs of access. What is missing in the original Anderson and Newman approach is the major issue of availability from the delivery or supply side of the equation. As Anderson (1995) comments, "Both community and personal enabling resources must be present for use to take place. First, health personnel and facilities must be available where people live and work. Then, people must have the means and know-how to get to those services and make use of them." The community variables have been neglected in most research using the Anderson and Newman model, and individual predictors seldom include culturally-based beliefs. Consequently, this complexity of factors has laid to rest any contention that health behavior is based purely on a rational cost-benefit approach by the individual. Furthermore, beliefs about the value of different forms of health care, as well as beliefs about the appropriateness of treating certain symptoms, are determinants of health behavior that may have their roots in long-standing ethnic traditions. For American Indians, native healers may be viewed as more appropriate sources of treatment than physicians for some illnesses. Evidence for these decisions may be seen in where the individuals go for health care and whether they self-treat certain possibly serious illnesses.

Another promising approach, with many similarities to the 4-A model, comes from a practice-orientation that organizes three of the As (awareness, accessibility, and acceptability) into types of barriers: knowledge, access, and intent (Yeatts, Crow, & Folts, 1992). Unfortunately, most data sets do not contain adequate measures of important barriers, as well as contextual information on actual availability. Common to all these conceptual models of service use, however, is the importance of barrier-reducing factors, factors malleable to intervention.

Other research has pointed to shortcomings in service use literature. For instance, the term *service* is operationalized differently, usually in nonspecific terms which prevent comparative evaluation of findings (Golant & McCaslin, 1979; Krout, 1983). In this research, we follow the Golant & McCaslin (1979) model of service classification, organizing services by their area of behavioral functioning: in-home services, community-based services, and preventive services.

A large portion of the empirically based literature on service utilization has come out of the individual predictors identified by Anderson and Newman (1973) as predisposing, enabling, and need. Therefore, although we focus on

the 4-A model to understand the barriers to service use, the Anderson and Newman framework brings together preexisting factors that predispose persons to use services, indicators of need for services, as well as enabling factors that reduce barriers to use. We first examine the distribution of predictors of service utilization and differences among respondents in the three residential locations. Second, we examine findings from a supplemental survey designed to measure the delivery perspective of 17 service providers. Finally, we present multiple regression results predicting utilization of the three types of service (in-home, preventive health, and community), testing the relative contribution of predisposing, enabling (i.e., barriers), and need factors.

Methods

Sample

Data obtained on services needed and desired by American Indians were collected from the first wave of the American Indian Long-Term Care Study which is being conducted with older American Indian men and women in Michigan. Based on the lower life expectancy of American Indians, an elder was defined in this research as an individual age 55 or older. This decision reflects the fact that all Michigan tribes have chosen age 55 as their criterion for elder services. Although Michigan has a substantial number of American Indians living on reservations, recent census data indicates that 58.8% of all the elders older than age 55 live in urban areas, and the majority of those live in the Detroit metropolitan area. In addition, 16.9% are estimated to be living in rural off-reservation communities and 24.3% in federally recognized tribal service areas.

The residential environment in which an older American Indian lives can have an impact along a number of dimensions. Residents of reservation catchment areas are able to utilize services offered by the IHS as well as those offered by the tribe itself. Older urban residents must rely on services targeted to the general public or special local programs that may exist to provide health care and perhaps social services for American Indians. Rural residents must often contend with long trips to urban or reservation communities where they can obtain services.

The American Indian Long-Term Care study is an effort to examine variations in the informal social networks, preferences, and attitudes toward long-term care, and utilization of health and long-term care services among urban, rural off-reservation, and reservation-based elders.

