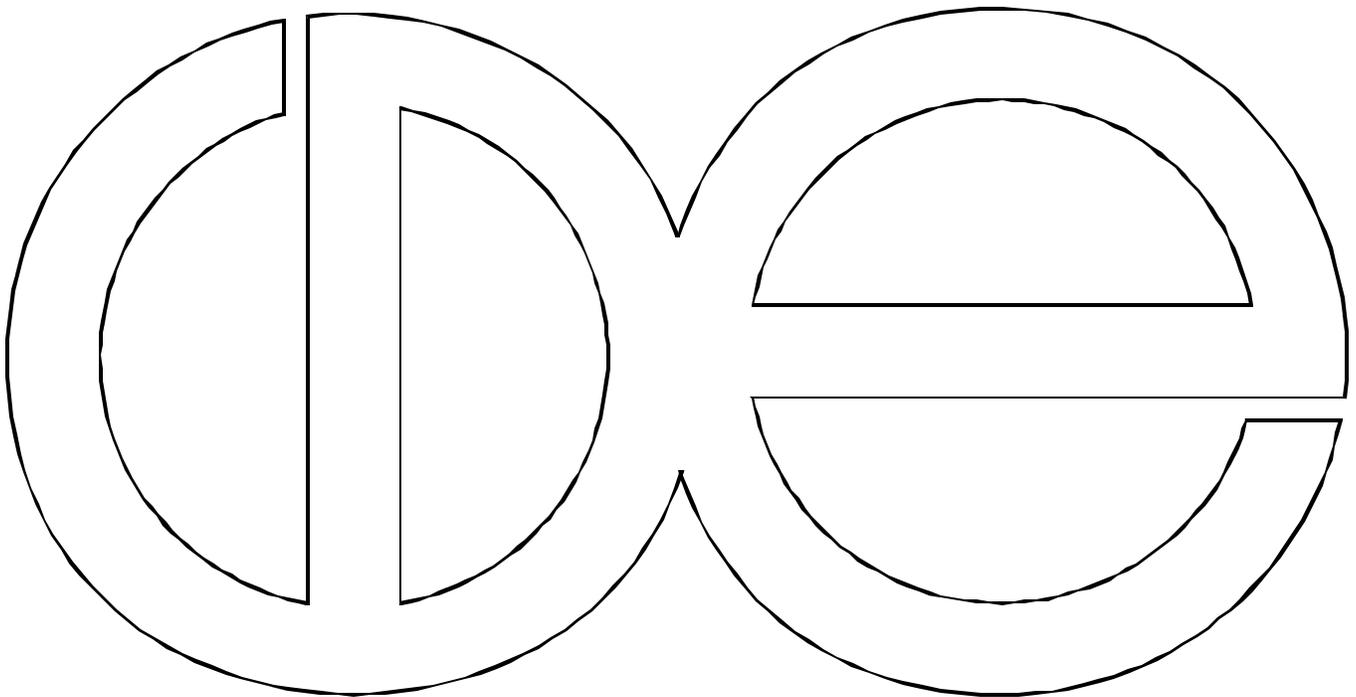# Center for Demography and Ecology

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Living Arrangements of Older Persons

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I. Introduction

During the last decade there has been a surge of interest in elderly living arrangements.[1] The theme has been part of the demography and sociology of the family, but only as an outcome subordinate to the broader issue of household and family organization. It has received new impetus due to the contribution of three interrelated factors: first, the rapidity and demographic inevitability of aging in the developed world and its even more accelerated pace in countries who experienced recent demographic transitions; second, the increasing availability of data and deployment of procedures to extract information from older sources and to analyze new ones; and third, an upsurge of research in the economics of intergenerational transfers, an area that for a long time was inextricably linked to the explanation of fertility changes but that now, paradoxically, experiences a revival to understand the consequences, not the causes of fertility change.

This paper takes stock of recent developments in the literature, summarizes key findings, provides a synthesis of theories and models, and reviews issues pertaining to statistical inference. It also suggests a road map for further research and identifies what appear to be the most salient problematic issues and likely solutions.

