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Foreword

The population aging which is occurring in all IIASA countries raises the question of how the elderly will be housed and cared for in coming decades. This question has led to several studies of kinship patterns and the role of kin patterns in determining the living and health-care arrangements of the elderly. This paper is one in a series of country case studies dealing with the effect of kin patterns on the household composition of older women.

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INTRODUCTION

In Hungary, as in many other countries in Europe and elsewhere, the population has been becoming more aged for many years. The phenomenon of population aging is projected to continue for several decades. For example, the percentage of the population 60 and older in Hungary rose from 11.3 in 1950 to 18.2 in 1985; the most recent projections by the United Nations (1988) indicate a further rise, to 24.2 percent, by 2025. The increasing numerical importance of the elderly has tended to focus the attention of scholars and policy makers on issues relating to the well-being of the elderly. Among the numerous dimensions of the well-being of the elderly, those of household structure and family relations have received particular attention; in the case of Hungary's older population, for example, the importance of family relations for the elderly has been stressed by Cseh-Szombathy (1983; 1987) and Klinger (1986).

Accompanying the trend towards a more elderly society has been a trend towards smaller households, in the population at large but also among the elderly population. Several recent papers have documented the trend towards smaller households in postwar Europe [see, for example, Keilman (forthcoming), Link (1987) and Schwartz (1988)]. An intriguing question, of course, is whether there is an association between population structure—that is, its age-composition—and the size distribution of households containing elderly people. A rather simple argument suggests that there is such an association: population aging is, to a great extent, the consequence of reduced fertility; when those cohorts whose reduced fertility caused the aging themselves reach old age, they have fewer living children, on average, than preceding elderly cohorts; with relatively few children, the traditional norm of providing support for one's older parents is strained and cannot be fulfilled, and this leads to an increased incidence of independent or isolated living patterns for the elderly. This argument, and empirical evidence consistent with it based on U.S. data, was presented in an influential paper by Kobrin (1976). More recently the argument has been shown to be supported by postwar European data as well (Wolf, 1987a).

The general question raised, then, is the question of how household composition is affected by kinship patterns—not only the number of living children, but the number and composition of kin networks including siblings, parents, and possibly more distant consanguineal relatives, and the corresponding relatives of spouses (and former spouses as well).

This paper addresses the question of household composition for older women in Hungary, and in particular the way in which older women's kin patterns affect their living arrangements. We do not have time-series data on kin patterns; rather, the analysis is based on cross-sectional data. Nonetheless, a cross-sectional analysis can contribute to our understanding of household structure, and can indicate the relative importance of kin availability and other demographic as well as socio-economic factors as determinants of living arrangements.

The analysis presented here can also help us to refine the "headship rate" approach to projecting future household patterns (Kono, 1987). The headship rate technique is widely used, and has been applied to the Hungarian population by several analysts, most recently Kamarás (1988). If kin patterns can be shown to influence living arrangements, and if there is some means of disaggregating a population projection by kin patterns as well as by more usual characteristics such as age, sex and marital status, then it should be possible to obtain a more refined projection of future household patterns. An example of this approach can be found in Wolf (1987b).

DATA AND VARIABLES

The data used in this analysis come from the 1984 Hungarian Microcensus, a two-percent random sampling of the population drawn from both private and institutional households. Several special questions were asked of the elderly, defined as people either of pensionable age (for women, 55 or older; for men, 60 or older) or currently receiving a pension; the latter includes disability pensioners younger than pensionable age. Further details of the survey can be found in a publication of the Hungarian Central Statistical Office (1986a); extensive tabulations of the data on the elderly have also been produced (Hungarian CSO, 1986b).

The sample used in this analysis consists of unmarried women—that is, women either single, widowed, or divorced—age 60 and over. Excluded from the analysis are women who live with a "life-partner" to whom they are not married, since the focus of the analysis is the living arrangements of women who do not have a spouse (or its equivalent). For the multivariate analysis reported later, attention is limited to women 70 and older, since only these women were asked the questions on limitations of activities used in that part of the study.

The most important concept measured in the present study is living arrangements, which distinguishes household composition according to the presence or absence of others, and by their relationship to the elderly respondent. This is a categorical variable, with categories assigned using information from both the household registration system and responses to the microcensus questionnaire. The registration system indicates whether the respondent lives alone, in an institution, or in a dwelling with others. To this is added the respondents' answers to questions about whether they live together with any of their children, and with sister(s) or brother(s)—including siblings of their spouse—and with parent(s)—again, including those of their spouse. Thus, it is possible that some of the unmarried women studied here may be living with a sibling or parent of their former husband; if so, they cannot be distinguished from women living with their blood siblings and/or parents.