The sampling frame was stratified by area of residence, oversampling the rural and reservation elders to obtain large enough numbers for statistical comparisons. Due to the widely dispersed and highly rural nature of Michigan's Indian population, a decision was made to use a two-stage sampling process; all seven reservations and six state historic tribes were represented in the first stage of stratification, and the selected segments are representative of their respective strata. The selected reservation stratum covered a three county area of one of the seven federally recognized tribes in Michigan. The rural off-reservation stratum included four of six state historical tribal groups, and the urban respondents were drawn from the tri-county Detroit metropolitan area. Lists of members older than age 55 were obtained from enrollment officials of the tribes, as well as four urban Indian agencies. Thus, the sampling frame consisted of more than 2,000 names obtained from tribal rolls and urban Indian agency mailing lists. Survey respondents were randomly selected from these lists. A multiplicity sampling technique was used to augment the urban list. Respondents were asked to identify two other persons who fit the age criteria. Twenty names in the urban area were added to the lists through this procedure with no resultant effect on the diversity of the respondent pool. These names were added to the sampling frame after the original list was exhausted. Interviews were conducted with 125 urban, 83 rural, and 101 reservation elders, for a total of 309. The data were post-weighted to adjust for the stratification so that 58.8% of the total is urban, 24.3% reservation, and 16.9% rural off-reservation. The overall response rate was 73%.

The sample was also relatively homogeneous in their tribal backgrounds, although this was less true of the urban elderly than reservation or rural respondents. The tribes represented in the rural and reservation areas are Ojibway, Odawa, and Potawatomi, historically called "The People of the Three Fires." Three fourths of the urban respondents were from these same tribes, with the remaining fourth representing more than 20 different tribes. Those American Indians not enrolled in any of the sampled tribes who live in the urban region and have never connected with one of the Native American health or social service agencies will remain outside the purview of these findings unless identified by the multiplicity technique. More than 97% of the reservation and rural sample were born in Michigan compared to 37.5% of the urban strata. However, more than 95% of the non-Michigan born urban respondents were from other tribes with origins in the Great Lakes or Woodland areas. Thus, the sample represents a group of American Indians with similar biological, cultural, and language roots, increasing confidence that differences noted between areas of residence and other important sociodemographic factors are not due to biocultural differences (Young, 1994).

American Indians of various ages living in the respective communities were trained as interviewers through a process of didactic instruction and role playing. Initial interviews of each interviewer were reviewed for reliability and frequent contact by the project staff with the interviewers ensured continued reliability of the interviews.

Data and Measures

Respondent Survey

Predisposing measures include sociodemographic variables, sex, (coded one when the elder is female), age, and education, and two social network measures. Both education and age are coded into categorical groups for descriptive purposes, but entered into the regression models as continuous variables. Table 1 delineates characteristics of the population. Females constitute 63.1% of the sample. More than half of the respondents (55.9%) had less than a high school education with the largest proportion of those with more education being found in the urban area. The overall age distribution of the respondents indicates a relatively young population, but examination of the areas of residence reveals one important difference: More than one third (34%) of the reservation respondents were older than age 75. Although the mean age of the respondents was 68 (SD = 8.56), it is also notable that 6% of the respondents were older than age 85. Two social network measures are included: (a) the number of children living within 30 minutes (of elder), and (b) marital status. The mean number of children for the total sample was 3.6, and more than 90% of the elders had at least one child living within 30 minutes, with a mean of 1.46 children in this range. Less than half (47.4%) of the respondents were married, although in the urban area the likelihood of being married increases.

Enabling measures include area of residence, income adequacy, native network, and knowledge or awareness of services. "Problems paying bills," as a measure of perceived income adequacy, was used because of the high number of missing values on direct questions about household and personal income. The question was "People frequently have problems paying their bills. Does this happen to you frequently, occasionally, or never?" 65% of the elders have frequent problems with paying their bills, and another 28.1% has this problem occasionally. Embeddedness in Native Network is an index of social integration, created from items related to cultural embeddedness and degree of contact with other American Indians. The Michigan tribes in this sample are not geographically isolated from society in general, affording opportunity for cross-cultural contact even among nonurban Natives. Main-

Table 1. Characteristics of the Population by Area of Residence ($N = 309$)

