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Premature Institutionalization Among the Rural Elderly In Arizona

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Partial funding for this project was provided by the Long Term Care Gerontology Center.

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SYNOPSIS

Rural areas of the United States, compared with urban areas, exhibit a scarcity of resources and programs designed to provide health and supportive services to impaired elderly persons living in the community. Furthermore, recent research has indicated that informal, familial support for the rural elderly has become increasingly attenuated because of such factors as outmigration of younger family members. Under these circumstances, there is reason for concern that a lack of available supportive services to help impaired rural elderly persons remain in the community may in effect drive them prematurely into nursing homes. In Arizona we have found that, consistent with such a process, elderly nursing home patients in rural areas tend on the average to be significantly less impaired in most areas of functional capacity, and younger at time of entry, than elderly nursing home patients in urban areas. This pattern remains when various possible confounding effects are statistically controlled.

PROFESSIONALS AND POLICY RESEARCHERS have long recognized that rural areas face special problems in access to and utilization of health care and social services (*1*). Lower incomes, lower population densities, and greater outreach and access distances all contribute to a relative shortage of formally organized social and health services for many rural residents (*2*). These problems can be expected to be especially acute for chronically impaired elderly persons living in rural areas (*3,4*).

For the impaired elderly, rural environments in some ways present particular risks and difficulties. For those with deficits in ambulation and sensorimotor capacity, longer distances and the lack of convenient and safe methods of transportation can present serious access barriers to essential health and social services, as well as to mundane necessities such as shopping and recreation. Also, the relative social and geographic isolation of the rural elderly makes them particularly at risk for acute, immobilizing illnesses or trauma, such as strokes or falls, that may leave them helpless and undiscovered, particularly in view of their greater propensity to be found living alone (*3*). Further, the availability of formally organized services for homemaking, help with chores, help with nutrition, and personal care is limited both by these services' relative scarcity in rural areas and by logistical problems caused by the distance

that must be covered to provide them. These problems have been exacerbated by the exodus of rural young people to urban areas, often leaving aging parents behind (*5*), and by other changes in the functioning of rural families that may limit their capacity to operate as an effective informal service network (*6*).

There is evidence that the rural elderly are particularly at risk for social isolation, poverty, illness, and substandard housing (compare *4*). It is also well documented that effective mobilization of resources to provide in-home care to the rural elderly lags far behind the development of such programs in urban areas. Hayslip and associates (*4*) found that social service systems for the impaired elderly in rural areas were strikingly underdeveloped, compared with such systems in urban areas, and that agencies' perceptions of the needs of the rural elderly often differed from the expressed needs of the elderly themselves in important respects. Further, they found that geographic resource allocation bore little systematic relationship to the distribution of the elderly population. Perhaps partially accounting for observed deficiencies in resource availability and allocation, Taietz and Milton (*7*) and Nelson (*8*) found that rural planning units are inferior to urban ones in structural and administrative characteristics related to capacity for effective mobilization of resources, particularly with regard to provision of services to the frail elderly in the community who are at risk for institutionalization. They found also that available resources for in-home care intended to prevent premature institutionalization of frail elderly persons were much more scarce in rural areas than in urban ones.

The argument has been made many times that lack of access to resources in the community is a major factor predisposing the elderly to premature and unnecessary institutionalization in nursing homes. Indeed, this has been the basic rationale for a series of major policy initiatives designed to create community-based programs providing "alternatives to institutionalization" (*9*). The motivating idea is that provision of such services to impaired elderly persons may permit them to remain in the community rather than be forced into a nursing home. Even for those persons not immediately at risk for institutionalization, such services may bolster health and social functioning so that the risk threshold is pushed back. These programs thus serve the humane purpose of permitting elderly persons to maintain the dignity, autonomy, and relatively normal social functioning of life in the community for as long, and to as high a level of impairment, as possible while at the same time minimizing the use (or misuse) of scarce and relatively expensive institutional resources.

'While a number of studies . . . document the relative paucity of essential services for the rural elderly, there appear to have been no empirical studies of the possible consequences of this scarcity for nursing home utilization.'

While a number of studies (several of which have been cited here) document the relative paucity of essential services for the rural elderly, there appear to have been no empirical studies of the possible consequences of this scarcity for nursing home utilization. If scarcity of appropriate community-based resources is in fact a factor predisposing the frail elderly to nursing home entry, then—other things being equal—it would be expected that the elderly in rural areas, who appear to face greater problems of access to these resources, would be especially prone to institutionalization. This is particularly the case in view of evidence that the informal support system of the rural elderly may be relatively weak (*5,6*). These considerations may mean that rural elderly persons are likely to enter nursing homes prematurely—that is, at lower levels of functional impairment than the urban elderly. This is the empirical question to which we now turn.

