

III. ECONOMIC AND SOCIAL CORRELATES OF LIVING ARRANGEMENTS

The present chapter examines the relationship of older persons' living arrangements to indicators of social and economic development at the national level, and, at the individual level, to three socio-economic characteristics: rural/urban residence, education and an index of material well-being. The general expectation, based on earlier literature regarding changes in families and households in the course of development, is that social and economic development is associated with a greater tendency for older couples and individuals to live apart from children and other relatives. Here the patterns are examined across countries rather than over time. Because aspects of development tend to be correlated with one another, this chapter employs multivariate analytic techniques to determine whether the indicators of different aspects of development retain a significant association with living arrangements after statistical control for other factors. Multivariate techniques are also used to examine the relationship of socio-economic and demographic factors to older persons' living arrangements within countries.

A. SOCIO-ECONOMIC DEVELOPMENT AND LIVING ARRANGEMENTS OF OLDER PERSONS: CROSS-NATIONAL RELATIONSHIPS

Indicators of development

The development indicators employed in this section include:

- Gross domestic product (GDP) per capita (for 1995);
- Proportion of the population living in urban areas (for 1995);
- Average number of years of education of the population aged 25 years or over (for 1995);
- Expectation of life at birth (for 1990-1995).

Higher levels of income, urbanization and education are expected to be associated with higher proportions of older persons living separately—

either alone or as a separate couple—and lower proportions living with others, especially children. It is less clear what relationship should be anticipated between living arrangements and life expectancy, once other indicators of development are controlled for statistically. Higher life expectancy, insofar as it is an indicator of development, is expected to be associated with lower co-residence with children and other relatives. However, other things being equal, higher life expectancy also means that there is a tendency for widowhood to occur later in life, which would tend to increase the proportions currently living as a couple relative to the numbers living alone. Higher life expectancy also decreases the probability that an older person's children will already have died, although the likelihood of having at least one surviving child, as well as the number of surviving children, obviously depends also on the total number of children that were born. Thus, it is not clear what relationship to expect between life expectancy and the proportion of older persons in different arrangements, after controlling for other development indicators.

The analysis includes, in addition to the indicators of social and economic development, a crude measure of the average number of younger adult kin available to live with and, potentially, to support the older population. The “kin availability index” is the ratio of the number of persons aged 20-55—an age range that includes most of the children of the older population—to the number aged 60 years or over, in 1995. A positive relationship is expected between the kin availability index and the proportions of the older population living with children and other relatives.

Correlations of development indicators with living arrangements

In order to assess the influence of macrolevel socio-economic factors on the propensity of older persons to live independently or with family members, first, simple correlations (Pearson's correlation coefficients) between the development indicators and the proportions in different living arrangements were calculated. In addition to the

categories of living arrangements examined in chapter II, two composite categories were constructed. The first of these combines the “alone” and “couple-only” groups, into a group representing residential arrangements that are independent of others; the second combines those living with children, grandchildren and other relatives into a combined “family” group.

Per capita GDP and kin availability are strongly correlated with the household structure of older persons, with correlation coefficients above 0.8 in absolute value for either the “independent” or combined “family” categories. Independent living is positively correlated with per capita GDP and negatively correlated with kin availability, while for the proportion living with family members the relationship is the reverse (figure III.1). The correlations of the socio-economic indicators with the remaining factors were also highly statistically significant, although lower in absolute size. In the case of education, the correlation coefficients were about 0.7. For life expectancy and proportion of urban population, the coefficients were about 0.6. All three indicators were positively associated with independent living and negatively associated with the family arrangement.

Turning to the more disaggregated categories, correlations with country-level indicators are in the same direction for both the proportion living alone and the proportion of solitary couples, but are generally lower in the case of those living alone (table III.1). Regarding family arrangements, correlations with most of the indicators of development are negative for both living with child/grandchild and living with other relatives. The absolute size of the correlations, however, is considerably higher in the case of living with child or grandchild compared with living with other relatives, and kin availability seems to have opposite effects on the two living arrangements. Availability of younger kin is positively correlated with co-residence with child/grandchild and negatively correlated with co-residence with other relatives.

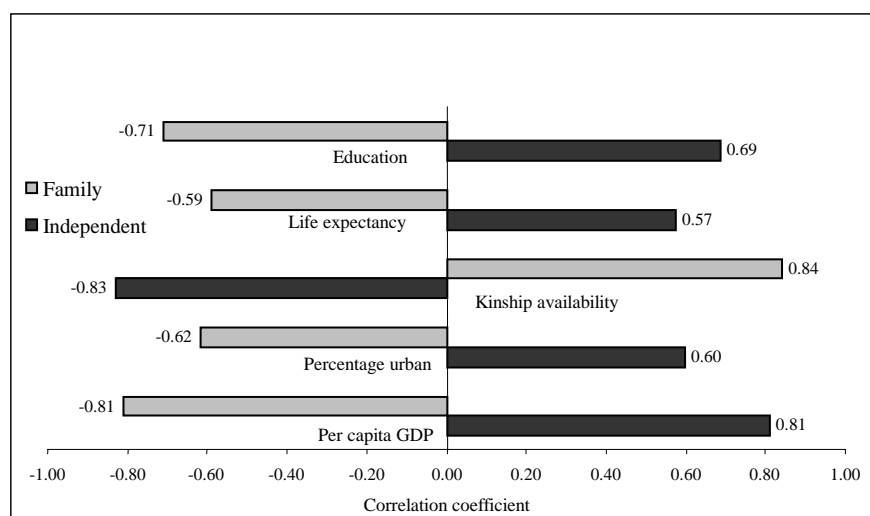
Multivariate analysis of living arrangements

The effects of country-level variables on the living arrangements of older persons were estimated through ordinary least squares (OLS) multiple regression models in which the observed rates of different living arrangements were defined as functions of per capita GDP, percentage urban, expectation of life at birth, and the index of kinship availability. In addition, variables indicating each country’s region were included in the models, in order to see whether the development indicators were able to explain the regional differences that had been observed earlier. These indicators have the value “1” if the country is in the specified region, and zero otherwise. The regional differences were assessed with respect to the values for Africa (the reference category).

The results from the multivariate analysis corroborate, in general, those from the bivariate correlation analysis. Per capita GDP has a statistically significant effect on all types of living arrangement. Higher GDP per capita is positively related to the proportions living alone and as a couple, and negatively correlated with the proportions living with child/grandchild or with other relative (table III.2). Kin availability, on the other hand, has a significantly negative effect on the probability of living alone or as a couple and a significantly positive effect on the probability of living with child/grandchild. As in the bivariate analysis, its effect on the probability of living with other relatives is negative in sign, but it is not statistically significant.

Education seems to enhance the chances of living alone and to reduce the chances of living with child/grandchild. Higher life expectancy, on the contrary, enhances the chances of co-residence with child/grandchild and reduces the chances of independent arrangements; this relationship is opposite in direction to that seen in the bivariate correlations (table III.1). The effect of urban/rural residence on older persons’ living arrangements—

Figure III.1. Pearson's correlation coefficients between proportion of older persons in family and independent arrangements and selected country-level variables



Source: See table III.1.

TABLE III.1. PEARSON'S CORRELATION COEFFICIENTS BETWEEN THE PROPORTION OF OLDER PERSONS IN DIFFERENT LIVING ARRANGEMENTS AND SELECTED COUNTRY-LEVEL VARIABLES

Country-level variable	Correlation coefficient					
	Alone	Couple	Independent	Child/ grandchild	Other relative	Family
Per capita GDP (thousands, in 1990 constant US\$)	0.71	0.81	0.81	-0.79	-0.35	-0.81
Percentage of population in urban areas	0.45	0.62	0.60	-0.63	-0.11	-0.62
Expectation of life at birth	0.50	0.62	0.57	-0.57	-0.26	-0.59
Kin availability index	-0.74	-0.84	-0.83	0.83	-0.33	0.84
Years of education (age 25+).....	0.69	0.70	0.69	-0.70	-0.29	-0.71
Number of countries	134	87	87	87	87	87

Sources: Living arrangements: tables II.1 and II.4; per capita GDP: United Nations (2002c); percentage urban: United Nations (2002d); expectation of life at birth and kin availability index: United Nations (2003b); years of education: R.J. Barro and J. Lee (2000).

NOTE:

The reference year for the percentage of older persons in different living arrangements varies from country to country, depending on the latest available data (see tables II.1 and II.4).

The reference year is 1995 for the country-level variables, except life expectancy, for which the reference period is 1990-1995. For education, in some countries data for 1990 were employed, if data for 1995 were not available.

The kin availability index was calculated as a ratio of the population aged 20-55 to the population aged 60 years or over.

The "independent" arrangement combines categories "alone" and "couple-only".

The "family" arrangement combines categories "child/grandchild" and "other relative".

slightly positive with respect to the probability of living as a couple only and slightly negative with respect to co-residence with child/grandchild—was less important than the other factors. Also, the likelihood of living with other relatives was generally less affected by the macrolevel indicators than were the other living arrangements.

Finally, the results in table III.2 show that important regional differences remain even after controlling for the macrolevel socio-economic indicators. In Europe, the likelihood of independent living (alone or as a couple) is significantly higher than in the other regions, while that of co-residence with child/grandchild is correspondingly lower. At the same time, the indicators of development do account for a large part of the regional differences that were seen in the descriptive analysis of chapter II. For instance, an average of 26 per cent of older persons were living with a child or grandchild in Europe, as contrasted with 74 per cent in Africa; this represents a difference of 48 percentage points (table II.5). Controlling for regional differences in the development indicators reduces that regional contrast to 19 percentage points (table III.2).

In summary, wealth and demographic forces can account for much of the cross-national variation in the living arrangements of older persons.¹ However, there are other factors that have not been included in the analysis but that might have important effects on living arrangements. For instance, the housing market, the amount of internal and international migration, and cultural norms are likely to influence living arrangements. In addition, the fact that the more developed countries tend to have wider coverage and higher benefits from pension and social security systems, makes it more affordable for older persons to maintain an independent household. However, in the absence of suitable measures of the latter factors, it was not possible to explore these ideas further for this publication.

Institutional living

Several trends—the ageing of the older population itself, the higher prevalence of chronic diseases among the oldest old, lower fertility, increased geographical mobility, and the rapid advances in medical technology—are often

mentioned as factors leading to institutionalization of higher proportions of older people (Kinsella, 1990). The descriptive overview in chapter II showed that institutional living was, in general, uncommon in developing countries, but that in many of the more developed countries of Europe, as well as in Northern America and Oceania, significant proportions of older persons reside in an institution, especially among those who are unmarried and aged 75 years or over. One question to be examined below is whether these differences, like those in household living arrangements, can be explained by national differences in levels of social and economic development.

An alternative explanation for differences in levels of institutional living is that they are due to long-standing cultural differences that tend to endure in the midst of economic change. Some family theorists classify societies as belonging to “strong family” and “weak family” types, which differ in their preference for able-bodied older persons to live with or apart from kin, as well as in the preferred residential arrangements for older persons needing care. According to Reher (1998, p. 212):

“Faced with the transition to old age, in one context individuals attempt to prolong their physical independence as long as possible and, when this is no longer feasible, to conserve a measure of economic independence that will enable them to enter a nursing home or afford some other solution. They would never give serious consideration to going to live with their children; nor would it enter the minds of their children to have their elderly parents at home with them ... In sharp contrast to this pattern, in areas of strong families, maintaining independence as a matter of principle would seem like nonsense, and this only happens when, for one reason or another, there is no family.”

If the strong family/weak family division is important in explaining levels of institutionalization cross-nationally, then there should be a positive association between the proportion of older persons living alone and the proportion living in institutions, since these are both non-family arrangements, and this association should persist even after controlling for differences in levels of social and economic development.

TABLE III.2. ESTIMATED COEFFICIENTS FROM THE OLS REGRESSIONS OF THE PROPORTION OF OLDER PERSONS IN DIFFERENT LIVING ARRANGEMENTS

Country-level variable	Living arrangement							
	Alone		Couple-only		With child/grandchild		With other relative	
	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
Per capita GDP (thousands, in 1990 constant US\$).....	0.39***	0.10	0.54***	0.14	-0.74***	0.17	-0.16*	0.07
Percentage of population in urban areas.....	0.01	0.05	0.16*	0.06	-0.18*	0.08	0.04	0.03
Years of education (age 25+).....	1.26***	0.34	0.52	0.46	-1.42*	0.59	-0.34	0.23
Expectation of life at birth	-0.26*	0.11	-0.36*	0.14	0.57**	0.18	0.02	0.07
Kin availability index ^a	-1.03***	0.37	-2.28***	0.50	3.09***	0.64	-0.35	0.25
Major area								
Europe.....	4.76*	2.74	13.08**	3.69	-19.23***	4.74	-3.50	1.85
Americas	-1.31	2.02	-0.08	2.72	-3.89	3.49	1.77	1.36
Asia and Oceania	-4.58*	1.90	1.88	2.55	4.58	3.28	-2.38	1.28
Intercept	27.28***	6.17	39.27***	8.31	29.80**	10.68	8.60*	4.17
Number of countries.....	96		71		71		71	
R ²	0.83***		0.88***		0.91***		0.47***	

Sources: See table III.1.

NOTE: Analyses encompassed the countries for which data were available for all the variables in the regression.

Significance levels: * p<0.05; ** p < 0.01; *** p < 0.001.

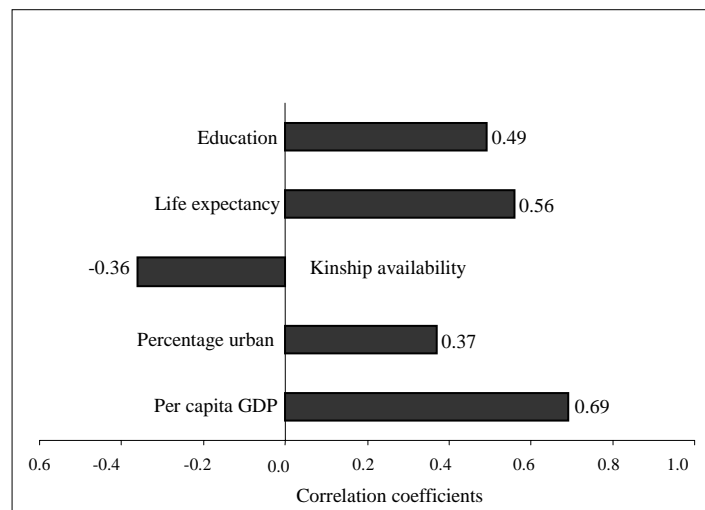
The reference year for the dependent variable (proportion of older persons in different living arrangements) varies from country to country, depending on the latest available data (see tables II.1 and II.4).