Variables	Percentages/Means				Significance χ^2 or F Test
	Total (309)	Reservation (101)	Urban (125)	Rural (83)	
Predisposing					
Gender					
Female	63.1%	60.4%	65.3%	63.1%	.748
Male	36.9%	39.6%	34.7%	36.9%	
Education					
Less than high school	55.9%	59.6%	52.8%	54.9%	.043
High school graduate	25.0%	24.2%	20.3%	32.9%	
Post high school	19.4%	16.2%	26.8%	12.2%	
Age					
55 to 64	37.3%	22.5%	40.9%	45.9%	.001
65 to 74	43.7%	43.1%	45.7%	37.6%	
75+	19.0%	34.3%	13.4%	16.5%	
Marital status					
Not married	52.6%	58.4%	46.8%	54.2%	.208
Married	47.4%	41.6%	53.2%	45.8%	
Number of children within 30 minutes	1.46 (1.49)	1.55 (1.56)	1.35 (1.44)	1.74 (1.53)	.198
Enabling					
Problems paying bills					
Frequently	65.0%	79.2%	52.1%	66.7%	.001
Occasionally	28.1%	14.9%	39.7%	27.2%	
Never	6.9%	5.9%	8.3%	6.2%	
Embeddedness in native network	13.48 (3.94)	15.08 (3.44)	12.36 (3.64)	13.17 (4.36)	.000
Knowledge of services	7.39 (3.55)	8.81 (2.71)	6.12 (4.08)	7.50 (2.93)	.000
Need					
ADL index	0.37 (0.99)	0.36 (0.92)	0.43 (1.01)	0.30 (1.07)	.650
IADL index	0.72 (1.50)	0.74 (1.47)	0.81 (1.53)	0.56 (1.48)	.497
Self-rated health					
Excellent	16.2%	15.8%	17.7%	14.3%	.686
Good	50.2%	51.5%	45.2%	56.0%	
Fair/Poor	33.6%	32.7%	37.1%	29.7%	
Index of all conditions	3.78 (2.44)	4.01 (2.29)	4.10 (2.55)	3.05 (2.33)	.005

NOTE: Standard deviations shown in parentheses.

taining Indian identity, especially in urban settings, may serve as an enabling factor in adaptation and management of the environment (Thornton & Grasmick, 1980). The index we created is based on theories of assimilation and environmental adaptation that utilized frequency of interaction with other Indians, as well as degree of contact with non-Indians (Snyder, 1971), to study migration adjustment. The embeddedness index was constructed from five variables (degree of contact with American Indian neighbors, contact with American Indian relatives, contact with American Indian friends within the past year, the proportion of neighbors who are Native, and the proportion of friends who are Native). Index scores ranged from 5 to 22, with an acceptable reliability coefficient (alpha = .72). The mean score is 13.48, (SD = 3.94) and significant differences were found between those living in reservation and rural areas and the urban residents, with the urban residents reporting the lowest degree of embeddedness. Awareness or knowledge of services was measured by follow-up questions to service use measures that asked if the respondent had heard of 11 services regardless of whether they had used them. Respondents had heard of an average of 7.39 services, with urban elders least likely to have heard of these services.

Need is represented by several health characteristics and includes a subjective global health rating, two functional health (or perceived need) measures and one index of self-reported health conditions. Two thirds (66.4%) of the respondents rated their health as "good or excellent" and 33.6% rated their health as "fair or poor." There was no significant difference between elders living in different areas of residence on this self-evaluation.

Functional health was assessed by Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL). The separate measures were coded into dummy variables coded 0 if the respondent reported being able to do the activity without any help, and 1 if the respondent needed some help or was completely unable to do the activity. Two indexes were developed by summing (a) 7 ADLs (eat, dress, groom, walk, get in or out of bed, bathe, toilet); and (b) 7 IADLs (telephone, get to places out of walking distance, shopping, prepare meals, housework, take medicine, handle money). Seventy-eight percent of respondents have no limitation on ADL, whereas 71.4% have no limitation on IADL. Means were .37 (SD = .99) and .72 (SD = 1.50), respectively.