The paper is in five sections. In Section I, I review briefly some well-known and other lesser-known characteristics of the aging process in both developed and developing countries. Using the case of Latin America as an example, it highlights conditions of the aging process that will constrain the social and demographic space where changes in future living arrangements of the elderly can take place. Section II examines the nature of recent trends in living arrangements, the current situation in both developed and developing countries, and reviews evidence regarding the relation between coresidence and well-being. Section III locates elderly living arrangements in a theoretical niche carved by the literature on households, families and intergenerational transfers, and identifies the most important findings for both developing and developed countries. Section IV offers an examination of theoretical

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[1] I will use the term 'living arrangement' or 'coresidential arrangements' interchangeably to refer to the household structure of the elderly. When living with at least one child (or other kin) I will use the term 'coresidence'. Unless otherwise noted, when elderly live with a spouse but no other kin or are unmarried and living with no other kin, I will use the term 'living alone'.

issues to be addressed, promising model formulations, and a synthesis of the kinds of data required to shed light on important issues with policy relevance. Section V is a concluding section that poses three strategic themes to be considered for future research.

II. Preamble: the institutional and demographic context of rapid aging

With the notable exception of the African continent, the populations in most countries of the world are aging rapidly. Commonly used indicators of aging are the fraction of the population attaining age 60 or 65 and indices, such as the dependency ratio, comparing the size of the elderly to the younger population. Table 1 displays values of the proportion below age 60 and availability ratios[2] estimated in 1995 and projected in 2020-25 for selected major regions of the world and selected countries. An interesting feature of this table is the increased homogeneity projected to prevail in 2020 as opposed to the heterogeneity in 1995. Countries with post-1970 demographic transitions and countries where the demographic transition was well-established in the 1930's are much closer to each other in terms of both indices. Convergence of indicators of aging is not just the result of the smoothing effects embedded in the persistence of a demographic regime, but an outcome of more rapid aging in countries with late demographic transitions. Figure 1 provides an illustration of the relative speed in the aging process of selected countries in the region and compares values of the mean ages of various populations (see also Palloni et al., 1999).

[Table 1; Figure 1]

The factors explaining population aging are well-known and will not be repeated here. Instead I will focus on two characteristics of the aging process in developing countries. These deserve attention because they could affect patterns of coresidence, and because they have a bearing on future levels of well-being of the elderly. I will do so using data for Latin America but, in principle, these conditions may be shared by other regions of the world.

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[2] The availability ratio is the ratio of the population 60 and over to the population between ages 15 and 59. The latter population is the pool of available individuals with whom elderly could coreside.

1. Incongruence between the speed of the aging process and the institutional context

There are a number of reasons why labeling aging as a 'problem' may well fit conditions found in developing countries, rather than being an excessively charged characterization. The point is a very simple one: the forces responsible for aging in most developing countries, sharp fertility decline after 1970 and mortality decline after 1950, lead to relatively fast and concentrated changes in the age structure. The changes take place before social and economic conditions that facilitate and secure transfers of wealth toward elderly have a chance to emerge, develop or consolidate. Instead, the institutional context is characterized by insufficiently developed capital markets, high risk and uncertainty that inhibits adequate private savings, insecure property rights, inflationary pressures, as well as lack of social security schemes, absence of private pension plans and insufficient health insurance.

In these countries there is a sharp incongruence between the advance of the aging process and the social and institutional context within which it takes place. The consequences of this dislocation are two: first, the demands associated with rapid aging are less likely to be met in these areas than elsewhere and, second, levels of well-being of the elderly will be endangered in the best of cases and will decline in the worst.

i. Social security

In the vast majority of countries in Asia and Latin America social security systems are nonexistent or poorly developed, and coverage only extends to a privileged sector of the work force. Even though social security systems were established in some Latin American countries much earlier than in the US, they are currently in disarray and are experiencing reforms that will drastically alter the programs' coverage and contract their safety net components (Barrientos, 1997; Palloni et al., 1999).

ii. Human capital

Populations attaining age 60 or 65 now and in the near future belong to cohorts whose wage earning history is fragile. These are cohorts whose levels of education are far lower than they are among elderly in developed countries. With a few exceptions, in Latin American countries not less than 30 percent of those attaining age 60 are illiterate. Massive literacy campaigns did not begin in earnest until the late fifties so that their effects cannot be felt until after 2025. Even then, the composition of the

elderly by levels of education will be lopsided toward incomplete primary and primary levels, far from assuring access to sources of income derived from accumulated assets, savings, and the private pension plans that are just now coming into existence.

ii. Gender differentials

Male and female mortality disparities in developing countries are at roughly comparable levels with those in developed countries. In Latin America just over two thirds of those surviving to age 60 are women and about half of them are elderly widows. Women's levels of education lag far behind those of males, and their patterns of labor force participation have historically stayed at very low levels. Their wage earning history is precarious and leaves them totally dependent on others in their families for income.