From this information is derived a six-category variable measuring living arrangements, with categories as follows: (1) living alone; (2) living in an institution; (3) living with others (but not with children, siblings, or parents); (4) living with children, but not siblings or parents; (5) living with siblings and/or parents, but not with children; and (6) living with children and with siblings and/or parents. The implications of living with siblings are rather different from those of living with parents, from the perspective of a woman herself in old age. A very elderly parent is very likely to require care and support, while a sibling may be either a source or a user of care. Nonetheless the small numbers of living parents encountered in the data require us to combine the two into a single "family of origin" category of shared household.

The data also allow us to determine the existence of living kin—children, siblings, and parents—not in the same household, and these items are used to determine the availability of kin. Kin availability is measured according to the number of living children (not including children living abroad), the number of living siblings, and the number of living parents. These we refer to collectively as "nuclear-family kin."

In addition to the variables measuring living arrangements and the availability of kin, the multivariate analysis uses information on age, health status and income. Indicators of health status are constructed from responses to three questions about the respondents' abilities to perform selected physical movements. These include the ability to move indoors; the ability to leave the dwelling unaided; and the ability to climb stairs. In each case we distinguish those respondents for whom the indicated movement is "difficult" (or can be performed only with help) and those for for whom the indicated movement is "impossible." The resulting indicators are analogous to indices of "activities of daily living" (ADLs) widely used in studying the well-being and care needs of the elder-

ly (Fillenbaum, 1987). Besides the ADL indicators, we use information on the number of chronic diseases currently suffered by the respondents.

Income is measured by the pension amount; this is measured with great accuracy, but does not reflect the true income situation of all respondents, since some receive not a pension but some other (less generous) publicly-provided retirement income [Cseh-Szombathy (1983): 75], while some pensioners supplement their pension with earnings from part-time or self-employment.

METHODS

The multivariate analysis of living arrangements reported here uses an approach virtually identical to that found in Wolf (1984). The purpose of the analysis is to explain the distribution of the sample across the several categories of the dependent variable, living arrangements. The distribution of living arrangements is postulated to depend upon several explanatory factors, including the availability of kin. Of particular importance is the fact that certain categories of the dependent variable—for example, living with one or more children—can be observed only if a certain type of kin—in the example, children—actually exist. The technique used is a straightforward adaptation of the multinomial logit technique (Amemiya, 1985; McFadden, 1982). The multinomial logit approach allows us to model the probability that a sample individual will be observed in each of the possible categories of the multi-categorical dependent variable.

Specifically, let the six categories of the living arrangements variable, discussed previously, be represented by the indices *a* (alone), *n* (institutionalized), *o* (with others), *c* (with children), *sp* (with siblings/parents), and *csp* (with children plus siblings/parents). Note that the first three categories, living alone, in an institution, or with "others", are all categories which do not depend upon the existence of any type of kin. Further, for the ith sample individual let $C_i = 1$ if i has any living children, while $C_i = 0$ otherwise; similarly, let $SP_i = 1$ if i has living siblings and/or parents. Finally, let X_i represent the array of explanatory variables associated with i.

Using the notation just defined, the multinomial logit specification represents the probabilities that i will be observed in each of the possible living-arrangements categories with equations of the form

$$pr(\text{living arrangement} = c) = \tag{1}$$

$$\frac{C_i e^{B_c X_i}}{e^{B_a X_i} + e^{B_n X_i} + e^{B_o X_i} + C_i e^{B_c X_i} + SP_i e^{B_{sp} X_i} + C_i SP_i e^{B_{csp} X_i}}$$

and so on, for each of the other living-arrangements categories. Note that for someone without living children (i.e. for whom $C_i = 0$) the probability of living with children automatically becomes zero, as does the probability of living with children plus siblings/parents. The denominator in (1) is defined in such a way that the probabilities of the different types of living arrangements will sum to one. The unknown parameters of this model are B_a, B_n, B_o, B_c, B_{sp} and B_{csp}. However, the restriction $B_a = 0$ is used to identify the rest of the parameters, and thus the category "living alone" becomes the baseline or reference category. The remaining parameters are estimated by standard maximum-likelihood techniques, using an appropriately-modified version of the CRAWTRAN program (Avery, 1980).