Sampling and Measurement

The data base consists of observations on 282 patients age 55 and older in skilled nursing facilities (SNFs) in Arizona, collected during April and May 1980. (Skilled nursing facilities were, at the time of the study, the only long-term-care facilities other than hospitals licensed for nursing care in Arizona. These facilities serve patients at all levels of care—skilled, intermediate, and personal care.)

The sample was a statewide staged cluster sample. From a census of the 71 SNFs then operating in the State, 28 were randomly selected. For each selected institution, a random subsample of the patient population was chosen that was proportional in size to the number of beds in the institution. Questionnaires concerning all patients in the subsamples were completed through interviews with

staff of the facilities (generally the charge nurses) who were knowledgeable with respect to the patients. Interviews were conducted by graduate students in the nursing and long-term-care administration programs at the University of Arizona who had been trained in the instrument protocol. The reliability and validity of such staff interview data in long-term-care institutions is well supported in recent research (*10*). Where necessary, patients' records were also consulted.

The instrument (available on request to the author) was designed to support a statewide planning effort by the Arizona Department of Health Services and inquired into a variety of demographic and impairment characteristics of SNF patients. Demographic characteristics included current marital status, sex, ethnicity, length of residence in the county of institutionalization, length of current institutional residence, and age. Impairment data included nine items measuring degree of impairment in activities of daily living (ADL): independent ambulation, bed-to-chair transfer, wheelchair use, bladder incontinence, bowel incontinence, bathing, dressing, grooming, and eating.

Also included were nine items measuring degree of psychosocial impairment: alertness (responsiveness to social and physical environment), impaired judgment, hallucination, depression, agitation, regression, wandering, verbal abusiveness, and propensity to be physically assaultive. Finally, the instrument included three items measuring degree of impairment in sight, hearing, and speech. All items were slight adaptations of those found in the long-term-care Minimum Data Set and were coded so that higher scores indicated more impairment (*11*).

From a geographic standpoint, Arizona is essentially a rural State: only 2 of 14 counties, Maricopa (which includes Phoenix) and Pima (which includes Tucson), contain population centers larger than 45,000 or have population densities exceeding 17 persons per square mile. In 1980, Pima had a population density of 57.5; Maricopa, 164.7. For purposes of this study, patients in SNFs in these two counties were classified as urban and those in SNFs in the other 12 counties as rural; as a result, 70 of the 282 elderly SNF patients, or 25 percent, were classified as rural. This proportion closely matches the proportion of rural persons over 55 years of age in the State. While this simple division into rural and urban groups ignores within-group variability that would be detected by a more refined rural-urban continuum, it is sufficient for the purpose of this study.

Results

Table 1 presents rural-urban comparisons for selected demographic characteristics of the nursing home patients in the study. Urban and rural patients did not differ significantly with respect to current marital status (about 20 percent were married), percentage of females (about 62 percent), percentage with Hispanic surnames (about 10 percent), or percentage who were county indigents (approximately 40 percent). (Long-term care for the poor in Arizona is financed through the counties. Arizona does not participate in the Medicaid program in the conventional manner, although its new indigent acute care system, the Arizona Health Care Cost Containment System, is financed in part through Medicaid waivers.)

The foregoing analysis, which links urban and rural socioeconomic conditions and resources with the characteristics of urban and rural nursing home patients, obviously requires that rural (urban) nursing home patients tend to be long-term residents of rural (urban) areas. In our sample, rural patients had been residents of the county in which they were institutionalized for an average of 41.8 years; urban patients for an average of 21.5 years. More than 95 percent of rural patients and 90 percent of urban patients were institutionalized in the county where they had previously resided.

More rural than urban SNF patients were found to have been living alone at the time of nursing home entry (21 percent compared with 13 percent); this was consistent with other findings (*3*) indicating that the rural elderly are disproportionately likely to live alone. Mean age at entry to a nursing home for rural patients was 75.7 years, compared with a mean age of 79.0 years for urban patients. These differences were statistically significant (table 1).

Table 1. Demographic characteristics of rural and urban nursing home patients

Characteristics	*Rural patients*	*Urban patients*	*Significance* [1]
Proportion currently married	.200	.203	NS
Proportion living alone at time of entry	.214	.132	$P < .04$
Proportion female	.629	.623	NS
Proportion Hispanic	.114	.099	NS
Proportion county indigent [2]	.400	.382	NS
Mean age at entry	75.7	79.0	$P < .09$

[1] Two-tailed *t* test of null hypothesis of no difference. Differences not significant at the .10 level are reported as NS.
[2] For explanation, see text above, under "Results."