2. Health status of the elderly: where does the growth of the elderly population come from?

At least in Latin America the rapid growth of the elderly population that will take place between now and the year 2025 or so has two main sources: the transient increase in fertility that took place between the years 1955 and 1965 and, most important, the massive mortality decline that began in 1950. Thus, the cohorts that attain their 60th birthday between 2000 and 2025 **are the beneficiaries of unusually large improvements in survival, particularly during early childhood**. For example, individuals born in 1960 experienced lower levels of early child mortality than those born in 1955. This will increase the relative size of the cohort attaining age 60 in 2020 relative to cohorts that reach age 60 five years earlier.

i. Empirical estimates of the contribution of mortality decline to the growth of the elderly

To assess the importance of mortality decline as a contributor to the growth of the elderly population we chose three countries that roughly represent the diversity of regimes of mortality decline in the region. For each of them we estimate the profile of mortality decline over the period 1900-1990, and calculate a projected life table to assess future changes during the period 1990-2030. We then proceed to estimate the (absolute) magnitude of the contribution of mortality changes to the rate of increase of the population in several quinquennial age groups at various points in time and for the years 2000-2020. Figure 2 displays the estimated magnitude of these changes for age groups 50-54, 55-59,

etc. for the year 2020. The vertical axis represents the total cumulated change of mortality rates experienced by cohorts reaching ages in the horizontal axis during the years 2020. Thus, for example, compared to those who will be in the age group 60-64, Chileans who attain ages 65-69 in the year 2020 will experience reductions in mortality rates after birth of the order of .0125. For Chileans aged 70-74 in 2020 the figure is about .028. Since the bulk of mortality decline, particularly during early in childhood, occurs in the post-World War II years, the peak of the graphs is attained among the cohorts born during those years (who will be aged between 70 and 80 in 2020). Older cohorts also experience mortality changes but, since they are not the beneficiaries of the typically larger gains accruing to early childhood, the magnitude of the changes are smaller. Note that the contribution of mortality changes to the growth of these cohorts is lower in Uruguay than it is in either Chile or Mexico, as should be on account of the earlier and more gradual nature of mortality changes in Uruguay.

[Figure 2]

Graphs for other countries in the region look very similar to those in Figure 2. The only difference is that in cases where mortality decline occurs later than in Chile, Mexico, or Uruguay the curves are displaced toward the left, and their peaks are associated with younger cohorts. Furthermore, in countries where mortality changes are less gradual and more concentrated in time (as in Bolivia, Peru, Ecuador or Paraguay) the curves are narrower and more spiked.

The estimates plotted in Figure 2 enable us to informally gauge the magnitude of the contribution of past mortality changes to current and future aging. In Chile, for example, about 43 percent (.015/.035) of the total rate of increase of the population 60+ by the year 2020 is due to mortality changes. In Mexico, the corresponding values are slightly lower. Thus, a substantial fraction of future aging is attributable to mortality changes experienced during the period 1930-1990. The remainder (about 57 percent in the case of Chile) is associated with either changes in the size of the birth cohorts, or, to a lesser extent, with changes in mortality at ages above 60.

As shown elsewhere (Palloni and Lu, 1995), about 70 percent of the mortality decline that

occurs between 1940 and 1980 is due to changes in mortality associated with infectious diseases in the first ten years of life. This statistic **suggests that the relatively compressed schedule of aging in the region can, in part at least, be traced to the medical and public health revolution that triggered the mortality decline nearly half a century ago**. This legacy may have important implications for the health and disability status of the elderly population after the year 2000.