Interpretation of the estimated parameters is complicated by the nonlinear relationship between explanatory variables and the probabilities of each of the categories of the dependent variable. An individual parameter indicates the quantitative relationship between its associated variable and the relative probabilities of the corresponding category and the reference category. For example, the odds of living with children (given that they are available), relative to living alone, are $exp(B_cX)/exp(B_aX)$; thus the log of these odds equals $(B_c - B_a)X$ or simply B_cX since $B_a = 0$. More informative are the absolute probabilities of the categories of the dependent variable, given specified values for the array X; these are calculated by substituting the specified X and the estimated parameters into equation (1).

DESCRIPTIVE ANALYSIS

Table 1 illustrates differences in patterns of available kin according to age and marital status, for unmarried women 60 or older. Surprisingly, around 20 percent of the never-married women report having living children. This may be due, in part, to misreporting of marital status. The highest proportions having living children occur among widows, followed by divorced women. We would expect divorced women to have fewer living children than widows, since the former would have spent fewer years on average in marriage, at risk of childbearing. It is also generally the case that within each marital status, the percentage having living children falls with age. However, among those with children, the average number of living children does not necessarily fall with age: among widows with children, for example, the oldest women have the most living children, on average.

Table 1. Availability of living kin by age and marital status.

	Age		
	60–69	70–79	80+
Single (n)	513	524	208
Percent with children	19.3	17.4	20.2
Average number of children[a]	1.78	1.69	1.71
Percent with siblings	67.8	62.0	45.7
Average number of siblings	2.65	2.22	2.12
Percent with parents	8.6	1.5	0.0
Average number of parents	1.09	1.25	-
Widowed (n)	3581	5140	2464
Percent with children	87.0	83.7	80.5
Average number of children	2.38	2.46	2.56
Percent with siblings	65.4	53.8	34.7
Average number of siblings	3.02	2.50	2.08
Percent with parents	6.0	1.1	0.7
Average number of parents	1.19	1.5	1.29
Divorced (n)	666	367	99
Percent with children	79.6	65.4	58.6
Average number of children	1.98	1.87	1.81
Percent with siblings	56.0	53.1	34.3
Average number of siblings	2.73	2.06	1.94
Percent with parents	8.0	1.1	1.0
Average number of parents	1.15	1.0	2.0

[a] Average numbers of kin pertain to those with kin.

There is no apparent association between marital status and patterns of sibling or parent availability, and little reason to expect one. The proportions with siblings and with parents, and the average numbers of siblings and parents, all fall with age, reflecting the effects of mortality.

Table 2 shows the overall relationship between kin availability and living arrangements. Here we confine our attention to women 70 and older, those who will appear in the subsequent multivariate analysis. Because so few women in this age group have living parents, the kin-categories "siblings" and "parents" are combined. Thus, four distinct groupings of kin availability can be defined: women with no children, siblings, or parents; women with living children but no siblings or parents; women with living siblings or parents but no children; and women with living children plus siblings and/or parents.

Table 2. Living arrangements by availability of kin and marital status, women aged 70 and older.

Marital status	Availability of kin			
	No children, siblings or parents	Children, no siblings or parents	Siblings and/or parents, no children	Children plus siblings and/or parents
Single (n)	245	67	354	66
Living alone (%)	63.7	20.9	43.5	27.3
In institutions	5.3	17.9	3.4	6.1
With others	31.0	13.4	13.0	10.6
With children, not siblings/parents	–	47.8	–	36.4
With siblings/parents, not children	–	–	40.1	13.6
With children plus siblings/parents	–	–	–	6.1
Widowed (n)	699	3258	628	3019
Living alone (%)	62.1	31.5	65.0	35.3
In institutions	12.6	1.9	4.3	0.7
With others	25.3	7.4	13.7	6.3
With children, not siblings/parents	–	59.2	–	54.5
With siblings/parents, not children	–	–	17.0	2.0
With children plus siblings/parents	–	–	–	1.6
Divorced (n)	84	152	84	146
Living alone (%)	76.2	30.2	64.3	40.4
In institutions	9.5	4.6	4.8	2.0
With others	14.3	9.2	5.9	2.7
With children, not siblings/parents	–	55.9	–	48.6
With siblings/parents, not children	–	–	25.0	2.7
With children plus siblings/parents	–	–	–	3.4

Several interesting patterns can be found in Table 2. Possibly the most prominent result is that the availability of children, much more than the availability of other nuclear-family kin, influences the tendency of older women to live alone. Particularly for widows and divorced women, the percentage living alone is only slightly reduced if there are living siblings or parents, compared to the situation of having no living children, siblings or parents. Yet the percentage living alone falls sharply if there are living children, whether or not there are also living siblings/parents. This pattern is not so pronounced, however, for single women. A likely explanation for this finding is that women who have never married have probably maintained closer ties with kin from their family of origin

over their lives than have women who have married.