The reference year is 1995 for the independent variables (country-level variables), except life expectancy, for which the reference period is 1990-1995. For education, in some countries data for 1990 were employed, if data for 1995 were not available.

^a Calculated as the ratio of the population aged 20-55 to the population aged 60 years or over.

^b Reference category for "area" is Africa.

Figure III.2. Pearson's correlation coefficients between the proportion of older persons living in institutions and selected country-level variables



Source: See table III.3.

TABLE III.3. ESTIMATED COEFFICIENTS FROM OLS REGRESSIONS OF THE LEVEL OF OLDER PERSONS' INSTITUTIONALIZATION ON SELECTED COUNTRY-LEVEL VARIABLES

Country-level variable	Model 1		Model 2	
	Coefficient	Standard error	Coefficient	Standard error
Per capita GDP (thousands, in 1990 constant US\$) ..	0.13***	0.03	0.10**	0.04
Percentage of population in urban areas	0.00	0.01	-0.01	0.02
Years of education (age 25+)	0.09	0.12	-0.04	0.14
Expectation of life at birth	-0.02	0.06	0.01	0.07
Kin availability index ^a	-0.25	0.17	-0.22	0.26
Region (reference category is Africa)				
Europe	-1.57	1.16	-2.54	1.67
Americas	-0.38	1.11	-0.68	1.56
Asia and Oceania	0.21	1.01	-0.13	1.50
Percentage of older persons living alone			0.07	0.04
Intercept	3.51	3.95	2.63	4.97
N (Number of countries)		56		50
R ²		0.58***		0.60***

Sources: Percentage institutionalized: table II.14; percentage living alone: table II.1. For other variables, see table III.1. NOTE: Analyses encompassed the countries for which data were available for all the variables in the regression. Significance levels: ** p < 0.01; *** p < 0.001.

The reference year for the dependent variable (level of older persons' institutionalization) varies from country to country, depending on the latest available data (see table II.11); the reference year is 1995 for the independent variables (country-level variables), except life expectancy, for which the reference period is 1990-1995, and percentage living alone, for which the reference year is the latest available year (see table II.1). In some countries, education data for 1990 were employed, if data for 1995 were not available.

^a Calculated as the ratio of the population aged 20-55 to the population aged 60 years or over.

Multivariate analysis of institutional living

The proportion of older persons living in institutions is strongly positively correlated with per capita GDP, the Pearson correlation coefficient being 0.69. For the other development indicators, the correlation coefficients are lower, although they are statistically significant ($p < 0.01$) (figure III.2).

When all these factors are entered into a multivariate regression model, per capita GDP continues to be a significant net predictor of the proportion of older individuals institutionalized, while urbanization, life expectancy, kinship availability and level of education become insignificant (table III.3, model 1). Regional differences are also statistically insignificant once the other variables are taken into account.

If the weak- versus strong-family distinction were an important reason for differences in levels of

institutionalization, a significant positive association would be expected between the proportion of older persons living alone and the proportion living in institutions. However, the results do not support this idea. When the variable "percentage of older persons living alone" is added to the analysis, per capita GDP remains the only significant net predictor of the proportion of older persons in institutions (table III.3, model 2).

The topic of institutional care for the aged is a complex one, which cannot be pursued in any depth with the data reviewed here. The types of services available, the division between private and public sector funding, and the role of charitable institutions vary considerably from country to country, as do official efforts to encourage and support family members in caregiving. Some countries with higher levels of institutional living have, in recent years, been trying to encourage de-institutionalization and to reserve nursing-home places for those with the

greatest need. One recurring theme in discussions of the topic, however, is the high cost of providing good-quality formal care and the disparity between available services and need. In a review of the situation in Europe (de Jong-Gierveld and van Solinge, 1995), the following observation was made: "Formal care services are seldom available to all who qualify for them. This is even the case in countries with an extensive care system. Most countries probably have in common that the demand for formal services is suppressed by the sheer lack of them" (p. 42). The cross-national findings reported here are consistent with the idea that the most important factor accounting for level of institutionalization from a global perspective is a society's ability to support the expense of institutional care.

B. RELATIONSHIP BETWEEN LIVING ARRANGEMENTS AND SOCIO-ECONOMIC CHARACTERISTICS OF OLDER PERSONS

Urban/rural residence

Societies that were traditionally rural are becoming increasingly urban. How does this development affect older persons' living arrangements? There are several factors that could lead to an urban/rural difference in the levels of co-residence among the older population (see Martin and Kinsella, 1994). Differing economic circumstances in rural and urban areas could influence living arrangements. The economics of family farming may be especially conducive to the formation and maintenance of extended-family households, for instance. Migration may also affect co-residence, as younger kin who move to cities leave older relatives behind in rural areas; however,

older kin might move to urban areas specifically to reside with their kin. Living arrangements could also reflect housing shortages in one area compared with another: housing shortages could cause some people to "double up". Ethnic factors could also account for some of the difference, if one group is more likely to be urban and another rural (for example, Chinese versus Malays or Latinos versus Indians). Finally, differences in the degree of secularization or modernity as related to ideas regarding the value of privacy, the use of economic resources, or a combination of these could also generate differentials in the prevalence of solitary living according to the place of residence.

Among the 69 countries with data available, older rural residents were more likely than older urban residents to live alone in 38 cases, while the opposite was true in 24 cases. In seven cases, the values were essentially nil (within 0.1 percentage point, table III.4). These findings are consistent with the idea that different forces are at work in different areas. They do not support the notion that older persons in rural areas are somehow better connected with an extended family. Also, an urban/rural difference of more than 2.5 percentage points (in either direction) is present in only 29 (42 per cent) of the 69 cases, suggesting that the effect of urban/rural residence on whether older persons live alone is often of little practical importance (table III.5). Yet, there are some countries in which the difference is large: the percentage living alone is 11-19 percentage points higher in urban areas in Kazakhstan, Kenya and Kyrgyzstan than in rural areas; and there is a difference of about 9 percentage points in the opposite direction in Bolivia and Mozambique.

TABLE III.4. PROPORTION OF POPULATION AGED 60 YEARS OR OVER LIVING ALONE, BY URBAN/RURAL RESIDENCE AND LEVEL OF EDUCATION (Percentage)

Country	Date/source	Total	Residence			Education ^a		
			Rural	Urban	Rural-urban	Some	None	Some-none
Africa								
Benin	2001 D	10.3	11.1	8.5	2.6	9.3	10.6	-1.2
Burkina Faso	1998/99 D	2.3	2.1	4.7	-2.6	0.0	2.4	-2.4
Cameroon	1998 D	8.3	9.0	5.5	3.5	6.5	8.8	-2.3

TABLE III.4 (continued)

Country	Date/source	Total	Residence			Education ^a		
			Rural	Urban	Rural-urban	Some	None	Some-none
Central African Republic.....	1994/95 D	12.5	14.6	8.7	5.9	8.5	13.0	-4.5
Chad	1996/97 D	11.2	11.6	9.3	2.3	2.4	11.4	-9.0
Comoros	1996 D	1.5	1.6	1.2	0.4	2.3	1.4	0.9
Côte d'Ivoire	1998/99 D	4.0	3.2	6.9	-3.7	9.5	3.8	5.7
Egypt	2000 D	8.3	7.0	9.9	-2.9	7.9	8.5	-0.6
Ethiopia	2000 D	5.0	4.7	7.1	-2.5	4.0	5.0	-1.0
Gabon	2000 D	11.0	11.2	10.7	0.5	13.6	10.4	3.2
Ghana	1998 D	21.6	20.6	24.2	-3.6	23.0	21.4	1.6
Guinea	1999 D	2.2	2.1	2.6	-0.4	1.5	2.3	-0.8
Kenya	1998 D	17.3	16.5	27.9	-11.4	13.4	19.7	-6.3
Madagascar.....	1997 D	8.0	8.2	7.3	0.8	5.9	10.2	-4.2
Malawi.....	2000 D	11.4	11.6	6.8	4.8	9.7	12.8	-3.1
Mali	2001 D	6.8	7.2	5.5	1.7	6.3	6.9	-0.6
Morocco	1992 D	5.7	5.6	5.8	-0.2	7.5	5.7	1.8
Mozambique.....	1997 D	14.3	15.6	7.1	8.5	12.9	15.1	-2.2
Namibia	1992 D	4.2	3.3	8.9	-5.6	6.0	3.5	2.6
Niger.....	1998 D	3.5	3.6	2.8	0.8	0.0	3.5	-3.5
Nigeria.....	1999 D	6.4	6.1	7.5	-1.3	4.2	7.5	-3.3
Rwanda.....	2000 D	6.5	6.6	6.3	0.3	3.2	7.6	-4.4
Senegal	1997 D	1.3	0.9	2.3	-1.5	..	..	..
South Africa	1998 D	8.1	6.7	9.5	-2.8	9.6	6.3	3.4
Togo	1998 D	8.0	9.4	2.5	6.9	9.6	7.9	1.7
Tunisia.....	1991 W	2.7	2.8	2.7	0.0	2.9	2.7	0.2
Uganda	1995 D	12.1	11.9	15.1	-3.2	9.7	13.4	-3.7
United Rep. of Tanzania.....	1999 D	7.5	7.5	7.6	-0.1	6.6	8.0	-1.3
Zambia.....	2001/02 D	8.8	9.7	5.2	4.5	6.8	11.1	-4.3
Zimbabwe.....	1999 D	8.8	7.8	13.3	-5.5	8.6	9.1	-0.5
Asia								
Armenia	2000 D	8.7	7.2	9.8	-2.7	8.5	11.0	-2.5
Bahrain ^b	1991 W	0.7	..	..	..	0.0	0.9	-0.9
Bangladesh	1999/00 D	1.8	2.0	0.8	1.1	0.9	2.3	-1.3
Dem. People's Rep. of Korea.....	1990 W	4.6	8.1	1.2	6.9	4.2	5.5	-1.3
India.....	1998/99 D	3.3	3.4	3.0	0.5	2.4	3.9	-1.5
Indonesia	1997 D	7.3	7.9	5.7	2.2	4.2	10.0	-5.8
Jordan	1991 W	7.0	5.7	7.6	-1.9	3.5	8.3	-4.8
Kazakhstan	1999 D	15.9	8.3	22.0	-13.7	16.1	14.6	1.5
Kyrgyzstan.....	1997 D	9.3	2.3	21.5	-19.2	10.3	2.0	8.4
Malaysia	1983/85 W	5.8	8.4	2.4	6.0	2.5	8.8	-6.3
Myanmar	1990 W	4.6	6.9	2.2	4.7	2.4	8.4	-6.0
Nepal	2001 D	4.5	4.6	3.5	1.1	1.5	4.8	-3.3
Pakistan	1990/91 D	2.7	3.2	1.2	1.9	0.7	3.0	-2.3
Philippines.....	1998 D	5.3	6.0	4.5	1.5	4.9	9.0	-4.2
Republic of Korea	1983/85 W	2.1	2.7	1.7	1.0	2.1	2.2	-0.1
Sri Lanka	1990 W	3.0	3.0	3.1	-0.1	3.2	2.2	1.0
Thailand.....	1990 W	3.7	3.3	4.2	-0.9	2.9	5.6	-2.7
Turkey	1998 D	8.5	5.8	11.0	-5.2	8.7	8.5	0.2
Uzbekistan.....	1996 D	7.6	4.0	11.4	-7.4	7.6	6.9	0.7
Yemen	1991/92 D	4.0	4.0	4.0	-0.1	..	..	..
Europe								
Bulgaria	1992 C	19.0	19.5	18.5	1.0	17.9	19.3	-1.4
Czech Republic.....	1991 C	33.6	..	..	..	27.1	38.2	-11.1
Estonia.....	1989 C	29.6	..	..	..	26.3	32.1	-5.8
Finland.....	1990 C	35.4	29.9	38.0	-8.2	32.3	36.2	-3.9
Latvia.....	1989 C	24.0	..	..	..	21.8	26.4	-4.6

TABLE III.4 (continued)

Country	Date/source	Total	Residence			Education ^a		
			Rural	Urban	Rural-urban	Some	None	Some-none
Romania	1992 C	20.3	..	..	..	18.5	21.7	-3.2
Latin America and the Caribbean								
Argentina.....	1980 C	10.9	11.3	10.9	0.4	11.7	10.5	1.2
Bolivia.....	1998 D	13.2	18.1	9.3	8.8	9.7	17.9	-8.2
Brazil.....	1996 D	8.8	8.8	8.8	0.0	8.1	9.7	-1.6
Chile.....	1992 C	8.8	9.0	8.7	0.3	8.0	9.5	-1.5
Colombia.....	2000 D	7.1	8.2	6.5	1.6	6.8	7.9	-1.1
Costa Rica.....	1984 C	7.8	8.0	7.6	0.4	8.0	7.6	0.4
Dominican Republic.....	1999 D	6.1	6.8	5.7	1.0	5.5	9.3	-3.8
Ecuador.....	1982 C	8.6	10.0	7.0	3.0	8.0	9.5	-1.5
Guatemala.....	1998/99 D	6.3	6.3	6.3	0.0	6.4	6.4	0.1
Haiti.....	2000 D	8.5	9.0	6.8	2.3	6.8	9.1	-2.3
Mexico.....	1990 C	7.4	7.6	7.3	0.3	7.3	7.5	-0.2
Nicaragua.....	1997/98 D	5.2	5.7	4.8	0.9	6.0	4.6	1.5
Panama.....	1980 C	12.3	12.0	12.8	-0.8	12.8	12.0	0.8
Paraguay.....	1990 D	5.4	4.8	6.0	-1.2	5.1	6.1	-1.1
Peru.....	2000 D	8.7	13.0	6.1	6.9	7.1	12.9	-5.8
Venezuela.....	1981 C	8.0	10.7	7.0	3.7	7.1	8.7	-1.6
Northern America								
United States of America ^c	2000 CPS	25.9	25.8	25.9	-0.1	24.7	28.8	-4.1
Oceania								
Fiji.....	1983/85 W	2.0	2.7	1.0	1.7	2.0	2.0	0.0

Sources:

C = National population censuses, special tabulations of microdata census samples.