Even if there are significant increases in mortality at older ages, it is worth asking how healthy the extra years will be and about the magnitude of health care costs associated with them. In what follows I briefly discuss what the future trends in health status among the elderly are likely to be.

ii. Prospective changes in mortality and health status

Even if it is true that additional gains in survivorship are possible, it is not at all clear that the added years of life will be healthy ones. The health status of the elderly will depend on two conditions. The first is access to satisfactory health or medical care. Health status will be worse for populations with limited access to health or medical care and better elsewhere. The second condition is the composition of the population at any age according to risk profiles. This is a complex result of three factors: early childhood exposure (perinatal, growth and development during first five years), lifetime behavioral risk profiles (smoking, drinking, diet, exercise), and past purchase of health inputs (possibly dependent on occupation, education, and assets). Although we have some knowledge about the effects of each of these factors on health status and mortality, we know virtually nothing about their prevalence in populations of the region. The only evidence available to us pertains to the composition of the cohorts who will attain their 60th birthday after the year 2000. As mentioned before, about half of the rate of increase of the population in this age group is associated with mortality decline in early childhood during the decades following WWII. These cohorts will be increasingly dominated by individuals who, during their early childhood, may have been exposed to conditions that would have been fatal several years before. To the extent that exposure to and contraction of conditions early in life has a physiological effect that endures and plays out many years later (Fogel, 1986; Fogel and Costa, 1997; Barker, 1997), we should expect that the health status of the corresponding cohort will deteriorate. These effects are likely to be stronger among populations that are more vulnerable or that have less

opportunity to purchase adequate health inputs. As documented elsewhere (Palloni et al., 1999) an important fraction of the elderly in the region will live in rural areas and will belong to the lowest social classes, that is, they will be exposed to conditions characterized by little, if any, access to satisfactory health care facilities and to mediocre informal care. Reforms in the public sector, the wholesale revamping of pension systems, and past trends in labor force participation will only worsen the situation by hampering the ability to purchase acceptable health services.

Elsewhere (Palloni et al., 1999) we use the example of respiratory tuberculosis, osteoporosis and dementia as three conditions tightly linked to health status in the past that are likely to affect the health status of the elderly in the near future to a larger extent than they do now or than they ever did in developed countries.

The foregoing considerations suggest the conjecture that future increases in life expectancy above age 60 in countries of the regions are unlikely to be accompanied by corresponding decreases in the prevalence of ill-health. A more likely scenario is one where an increasing fraction of years of life gained are spent in disability or ill-health.

iii. Empirical assessment of recent conditions

Is there any empirical evidence directly or indirectly supporting the conjecture stated above?

The only two sources of information about health conditions among the elderly in the region are a multi-country study coordinated by the Pan American Health Organization in the early eighties and two very recent surveys carried out in Sao Paolo, Brazil, and Mexico City. For a number of reasons the only comparable item that provides useful variability across countries in the region is self-reports on health status. Table 2 displays the percentage of sample population aged 60 and above reporting their health in various categories in a continuum from 'bad' to 'very good' or 'excellent'. Although age distinctions would have been desirable, sample sizes do not permit us to compute reliable age-specific estimates. The table also includes comparable percentages calculated from the HRS and AHEAD, two of the most important data sources on the elderly in the US. Figures in the table are shown by gender and, in the case of the US, by ethnic group. Table 2 includes results for five additional countries (Brazil, Colombia, El Salvador, Jamaica, and Venezuela) where the categories for self-reporting employed

originally did not allow us to make a distinction between 'poor' and 'average' or between 'good' and 'very good'. In addition, we include results from two recent studies carried out in Sao Paolo, Brazil, and Mexico City. In order to compare all countries we merged 'poor' and 'fair' on the one hand, and 'good' and 'very good' on the other.

[Table 2]

While self-reported health status is not an ideal indicator of health conditions, it can be shown to be surprisingly accurate and a very good predictor of subsequent ill-health and mortality (Idler and Kasl, 1991; Idler and Benyamini, 1997, Mare and Palloni, 1988). Three features stand out in the table. First, in all countries of the region except Argentina, the fraction that reports not being in good health status ('poor' or 'fair') is two to three times higher than comparable figures for the White population in the AHEAD study. It should be remembered that the sample studied in AHEAD corresponds to an older age bracket (70+), whereas those of the HRS correspond to a younger age bracket (51-61). Thus, in the US-AHEAD the fraction of reported to be in poor/fair health condition is 33.5% among males and 34.0% among females. In the best case in the region (Argentina) the corresponding numbers are 37% among males and 52.7% among females. In all other countries the percentages are much higher, from around 55.3% among males in Colombia to about 86.0% among females in Jamaica. As would be expected, the comparison is more favorable if one takes as reference the US Black population. But even then only Argentina seems to fare better. Second, the heterogeneity within the region is substantial and appears to be only weakly correlated with mortality levels. Thus, the lowest percentage reported to be in average or worse health conditions occurs in Argentina (37%-52.7%), while the highest occurs in Jamaica (79.7%-86.0%) and Venezuela (82.7%-77.3%). Third, there are very large gender disparities and, with the exception of Venezuela, all of them favor males. The differences can be as large as 15.2 percentage points in Argentina and as tenuous as 1 or 2 percentage points in El Salvador. It should be noted that in the US and other developed countries the male-female differences are insignificant or exhibit the opposite pattern. If these gender differentials in self-reports do