Table 2 also suggests that for older women, having nuclear-family kin available tends to lower the chances of living in an institution. This is unambiguously true for the widows and the divorced women, but not for the never-married women; the latter result, however, might be dismissed due to the small sample sizes involved.

The third column of Table 2 indicates that when siblings or parents do exist, older women do co-reside with them to some extent; however, if there are also living children, the propensity to live with siblings/parents falls sharply. In fact, in every case in which there are children, living with children is the most common living arrangement, in Table 2. Note, also, that complex households involving children as well as siblings/parents are rare.

In a recent paper Kamarás (1988) noted that the differentiation of the elderly in Hungary across household status appeared to be due much more to marital status than to either age or sex. Some further evidence of the importance of marital status can also be seen in Table 2. For example, among the kinless elderly (as defined here—those found in the first column of the table) the singles are the least likely to be in institutions, while the widows are the most likely to be in institutions. The physical capabilities of the never-married, given survivorship to age 70 or more, may be greater than that of the ever-married (although there is little evidence for this in the health variables included in this study, as will be found in Table 4); another possibility is that women who have never married are more socially and economically independent than ever-married women, and this independence is partly revealed by a reduced incidence of institutionalization.

Marital status also appears to influence the propensity to coreside with children. Among those with living children (whether or not there are also living siblings or parents) widows are most likely to live with their children, followed by the divorced women and finally by the never-married women. Divorce may strain the relationships between parents and children, which might in turn reduce their tendency to co-reside; moreover, a given child may be living with its other parent, in the case of parental divorce, and this would reduce the effective availability of children. Finally, we can observe that never-married women with living siblings or parents, but no children, are much more likely to live with siblings/parents than are either widows or divorced women in the same available-kin circumstances. This appears to be another case in which never-married women maintain closer relationships with their family-of-origin kin than do ever-married women.

Table 2 has shown the importance of kin availability, in addition to marital status, as a determinant of living arrangements. In Table 2 we measured kin availability crudely, distinguishing only between the presence or absence of a given category of relatives. We can also investigate whether the number of relatives in a given category influences living arrangements. Table 3 does so, for the case of number of living children. In most instances, the women in each age group are less likely to live alone, the more living children they have.

Table 3. Unmarried women living alone, by age and number of living children (percent).

	Number of living children				
Age group	All	0	1	2–3	4 or more
60–64	47.8	69.6	46.0	43.4	28.4
65–69	47.2	67.7	41.7	43.7	33.6
70–74	46.8	70.6	39.7	40.8	37.2
75–79	41.7	63.9	35.8	34.0	34.1
80–84	34.3	54.8	26.9	28.7	26.8
85–89	25.4	42.8	22.2	16.3	21.8
90+	21.4	40.0	17.9	15.8	10.3

We end this section with a table of summary statistics for the variables used in the multivariate analysis, found in the following section. Table 4 presents the average values of the explanatory variables separately for each of the three marital-status groups. There are few substantial differences in the mean values by marital status, with the obvious exception of number of living children. Health problems are prominent in these samples, in which the average age is around 76. Nearly a third in each group report that movement within their house is difficult, or can only be performed with help. The puzzling fact that a much lower proportion appears to have difficulty getting around outdoors is likely a consequence of the different wording of the respective questions: women asked whether they were able to walk out of the dwelling alone had to choose a response from among three possibilities—yes, not at all, and only if accompanied by someone—while the question about ability to move about indoors could be answered from one of six possibilities, including four involving some sort of help (from a person or implement). The most prominent health problem mentioned, among those measured here, was difficulty in climbing stairs.

Table 4. Summary statistics for multivariate analysis samples; women aged 70 and older.

	Marital status		
Variable	Single	Widowed	Divorced
Number of children	0.31	2.06	1.19
Number of siblings	1.26	1.14	1.00
Number of parents	0.01	0.01	0.01
Indoor movement with difficulty/requires help	0.26	0.31	0.26
Indoor movement impossible	0.04	0.03	0.04
Outdoor movement with help	0.07	0.12	0.09
Outdoor movement impossible	0.18	0.14	0.11
Climbing stairs with difficulty/requires help	0.46	0.49	0.44
Climbing stairs impossible	0.13	0.11	0.10
Number of chronic diseases	0.67	0.77	0.84
Age	76.6	77.3	75.8
Pension amount (forints)	2349.0	2477.0	2392.0
Living arrangement			
– alone	0.467	0.386	0.479
– institution	0.056	0.026	0.047
– with others	0.189	0.091	0.097
– with children, not siblings/parents	0.077	0.470	0.335
– with siblings/parents, not children	0.206	0.022	0.054
– with children plus siblings/parents	0.005	0.005	0.011
Sample size	732	7604	466

MULTIVARIATE ANALYSIS

The results of the multivariate analysis are presented in two parts. First we present the estimated parameters of the multinomial logit model, and discuss statistical significance and direction of effects of the explanatory variables on the relative probabilities of selected categories of living arrangements. Then we present tables of calculated absolute probabilities of selected categories of living arrangements, examining the partial effects of certain variables on these probabilities.