While it might be thought that the difference between the two groups in mean age at entry suggests a pattern of premature entry by the rural elderly, it may also be that, as a result of the higher incidence of many debilitating diseases in rural areas, rural patients on the average experience more impairment at an earlier age than urban patients. An inspection of table 2 makes it clear, however, that rural patients in this study were not only younger but also considerably less impaired, on the average, in functional capacity on all indicators of ADL impairment except wheelchair utilization, and on the key psychosocial indicators of external orientation and judgment. These findings are consistent with a hypothesis of premature entry, as defined. On indicators of antisocial behavior, active psychopathology, and sensory-communication impairment, however, urban and rural patients did not differ significantly.

One limitation of the data analysis to this point arises from the fact that the impairment data are cross-sectional and reflect condition of the patients at the time of the study, rather than at the time of entry to an institution. This raises the possibility that

Table 2. Mean functional impairment levels for rural and urban nursing home patients

Impairment areas	*Rural patients*	*Urban patients*	*Significance* [1]
Activities of daily living			
Ambulation	3.22	3.79	$P < .03$
Bed-to-chair transfer	2.64	3.08	$P < .02$
Wheelchair	3.01	3.33	NS
Bladder incontinence	2.59	3.24	$P < .01$
Bowel incontinence	1.97	2.31	$P < .05$
Bathing	3.08	3.58	$P < .001$
Dressing	2.89	3.27	$P < .008$
Grooming	2.45	2.76	$P < .05$
Eating	1.55	1.78	$P < .07$
Psychosocial functioning			
Alertness	1.61	1.99	$P < .001$
Impaired judgment	1.87	2.32	$P < .001$
Hallucination	1.27	1.34	NS
Depression	1.89	1.87	NS
Agitation	1.76	1.83	NS
Regression	1.59	1.56	NS
Wandering	1.29	1.30	NS
Verbally abusive	1.29	1.42	NS
Assaultive	1.37	1.28	NS
Sensory-communication			
Sight	1.99	1.77	NS
Hearing	1.90	1.69	NS
Speech	1.64	1.65	NS

[1] Two-tailed t test of hypothesis of no difference. Differences not significant at the .10 level are reported as NS. To control for capitalizing on chance in these pairwise tests, a Hotelling's T^2 statistic was calculated for the mean vectors overall. The hypothesis of equal means vectors was rejected at $P < .001$.

'From the data, then, it appears that rural nursing home patients in Arizona tend to enter institutional care at younger ages and, more importantly, at lower levels of functional impairment than do their urban counterparts . . .'

the observed differences in impairment may be in part spurious, being due to factors correlated with differences in length of institutional residence across the rural and urban groups. (The rural residents had been institutionalized an average of 2.9 years, as opposed to 2.0 years for the urban residents.) To control for this, analysis of covariance methodology was used to linearly adjust the rural and urban impairment means for differences in length of residence by using length of institutional residence as a covariate. At the same time, adjustments were made also to control for possible spurious joint effects due to sex, Hispanic ethnicity, and prior living arrangements (whether or not the patient had lived alone at the time of entry to the institution). Hispanic ethnicity, with its propensity to strong extended-family ties, might enhance the ability of an older person to remain in the community, as might sex of the patient, given differential morbidity and survivorship patterns for men and women (*12*). Living arrangements in the community—in particular, the ability to live with spouse or family—are well known to influence propensity to nursing home entry (compare *13*).

The model to be estimated for each impairment indicator, then, is a one-factor (rural-urban) analysis of covariance with length of institutional residence, sex of patient, Hispanic ethnicity, and prior living arrangement as covariates. A classical estimating approach was used, with the dependent variable means adjusted for the effects of the covariates prior to introduction of the rural-urban factor.

The rural and urban impairment means, adjusted simultaneously for these covariates, are given in table 3. While levels of significance differ somewhat on some variables, the overall pattern is identical to that for the unadjusted means given in table 2. That is, rural patients remained uniformly less impaired in ADL functioning than urban patients and remained significantly less impaired in orientation and judgment. In no impairment category were urban patients significantly less impaired, on the average, than rural patients.

'. . . the pattern described here should be a subject of policy concern, both from the standpoint of equity for the rural elderly and that of possible inappropriate use of institutional resources.'