indeed reflect unobserved differentials in underlying health conditions, the patterns displayed are of importance since, as suggested before, elderly women not only represent close to two thirds of the elderly population but are also at higher risk of experiencing worse economic conditions.

III. Trends in elderly living arrangements and elderly well-being

Living arrangements of the elderly are just one element among many others included in a package of transfers toward the elderly originating within the boundaries of the kin group or family. I will refer to these as 'familial' or 'family transfers'. In turn, these transfers are just one part of the totality of transfers toward the elderly which also include societal resources such as pensions, disability income, health payments, and transfers in the form of subsidies for institutionalization, home-care, and housing. I will refer to these as 'social transfers'. Thus, coresidence of elderly with their children (or other kin) is just one among many other transfer flows involving the elderly. Social transfers and family (kin group) transfers are the most important sources of support for the majority of the elderly. Other sources include assets, wages and private pension plans.

The observed prevalence of coresidence with children may be related to the magnitude of other flows, but the exact direction of causality is not always clear. The demand for coresidence with children or other kin is probably heightened in societies with precarious institutionalization of social transfers, with traditionally low levels of human capital investments, and where the health and disability of elderly require large expenditures on care and health services.

1. Trends in coresidence of the elderly

Two dimensions of coresidence of the elderly are of interest: the overall levels of living alone, and the age patterns of coresidence. We deal with each of these in turn.

i. Overall levels of living alone among the elderly

Censal information for the US in 1990 shows that about 75 percent of White males and females older than 65 lived alone or with a spouse. Roughly two thirds or 65 percent of White unmarried women and unmarried men live alone (Kramarow, 1995; Ruggles, 1994; Schoeni,1998). For African-Americans the figures are 51 and 48 percent respectively.

In Western and Northern Europe as well as in the US the prevalence of living in a single-person

household among the elderly population, regardless of marital status, is within a range between 15 and 40 percent (Keilman, 1988; Kinsella, 1990). Moreover, prevalence of living alone in these countries is anticipated to be much higher in the short-run since recent trends point to a rapid increase in this type of living arrangements (Pampel, 1992), with all the consequences that this transformation may entail (Reher, 1998).

This is in contrast to the situation in most countries of Asia and Latin America where the proportion of all elderly living alone never exceeds 10 percent. Countries in the Caribbean occupy an intermediate position with prevalence of living alone ranging from 10 to 20 percent (Kinsella, 1990). The aforementioned figures for these countries are calculated using as reference the entire elderly population and, therefore, conceal higher levels of living alone among those who **do not have a spouse.** Since the fraction of all elderly over 60 or 65 who are unmarried ranges between one third and one half, the fraction of all unmarried elderly who live alone cannot be much higher than .20 in countries of Asia and Latin America, and smaller than .40 in the Caribbean.[3]

Current levels of living alone among the elderly in the US and in Western and Northern Europe are the result of changes that may have begun in earnest before 1900 but whose full effects are felt only after 1950. By contrast, and with only few exceptions, the observed changes in Asia, Latin America, and the Caribbean are of only very recent origin and of considerably lower magnitude. The two most noticeable exceptions are Japan and Taiwan. In Japan, a society with traditionally high levels of elderly coresidence, the proportion living alone has increased steadily since 1960, at an estimated rate of about 1 percent per year, and reached values close to .30 in 1990. It is projected to increase even more (Hirosima, 1997). Similarly, in Taiwan and Korea, two Asian countries with traditionally high levels of coresidence, the trend towards higher levels of living alone is unequivocal (Hermalin, 1997; Hermalin et al., 1992a; Hermalin et al., 1992b; DeVos and Lee, 1988). Other countries in Asia and Latin America reveal even less turmoil on patterns of coresidence. Table 3a displays the fraction living alone among all unmarried elderly in the US. Table 3b summarizes comparable information available for European