Multinomial Logit Parameters

The estimated multinomial logit parameters are shown in Table 5. Before discussing these results, some technical features of the estimation should be noted. First, the very few numbers of observations with living parents in the samples of single and divorced women necessitated the grouping together of the variables "number of siblings" and "number of parents," yielding a composite variable measuring the number of family-of-origin kin. Second, the fact that there were very few observations in the "living with chil-

dren plus siblings/parents" category, again in the samples of single and divorced women, also required the imposition of restrictions on the estimation. In particular, for each explanatory variable, the effect on "living with children plus siblings/parents" was constrained to equal the sum of its effects on "living with children" plus "living with siblings/parents." This is equivalent to the assumption that each variable's effect on the probability of living with children is independent of whether or not the woman also lives with her siblings/parents, and vice-versa. This is an unfortunate but unavoidable restriction; the probability of the combined children-plus-siblings/parents category is evidently positive, but very small—so small, in fact, that we are unable to model it.

Finally, note that in the estimation a simplified representation of the health-status variables was used. The ***number*** of movements—getting around indoors, getting around outdoors, and climbing stairs—for which the respondent reported "difficulty" was used; and the ***number*** of such movements reported to be "impossible" was used. Each can equal 0, 1, 2, or 3; for a given women, the sum of these two indices also must equal no more than 3.

As mentioned before, the multinomial logit parameters themselves are not easily interpreted in quantitative terms. Note that a positive sign on a parameter means that the associated explanatory variable raises the probability of the indicated category of the dependent variable, relative to the probability of living alone. And, a negative sign on a parameter means that the associated explanatory variable lowers the probability of the indicated category of the dependent variable, relative to the probability of living alone.

The results found in Table 5 indicate that kin availability, health status, and income are all important factors in explaining the distribution of older women's household status in Hungary. The most consistently significant results are found for the health indices, especially the extent to which key physical movements are "impossible." Having such a severe physical impairment raises the odds of living in institutions, and of living with other people—whether children, siblings/parents, or others—relative to living alone. Moreover, for all three marital-status groups, the largest such effect is on the odds of institutionalization. The variable measuring activities with which the respondents have "difficulty" has less striking results; however, in all those cases in which the parameters for this variable are statistically significant, they indicate an effect of raising the likelihood of living either in an institution or together with other people, as opposed to living alone.

The variable measuring the number of chronic diseases produces puzzling results. In particular, for widows it lowers the odds of living with other people—children, siblings/parents, or others—yet it fails to raise the odds of living in an institution. For

Table 5. Estimated parameters of multinomial logit models of living arrangements; women aged 70 and older.

	Marital status		
	Single	Widowed	Divorced
Effects on living in institutions:			
Intercept	0.448	-6.347***	-12.290***
Number of children	0.419**	-0.295***	0.000
Number of siblings	-0.210	-0.263***	-0.047
Number of parents	*a*	-0.358	*a*
Number of movements "with difficulty"	0.968***	-0.020	0.249
Number of movements "impossible"	1.313***	1.113***	1.136***
Number of chronic diseases	-0.124	0.128	-0.212
Age	-0.037	0.059***	0.135***
Pension amount (in 1000s)	-.718***	-0.463***	-0.413**
Effects on living with others:			
Intercept	-3.622**	-5.585***	-11.075***
Number of children	0.091	-0.127***	0.124
Number of siblings	-0.050	-0.031	-0.335
Number of parents	*a*	0.200	*a*
Number of movements "with difficulty"	0.149	0.662	0.013
Number of movements "impossible"	0.256*	0.374***	0.599**
Number of chronic diseases	0.131	-0.116**	0.117
Age	0.040*	0.059***	0.125***
Pension amount (in 1000s)	-0.248***	-0.090	-0.201
Effects on living with children:			
Intercept	1.406	-2.126***	-4.396*
Number of children	-0.084	0.038**	-0.046
Number of siblings	0.040	-0.030*	-0.045
Number of parents	*a*	0.262	*a*
Number of movements "with difficulty"	0.146	0.110***	0.117
Number of movements "impossible"	-0.186	0.416***	0.573**
Number of chronic diseases	-0.061	-0.121***	-0.053
Age	-0.008	0.042***	0.067*
Pension amount (in 1000s)	-0.071	-0.285***	-0.108
Effects on living with siblings/parents:			
Intercept	0.450	-5.406***	5.326
Number of children	-0.285	-0.596***	-0.648
Number of siblings	0.042	-0.107*	0.010
Number of parents	*a*	1.008***	*a*
Number of movements "with difficulty"	0.344**	0.028	0.290
Number of movements "impossible"	0.0371**	0.522***	1.069***
Number of chronic diseases	-0.215	-0.163*	-0.273
Age	-0.006	0.060***	-0.095*
Pension amount (in 1000s)	-0.148	-0.199*	0.138