We examined the impact of 21 chronic conditions and report the 10 most frequently mentioned conditions, as well as the index of the 21 conditions, in Table 2. The presence of chronic conditions is obtained by self-report. All conditions are assessed from responses to a question that probes whether the respondent had been told by a doctor or health professional within the past 12 months that they had a particular illness such as arthritis. The answer is

coded 1 if the respondent has arthritis, and 0 if the respondent has no arthritis. An index was created by summing the 21 responses. A mean of 3.78 conditions was reported, with a range of 0 to 12 conditions. The highest prevalence was joint problems (60.4%); 42.5% had high blood pressure, 29.5% diabetes, 28.7% hearing problems, 27.8% vision problems, 29.9% weight problems, and 23.1% heart disease. Other health problems were substantially lower in their prevalence among this group. There were no statistically significant differences between those living in the three areas of residence in the prevalence of any one of the health problems, although the summed index does reveal a significant difference by residence, with the urban (4.10, $SD = 2.55$) and reservation (4.01, $SD = 2.29$) reporting more symptoms than the rural (3.05, $SD = 2.33$). Combinations of illnesses may increase health burden substantially, and 65.5% of the respondents had three or more of these health problems. The largest number of individuals with three or more health problems were reservation residents (71.6%). Regardless of the high percentage of respondents with multiple health problems, 66% of the respondents rated their health as "good or excellent" and 57.9% asserted that their health was now a "little or much better" than the previous year.

Dependent Measures

Service use measures were derived from questions asking if the respondent had used a particular service within the last 12 months. Three utilization indices were created by summing first, in-home use (chore or homemaker and home health aide, visiting nurse or CHR (Community Health Representative), second, utilization of community based services (congregate meals, food commodities, home repairs, and emergency assistance that provides short-term aid for such crises as inability to pay utility bills) and third, utilization of preventive health related services (smoking cessation, health screening, vision or hearing services, and nutrition counseling).

Providers Community Service Assessment

Community information on service availability was obtained by a mail survey of providers about specific programs in their service delivery area. The service providers selected were located in the urban, rural, and reservations communities where interviews with older American Indians were conducted. Mail surveys were sent to 20 providers, and 17 usable surveys were completed. The providers were aging services directors and Title VI directors in Michigan tribes, Area Agency on Aging directors, and directors

Table 2. Comparison of 10 Most Frequent Chronic Health Conditions by Area of Residence

	Percentages/Means				
Variables	*Total*	*Reservation*	*Urban*	*Rural*	*Significance χ^2 or F Test*
Chronic health conditions					
Arthritis	60.4%	66.3%	61.8%	51.2%	*ns*
High blood pressure	42.5%	48.5%	43.1%	34.5%	*ns*
Diabetes	29.5%	24.8%	35.8%	26.2%	*ns*
Obesity	29.9%	31.7%	26.8%	32.1%	*ns*
Hearing impairment	28.7%	26.7%	31.7%	26.5%	*ns*
Vision problems	27.8%	26.7%	30.3%	25.3%	*ns*
Heart disease	23.1%	26.7%	25.2%	15.5%	*ns*
Allergies	18.8%	18.8%	23.6%	11.9%	*ns*
Emphysema/Asthma	18.6%	20.8%	20.3%	13.3%	*ns*
Kidney/Prostate	11.8%	13.9%	13.2%	7.2%	*ns*
Index of all symptoms	3.78	4.01	4.10	3.05	.005
	(2.45)	(2.29)	(2.55)	(2.33)	

NOTE: Standard deviations shown in parentheses.

at urban Indian service programs. The providers were asked to rate the factors that they believed were important in the use or nonuse of services by older American Indians.

Accessibility and acceptability, as well as direct service cost, were also measured in the survey of providers. Providers were asked to evaluate the extent (low, medium, high) to which they believed the following factors had an impact on the use of services by older American Indians: (a) time services are offered, (b) awareness of services, (c) awareness by the older person that services are needed, (d) acceptability of services by elder (measured by degree of satisfaction), (e) past experiences with services, (f) mistrust of formal services, (g) cost of services, and (h) transportation to the service.

Results

Availability

A variety of services are available for older Indians. These include services funded through Title III and Title VI of the OAA as well as services under the auspices of the Indian Health Service and urban service agencies. Results from the supplemental survey of providers indicated that services were widely available in all of the areas of residence. Although only four providers

offered smoking cessation programs, a majority of the providers offered the other services. Costs for these services were related to their funding sources and requirements of programs such as the OAA. IHS programs are available on reservations and through one health clinic in Detroit. Programs offered through tribes or through urban Indian agencies are more likely to be oriented to American Indian culture. It is also likely that the greater number of human service practitioners on reservations promotes greater use of services by elders through referrals by these practitioners to a variety of agencies.