CPS = United States Current Population Survey, special tabulations.

D = Demographic and Health Survey

W = special World Health Organization (WHO) survey of older persons, special tabulations.

NOTE: For the household population.

^a In developing countries, the education dichotomy was between none and any; in more developed countries, it was between having less than, or at least, a grammar school education.

^b All residents living in urban areas.

^c In the United States, residence differences were between living in a metropolitan area or not rather than between living in an urban area or not.

As in the case of solitary living, in many countries, shared forms of living among older persons seem to be only marginally affected by place of residence. Among the 50 countries with data available from the DHS, there is no consistent difference in the direction of the urban/rural differences in proportions of older persons within most arrangements. For most countries, in addition, the differences that do exist are of little practical importance (annex table A.IV.12 and table III.5). However, a pattern can be detected in which the “couple-only” as well as the “grandchild” arrangements are more frequent in rural than urban areas, whereas the opposite is true for the remaining

categories—“with child” “with other relatives” and “with non-relatives”. Taking the regional averages, the proportion living with children is about 4 percentage points higher in urban than in rural areas in Latin America and the Caribbean and 2 points higher in Africa, but about 4 percentage points lower in Asia (table III.6). Some of these averages are dominated by large relative differences in a few countries. For instance, although in a majority of Latin American and the Caribbean countries, the proportion living with children is higher in rural than in urban areas, the mean value for the region lies in the other direction.

TABLE III.5. SUMMARY OF RURAL/URBAN DIFFERENTIALS IN FREQUENCY OF DIFFERENT LIVING ARRANGEMENTS

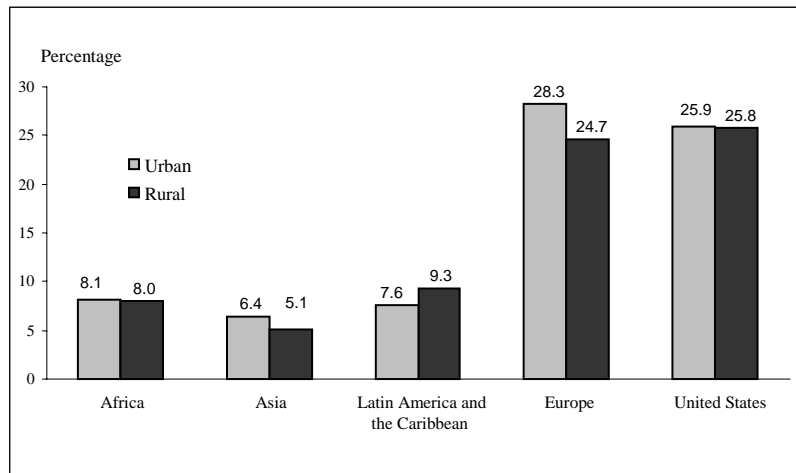
Percentage of countries where living alone is:	Living arrangement					
	Alone	Couple only	With child	With grand-child	With other relatives	With non-relatives only
More common in urban areas ^a	22	16	42	2	36	20
About the same in rural and urban areas ^b	58	36	30	56	56	80
More common in rural areas ^a	20	48	28	42	8	0
Total	100	100	100	100	100	100
N of countries.....	69	50	50	50	50	50

Sources: Table III.4 and annex table A.IV.12.

^a Difference between the groups exceeds 2.5 percentage points.

^b Difference between the groups is within 2.5 percentage points.

Figure III.3. Proportion of older persons living alone by place of residence: unweighted averages for major areas and the United States of America



Source: Table III.4.

In all three regions, the proportion of older persons living with other relatives as well as with non-relatives is slightly higher in urban than in rural areas. By contrast, the skipped-generation arrangement is more characteristic of rural settings, particularly in Africa and Latin America and the Caribbean, which are the regions with the highest prevalence of such households (table III.6).

Even though the rural/urban differences are small when averaged over all countries with available data, for each type of living arrangement,

large rural/urban differences exist in some countries, especially with respect to the commonest arrangement, living with children—but again, there is no consistency with respect to the direction of these large differences (figure III.4 and annex table A.IV.12). In Kazakhstan, Kyrgyzstan, Namibia and Uzbekistan, the proportion of rural older persons living with children is greater than that of urban older persons by at least 15 percentage points—in Kyrgyzstan the difference is over 30 percentage points. On the other hand, in Bolivia, Peru and Zambia, the proportion of urban older persons living

with a child is greater than that of rural older persons by over 15 percentage points. The same countries tend to have relatively large rural/urban contrasts—but in the opposite direction—with respect to couple-only households.

The situation is different with respect to skipped-generation households: in countries where the rural/urban difference is large, skipped-generation households are always more common in rural settings. The largest differences amount to 10–11 percentage points, in the Dominican Republic, South Africa and Zimbabwe.

Rural/urban differences in the proportion living with relatives other than children rarely exceed 5 percentage points. The largest difference is in Côte d'Ivoire, where the proportion of rural older persons living in such households exceeds that of urban older persons by 10 percentage points. Finally, while in most countries very low proportions of older persons are living with non-relatives only, in a few cases there is a substantially higher prevalence of such households in urban areas. In Kenya, the difference amounts to 14 percentage points, and in Guatemala, to 7 percentage points.

Level of education

As was the case with type of place of residence, there are no consistent differences in living arrangements according to education. Certainly it cannot be concluded that less-educated older persons are generally more likely to live in traditional extended family households; if anything, it is the reverse. The proportion living alone, for instance, is most often higher among those with little or no education (52 of 72 countries with available data), although in a substantial number of countries the opposite is true (table III.4). It might be more accurate to say that education often has just a small effect on the likelihood of living alone, as nearly 60 per cent of the countries had an educational difference of 2.5 percentage points or less (table III.7). Those in which there is an educational differential of 6 percentage points or more include Bolivia, Chad, the Czech Republic, Kenya, Malaysia and Myanmar—where more of the less educated live alone—and Kyrgyzstan, where the opposite is true.² Considering the regional averages for countries with available data, the proportion of older persons living alone was higher among those with little or no education in all regions and the United States of America (figure III.5).

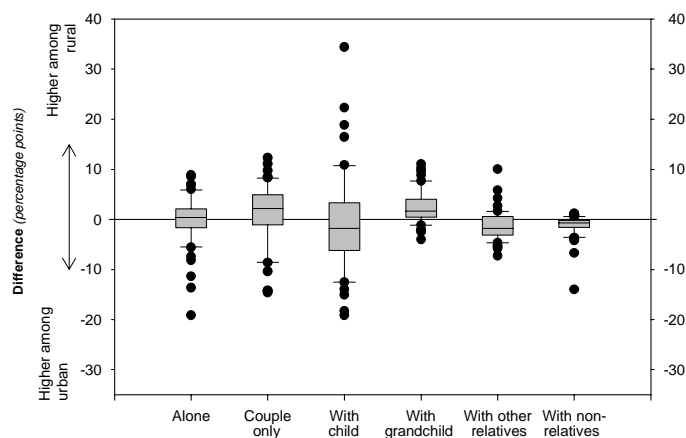
TABLE III.6. PROPORTION OF OLDER PERSONS IN DIFFERENT CO-RESIDENTIAL LIVING ARRANGEMENTS, BY PLACE OF RESIDENCE: AVERAGES FOR MAJOR AREAS (Percentage)

<i>Co-residential living arrangement</i>	<i>Africa</i>			<i>Asia</i>			<i>Latin America and the Caribbean</i>		
	<i>Rural</i>	<i>Urban</i>	<i>Rural-urban</i>	<i>Rural</i>	<i>Urban</i>	<i>Rural-urban</i>	<i>Rural</i>	<i>Urban</i>	<i>Rural-urban</i>
Couple-only.....	8.6	6.9	1.7	13.5	13.7	-0.2	13.4	11.1	2.3
w/ Child.....	60.6	62.6	-1.9	73.5	69.5	4.1	58.6	62.2	-3.6
w/ Grandchild.....	12.7	10.0	2.7	3.4	2.2	1.2	10.4	6.6	3.8
w/ Other relative.....	8.7	9.5	-0.8	4.2	5.5	-1.3	6.1	8.8	-2.7
w/ Non-relative.....	1.2	2.7	-1.5	0.5	0.9	-0.4	2.5	4.6	-2.0
Total co-resident.....	91.8	91.7	0.1	95.1	91.8	3.3	91.0	93.3	-2.3

Source: Annex table A.IV.12.

NOTE: For the household population; unweighted averages for countries with data available.

Figure III.4. Summary of differences by rural/urban residence in the proportions living in different arrangements: averages over all countries with available data



Sources: Table III.4 and annex table A.IV.12.

NOTE: The figure shows the distribution of country values of the rural/urban differences in proportions of older persons living in each arrangement. The central 50 per cent of observations fall in the range indicated by the “box”. The horizontal line within the box marks the median. The 10th and 90th percentiles are indicated by the “whiskers” extending from the box. Values lower than the 10th or higher than the 90th percentile are shown as separate dots.

As in the case of solitary living, there is considerable variation among countries with respect to the relationship of education to co-residential living arrangements (annex table A.IV.13, table III.7 and figure III.6). Education differences in the proportion living with children are sizeable in many countries: in over three fourths of the countries, the difference according to education exceeds 2.5 percentage points. In the majority of the countries, this status is more common among older persons who received an education, but there are also some countries with very large differences in the opposite direction. Countries with more than 15 percentage-point differences according to education include Chad, Ethiopia and Zambia, where more of the educated live with a child, and Kazakhstan, Kyrgyzstan and Turkey, where more of the uneducated do. For the remaining living arrangements, the differences according to education are fairly small in most countries. However, in Kazakhstan and Turkey, the proportion living as a solitary couple is over 15 percentage points higher among the educated. With regard to the predominant

direction of the differences according to education, living as a couple or with non-relatives is more common among the educated in about half the countries and is less so in the other half; median values are indicated in figure III.6. In most countries, the uneducated are more likely than the educated to live alone, in skipped-generation households or with relatives other than children and grandchildren.

When the averaged figures for the regions are considered (table III.8), living as a couple and living with non-relatives are the only arrangements for which the direction of the relationship with education is the same—higher for those with some education compared with no education—for all three regions. The average proportion living with children is higher among those with some education in Africa and Latin America and the Caribbean and among those with no education in Asia.³ The average proportion living with grandchildren, on the other hand, is markedly lower among those with some education in Africa and Latin America and the Caribbean, but differs little between the education

groups in Asia. In Latin America and the Caribbean, the proportion living with other relatives is slightly higher among those with some education, while in Africa and Asia this proportion is higher among those with no education.

Material well-being

A major reason for interest in patterns of living arrangements of older persons is that they may be related to well-being. Traditionally, co-residence with adult children or other family members was, in most societies, a fundamental means of ensuring that the day-to-day needs of the older population would be met. Indeed, as was already discussed, the extended-family

with parents and children remains the most common living arrangement for older persons in most countries today. Given this traditional role, trends pointing to a dissolution of traditional co-residence patterns are often seen as worrisome. This situation is of particular concern in the case of newly developed or developing countries, where public-sector transfers towards older persons are either non-existent or not well established, and where the need for tight fiscal discipline conflicts with attempts to reform the situation. Thus, Governments in many countries have undertaken campaigns to reassert that families have obligations towards their older members (Martin and Kinsella, 1994; Knodel, Amornsirisamboon and Khiewyoo, 1997; Reher, 1998; see also Brandes, 1996).

TABLE III.7. SUMMARY OF EDUCATION DIFFERENTIALS IN FREQUENCY OF DIFFERENT LIVING ARRANGEMENTS

Percentage of countries where living alone is:	Living arrangement					
	Alone	Couple only	With child	With grand-child	With other relatives	With non-relatives only
More common among the educated ^a	6	29	58	4	4	6
About the same among more and less educated ^b	58	56	23	48	69	92
More common among the less educated ^b	36	15	19	48	27	2
Total.....	100	100	100	100	100	100
N of countries.....	72	48	48	48	48	48

Sources: Tables III.4 and annex table A.IV.13.

NOTE:

^a Difference between the groups exceeding 2.5 percentage points.

^b Difference between the groups being within 2.5 percentage points.

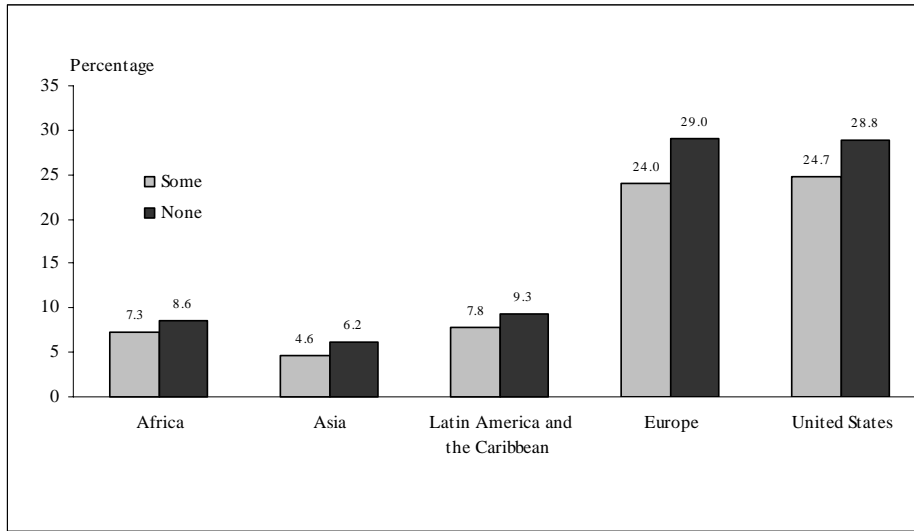
TABLE III.8. PROPORTION OF OLDER PERSONS IN DIFFERENT CO-RESIDENTIAL LIVING ARRANGEMENTS, BY LEVEL OF EDUCATION, AVERAGES FOR MAJOR AREAS (Percentage)

Co-residential living arrangement	Africa			Asia			Latin America and the Caribbean		
	Some	None	Some-none	Some	None	Some-none	Some	None	Some-none
Couple-only.....	8.4	8.3	0.2	16.1	8.7	7.4	12.8	11.7	1.1
w/ Child.....	66.0	59.2	6.8	70.6	75.9	-5.3	61.6	58.2	3.5
w/ Grandchild.....	9.2	13.3	-4.0	3.0	2.9	0.1	6.9	10.7	-3.9
w/ Other relative.....	7.3	9.1	-1.8	3.7	5.1	-1.4	7.8	7.2	0.7
w/ Non-relative.....	1.6	1.4	0.2	0.7	0.5	0.2	4.1	3.0	1.1
Total co-resident.....	92.6	91.2	1.4	94.0	93.1	0.9	93.2	90.7	2.5

Source: Annex table A.IV.13.