Table 3. Covariate-adjusted mean impairment levels for rural and urban nursing home patients

Impairment areas	Rural patients	Urban patients	Significance [1]
Activities of daily living			
Ambulation	3.18	3.87	$P < .008$
Bed-to-chair transfer	2.63	3.07	$P < .02$
Wheelchair use	2.99	3.41	NS
Bladder incontinence	2.55	3.27	$P < .006$
Bowel incontinence	1.92	2.35	$P < .02$
Bathing	3.07	3.55	$P < .001$
Dressing	2.85	3.24	$P < .01$
Grooming	2.45	2.76	$P < .06$
Eating	1.53	1.73	$P < .09$
Psychosocial functioning			
Alertness	1.56	1.97	$P < .001$
Impaired judgment	1.83	2.31	$P < .001$
Hallucination	1.27	1.35	NS
Depression	1.87	1.84	NS
Agitation	1.67	1.80	NS
Regression	1.54	1.54	NS
Wandering	1.25	1.30	NS
Verbally abusive	1.25	1.41	NS
Assaultive	1.36	1.27	NS
Sensory-communication			
Sight	1.96	1.77	NS
Hearing	1.87	1.70	NS
Speech	1.62	1.65	NS

[1] *F* test for main (rural-urban) effect adjusted for covariates. Complete ANCOVA and Multiple Classification Analysis results, too bulky to be reported here, are available on request to the author.

Discussion

From the data, then, it appears that rural nursing home patients in Arizona tend to enter institutional care at younger ages and, more importantly, at lower levels of functional impairment than do their urban counterparts, suggesting a propensity to premature institutionalization. A likely reason for this propensity may be that the relative shortage of accessible health and social services found in rural areas forces impaired rural elderly persons into institutional care earlier than their urban counterparts. In Arizona, for example, only Pima and Maricopa Counties (the urban counties in the study) have implemented publicly supported programs specifically designed to prevent or delay nursing home entry by impaired elderly persons. While planning efforts to develop such programs in rural counties are underway, implementation has been hampered by a lack of funding and organizational resources.

As in any nonexperimental, cross-sectional study, however, results must be interpreted cautiously. Indeed, the findings given here should be considered preliminary rather than definitive. Investigators carrying out further research on this issue will wish to gather impairment data at the time of nursing home entry rather than use statistical adjustments to cross-sectional data, as has been done here. It would also be useful to be able to control for any rural-urban differences in nursing home admissions policies—for example, possible "creaming" of less impaired patients by rural facilities. Further, longitudinal data—including data on formally and informally provided supportive services available to each patient before entry to a nursing home—would permit a clearer identification of the causal factors that may be at work.

In view of much recent research documenting the crucial role of informal supports in delaying or preventing institutional entry for elderly persons generally, a factor that should continue to bear careful scrutiny is the role of the rural family and such changes in family structure and process as may be occurring. Finally, it would be useful if the relationships reported for Arizona were tested using data from other States. It seems likely that the data in the National Nursing Home Survey, conducted by the National Center for Health Statistics in 1977, could be adapted to this purpose, provided that the rural-urban status of the patients, or their facility of residence (data gathered but not in the published file), can be established. Meanwhile, however, the pattern described here should be a subject of policy concern, both from the standpoint of equity for the rural elderly and that of possible inappropriate use of institutional resources.

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Out-of-Hospital Births, U.S., 1978: Birth Weight and Apgar Scores as Measures of Outcome

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This research was supported by a grant from the Faculty Development Committee of Merrimack College.

SYNOPSIS

An examination of 1978 natality data for the United States disclosed that low birth weight was less common among 30,819 infants born out of hospital than among 3,294,101 infants born in hospital in that year. When controls were applied for birth attendant, infants' race, and mothers' education, age, nativity, and parity, the data revealed that white, well-educated women between 25 and 39 years of age, who were having their second babies and were attended by midwives out of hospital, were at least risk of bearing low birth weight infants. The incidence rate of low birth weight babies was lower for midwife-attended births in every category examined. For college-educated white women, for example, the incidence rate was 2.0 percent among those attended by midwives, 4.6 percent among those giving birth in hospital, and 3.6 percent among those whose out-of-hospital deliveries were attended by physicians.

Apgar scores for babies born both in and out of hospital were also studied but, because of inconsistent reporting, were given less attention. Excellent (9–10) Apgar scores were more common among babies born out of hospital than among those born in hospital (63 percent compared with 49 percent), particularly for out-of-hospital births attended by physicians.

At least with respect to birth weight and Apgar scores, the claim that out-of-hospital births are inherently more dangerous than hospital births receives no support from these data. The findings also suggest the need for further refinement of vital statistics categories to permit the analysis of distinctions between births attended by certified nurse-midwives and those attended by lay midwives, as well as differences between births at home and those in alternative birth centers.

THE 40-YEAR MOVEMENT in the United States of place of birth from home to hospital has slowed in the past decade (*1*). Indeed, some States have experienced an increase in out-of-hospital births in recent years (references *2* and *3* and "Distributions of Live Births by Attendant, by Place of Delivery and Race: United States and Each State of Occurrence," an unpublished report of the National Center for Health Statistics).

Decisions by mothers to bear their children out of hospital have sparked controversy among parents, health professionals, and government officials (*4*–