Effects on living with children plus siblings/parents:			
Intercept	0.338	-5.415*	0.536
Number of children	*b*	-0.316**	*b*
Number of siblings	*b*	-0.032	*b*
Number of parents	*b*	1.087***	*b*
Number of movements "with difficulty"	*b*	0.223***	*b*
Number of movements "impossible"	*b*	0.777***	*b*
Number of chronic diseases	*b*	-0.248*	*b*
Age	*b*	0.033	*b*
Pension amount (in 1000s)	*b*	-0.001	*b*
Sample size	732	7604	466

* .05 ≤ significance level < .10
** .01 ≤ significance level < .05
*** significance level < .01
[a] Effects of "number of siblings" and "number of parents" constrained to be equal.
[b] Effect constrained to equal the sum of effects on "living with children" and "living with siblings/parents".

single and divorced women, the variable has no apparent effect. The results for widows are puzzling since we would expect that older women with chronic diseases would require personal care, which would in turn lead them to live either with others or in an institution. It should be noted that institutional places for the elderly are in short supply in Hungary; it has been estimated that there are only places for one-fourth to one-third of those requiring care (Cseh-Szombathy, 1983). Nonetheless, we might expect that medical needs would be a prime criterion by which decisions are made regarding who obtains institutional care. One reason for the unexpected findings may be that part of the effect of chronic illnesses—particularly those, such as arthritis, which tend to limit physical capabilities—is captured in the model by the variables measuring problems with movement. Another possible reason may lie in the shortcomings of the living-arrangements variable: hospitalized respondents, for example, are not identified in the microcensus data. If older women living alone are more likely than others to enter a hospital due to needs associated with chronic disease, then findings such as those presented here might emerge: an appearance that having chronic diseases leads older women to live alone.

Turning to the parameters for variables measuring kin availability, we find several significant effects, nearly all of which are in the expected direction. For widows, the number of living children is positively associated with the probability of living with children, relative to living alone; and, the number of living children is negatively associated with the probability of all other living arrangements (including living with both children and siblings/parents) relative to living alone. Thus, for an older woman the more children she has, the more likely is she to live with a child—relative to living alone—but also, the less likely is she to be institutionalized—relative to living alone.

Only for the sample of widows was it possible to examine separately the effects of number of living siblings and number of living parents. It is interesting to note that it is the existence of parents, rather than of siblings, which raises the odds of living with siblings/parents (both with, and without, children as well).

Among the single and divorced women, the effects of kin availability are less striking. Few of the parameters are statistically significant. One peculiar finding emerges: for single women, having more children appears to raise the odds of being in an institution. This is consistent with the descriptive results presented in Table 2, but has no obvious explanation.

Finally, the parameters for the pension-amount variable confirm findings reported by others, using data from other countries [for example, Michael, et al. (1980), and Wolf (1984), both of which use U.S. data]: as in the other studies cited, we find that in Hungary income is positively associated with the propensity to live alone. This is revealed by the fact that nearly all the parameters for the pension variable (and all of the statistically significant ones) are negative in sign, indicating that raising the pension amount reduces the probability of living in the indicated category, relative to the probability of living alone.

Illustrative Probabilities

The estimated parameters discussed in the preceding section can be used to infer the partial effects of a given variable upon the probabilities of each of the categories of living arrangements. To do this, we substitute the estimated parameters, as well as specified values of the array of explanatory variables, into equation (1) which allows us to calculate the probability—according to the estimated model—of each of the categories of the dependent variable. We then systematically vary just one of the explanatory variables, looking to see how the calculated probabilities change with this one explanatory variable, other factors held constant.