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[3] We suspect that prevalence of living alone among elderly in Africa, though varying widely across countries, is at lower levels than in Asia and Latin America. This could be changing rapidly, particularly in countries with high levels of HIV prevalence.

countries whereas Table 3c displays comparable figures for a sample of countries from the developing and developed world with available data for two points in time. While the bulk of changes have undoubtedly occurred in the US and Europe, the situation in some Asian countries (Japan and Taiwan) has already destabilized. In Latin America and the Caribbean observed changes are quite muted, and there are no unequivocal indications of a massive and clean break with the past (see also DeVos, 1990; Palloni and DeVos, 1992). Table 4 displays more detailed information at two points in time for selected countries in Latin America and the Caribbean. Altogether, the figures in Tables 3c and 4 show that changes in the same direction, albeit of smaller magnitude, as those experienced by forerunners are occurring in the developing world as well.

[Table 3a, Table 3b, Table 3c, Table 4]

Not only are changes in developed countries of small magnitude but they start from lower baseline values. Yet researchers and policy makers alike suspect that much larger changes are in the making, and that patterns very similar to those experienced by the US and Europe will soon engulf Asia and Latin America alike, while Africa, in all likelihood, will continue to lag behind.[4]

ii. Age patterns of living alone among the elderly

Age patterns of living alone among the elderly is a somewhat less studied aspect of the phenomenon. With a few exceptions (see Liebfroer and de Jong-Gierveld, 1995) the prevalence of elderly coresiding with children (or kin) decreases from about age 50 to about age 75 or 80 and then increases again (Kinsella, 1990). This age pattern is clearly exhibited among all elderly in the US microcensus data from 1880 on (Ruggles, 1994), and among elderly widows in the 1960-1990 CPS time series (Mancunovich et al., 1995). Over time the increase in living alone has been proportionately higher among the old-old (over 85) than among the young-old (Ruggles, 1994; Sandefur and Tuma, 1987). This age pattern of living alone is less pronounced but still detectable in Canada (Legare, 1998)

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[4] Coresidence regimes in Sub-Saharan Africa are undergoing sustained stress and may become quickly de-stabilized as a consequence of massive effects of the HIV/AIDS epidemic. See below and Lee and Palloni (1992).

and in data for Japan (Hirosima, 1997) and a handful of European countries (Kinsella, 1990).

Furthermore, in most cross-sectional studies the estimated effects of parental age on the probability of coresidence are either increasing or display the non-linear form present in the US data. Let us assume for a moment that these patterns remain constant. Since the difference between the minimum and maximum values of the fraction coresiding by age can be fairly large (of the order of 10 to 15 percent in the US), modest changes in the age distribution of the elderly could have non-trivial effects on the overall fraction living alone, even in the absence of changes in the age-specific probabilities of living alone. The direction and magnitude of these effects will depend on the relative size of consecutive cohorts of elderly. In turn, the overall magnitude of the difference between them will be a function of the past history of fertility and mortality. In the developing world the size of the first few cohorts attaining age 60 by the year 2020 will create a bulge that will surely inflate the overall proportion living alone. This effect will increase for a number of years before it reverses or is attenuated as the same cohorts attain ages 75 or 80, the age interval where the age specific rates of living alone begin to decrease again.

It is unlikely that observed age patterns will remain constant for too long. For one thing they may reflect cohort effects: the oldest-old of today belong to cohorts with less education and more modest wage earning history. This makes them less likely to have a wide variety of choices available other than coresidence with children. Also, the oldest-old have higher prevalence of disability and chronic illnesses and are more likely to be offered care by kin or children (see below). If the age of onset of the most prevalent forms of disability increases (decreases) age patterns of coresidence could experience a downward (upward) shift at younger ages. Finally, there is a relation between length of generation and co-residence (see below). If the age difference between parents and the youngest of their children changes--as a result of delaying or anticipatory fertility tactics--the age patterns of coresidence will also be affected.[5]

2. Elderly coresidence and levels of well-being

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[5] For a view imputing changes in age patterns of living alone to past oscillations in fertility, see Mancunovich et al., 1995.