NOTE: For the household population; unweighted averages for countries with data available.

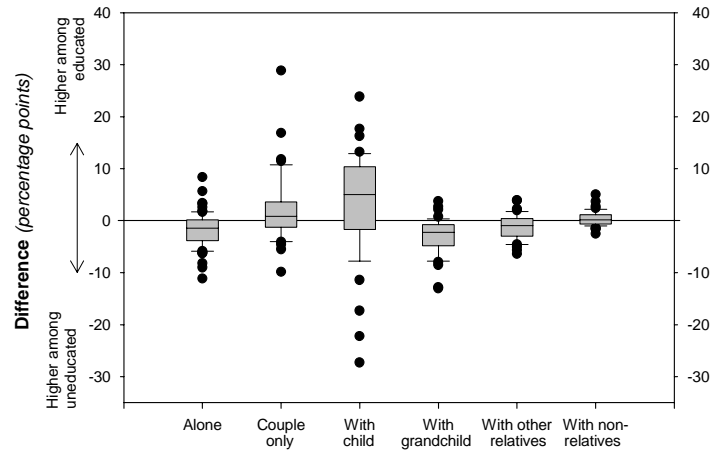
Figure III.5. Proportion of older persons living alone by level of education: unweighted averages for major areas and the United States of America



Source: Table III.4.

NOTE: In developing countries, the education dichotomy was between none and any; in more developed countries, it was between having less than, or at least, a grammar school education.

Figure III.6. Summary of differences by education in the proportions living in different arrangements



Sources: Table III.4 and annex table A.IV.13.

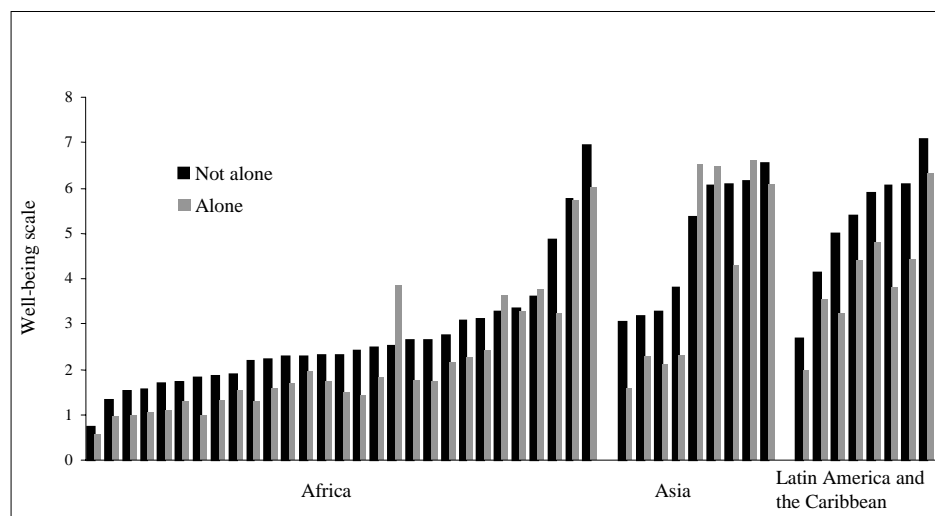
NOTE: The figure shows the distribution of country values of the education differences in the proportions of older persons in each living arrangement. The central 50 per cent of observations fall in the range indicated by the "box". The horizontal line within the box marks the median. The 10th and 90th percentiles are indicated by the "whiskers" extending from the box. Values lower than the 10th or higher than the 90th percentile are shown as separate dots.

In the developed world, industrialization and modernization may have eroded familial bonds, but they eventually fostered a system of compensatory social transfers towards older persons. In the developing world, in contrast, co-residence with children and relatives may be a necessary mechanism of last resort if older people are to avoid living in poorer conditions. Many studies observe a positive association between income and living alone in more developed countries but outside of advanced industrialized societies, it is often impossible to obtain adequate information on assets, income or other indicators of material well-being (see, for example, Psacharopoulos and others, 1997; also DaVanzo and Chan, 1994). However, many analytic studies now informally develop a poverty scale based on information on household amenities that is commonly gathered in censuses and surveys. The Demographic and Health Surveys included such information in rounds II and higher. Such information is not equivalent to the income-poverty indices that are derived from special income or consumption surveys, but the data on household amenities can still provide useful insights regarding variations in material standards of living.⁴ In this study, scores on a scale of material well-being were calculated based on the existence of seven items in

the household relevant to the well-being of older persons: water, toilet, floor, electricity, radio, television and refrigerator. The calculation of the well-being scores is described in annex II.

As can be seen in table III.9 and figure III.7, the contrast in mean scores between older persons who live alone and those who live with others is often large. In most cases, older persons who live alone have a significantly lower mean score than those who live with others.⁵ In Africa, of 29 countries with data available, this is the case in 26. In six countries, the difference in well-being scores is not statistically significant, but in several of these so few older persons live alone as to make any estimate very unstable. Only in Namibia is the mean score statistically significantly higher for older persons who live alone than for older persons who live with others. In Latin America and the Caribbean, people who live with others have a significantly higher score in all of the countries with data available. Significantly higher scores also appear in most of the Asian countries, except for countries in its south-central subregion—Kazakhstan, Kyrgyzstan and Uzbekistan—where older people who live with others tend to have a lower score than older persons who live alone.

Figure III.7. Mean material well-being scale of older persons living alone and not living alone, by country ranking and major area



Source: Table III.9.

NOTE: Each pair of bars represent an individual country.

These same general findings held for both older men and older women (figures not shown). Thus, if they end up living alone, men in developing countries may not avoid the poverty experienced by older women who live alone.

Among the older persons who do not live alone, those living with grandchildren but not with children are in general the ones with lower indices of well-being (table III.10 and figure III.8). In fact, in most developing countries for which data were available, the indices associated with the

skipped-generation households are comparable with those associated with living alone. This is particularly true in Africa and Asia, where the average well-being index for skipped-generation households is practically the same as the average index for those living alone (figure III.9). This illustrates a situation of growing concern in several parts of the world but especially in Africa where older persons are facing the responsibility of taking care of orphaned grandchildren in an ever-increasing number of families affected by HIV/AIDS.

TABLE III.9. MEAN VALUE OF THE MATERIAL WELL-BEING SCALE OF OLDER PERSONS LIVING ALONE AND THOSE LIVING WITH OTHERS

Country	Date	Total	Living arrangements		Means difference (A) - (NA)	Significance of difference in means ^a
			Alone (A)	Not alone (NA)		
Africa						
Benin	2001	2.55	1.72	2.65	-0.92	***
Burkina Faso.....	1998/99	1.85	1.33	1.86	-0.53	*
Cameroon	1998	2.57	1.75	2.64	-0.89	***
Central African Republic.....	1994/95	1.72	0.99	1.83	-0.84	***
Chad.....	1996/97	1.29	0.97	1.33	-0.35	***
Comoros	1996	3.08	2.25	3.09	-0.84	
Côte d'Ivoire	1998/99	3.62	3.76	3.61	0.15	
Egypt.....	2000	6.88	6.03	6.96	-0.93	***
Ethiopia	2000	0.71	0.57	0.71	-0.14	
Gabon	2000	3.03	2.42	3.10	-0.68	***
Ghana.....	1998	3.31	3.28	3.32	-0.04	
Guinea.....	1999	2.30	1.48	2.32	-0.84	**
Kenya.....	1998	2.24	1.95	2.30	-0.35	***
Madagascar.....	1997	1.53	1.07	1.57	-0.50	**
Malawi.....	2000	2.20	1.68	2.27	-0.59	***
Mali	2001	2.71	2.16	2.75	-0.60	***
Morocco.....	1992	4.77	3.23	4.85	-1.62	***
Mozambique.....	1997	1.67	1.29	1.73	-0.44	***
Namibia	1992	2.57	3.84	2.51	1.33	***
Niger.....	1998	1.49	1.00	1.51	-0.51	***
Nigeria	1999	2.44	1.80	2.48	-0.68	***
Rwanda.....	2000	1.87	1.51	1.89	-0.38	***
Senegal	1997	2.40	1.43	2.41	-0.98	**
South Africa.....	1998	5.74	5.72	5.74	-0.03	
Togo.....	1998	2.25	1.72	2.30	-0.58	***
Uganda.....	1995	1.60	1.10	1.67	-0.57	***
United Rep. of Tanzania	1999	2.17	1.60	2.22	-0.62	***
Zambia.....	2001/02	2.11	1.30	2.19	-0.90	***
Zimbabwe	1999	3.29	3.62	3.26	0.36	
Asia						
Armenia	2000	6.51	6.08	6.55	-0.47	***
India.....	1998/99	3.22	2.12	3.26	-1.14	***
Indonesia	1997	3.12	2.29	3.19	-0.90	***
Kazakhstan.....	1999	6.21	6.61	6.14	0.47	***
Kyrgyzstan.....	1997	5.47	6.53	5.37	1.16	***

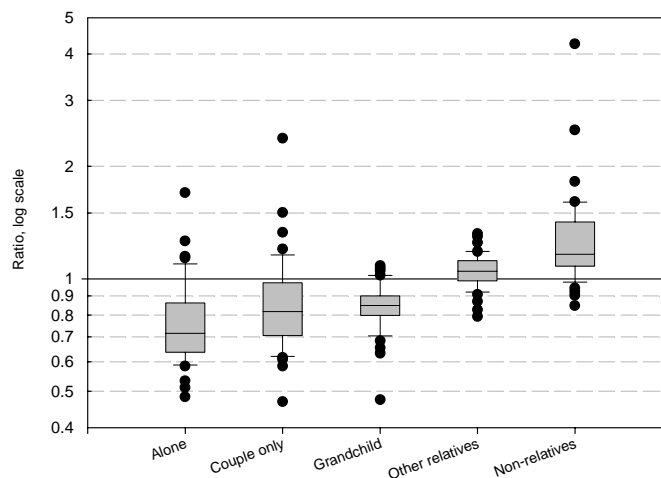
TABLE III.9 (continued)

Country	Date	Total	Living arrangements		Means difference (A) - (NA)	Significance of difference in means ^a
			Alone (A)	Not alone (NA)		
Pakistan	1990/91	3.01	1.57	3.05	-1.48	***
Philippines	1998	6.02	4.31	6.10	-1.79	***
Uzbekistan	1996	6.09	6.46	6.06	0.40	***
Yemen.....	1991/92	3.75	2.30	3.81	-1.51	***
Latin America and the Caribbean						
Bolivia	1998	4.76	3.25	4.99	-1.74	***
Brazil	1996	7.02	6.31	7.09	-0.78	***
Colombia	2000	5.80	4.79	5.88	-1.09	***
Dominican Republic	1999	6.00	4.44	6.10	-1.65	***
Guatemala	1998/99	4.09	3.52	4.13	-0.61	***
Haiti	2000	2.63	1.99	2.69	-0.71	***
Nicaragua.....	1997/98	5.32	4.41	5.37	-0.97	***
Peru.....	2000	5.84	3.81	6.04	-2.22	***

Source: Demographic and Health Survey (DHS).
NOTE: For the household population.

^a Based on the t-test on the equality of means for interval-level variables.
* p<0.05.
** p<0.01.
*** p<0.001.

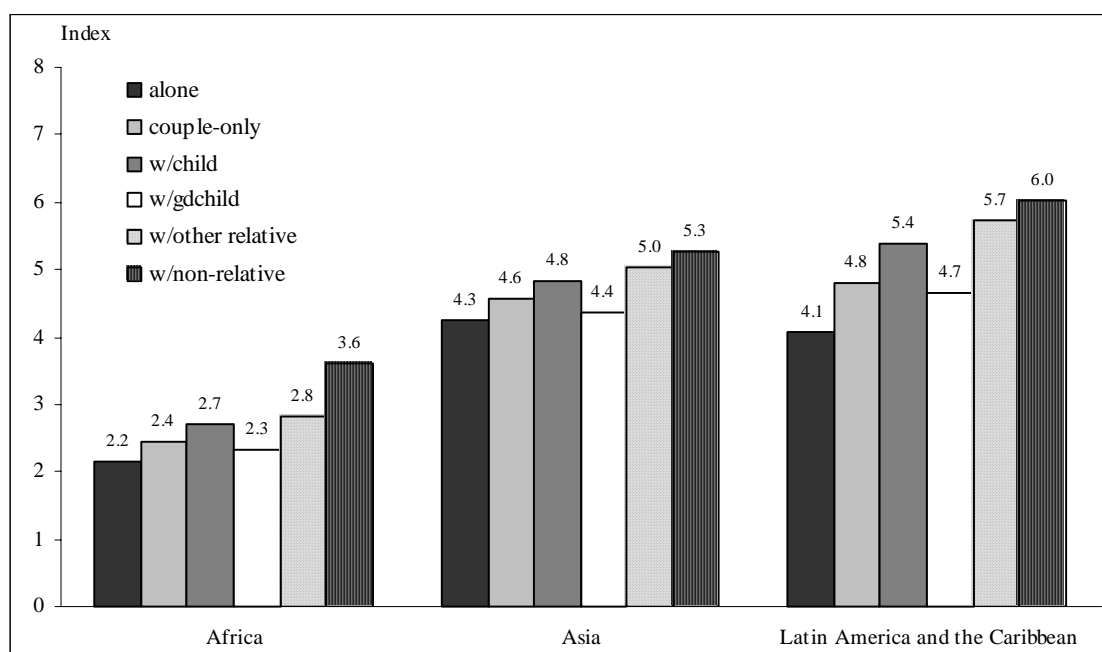
Figure III.8. Summary of ratios comparing the mean score on the well-being index for different living arrangements to the score for those living with children



Source: Table III.10.