For this illustrative exercise, we use only the results from the sample of widows, which is numerically the most important group of older unmarried women. Moreover, we present calculated probabilities only for the two categories "living alone" and "living with children," which are the most important from both substantive and public-policy perspectives.

In Table 6 are found calculated probabilities of living alone, for widows with several different hypothetical patterns of available kin. The table also illustrates the partial effects of age, physical disability, and pension amount on the probability of living alone,

given an available-kin configuration. Thus the table allows us to judge the relative importance of kin availability, age, disability status and income on the propensity to live alone. In the illustrations, unless otherwise indicated the explanatory variables are fixed at values close to the mean values observed in the sample of widows: number of parents = 0; number of "difficult" movements = 1; number of "impossible" movements = 0; number of chronic diseases = 1; age = 77; and pension amount = 2500 forints.

Table 6. Partial effects of selected variables on probability of living alone; widows aged 70 and older.

		Availability of kin					
	Number of children =	0	0	1	1	2	2
	Number of siblings =	0	2	0	2	0	2
Age:[a]	70	.74	.69	.41	.41	.41	.41
	80	.61	.55	.30	.30	.30	.31
	90	.46	.40	.22	.21	.22	.22
Number of movements "with difficulty":	0	.76	.68	.38	.38	.38	.38
	1	.65	.59	.33	.33	.33	.34
	2	.50	.47	.28	.28	.28	.29
	3	.35	.34	.22	.22	.23	.23
Number of movements "impossible":	1	.53	.48	.25	.24	.25	.25
	2	.39	.35	.17	.17	.17	.18
Amount of pension (forints):	0	.56	.50	.21	.21	.21	.21
	2000	.63	.58	.31	.31	.31	.31
	4000	.69	.64	.42	.41	.42	.42
	6000	.73	.70	.53	.52	.54	.53

[a] Unless otherwise noted, number of parents = 0; number of movements "with difficulty" = 1; number of movements "impossible" = 0; number of chronic diseases = 1; age = 77; amount of pension = 2500.

Table 6 suggests that it is not the number, but the mere existence, of available kin which has the strongest influence on the propensity to live alone. Within each row of the table, the biggest differences are between women with one child and women with no children. Having a second child leaves virtually unchanged the probability of living alone. Having siblings lowers the probability of living alone, but by a much smaller amount than does having children. Also, very strong effects of disability are found. The differences between women with no difficulties in movement, and those with difficulties in all three types of movement used in the analysis, are large: the former are nearly twice as likely to live alone than the latter. Similarly large effects are found for the number of movements reported to be impossible.

Finally, Table 6 illustrates the importance of income as a determinant of living alone. There is a large difference in the predicted probability of living alone as pension income rises from 2000 forints—a figure somewhat below the mean in the sample—to 6000 forints—a figure more than twice the sample average; this difference is larger for women with than for women without living nuclear-family kin.

Table 6 deals only with the predicted probability of living alone, which is only one of six possibilities in the model used. The results show that the probability of living alone is strongly affected by having one child, compared to having no children, but is essentially unaffected by a second child, or by the availability of siblings in addition to one or more child. However, this does not mean that living arrangements are unresponsive to the number of living kin. In Table 7 we show the predicted probabilities of living with children, corresponding to the situations shown in Table 6.

Table 7. Partial effects of selected variables on probability of living with children; widows aged 70 and older.

		Availability of kin			
	Number of children =	1	1	2	2
	Number of siblings =	0	2	0	2
Age:[a]	70	.46	.44 (.45)[b]	.48	.46 (.47)[b]
	80	.52	.49 (.51)	.55	.52 (.53)
	90	.57	.53 (.54)	.59	.57 (.58)
Number of movements "with difficulty":	0	.52	.48 (.50)	.54	.51 (.52)
	1	.51	.48 (.50)	.53	.51 (.52)
	2	.48	.45 (.46)	.50	.48 (.49)
	3	.42	.40 (.41)	.45	.43 (.44)
Number of movements "impossible":	1	.57	.53 (.55)	.59	.57 (.59)
	2	..60	.56 (.59)	.64	.61 (.63)
Amount of pension (forints):	0	.65	.62 (.63)	.67	.65 (.66)
	2000	.54	.51 (.52)	.56	.54 (.55)
	4000	.42	.39 (.40)	.43	.41 (.42)
	6000	.30	.28 (.29)	.31	.29 (.30)

[a] Unless otherwise noted, number of parents = 0; number of movements "with difficulty" = 1; number of movements "impossible" = 0; number of chronic diseases = 1; age = 77; amount of pension = 2500.
[b] Probability of living with child(ren) *and* sibling(s) in parentheses.