The respondents, however, were not users of a large number of services. The mean of service usage across all areas of residence was only 1.49 (Table 3). More than 30% of the total sample had used no services, and almost one quarter (23.6%) had used only one service. Categorized by type of services, 26.1% used in-home services, 38.9% used community services, and 39.2% used preventive health services within the past year. Service usage was higher among reservation residents than among elders living in rural or urban areas ($p > .004$). This difference by residence is statistically significant for preventive and in-home services with reservation elders using twice as many services on average as rural or urban residers. Reservation residence allows for greater access and a more culturally acceptable service provision. Although it may appear obvious that reservation-based elders would use more services due to the IHS presence, this relationship is not supported by the literature. This may be an artifact of the method used for comparison, because most studies compare urban to rural (including everything nonurban under one heading). Although there are a number of studies relating urban-rural differences in health and mental health among American Indians (Byrde, 1970; Kramer, 1991; LaFromboise, 1988; Leighton, 1971; Manson & Callaway, 1990), few compare the tripartite geographical pattern that accounts for both the off- and on-reservation location and urban or rural residence. A notable exception is Chapleski & Dwyer (1995), who employed a tripartite model of area of residence to examine in-home service use, and found that service utilization and its determinants vary greatly between the three areas of residence. Reservation residers were significantly more likely than rural off-reservation or urban older American Indians to use several types of in-home service, suggesting that the typical rural-urban or on-off reservation dichotomies are not sufficient to capture variation by area of residence.

Awareness

Although we would expect that knowledge of services is a necessary prerequisite for their use, it is evident that this knowledge is not sufficient to explain the usage patterns. The knowledge of services was very disparate

Table 3. Great Lakes American Indians Age 55 and Above Use and Knowledge of Services by Area of Residence

Variables	Means				Significance χ^2 or F Test
	Total	Reservation	Urban	Rural	
Index of use of 11 services[a]	1.49 (1.70)	1.94 (1.68)	1.27 (1.55)	1.26 (1.84)	.004
Index of use of preventive health services[b]	0.72 (1.00)	1.04 (1.09)	0.57 (0.89)	0.54 (0.94)	.000
Index of use of in-home services[c]	0.31 (0.54)	0.45 (0.61)	0.25 (0.49)	0.22 (0.50)	.005
Index of use of community services[d]	0.47 (0.77)	0.46 (0.73)	0.44 (0.75)	0.51 (0.86)	.811

NOTE: Standard deviations shown in parentheses.
a. Index consists of the emergency, home health, health screening, hearing screening, vision screening, smoking cessation, nutrition, congregate meals, home repair and food commodity variables.
b. Index consists of the nutrition, smoking cessation and the vision, hearing and over-all health screening variables.
c. Index consists of the chore and home health variables.
d. Index consists of the food commodity, home repair, emergency and nutrition variables.

among the American Indian elders and ranged from 7.3% of the respondents who had heard of none of the services to 25% who had heard of all of them. Knowledge of specific services was very high and ranged from 78% of respondents who had heard of congregate meals to 58% who knew about chore services. Except for chore services, food commodity programs, and emergency services, knowledge of each of the services was highest among the reservation respondents. Awareness of each of the services was lowest among the urban respondents. These differences were statistically significant for all services except chore services. Among the 17 providers who responded to the survey, 13 ranked awareness of services as having a high impact on the service usage of older American Indians.

Acceptability

Acceptability of the service was ranked as having a high impact on use by 11 of the providers who responded to the questionnaire. Mistrust of services and past experiences with services was ranked high by 12 of the agency staff. If acceptability of services is in part determined by the background of the

providers, respondents would be expected to express a strong preference for American Indian service providers. Asked about the importance of long-term care service providers being American Indian, 70% of Indian elder respondents said it was somewhat or very important.