NOTE: The figure shows the distribution of country values of ratios of the mean index of material well-being between each of the living arrangements indicated and the mean for older persons who live with children. The central 50 per cent of observations fall in the range indicated by the "box". The horizontal line within the box marks the median. The 10th and 90th percentiles are indicated by the "whiskers" extending from the box. Values lower than the 10th or higher than the 90th percentile are shown as separate dots.

Figure III.9. Mean value of the well-being index for older persons, by living arrangements, unweighted averages for major areas



Source: Table III.10.

TABLE III.10. MEAN VALUE OF THE MATERIAL WELL-BEING INDEX OF PERSONS AGED 60 YEARS OR OVER BY LIVING ARRANGEMENTS, SELECTED COUNTRIES

Country	Date	Total	Alone	Couple only	With children			Grandchild	Other relative	Non-relative
					Total	Young ^a	Adult ^b			
Africa										
Benin.....	2001	2.55	1.72	1.70	2.76	2.47	2.98	2.28	2.68	..
Burkina Faso.....	1998/99	1.85	1.33	1.54	1.90	1.74	2.08	1.67	1.99	..
Cameroon.....	1998	2.57	1.75	1.75	2.81	2.48	2.98	2.25	2.55	3.13
Central African										
Republic.....	1994/95	1.72	0.99	1.19	2.04	1.70	2.25	1.54	1.90	..
Chad.....	1996/97	1.29	0.97	1.02	1.35	1.28	1.44	1.11	1.59	2.08
Comoros.....	1996	3.08	..	2.53	3.11	2.81	3.25	2.65	3.23	3.38
Côte d'Ivoire.....	1998/99	3.62	3.76	..	3.74	3.75	3.73	3.01	3.58	..
Egypt.....	2000	6.88	6.03	7.01	6.95	6.78	6.99	7.04	6.84	..
Ethiopia.....	2000	0.71	0.57	0.35	0.75	0.58	0.92	0.49	0.98	1.17
Gabon.....	2000	3.03	2.42	2.18	3.51	3.51	3.51	2.99	2.90	3.17
Ghana.....	1998	3.31	3.28	3.21	3.29	2.97	3.55	3.36	3.64	..
Guinea.....	1999	2.30	1.48	1.41	2.32	2.03	2.52	1.84	3.06	..
Kenya.....	1998	2.24	1.95	2.17	2.31	2.11	2.51	2.08	2.53	5.78
Madagascar.....	1997	1.53	1.07	1.51	1.64	1.25	1.89	1.12	1.95	2.24
Malawi.....	2000	2.20	1.68	2.04	2.39	2.34	2.44	2.14	2.25	2.72
Mali.....	2001	2.71	2.16	2.44	2.90	2.63	3.39	2.07	3.24	..
Morocco.....	1992	4.77	3.23	3.35	4.94	4.06	5.14	4.07	5.55	5.77
Mozambique.....	1997	1.67	1.29	1.24	1.82	1.41	2.20	1.97	1.44	..
Namibia.....	1992	2.57	3.84	5.38	2.26	2.07	2.35	1.88	2.62	3.44
Niger.....	1998	1.49	1.00	1.19	1.58	1.48	1.66	1.24	1.51	..
Nigeria.....	1999	2.44	1.80	1.67	2.57	2.29	2.83	2.29	2.89	2.86
Rwanda.....	2000	1.87	1.51	1.86	1.94	1.79	2.17	1.71	2.43	2.74
Senegal.....	1997	2.40	1.43	2.66	2.42	1.75	2.61	1.53	2.51	..

TABLE III.10 (continued)

Country	Date	Total	Alone	Couple only	With children			Grandchild	Other relative	Non- relative
					Total	Young ^a	Adult ^b			
South Africa	1998	5.74	5.72	7.50	5.63	4.46	5.88	4.76	5.89	7.22
Togo	1998	2.25	1.72	1.92	2.33	2.11	2.46	2.10	2.41	..
Uganda	1995	1.60	1.10	1.30	1.74	1.74	1.73	1.56	1.98	..
United Republic of Tanzania	1999	2.17	1.60	2.01	2.28	2.16	2.36	1.95	2.26	..
Zambia	2001/02	2.11	1.30	1.56	2.43	2.08	2.67	1.88	2.12	..
Zimbabwe	1999	3.29	3.62	4.74	3.15	2.82	3.39	2.80	3.05	4.90
Asia										
Armenia.....	2000	6.51	6.08	6.32	6.61	6.54	6.61	6.36	6.57	..
India	1998/99	3.22	2.12	2.68	3.31	2.49	3.43	2.56	3.49	4.68
Indonesia.....	1997	3.12	2.29	2.85	3.30	2.98	3.40	2.79	3.30	3.86
Kazakhstan.....	1999	6.21	6.61	6.62	5.81	5.83	5.81	6.18	5.91	..
Kyrgyzstan	1997	5.47	6.53	6.22	5.17	4.60	5.30	5.43	5.67	..
Pakistan.....	1990/91	3.01	1.57	2.42	3.08	2.62	3.20	1.46	3.36	5.61
Philippines	1998	6.02	4.31	4.95	6.26	5.39	6.43	5.27	6.58	7.70
Uzbekistan.....	1996	6.09	6.46	6.53	5.98	5.45	6.08	6.11	6.10	..
Yemen	1991/92	3.75	2.30	2.51	3.94	3.43	4.18	3.15	4.35	4.43
Latin America and the Caribbean										
Bolivia.....	1998	4.76	3.25	3.86	5.40	4.09	5.83	4.46	5.79	7.21
Brazil.....	1996	7.02	6.31	7.34	7.08	6.54	7.25	6.19	7.01	7.68
Colombia.....	2000	5.80	4.79	5.78	5.92	5.32	6.01	5.58	5.87	5.88
Dominican Republic	1999	6.00	4.44	6.27	6.08	5.67	6.22	5.50	7.08	..
Guatemala	1998/99	4.09	3.52	3.74	4.09	3.42	4.36	3.61	4.50	5.78
Haiti	2000	2.63	1.99	2.12	2.72	2.29	2.89	2.24	3.22	3.10
Nicaragua	1997/98	5.32	4.41	4.81	5.39	4.39	5.60	4.89	5.98	5.82
Peru	2000	5.84	3.81	4.57	6.42	4.73	6.76	4.81	6.36	6.70

Source: Demographic and Health Survey (DHS).

NOTE: For the household population. (..) indicates that fewer than 20 observations were available.

Indices based on 20-49 observations are italicized.

^a Referring to older persons living with children only under age 25.

^b Referring to older persons living with at least one child aged 25 years or over.

For the remaining living arrangements, the relative ranking according to the average index of well-being is similar across regions, although the levels are significantly lower in Africa than in Asia and Latin America and the Caribbean. In all three regions, the average index is highest for those residing with non-relatives, followed by those residing with relatives other than spouse and children. However, besides being relatively rare situations, these are the living arrangements in which the access of the older person to the household goods is most questionable, as suggested by the significantly lower household headship rates of older persons living either with other relatives or non-relatives as

compared with the rates associated to other living arrangements (see table II.11). Older persons living with non-relatives may sometimes be lodgers or servants, for instance. The relatively favourable material circumstances of those living with relatives other than children may reflect a tendency for older persons who need support to be taken in by those relatives who can best afford to offer it. However, these ideas cannot be tested with the data examined here. The average index associated with co-residence with children is slightly lower than the index associated with co-residence with other relatives, and slightly higher than the index associated with those living as a couple (figure III.9).

Although in most developing countries co-residence with children is associated with relatively high levels of material well-being, the age of the children is likely to matter. Even though young-adult children can sometimes assume the role of household provider, in general the support flow most probably goes from the parents to younger children. This suggests that there might be no material advantage to older persons who live with younger children compared, for instance, with those living alone or separately as a couple. Co-residence with older adult children, on the other hand, is more likely to represent a situation in which the flow of support goes—or at least could go—from the younger to the older generation. In this case, higher levels of material well-being might be associated with this particular living arrangement, as these are the households containing an adult of prime working age. In addition, if the situation is one in which parents have moved in with an adult child, children living in better material conditions may be preferred.

Even though it is conventional to define the child population as being confined to ages under 15 years, young people in their late teenaged years and early twenties are often not fully able to support themselves. Some are still in school, and others are just beginning to master the skills needed to earn a living. Therefore, a distinction is made below between households containing at least one child aged 25 years or over and households that contain younger children only.

Table III.10 shows that, older persons living with children aged 25 years or over do tend to be better off in material terms than those living with younger children. In 42 of the 46 developing countries for which data were available, the material well-being index for older persons living with adult children was significantly higher than the index for those living only with younger children. In no country was there a significant difference in the opposite direction. In all three regions shown in table III.10, only the small group living with non-relatives has a clearly higher well-being index than those living with an older child. For those living with young children only, in Latin America and the Caribbean, the well-being index is similar to that for those living with grandchildren, although it remains

higher than for those living alone. In Africa and Asia, the index is practically the same for those with young children as for those living either alone or with grandchildren (table III.11).

TABLE III.11. MEAN VALUE OF THE MATERIAL WELL-BEING INDEX FOR OLDER PERSONS IN SELECTED LIVING ARRANGEMENTS, AVERAGES FOR MAJOR AREAS

Major area	Living alone	Living with grand-child ^a	Living with children		Total
			Only young ^b	At least one adult ^b	
Africa	2.16	2.32	2.44	2.89	2.72
Asia	4.25	4.37	4.37	4.94	4.83
Latin America and the Caribbean.....	4.06	4.66	4.56	5.61	5.39
All countries	2.90	3.13	3.18	3.77	3.60

Source: See table III.10.

NOTE: For the household population. Unweighted averages for countries with data.

^a Skipped generation households.

^b Adult children are those aged 25 years or over; young children are those under age 25.

C. MULTIVARIATE ANALYSIS OF THE EFFECTS OF DEMOGRAPHIC AND SOCIO-ECONOMIC VARIABLES ON SOLITARY LIVING AMONG OLDER PERSONS

Although levels of solitary living among older persons vary significantly with many individual demographic and socio-economic characteristics, multiple factors, in reality, work together, sometimes cancelling out and sometimes reinforcing the effects of one another. In order to assess the significance of each factor net of the others, multivariate models were fitted to the likelihood of living alone, with age, sex, education, urban/rural residence and the material well-being scale as the control/independent variables.⁶ The models were estimated for all older persons, but then, since only the unmarried are at risk of living alone, the same models were applied for unmarried older persons only. Because most Demographic and Health Surveys did not collect marital status data, a special procedure was used for imputing marital status in data drafted from these data sources (see annex I for further discussion). The analyses for the total and unmarried groups often, but not always, yield similar results.

The same variables were employed in the analyses for most countries; but in a few cases, adjustments had to be made because of missing information or other problems. Most data sets contained information on education and urban/rural residence as well as age and sex. However, a few did not have information either on urban/rural residence (Czech Republic, Estonia, Latvia and Romania) or on the education level (Senegal and Yemen) of older people living alone. In addition, insufficient data variation in the cases of Burkina Faso, the Democratic People's Republic of Korea, Sri Lanka and Thailand made it impossible to run the full model without committing the error of having one variable be a linear combination of other ones. In those cases, the models were run omitting the missing variables.⁷

Because only DHS data sets contained the information on household amenities that was used to construct the material well-being scales, a second set of models including the well-being variable was estimated for DHS countries only.⁸ In this case, however, it is important to note that the predominant direction of causality is unclear. It has been found to be the case, for instance, that many older people live alone because they value privacy and can afford it. However, co-residence offers economies of scale. Furthermore, better-off households can better afford the cost of supporting additional dependants, and when there is a choice of whom to live with, the outcome is likely to be influenced by the relative affluence of the possible situations. To resolve these issues of causality, however, would require, at a minimum, longitudinal data with which to look at the process over time.

In the end, two sets of models were fitted: one for all countries with available data, in which age, sex, education and urban/rural residence were included as independent variables, and one for DHS data sets only, in which age, sex, education and the material well-being scale were included as independent variables. Each model was estimated for all older persons and for the unmarried only.

Annex table A.IV.14 shows the odds ratios of the variables age, sex, urban/rural residence and education derived from the logistic regressions that included all older people for each one of the

available countries. For instance, the odds of living alone among older persons in Benin is 20 per cent ((1-0.80) x 100) lower for those who are 60-64 years of age compared with those who are 65-69 years of age, controlling for all other variables included in the model. In Zambia, the same odds of living alone are more than twice (2.29 times) as high among older women compared with older men.⁹ The model fit was significant in 60 of the 73 countries.¹⁰ Annex table A.IV.15 shows the odds ratios of the same variables for unmarried older persons. Annex table A.IV.16 presents the odds ratios of the variables age, sex, education and material well-being derived from the logistic regressions for all older people, for the DHS countries, while annex table A.IV.17 contains the odds ratios of the same variables and countries as annex table A.IV.16, but derived from the logistic regressions that included unmarried older persons only.

Effect of age

The general age pattern for living alone, as observed in the bivariate analysis, is one of increased likelihood up to rather old ages among the entire older population. When controlling for other factors, however, such a pattern does not always exist or, if it does, is not always statistically significant. Two contrasts to age group 65-69 were entered into the multivariate models: age groups 60-64 and 70 or over. Contrasts consistent with the general pattern of an increase with age would be negative (odds ratio lower than 1) in the first instance and positive (odds ratio higher than 1) in the second instance. In fact, with the sole exception of Bangladesh, significant contrasts were always in this expected direction; however, in only 18 countries—mostly those with larger samples—were both contrasts statistically significant (annex table A.IV.14).

Among unmarried people, living alone generally peaks at an earlier age except in populations with rather high levels of solitary living (see chapter II). If this pattern also existed in the multivariate case, the contrasts would be negative (odds ratios lower than 1) for both the earlier and later ages. While most of the significant contrasts were indeed negative, in only 11 cases—most of them with large samples—were both contrasts significantly negative at the same time (annex table A.IV.15). There were

four cases in which the second age contrast was significantly higher than one: Ghana, Rwanda, Finland and the United States of America. For the later two countries this result is consistent with what had been observed before in chapter II—that for countries with high proportions living alone, that level kept climbing with age until very advanced ages. For the African countries, however, this result was not expected.