Table 7 shows that even though the probability of living alone is unchanged for the various combinations of zero or two siblings with one or two children, there is a moderate amount of variation in the probability of living with children, according to both the

number of children and the number of siblings. The reason for the latter result is that additional siblings raise the probability of living with siblings (while leaving unchanged the probability of living alone). The differences in probabilities across available-kin configurations in Table 7, however, are rather small—never more than two or three percentage points—and therefore must not be taken too literally. Instead, we can suggest a qualitative conclusion based on these calculations: variations in the number and composition of available kin can change some aspects of the mix of living arrangements, while leaving unchanged key types of living arrangements, such as living alone.

DISCUSSION

This paper has examined the living arrangements of older unmarried women in Hungary, with particular emphasis on the effects of available-kin patterns as determinants of living arrangements. The multivariate analysis suggests that not only available-kin patterns, but also health status, age and income strongly influence living arrangements.

What can we infer about the future of living arrangements of elderly women in Hungary, using these results? First, it seems clear that projections of future household patterns based on a headship-rate approach would be misleading, if available-kin patterns are also changing over time.

Available evidence suggests that kin patterns are, in fact, changing and will continue to do so. For example, the distribution of number of children born, by age group, for married Hungarian women in 1984 is as follows:

65–69 – 2.23 children/woman;
60–64 – 2.12 children/woman;
55–59 – 2.01 children/woman;
50–54 – 1.99 children/women;
45–49 – 1.95 children/women; and
40–44 – 1.93 children/women.

Therefore successive groups of women entering the 70-and-older age group in the future will have fewer living children, on average. At the same time, however, the percentage of older women with no living children may fall in coming decades. For the same age groups, the percentage with zero children is as follows:

65–69 – 13.8 percent with no children;
60–64 – 11.7 percent with no children;
55–59 – 10.4 percent with no children;
50–54 – 6.8 percent with no children;
45–49 – 6.6 percent with no children; and
40–44 – 5.4 percent with no children.

[The source for these figures is Hungarian CSO (1985): 97.] Thus it is possible that in future cohorts of older women, a larger percentage will have access to at least one child, and this will raise slightly the extent of co-residence across the generations. This very slight demographic effect might, however, easily be outweighed by further "...changes in the habits of intergenerational cohabitation..." (Kamarás, 1988: 201) and further development of the nation's housing stock.

The preceding analysis indicates that the number of children is more important than the number of siblings or parents as a determinant of living arrangements. But patterns of living siblings and parents can also be expected to change in the future, and this might in turn lead to changes in living arrangements. Birth rates have been low in Hungary for many years; ultimately, sustained low birth rates will be reflected in lowered average numbers of siblings, among women entering old age. The worsening of old-age mortality in Hungary, which has been observed in recent years, will also play a role in shaping kin patterns if it continues. Ajkay (1983), for example, presents data showing mortality rates by age and sex during the period 1972–1976; in age groups 60–64 through 80–84, mortality rates rose in the range of 1.4 percent to 3 percent annually for men, and from 0.6 to 1.5 percent annually for women. In all those age groups the average annual increase was greater for men than for women. Only in the 85-and-older group was the pattern reversed, with mortality rates for men rising at an annual rate of 0.4 percent compared to 0.9 percent for women. Mortality increases such as these will further reduce the average number of siblings of the surviving elderly, and have the potential to greatly reduce the already-low incidence of living parents among the elderly.

A final consideration concerns trends in the incidence of physical disabilities or chronic disease among surviving elderly. There is relatively little information available on the question of trends in health status, although Ajkay (1983) presents some evidence of growing incidence of selected chronic diseases among hospitalized elderly over the 1972–1976 period. This does not necessarily imply, however, a rising incidence of the same health conditions among the elderly population overall. Indeed, considerations of selectivity in mortality according to latent or underlying "frailty" [see, for example, Vaupel and Yashin (1985) or Manton and Soldo (1985)] suggest that one consequence of rising mortality rates over time might be a reduced incidence of physical debilitation within the population of surviving elderly.

Besides the questions of future changes in the structure and composition of the elderly population, in the patterns of kin available to the elderly for forming shared-household and care arrangements, and in the incidence of disabling health conditions, all of which the preceding analysis indicates are important determinants of living arrangements, we

must also consider other factors outside the model. Two very important such factors are the overall state of the housing supply in Hungary, and the supply of places in institutions. Together, these factors will determine whether the family, or the state—or, possibly, both—will be "squeezed" by the care needs of a growing older population in Hungary in the coming decades.

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