Accessibility

Three specific access issues were assessed by the providers: (a) time services are offered; (b) cost of services; and (c) transportation to the service. Only two agencies viewed time as highly important, whereas 9 rated transportation, and 8 rated cost of services, as highly important.

Regression Results

To further clarify the findings, three regression models were used to explain the use of in-home services, preventive services, and community services (Table 4). Following the Anderson and Newman (1973) conceptual framework, we hypothesized that enabling and need variables would explain more of the variance of service use than predisposing variables, and that the predictive models would differ for the three types of service. Using hierarchical regressions for the three types of service and entering the three blocks of variables separately, we can assess the relative contribution of each of the three concepts to the full model. Table 4 shows the regression results at the final step, reporting the increments to the explained variances (R^2) at each step, and the significance of each of the betas once all the variables are entered. In addition, it was believed that the social network and embeddedness of the individual in the Native community would have an impact on their attitudes and use of available services. An individual's social resources, including the availability of children for assistance and their own available social network, may play a large role in their service usage patterns. However, given the complexity of social networks and extended family systems among American Indians, perhaps marital status and number of children living within 30 minutes of the elder were insufficient measures to tap this concept. Embeddedness does predict use of preventive health services, however, and it is strongest in reservation communities where preventive services are most used.

The first block of variables measured the impact of the predisposing measures, including demographic factors such as age, sex, education, marital status and child proximity. Predisposing factors were significant in the in-home and community models but contributed none of the variance to

Table 4. Regression of Three Types of Services on Selected Predisposing, Enabling and Need Variables

	In-home		*Preventive health*		*Community*	
Variables	*Beta*	T *Value*	*Beta*	T *Value*	*Beta*	T *Value*
Predisposing						
Female	0.15	2.64**	–0.06	–1.02	0.04	0.75
Education	–0.02	0.41	–0.02	–0.32	–0.16	–2.40*
Age	0.19	2.84**	–0.01	–0.16	–0.06	–0.81
Number of children within 30 minutes	–0.05	0.83	0.00	–0.07	–0.12	–1.83
Married	0.08	1.36	–0.04	–0.58	–0.08	–1.23
R^2 increment	0.13***		0.00		0.05*	
Enabling						
Problems paying bills	0.12	2.12*	0.05	0.88	0.13	1.93*
Knowledge of services	0.13	2.07*	0.25	3.98***	0.78	1.16
Lives in urban area	0.05	0.68	0.06	0.75	–0.13	–1.65
Lives on reservation	0.15	2.16*	0.15	2.08*	–0.02	–0.22
Embeddedness in native network	0.07	1.16	0.18	2.93**	–0.02	–0.27
R^2 increment	0.07***		0.17***		0.04*	
Need						
Self-rated health	0.06	0.98	0.04	0.66	–0.05	–0.65
Index of all symptoms	0.08	1.24	0.22	3.24***	0.21	2.85*
Index of ADLs	–0.15	–1.93*	–0.18	–2.38*	–0.10	–1.11
Index of IADLs	0.40	4.96***	0.15	1.70	0.08	0.82
R^2 increment	0.12***		0.06***		0.03*	
R^2	0.32		0.23		0.12	
F	8.03		5.18		2.39	
Significant F	.000		.000		.004	

NOTE: ADL = activities of daily living. IADL = instrumental activities of daily living.
* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

preventive health. Being female and older contributed significantly to the use of in-home services, whereas having less education was a predictor of use of community services. Enabling factors were entered in the second block and included measures predicted and identified by the 4-A's as barriers or enablers to service use, including knowledge or awareness, money problems, area of residence and embeddedness in the native network. Enabling factors contributed significantly, over and above the predisposing, in all three service types, but were most influential in the preventive health model, accounting for 74% of the total variance. Awareness of services was a significant predictor of both in-home and preventive health services, as was area of residence. Addition-

ally, embeddedness in the native network contributed significantly to the use of preventive health services. Need factors, including global self-rating of health, number of health symptoms, and problems with daily living activities were entered as the last block and contributed significantly to both in-home service use and to preventive service use.