Effect of gender

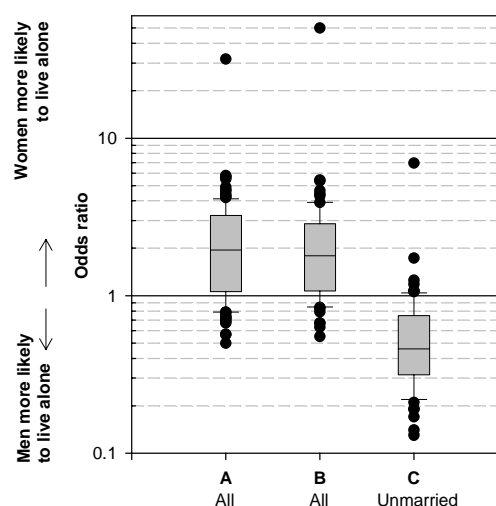
The bivariate tabulations showed that older women, in general, are more likely to live alone than older men. The multivariate results echo that basic finding, with the qualification that in many of the samples the gender difference is not statistically significant. Controlling for age, education and urban/rural residence, the gender difference was statistically significant in 47 of the 73 cases; that is to say, in more than one third of the cases there was no significant net difference. Living alone was significantly more common among men rather than among women in three Latin American countries, namely, Nicaragua, Panama and Venezuela (annex table A.IV.14), which is consistent with the bivariate results for those countries (annex table A.IV.1).

The general situation was very different among unmarried people. Figure III.10 compares the effects of gender on likelihood of living alone among all older persons with and without control for other variables (box plots A and B) and among the unmarried (plot C). In this figure, the bivariate results have been expressed in terms of odds ratios in order to facilitate comparison. In most cases, the positive gender effect overall (women being more likely than men to live alone) that was found in annex table A.IV.14 either disappeared or was reversed among the unmarried. The Democratic People's Republic of Korea, the Czech Republic and Finland were the only exceptions to this general rule; in those countries, women were significantly more likely than men to be living alone among the unmarried as well as in the older population as a whole. In 15 countries, mostly from Asia, there was a significant effect of gender in the entire older population but no effect among unmarried people. Conversely, in 23 countries, mostly in Latin America and Africa, there was no statistically significant

effect overall but a significant negative effect (unmarried men being more likely to live alone) among the unmarried (annex table A.IV.15).

Women were more likely to live alone among unmarried older persons in the Czech Republic and Finland, whereas in Bulgaria, Estonia, Latvia and Romania the opposite was true. It would probably be necessary to have a broad knowledge of the economic and family situation of older men and women in each particular country to understand the various situations.

Figure III.10. Odds ratios showing effects of gender on living alone, controlling for other variables: for all older persons and for the unmarried



- A: From bivariate tabulations, N=127 (table II.1).
- B: Controlling for age, rural/urban residence and education, N=73 (annex table A.IV.14).
- C: Controlling for age, rural/urban residence and education and restricted to unmarried older persons, N=73 (annex table A.IV.15).

Sources: Table II.1 and annex tables A.IV.14 and A.IV.15.
 NOTE: The figure shows the distribution of country values of the odds ratios for the indicated groups. The central 50 per cent of observations fall in the range indicated by the “box”. The horizontal line within the box marks the median. The 10th and 90th percentiles are indicated by the “whiskers” extending from the box. Values lower than the 10th or higher than the 90th percentile are shown as separate dots.

Effect of urban/rural residence

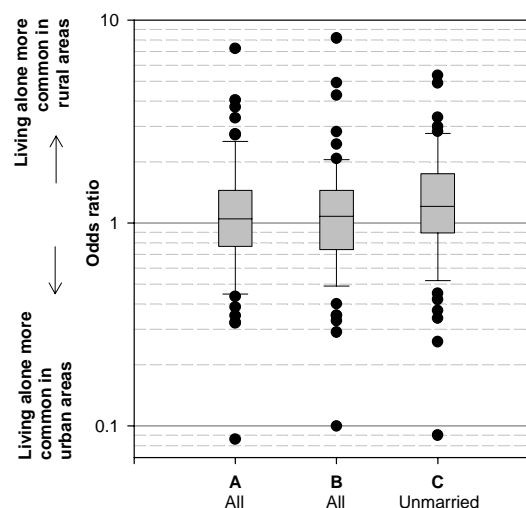
In general, differences between rural and urban areas in the proportion of older persons living alone are similar after controlling for effects of age, gender, education and marital status to those seen in the bivariate tabulations. There is little difference in

the distribution of the effects of rural/urban residence between the bivariate analysis (plot A in figure III.11) and the multivariate analyses (plots B and C). In this figure, the bivariate results from table III.4 are, again, expressed in terms of odds ratios in order to facilitate comparison.

In the multivariate analysis based on all older persons, the effect of urban/rural residence on the likelihood of living alone was statistically significant in 30 of the 69 countries analyzed (annex table A.IV.14). In 18 of those cases, living alone was more likely among rural residents than among urban residents (odds ratio higher than 1), but in 12 cases, the opposite was true. Rural residents tended to be more likely to live alone in Latin America and in South-eastern Asia. Urban residents tended to be more likely to live alone in South-central Asia. In Africa, the direction of effects was mixed.

In 26 of the 30 cases in which the effect of urban/rural residence was statistically significant among all older people, the effect was also significant—and in the same direction (in terms of whether more likely among rural or urban residents)—among the unmarried. For some individual countries, though, the results for the unmarried, however, differed from those for all older persons. For instance, in Costa Rica, Yemen, India, the Republic of Korea and the United States, there was no significant residence difference among all older persons; but among the unmarried, rural residents were more likely to live alone than were urban residents, net of other factors (annex table A.IV.15). In a few cases, including Ghana and Panama, urban residents were more likely than rural residents to live alone among all older persons but not among the unmarried. Again, it would probably be necessary to examine the situation separately in individual countries, as different mechanisms seem to be at work.

Figure III.11. Odds ratios showing effects of rural/urban residence on living alone, controlling for other variables: for all older persons and for the unmarried



- A: From bivariate tabulations, N=69 (table III.4).
- B: Controlling for age, sex and education, N=69 (annex table A.IV.14).
- C: Controlling for age, sex and education and restricted to unmarried older persons, N=69 (annex table A.IV.15).

Sources: Table III.4 and annex tables A.IV.14 and A.IV.15.

NOTE: The figure shows the distribution of country values of the odds ratios indicating effects of rural vs. urban residence on the likelihood of living alone. The central 50 per cent of observations fall in the range indicated by the “box”. The horizontal line within the box marks the median. The 10th and 90th percentiles are indicated by the “whiskers” extending from the box. Values lower than the 10th or higher than the 90th percentile are shown as separate dots.

Effect of education

The bivariate tabulations examined earlier (table III.4) indicated that there was no general tendency for education to either increase or decrease the likelihood of living alone. In most cases, differences according to education were in the same direction and of similar size after controlling for age, sex and rural/urban residence as they were in the bivariate results (tables III.4 and annex table A.IV.14). After

control for effects of the other variables, education had a significantly positive effect on the likelihood of living alone in 13 cases (out of 69), and a significantly negative effect in 14 cases.

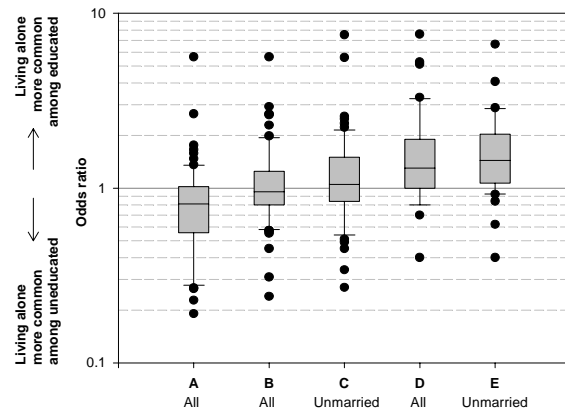
These results pertain to all older persons, but it is generally only the unmarried who are at risk of living alone. Among unmarried older persons, the educated are usually more likely to live alone, in countries where the effect of education is statistically significant. Controlling for effects of age, sex and rural/urban residence, those with more education were significantly more likely to live alone in 23 of 69 countries and significantly less likely to live alone in 3 (annex table A.IV.15).

To obtain an overview of the education effects before and after inclusion of controls for other variables, the first three plots in figure III.12 show the distribution across countries of the education effects from the bivariate tabulations and the multivariate analyses just discussed. Once again, the results of the bivariate tabulations are expressed as odds ratios in order to facilitate comparison. The figure shows that the inclusion of the statistical controls tended to shift the distribution of odds ratios upward to a modest degree. For instance, in the bivariate results (plot A), the median odds ratio was 0.80, indicating that, in the typical country the odds of living alone among the more educated were about 80 per cent of the odds for those with less education. After control for age, gender and rural/urban residence the median value was 0.95 (plot B) and when attention is in addition restricted to the unmarried the median was slightly over 1.0 (plot C).

If the index of material well-being was added as a control variable, instead of rural/urban residence, the pattern shows a greater shift (figure III.12, plots D and E). Given similar levels of the wealth index, educated older persons were more likely than the uneducated to live alone in many countries, though not in all. In 13 cases (out of 42), after controlling for household wealth, education had a statistically significant positive effect on solitary living, and nowhere was there a significant negative effect (annex table A.IV.16).¹¹ Among unmarried older persons, education's effect was also positive in all countries where the effect was statistically

significant (17 of 42 countries, annex table A.IV.17). The results suggest that there is an underlying tendency for education to increase the likelihood of living alone if other factors, including wealth, are equal.

Figure III.12. Odds ratios showing effects of education on living alone, controlling for other variables: for all older persons and for the unmarried



- A: From bivariate tabulations, N=72 (table III.4).
- B: Controlling for age, sex and urban/rural residence, N=69 (annex table A.IV.14).
- C: Controlling for age, sex and urban/rural residence and restricted to unmarried older persons, N=69 (annex table A.IV.15).
- D: Controlling for age, sex and the index of material well-being, N=42 (annex table A.IV.16).
- E: Controlling for age, sex and the index of material well-being, and restricted to unmarried older persons, N=42 (annex table A.IV.17)

Sources: Table III.4 and annex tables A.IV.14-A.IV.17.

NOTE: The figure shows the distribution of country values of the odds ratios indicating effects of having more vs. less education on the likelihood of living alone. The central 50 per cent of observations fall in the range indicated by the "box". The horizontal line within the box marks the median. The 10th and 90th percentiles are indicated by the "whiskers" extending from the box. Values lower than the 10th or higher than the 90th percentile are shown as separate dots.

Effect of well-being index

The bivariate analysis of the relationship between material well-being and co-residence showed that, with only a few exceptions, older persons who lived alone had significantly lower levels of material well-being than did people who lived with others (see table III.9). This same conclusion remains valid in the multivariate analysis. After controlling for age, sex and education, the material well-being scale had the expected significantly negative relationship with the likelihood of living alone (odds ratios lower than 1) in almost all countries surveyed, for both all older persons and the unmarried (annex tables A.IV.16 and A.IV.17).

Consistent with the bivariate findings, the major exceptions were Namibia in Africa and Kazakhstan, Kyrgyzstan and Uzbekistan in South-central Asia, where the relationship was positive rather than negative. In South Africa, the bivariate relationship was not statistically significant, but the multivariate analysis found a negative relationship among all older persons, although not for the unmarried subgroup. In Ethiopia, there was an insignificant bivariate relationship but in the multivariate analysis there was a negative relationship among all and unmarried older persons.

D. RELATIONSHIP BETWEEN MATERIAL WELL-BEING AND DIFFERENT FORMS OF LIVING ARRANGEMENTS

In order to examine the relationship between material well-being and different co-residential arrangements, a model was devised similar to the binary logistic one that focused on the likelihood of living alone, only this time using multinomial logistic regression and choosing one category, that of living with a child, to be contrasted with each of the others (alone, couple-only, with grandchild in a skipped-generation household and with other relatives or non relatives).¹² The binary logistic model examined the effect of the material well-being scale controlling for age, sex and education. Here, a control was added for marital status and for urban/rural residence.¹³ Annex table A.IV.18 reports the odds ratios for the well-being scale from this model.

In general, the results in annex table A.IV.18 are in accordance with the bivariate results displayed in table III.10 (also compare figures III.8 and III.11). For most countries, the mean material well-being index remained significantly lower among those living alone, as a solitary couple or with grandchild, compared with the mean index of those living with children, even after controlling for the older persons' demographic and socio-economic characteristics. The few exceptions, in which the mean index of well-being was lower among those living with children, were Namibia and South Africa in Africa, Kazakhstan, Kyrgyzstan and Uzbekistan in Asia, and Brazil in Latin America. These cases were noted earlier, in the discussion of the bivariate tabulations. In Namibia, the higher values of the index were

associated with living alone or as a separate couple, in contrast with living with children. In South Africa as well as in Brazil, higher values of the index were associated with living as a couple, but the effect on living alone or with grandchildren remained negative. In the South-central Asian countries, there were no significant differences in well-being indexes between those living with children and those living alone or with a grandchild; the index, however, was significantly higher for those living as a couple.

The well-being index usually did not have a statistically significant relationship with the likelihood of living with children versus living with other relatives and non-relatives. In only four countries in Africa (Central African Republic, Cameroon, Gabon and Mozambique), two countries in Asia (India and Kazakhstan) and one country in Latin America and the Caribbean (Peru), was the effect significant. In the African countries as well as in Peru, living with others (versus with children) tended to be associated with lower levels of material well-being. The opposite was true in the two Asian countries.

E. SOCIAL AND ECONOMIC DIFFERENTIALS IN LIVING ARRANGEMENTS IN THE COURSE OF DEVELOPMENT

Ruggles (2001), in his study of historical trends in the United States of America, found that as the country developed economically and co-residence with children became less common, the relationship between living arrangements and socio-economic status also changed. In the mid-nineteenth century, older persons who were wealthier or had higher-status occupations had been more likely than others to live with adult children. Over time, the relationship between socio-economic status and co-residence weakened and eventually reversed direction. By 1960, co-residence was clearly associated with lower socio-economic status.