Use of in-home services was largely explained by the predisposing variables which contributed 13% to the total variance (see Table 4). Enabling factors explain an additional 7% of the variance and the R^2 increment was statistically significant. As expected, the need variables increased the explanatory power significantly also and added another 12% to the variance, with instrumental daily living disability offering the largest contribution. The total explained variance reached 32% in the full model.

A similar result is found in the case of preventive health service usage although health variables had a lesser impact on total explained variance and only 23% of the variance is explained by the full model. Two health variables predict use of preventive services. First is the co-occurrence of health conditions, and the second is having fewer reported problems with ADL. The more conditions an individual reports, the more likely he or she will seek preventive services. However, the most frail are less likely to seek preventive health. Community services in this model is limited to meals, food, home repairs, and emergency assistance, and clearly does not include many community-based services. Furthermore, this category included unrelated services for which the need factors have little predictive power. Therefore, the variables entered explain substantially less of the community services usage pattern than they did of the in-home or preventive health services.

Discussion

The American Indian Long-Term Care Study builds upon the assertion of Miller et al. (1996) that community-based long term service use must be examined at the local level. As they argue, "Service use is only one aspect of a complex process of interaction between individuals' definition/search for help and service availability and accessibility" (Miller et al., 1996, p. S80). In the case of the Michigan American Indian population examined in this research, the four As clearly play a role but availability, awareness, acceptability, accessibility, as measured here, do not fully explain the usage patterns among this sample. The path from awareness to use is complex requiring researchers to search for better measures of prediction. Results show predictors of use vary by type of service, confirming the importance of separating service use into conceptually similar typologies. Health and functional status

of the individual clearly play a role in service usage. Awareness of the service, reservation residence, and need characteristics predict in-home and preventive health service use. Embeddedness in the native network is a significant predictor of use of preventive services. It is plausible that these strong network ties were in part responsible for influencing the elder to use the preventive health service. These network members may therefore be important linkages for service providers to access. If connectedness, as well as increased awareness, provides a link to service use, we must identify the key components in these networks.

Clearly, other factors are playing a role in decisions about service usage. It is likely that much of the remaining variability in usage patterns is related to the factors of mistrust of the formal service system and negative past experiences stressed by many of the providers interviewed. Furthermore, providers also placed emphasis on the issues of acceptability, and these need to be examined more intensively. Acceptability may relate to internalized beliefs that are individually or culturally based. Tapping into these beliefs at the individual level is difficult.

The most impressive finding from this first wave of data is the higher use of services by individuals living in reservation communities than their rural or urban counterparts. Although there may be as great a variety of accessible services available in an urban environment, very few are directed specifically to American Indians and many of the available services are unacceptable. The federally recognized reservations not only offer considerably more resources targeted specifically to Indians than rural and urban communities, but the services may be more acceptable to recipients because they are, for the most part, provided by and for other American Indians. Whether the greater availability of services targeted for American Indians in these communities or the level of comfort of older persons with services oriented to American Indians explains this greater usage remains to be ascertained. What is clear, is the need to promote the availability, acceptability, and use of services among older American Indians living in off-reservation areas.

The respondents in this first data collection represent a still relatively young and healthy population, particularly among the urban and rural strata. Given the significance of the health and functional variables in usage patterns, it can be expected that usage will increase with greater chronic illness and functional problems. It is difficult to hypothesize that there will be a linear relationship between functional problems and service usage particularly in the area of community services if there are major issues of acceptability that need to be confronted. These issues may be best addressed by including family and tribal networks in the process. Although the advantages and significance of embeddedness in their own cultural network are not entirely

clear, this concept may prove to be useful in understanding all types of health and service utilization behaviors. This research was limited by its cross-sectional nature. Given the dynamic nature of social service use, the application of longitudinal data would enhance causal inference. The American Indian Long-Term Care project has completed its second wave of data—18 months subsequent to the first survey. The changes in functional problems and service usage among the respondents should shed some light on the relationships between the variables examined among an aging population.

Finally, if an older female with problems in performing IADL, who is living on a reservation, makes up the profile of the in-home service user, we must ask what that means for those living in off-reservation locations. Although enabling factors are the most amenable to change via the service delivery system, the commitment required to overcome barriers to equitable service delivery can be both burdensome and rare.

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