Is the historical progression just described found in other countries as well as, a typical part of social and economic development? At present, the historical data needed to answer this question are not available. However, if the process that Ruggles observed is a general one, one not specific to the particular historical circumstances of one country,

then a pattern might appear in the effects observed across countries that are currently at different stages of social and economic development. The expectation would be that, in the least developed countries, co-residence with children would be more common among those with higher socio-economic status, but that the relationship would be weaker or in the opposite direction among relatively more developed countries. The analysis below explores this hypothesis.

To examine whether the association of living arrangements differs according to the level of a country's social and economic development, cross-national regression analyses were conducted. For these regression analyses, the dependent variables were the differences in living arrangements according to rural/urban residence, education and the well-being index, from table III.4 and annex tables A.IV.12, A.IV.13 and A.IV.18. The predictor or independent variables were the same national-level characteristics that were employed earlier, but with "adult literacy" employed as the indicator of educational progress.¹⁴

The results show that there is indeed a statistically significant association between indicators of development and the socio-economic differentials in living arrangements of older persons. The regression results are shown in tables III.12-III.14.

Turning attention first to the statistical significance of effects of the development indicators on the education differentials, (the country's level of gross domestic product (GDP) per capita) significantly affects whether educated older persons are more likely than the uneducated to live with children or with the spouse only (table III.12). In higher-income countries, educated older persons are relatively more likely to be found living as a solitary couple, and relatively less likely to be living with children. Few of the other coefficients in table III.12 are individually significant, and the national characteristics taken together do not significantly explain the differences in the percentages living with other relatives or non-relatives. Education differentials in the percentage living alone are not strongly related to the economic or social factors,

although there are statistically significant variations in the size of the differential according to region.

The rural/urban difference in the percentage living as a separate couple and the percentage with children also varies with the level of GDP per capita (table III.13). In higher-income countries, rural older persons are relatively less likely to live as a solitary couple and more likely to live with children. The degree of urbanization of the country also affects the rural/urban differential in living arrangements, but the direction of the relationship is counter to that observed for GDP per capita. In more-urbanized countries, those in rural areas are relatively more likely to be living as a solitary couple, and less likely to be living alone, with children, or in skipped-generation households with grandchildren. It is not obvious why urbanization and GDP have opposite effects on the differentials in living arrangements, but a similar situation exists with respect to the education differentials in table III.12. However, in that case the effects of urbanization did not achieve statistical significance.

A country's level of development also influences the contrasts in living arrangements according to the index of material well-being, although in this case the effects are more consistently associated with the national level of literacy than with the level of GDP per capita (table III.14). The earlier discussion showed that in most of the countries examined here, older persons living with children have higher average levels of material well-being than those living alone or as a couple. In table III.14, a positive sign for a variable's coefficient means that higher values for the predictor tend to reduce or eliminate the wealth disadvantage that is typically associated with a particular other living arrangement, relative to living with children. Thus, older persons in countries with lower literacy tend to suffer the most, in material terms, by living in an arrangement other than with children. In countries with higher literacy, the material disadvantage of living alone, as a couple, with grandchildren only, or with others tends to be less. Once again, the effects of greater urbanization operate in a contrary direction to those of higher income and higher literacy.

As an aid to interpreting the regression results, the predicted size and direction of the socio-

economic differentials have been calculated for three hypothetical countries representing different levels of social and economic development.¹⁵

- Country 1 is a typical member of the 50 countries identified by the United Nations General Assembly as being least developed.
- Country 2 represents an intermediate level of development, with approximately the average values of income, urbanization, life expectancy,

literacy and the kin availability ratio observed in Latin America in 1995.

- Country 3 represents the highest levels for the various development indicators among the countries included in the regression analyses. It has the levels of income and urbanization observed in Brazil, the literacy level of Kazakhstan, and the life expectancy and kin availability ratio of Armenia.¹⁶

TABLE III.12. EFFECTS OF SOCIAL AND ECONOMIC DEVELOPMENT ON EDUCATION DIFFERENTIALS IN LIVING ARRANGEMENTS: ESTIMATED COEFFICIENTS FROM CROSS-NATIONAL REGRESSION ANALYSES

Predictor variable	<i>Dependent variable is the percentage among those with more education minus the percentage among those with less education who are living:</i>					
	<i>Alone</i>	<i>With spouse only</i>	<i>With child</i>	<i>With grand-child^a</i>	<i>With other relative</i>	<i>With non-relative</i>
ln GDP per capita (1990 constant US\$).....	0.82	4.34**	-5.77*	-1.03	-0.52	-0.04
Percentage of population in urban areas	-0.04	-0.12	0.23	-0.05	0.08*	-0.03
Percentage literate, ages 15+	-0.03	0.07	-0.04	0.04	-0.03	0.01
Expectation of life at birth.....	0.18*	-0.02	-0.34	0.16	-0.03	0.06
Kin availability index	0.13	-1.62*	1.18	-0.38	0.04	0.33
Major area (reference category is Africa):						
Americas	-1.96	-2.63	2.57	-0.93	1.83	1.00
Asia and Oceania	-2.65*	1.09	-2.50	1.90	1.01	-0.17
Europe.....	-5.56**	..	..	..	..	..
Intercept	-14.13**	-10.93	44.08*	-3.36	2.15	-4.41
R ²	0.28***	0.62***	0.56***	0.35*	0.27	0.19
N.....	68	46	46	46	46	46

Sources: As listed in table III.1, except for living arrangements data: table III.4 and annex table A.IV.13; literacy: United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute for Statistics (2002).

NOTE: Analyses are based on the countries for which data were available for all the variables in the regression.

Reference year for the percentage of older persons in different living arrangements varies from country to country, depending on the latest available data (see table III.4 and annex table A.IV.13).

Reference year for the country-level variables is 1995, except for life expectancy, for which it is 1990-1995.

Kin availability index was calculated as the ratio of the population aged 20-55 to the population aged over 60.

Significance levels: * p < 0.05; ** p < 0.01; *** p < 0.001.

^a Skipped generation households.

TABLE III.13. EFFECTS OF SOCIAL AND ECONOMIC DEVELOPMENT ON RURAL/URBAN DIFFERENTIALS IN LIVING ARRANGEMENTS: ESTIMATED COEFFICIENTS FROM CROSS-NATIONAL REGRESSION ANALYSES

Predictor variable	<i>Dependent variable is the percentage among those in rural areas minus the percentage in urban areas who are living:</i>					
	<i>Alone</i>	<i>With spouse only</i>	<i>With child</i>	<i>With grandchild^a</i>	<i>With other relative</i>	<i>With non-relative only</i>
In GDP per capita (1990 constant US\$).....	1.59	-6.68***	8.98***	0.79	0.18	0.20
Percentage of population in urban areas.....	-0.11*	0.27**	-0.56***	-0.11*	0.08	0.09*
Percentage literate, ages 15+	0.05	-0.06	0.09	0.07*	0.01	-0.04
Expectation of life at birth.....	0.12	-0.09	0.43	0.01	-0.01	-0.14
Kin availability index	-0.07	0.25	-0.89	0.82	0.10	-0.24
Major area (reference category is Africa):						
Americas	-4.21*	2.40	-3.52	2.31	-4.37**	-0.60
Asia and Oceania	-2.10	3.90	-4.80	-1.48	-1.28	2.21*
Europe	-2.76	..	..	..	..	..
Intercept.....	-14.60	38.66**	-57.49**	-9.43	-5.55	5.36
R ²	0.27*	0.52***	0.53***	0.31*	0.25	0.25
N.....	66	48	48	48	48	48

Sources: As listed in table III.1, except for living arrangements data: table III.4 and annex table A.IV.12; literacy: UNESCO Institute for Statistics (2002).

Reference year for the percentage of older persons in different living arrangements varies from country to country, depending on the latest available data (see table III.4 and annex table A.IV.12).

Reference year for the country-level variables is 1995, except for life expectancy, for which it is 1990-1995.

Kin availability index was calculated as the ratio of the population aged 20-55 to the population aged over 60.

Significance levels: * p < 0.05; ** p < 0.01; *** p < 0.001.

^a Skipped generation households.

It should be noted that the regression analyses are based on observations of developing countries, and do not offer a sound basis for extrapolation to the situation of the more developed countries.¹⁷ Indeed, even deriving “predicted” results for country 3 requires extrapolation beyond the combinations of values that actually occur in the data available for analysis. Although there is overlap between the values of the development indicators for the more developed and the less developed regions, the typical developed country has a much higher income per capita, and a much lower kin availability ratio, than those observed in any of the countries contributing to this analysis.

Table III.15 shows the values for countries 1, 2 and 3 with respect to the indicators of development, and the predicted differentials in living arrangements according to rural/urban residence, education and the index of material well-being.¹⁸ Panel A of table III.15 shows the predicted education differentials in living arrangements for the three countries. A

positive value indicates that a particular living arrangement is expected to be more common among those with some education, and a negative sign indicates the reverse. For example, in country 1, living with children is expected to be more common (by 4 percentage points) among older persons with some education than among the uneducated, and living with grandchildren is expected to be less common (by 3 percentage points). The analysis predicts that a shift from the situation of a least developed country (country 1) to that of a relatively advanced developing country (country 3) would lead to a reversal of the direction of the education differential in the percentage living with children, and also to the emergence of a substantial (12 percentage point) education differential in the prevalence of couple-only households. Effects on other, less prevalent, categories of living arrangement would be much smaller. In all three country cases, skipped-generation families are expected to be more common among the uneducated.

TABLE III.14. EFFECTS OF SOCIAL AND ECONOMIC DEVELOPMENT ON DIFFERENTIALS IN LIVING ARRANGEMENTS ACCORDING TO THE INDEX OF MATERIAL WELL-BEING: ESTIMATED COEFFICIENTS FROM CROSS-NATIONAL REGRESSION ANALYSES

Predictor variables	Dependent variable is the effect of wealth index on chances of living:			
	Alone versus with children	Couple versus with children	With grandchildren ^a versus with children	With other relatives or non-relatives versus with children
In GDP per capita (1990 constant US\$)....	0.067	0.121*	-0.010	0.019
Percentage of population in urban areas ...	-0.006	-0.009**	-0.005*	-0.004*
Percentage literate, ages 15+.....	0.006**	0.005**	0.004**	0.002**
Expectation of life at birth	0.010	0.011*	0.006	0.004
Kin availability index.....	-0.007	0.020	-0.025	0.025
Major area (reference category is Africa):				
Americas	-0.061	0.058	0.066	0.062
Asia and Oceania.....	-0.096	-0.059	-0.074	0.082
Intercept.....	-1.429**	-1.719***	-0.285	-0.589**
R ²	0.49**	0.61***	0.49**	0.49***
N	44	44	44	44

Sources: As listed in table III.1, except: effect of wealth index on living arrangements: annex table A.IV.18; literacy: UNESCO Institute for statistics (2002).

The dependent variable for each regression is the size and direction of the effect of the wealth index on the likelihood of being in one of the other living arrangements (as indicated in the column heading) versus living with children. The values representing effects of the wealth index are the log of the odds ratios of the wealth index shown in annex table A.IV.18.

Reference year for the percentage of older persons in different living arrangements varies from country to country, depending on the latest available data (see annex table A.IV.13).

Reference year for the country-level variables is 1995, except for life expectancy, for which it is 1990-1995.

Kin availability index was calculated as the ratio of the population aged 20-55 to the population aged over 60.

Significance levels: * p < 0.05; ** p < 0.01; *** p < 0.001.

^a Skipped generation households.

With respect to rural/urban differentials (panel B), the results imply that an increase in development levels from those of country 1 to those of country 3 would lead to the elimination of the rural/urban difference in prevalence of skipped-generation households and to a reversal of the direction of the differential for most other types of living arrangement. For instance, in country 1, couple-only households are expected to be more common (by 2 percentage points) in rural areas, but in country 3 they are more common (by 3 percentage points) in urban areas.

For the index of material well-being, the values shown in panel C are odds ratios rather than percentage-point differences. In the least developed country (1), there are substantial differences in living arrangements associated with even a one-unit

increment to the index, such as would be produced by the presence (versus absence) of a radio or television, or by the difference between an earthen or wood-covered floor. In country 1, a one-unit increase in the index is associated with a roughly 20 per cent reduction in the chances of living in a couple-only or skipped-generation household instead of with children, and a 40 per cent reduction in the odds of living alone instead of with children. As the level of development increases (situations of countries 2 and 3), these differentials are greatly reduced. In country 3, affluence is no longer associated with the likelihood of being in couple-only households rather than with children, and a one-unit increase in the well-being index is associated with approximately a 10 per cent reduction in the likelihood of living alone or in a skipped-generation household instead of with children.

TABLE III.15. PREDICTED SOCIO-ECONOMIC DIFFERENTIALS IN LIVING ARRANGEMENTS FOR THREE HYPOTHETICAL COUNTRIES

	<i>Country 1</i> <i>(least developed)</i>	<i>Country 2</i> <i>(intermediate)</i>	<i>Country 3</i> <i>(higher)</i>
<i>A. Percentage in the living arrangement among those with some/more education minus percentage among those with less/none</i>			
	<i>Percentage-point difference</i>		
Alone	-3	-1	-1
Couple	1	9	12
With children	4	-5	-8
With grandchildren	-3	-3	-2
With other relatives	-1	0	0
With non-relatives	1	0	-1
<i>B. Percentage in the living arrangement in rural areas minus percentage in urban areas</i>			
	<i>Percentage-point difference</i>		
Alone.....	-1	0	1
Couple.....	2	-2	-3
With children.....	0	2	4
With grandchildren.....	4	0	0
With other relatives	-3	1	2
With non-relatives	-2	0	0
<i>C. Odds of being in alternative living arrangements associated with a one-unit increment on the index of material well-being</i>			
	<i>Odds ratio</i>		
Alone versus with children.....	0.6	0.8	0.9
Couple versus with children	0.8	0.9	1.0
Grandchild only versus with children	0.8	0.9	0.9
Other versus with children.....	1.0	1.0	1.0
<i>D. Values of development indicators</i>			
Per capita GDP (constant 1990 US\$)	350	2 900	3 380
Percentage of population in urban areas	23	73	78
Expectation of life at birth	48.6	68.0	71.5
Kin availability index	8.0	6.1	4.6
Adult literacy rate (percentage).....	47	87	99

In summary, this analysis shows that the direction and size of social and economic differentials in older people's living arrangements depend on a country's level of development. In countries with very low levels of development, co-residence with children tends to be associated with higher social and economic status, as assessed by educational attainment and an index of material well-being. Among countries at moderate levels of development, these differentials tend to disappear and/or reverse direction. The results are broadly consistent with trends that had been observed in the United States of America between 1850 and 1980,

as that country was transformed from a predominantly agrarian society into a modern developed one. The results reported here also reinforce the idea that, in the poorest countries, older persons living alone tend to be an especially disadvantaged group—the poorest of the poor.

F. CONCLUSIONS

This chapter has examined the relationship of older persons' living arrangements to indicators of social and economic development at the national level, and to socio-economic characteristics at the

individual level. The national-level indicators included GDP per capita, percentage of the population living in urban areas, average number of years of education of the population aged 25 years or over and expectation of life at birth. The analysis also included a kin availability index, which is a crude measure of the average number of younger adult kin available to live with and, potentially, to support the older population. The individual-level characteristics included rural/urban residence, education and an index of material well-being. Although there are many factors that have not been included in the analysis but that might have important effects on living arrangements such as the housing market, the amount of internal and international migration and cultural norms, it can be concluded that wealth, education and demographic forces can account for much of the cross-national variation in the living arrangements of older persons.

Cross-national effects of development on living arrangements

Per capita GDP has a highly significant statistical relationship with all types of living arrangement. Higher income levels are associated with higher percentages living alone and as a couple, and lower percentages living with a child or grandchild or with other relatives. Education also seems to enhance the chances of living alone and to reduce the chances of living with a child or grandchild. Greater availability of younger kin, on the other hand, is associated with significantly lower percentages living alone or as a couple and significantly higher probability of living with a child or grandchild (table III.2).

Higher life expectancy enhances the chances of co-residence with a child or grandchild and reduces the chances of independent arrangements (alone or as a couple). This is opposite in direction to that of the relationship seen in the bivariate correlations. The effects of urban/rural residence on older persons' living arrangements are usually not statistically significant, once controls for other variables are introduced. Also, the likelihood of living with other relatives is generally less affected by the macrolevel indicators than are the other living arrangements.

Finally, the results show that important regional differences remain even after controlling for the macrolevel socio-economic indicators. In Europe, the likelihood of independent living is significantly higher than in the other regions, while that of co-residence with a child or grandchild is correspondingly lower. At the same time, the indicators of development do account for a large part of the regional differences that were seen in the earlier descriptive analysis of chapter II, which did not control for the effects of differing levels of development between regions.

Cross-national effects of development on institutionalization

The percentage of older persons living in institutions is strongly positively correlated with per capita GDP. For the other development indicators, the correlation is less strong although still statistically significant (figure III.2). When all indicators were entered into a multivariate regression model, however, per capita GDP continued to be a significant net predictor of the proportion of older individuals institutionalized, while effects of urbanization, life expectancy, kinship availability and level of education become insignificant. Regional differences were also statistically insignificant once the other variables were taken into account (table III.3).

Some researchers had suggested that there is an important, enduring cultural distinction between "strong family" and "weak family" societies, which should be reflected both in levels of solitary living and in the acceptability of moving to an institutional setting when support is needed, rather than moving in with kin. However, this idea did not receive strong support: there was no statistically significant relationship found between the national percentages of older persons living alone and the percentage in an institution, once the effects of other variables were controlled.

Although the complex topic of institutional care for the aged cannot be pursued in any depth with the data reviewed here, the cross-national findings in this publication are consistent with the idea that the main factor accounting for level of

institutionalization from a global perspective is a society's ability to support the expense of institutional care.

Effects of social and economic characteristics of individuals on their living arrangements

Urban/rural residence

There are several factors that could lead to an urban/rural difference in the levels of co-residence among the older population. The findings in this publication do not support the notion that older persons in rural areas are somehow better connected with an extended family: they are rather consistent with the idea that different forces predominate in different areas. In some cases, older persons in urban areas are more likely to live independently than are their rural counterparts, while in other countries it is the reverse. The results also suggest that the effect of urban/rural residence on whether older persons live alone is often of little practical importance.

As in the case of solitary living, in many countries, shared forms of living among older persons seem to be only marginally affected by place of residence. However, a pattern can be detected in which the "couple-only" as well as the "grandchild" arrangements are more frequent in rural than in urban areas, whereas the opposite is true for the remaining categories, namely, "with child", "with other relative" and "with non-relative". Moreover, in some countries, differences in respect of those living as a couple or with children were quite large, but the direction of the difference varied (table III.5 and figure III.4).

Multivariate regression analyses were undertaken, in order to see whether rural/urban differences in education of older persons or in their demographic characteristics—age, marital status, or gender—might help explain the overall differences observed. In most cases, the net effects of urban/rural residence in the multivariate analysis were similar to the bivariate results. The analysis did not identify any important difference in the distribution of the effects of rural/urban residence between the analyses based on all older

persons and those for the unmarried subsamples (table III.10b).

Education

As was the case with type of place of residence, within countries there are no consistent differences in living arrangements according to education. It cannot be simply concluded that older persons with less education are more likely to live in traditional extended family households; indeed, in the developing countries, it is more often the reverse. Considering the regional averages for countries with available data, living alone, living as a couple and living with non-relatives are the only arrangements for which the direction of the relationship with education is the same—higher for those with some education compared with those with no education—for all three regions. The average proportion living with children is higher among those with some education in Africa and Latin America and the Caribbean and among those with no education in Asia. The average proportion living with grandchildren, on the other hand, is significantly lower among those with some education in Africa and Latin America and the Caribbean, but practically the same in Asia among those either with some or no education at all. In Latin America and the Caribbean, the proportion living with other relatives is slightly higher for those with some education, while in Africa and Asia, this proportion is higher among those with no education (table III.8 and figure III.5).

The basic finding from the bivariate results—that there was no consistent direction of relationship between education and the likelihood of living alone—also holds after controlling for effects of age, gender, urban/rural residence and marital status. However, particularly when the index of material well-being is added to the equation, the inclusion of controls for the other variables tends to shift the size and sometimes the direction of the estimated effects of education. Given similar levels of the wealth index, educated older persons are more likely than the uneducated to live alone in many countries, though not in all. The results suggest that there is an underlying tendency for education to increase the likelihood of living alone if other factors, including wealth, are equal.

Material well-being

In order to examine differences in material living conditions, an index was constructed based on information about housing quality and the presence or absence of various consumer durables and other amenities. This part of the analysis was based only on DHS surveys in developing countries, as comparable information was not available from other data sources.

There is a striking contrast in mean well-being scores between older persons who live alone and those who live with others. In most cases, older persons who live alone are significantly poorer than those who live with others (table III.9). This finding holds for both older men and older women; thus, if they end up living alone, men in developing countries may not avoid the poverty experienced by older women who live alone.

Among the older persons who do not live alone, those living with grandchildren but not with children are, in general, the ones with lower levels of material well-being. This is particularly true in Africa and Asia, where the average well-being index for skipped-generation households is practically the same as the average index for those living alone (table III.11). This highlights a situation of growing concern in several parts of the world but especially in Africa, where older persons are facing the responsibility of taking care of orphaned grandchildren in an ever-increasing number of families affected by HIV/AIDS.

Although in most developing countries co-residence with children is associated with relatively high levels of material well-being, the age of the children matters. Older persons living with children over age 25 tend to be better off in material terms than those living with younger children. Taking the regional averages, in all three regions, only the small group living with non-relatives has a clearly higher well-being index than those living with an older child. For those living with young children only, in Latin America and the Caribbean, the well-being index is similar to that for those living with grandchildren, although it remains higher than for

those living alone. In Africa and Asia, the index is practically the same for those with young children as for those living either alone or with grandchildren.

These conclusions remained valid in the multivariate analysis, and held both for all older persons and for the unmarried. For most countries, the mean value of the material well-being index remained significantly lower among those living alone, as a solitary couple or with grandchildren, compared with those living with children, even after controlling for the older persons' demographic and socio-economic characteristics (annex table A.IV.18).

Social and economic differentials in the course of development

To examine whether the relationships between living arrangements and rural/urban residence, education and material well-being differ according to the level of a country's social and economic development, cross-national regression analyses were conducted. For these regression analyses, the dependent variables were the differences in living arrangements according to rural/urban residence, education and the well-being index.

In brief, this analysis showed that the direction and size of social and economic differentials in older people's living arrangements depend on a country's level of development. In countries with very low levels of development, co-residence with children tends to be associated with higher social and economic status, as assessed by educational attainment and an index of material well-being. Among countries at moderate levels of development, these differentials tend to disappear and/or reverse direction (table III.15). The results are broadly consistent with trends that had been observed in the United States of America between 1850 and the present, as that country was transformed from a predominantly agrarian society into a modern developed one. The results reported here also reinforce the idea that, in the poorest countries, older persons living alone tend to be an especially disadvantaged group.

NOTES

¹In a recent study, Bongaarts and Zimmer (2001) used a similar approach to estimate the effect of socio-economic variables on the living arrangements of older persons based exclusively on DHS data. Although their findings mostly coincide with those in this publication in terms of the direction of the relationships, there are some differences with respect to the significance of the relationships. The effect of GDP per capita, for instance, is found to be much stronger in this publication, while the effect of education proved to be stronger in the Bongaarts and Zimmer study. These differences may be due to the present study's inclusion of both developed and developing countries (Bongaarts and Zimmer studied developing countries only) or to differences in the measurement of certain of the indicators included.

²It is possible that larger contrasts according to education would appear if a more refined classification of education were employed. In many of the developing countries included in this analysis, few older adults had attended school, so that sample size limitations precluded the use of a more detailed classification.

³It should be noticed that this divergent pattern in Asia is due to the significant differences found in some countries of its south-central sub-region—Kazakhstan, Kyrgyzstan and Uzbekistan—as well as in Turkey (see annex table A.IV.13).

⁴Demographers have investigated the use of these poverty indexes indices with mixed results. On the one hand, Filmer and Pritchett (1999, 2001) found them quite useful when studying educational enrolment and educational achievement in developing countries throughout the world (see also Bollen, Glanville and Stecklov, 2001). On the other hand, Montgomery and others (2000) found household amenity indicators only weak predictors of consumption per adult, but recommended that such information be used in the absence of preferred indicators directly measuring consumption expenditure. Kinsella (1990) warns that some indicators may not be appropriate for measuring the well-being of older people (for example, whether the household has an automobile). Ayad, Barrère and Otto (1997) discussed a “standard-of-living index” at some length in a summary report on the “Demographic and Socioeconomic Characteristics of Households”.

⁵The basic t-test in table III.9 assumes interval-level data. Although the scale is ordinal, not interval, the findings are robust and provide a rough guideline for significance. Differences are considered statistically significant when the p-value of the t-test is lower than 0.05.

⁶Logistic function for a bivariate dependent variable was used in estimating the multivariate effects. See Hosmer and Lemeshow (1989) for a detailed examination of the logistic regression technique.

⁷Omitted variables or categories were education for Burkina Faso, age for Thailand, age group 60-64 for the Democratic People's Republic of Korea and age group 70 years or over for Sri Lanka.

⁸Since material well-being information and urban/rural residence were strongly-correlated (results not shown), the latter variable was excluded from this second set of models. In fact, a major criticism of material well-being (or poverty) scales such as the one constructed in this study is that they largely reflect urban/rural residence (Ayad, Barrère and Otto, 1997). However, the material well-being variable does capture

some of the range of circumstances that exist within the rural population, and it adds to the limited arsenal of socio-economic information about older people.

⁹In most countries the predictors had a statistically significant relationship to the dependent variables, but there were exceptions. In annex table A.IV.14 the model fit was significant ($p < 0.05$) in 60 of the 73 countries, and in annex table A.IV.15, which employed the same variables as annex table A.IV.14 but for the unmarried sample only, the fit was significant in 65 of the 73 countries. Only three countries had models for which the fit was non-significant in both cases: Senegal, Tunisia and Fiji. In 55 countries, out of 73, the model fit was significant both times. In annex table A.IV.16 the model fit was significant in 43 of the 46 countries, and in annex table A.IV.17 it was significant in 44 of the 46 countries.

¹⁰Model fit (R^2) is considered significant in the cases where $p < 0.05$.

¹¹Because the wealth index is available only for Demographic and Health Surveys, annex table A.IV.15 is based on a smaller set of countries than annex table A.IV.14. For the countries included in both analyses, the education effect in annex table A.IV.14 was significantly positive in 7 cases and significantly negative in 6.

¹²The latter two categories were combined due owing to the small number of cases of co-residence with non-relatives only.

¹³Although the well-being index tends to be much lower within rural than within urban areas, the correlation between type of place of residence and the well-being index was found not to be so great as to require omitting the residence variable.

¹⁴Data on adult literacy are available for more of the countries included in these regressions than is the case for “average years of schooling”, the variable used in earlier regression analyses. In other analyses, “literacy” has a disadvantage, in that it does not capture educational variations among the more developed countries, most of which have achieved near-universal basic literacy. However, most of the data analysed in the present section are for developing countries, most of which still have substantial levels of adult illiteracy.

¹⁵The analyses of rural/urban and education differentials in the percentage living alone include a few developed countries; but in all other cases, the regression results are based exclusively on samples of countries in the less developed regions.

¹⁶Gabon had a higher level of GDP per capita than Brazil, but was excluded from the regression analyses because it lacked data on illiteracy.

¹⁷However, the regressions involving education and rural/urban differentials in the percentage living alone include some more developed countries.

¹⁸Values in Panels A-C of table III.15 were derived from the regression results using the combinations of values shown in panel D, with the additional arbitrary assumption that each hypothetical country occupied a “neutral” region that was one-third African, one-third Asian and one-third Latin American. For example, the first value in panel A, a value of -3 for the education difference in the percentage living alone in country 1, is calculated by multiplying country 1's values in panel D by the regression coefficients in table III.12: $[-14.13 + 0.82 \ln(350) - 0.04(23) - 0.03(47) + 0.18(48.6) + 0.13(8.0) - 1.96(0.33) - 2.65(0.33)]$.