A concentrated research focus on elderly living arrangements is a relatively newer theme. It is driven by concerns raised around the world in general, and in developed countries in particular, about consequences of rapid aging. To the extent that coresidence with adult children or other family members is seen as a fundamental strategy to bolster the overall levels of well-being of the elderly, trends pointing to a dissolution of traditional living arrangements, where most elderly live with children or relatives, are seen as worrisome and threatening.

This preoccupation is exacerbated in recently industrialized and in developing countries alike, where these trends are of more recent origins. They take place, however, within more fragile institutional contexts, where social transfers toward the elderly are nonexistent or not well established, and whose prospects appear increasingly compromised by institutional reforms and tight fiscal discipline. It is well-known that levels of poverty everywhere have been historically higher among elderly people, and this is probably even more pronounced in developing countries now that it used to be the case in more developed countries (Ramashala, 1997; Townsend and Wedderburn, 1965; Townsend, 1979). Given current conditions of overall poverty and well-being in most developing countries, there is little evidence to suspect that this state of affairs could change anytime soon (Gwatkin, 1998).

The combination of fiscal restraint and insufficiently developed mechanisms of social transfers could constrain even more the range of options during an epoch of swelling demand caused by the sheer increase in the size of the elderly population, even if their patterns of illnesses and disability were to remain unchanged. Thus, the argument goes, poverty among the elderly is much more likely to increase.

It is widely thought that the erosion of a traditional norm whereby elderly commonly reside with children or relatives will hinder the levels of elderly well-being. This outcome is likely if the onset of a newer regime with lower coresidence is not accompanied by improvements in elderly command over private income, does not trigger changes in other elements of familial transfers, or does not induce an improvement of existent social transfers. Indeed, central governments in many countries have undertaken not so subtle campaigns to reassert family obligations toward the elderly (Martin and

Kinsella, 1994; Knodel et al., 1997; Reher, 1998).

In the developed world, industrialization and modernization may have eroded familial bonds but they simultaneously fostered a system of social transfers that effectively operates as a compensatory mechanism to reinforce transfers toward the elderly. The onset and evolution of this system of institutionalized transfers may itself have reduced even further the need for and discouraged the continuation of family transfers, including coresidence. In addition, through investments in human capital, older individuals are able to command higher levels of income while, as insurance or as a complement, they are open to and actively pursue the option of continuing to participate in the labor force. Competing with other needs and demands, the efficiency and sufficiency of compensatory social transfers, however, has been questioned in the US (Preston, 1984) and are even less likely in the less developed world.

In developing countries elderly access to sources of income is deemed to be far below what is necessary to secure self-sufficiency while their continued participation in the labor force, for a long time a necessity rather than an option, may be endangered by rapid economic change and growing obsolescence of human capital. Furthermore, both in the developed and developing world, the overall demand for care and attention for the elderly will be a function of the prevalence of illness and disability, and of the amount of time lived healthy at older ages. Recent research suggests that trends in disability and ill health have not deteriorated in some developed countries (Crimmins et al., 1994, Crimmins et al., 1997; Manton et al., 1993). But this may be a transient phase and, as suggested above, may not hold true at all in developing countries, where the available evidence suggests that the elderly could be far worse off than their counterparts in developed countries. Thus, even if there are compensatory changes in social transfers and improvements in private sources of support were feasible, the well-being of the elderly will remain compromised. In this pessimistic scenario, coresidence with children and relatives is seen as a mechanism of last resort.

Are observed changes in coresidential arrangements of the elderly associated with other changes affecting this sub-population? The study of patterns of elderly coresidence is not just a theoretical exercise to understand the historical evolution of families and households. It is also an area of

concrete concern for policy makers. Implicitly or explicitly some constituencies hold the strong belief that a reduction of elderly coresidence with kin can and will translate into deterioration of elderly levels of well-being.[6] What evidence is there to support this conjecture?

In order to construct a robust test we need time trends on indicators of levels of well-being for elderly by residential arrangements. We also need at least some foundation to assess the precise direction of causality or, to put in the technical jargon, to determine whether well-being is endogenous. I am not aware of any comparative studies of changes over time of elderly levels of well-being according to living arrangements and, despite many efforts, the problem of endogeneity appears to remain intractable.[7] It is possible, however, to use a number of disparate data sources that do shed some light on the issue. Although these data sources provide information on a rather large number of indicators, for our purposes it suffices to focus on the relations between a handful of them.

Let us say that a satisfactory indicator of well-being is some demarcator enabling us to distinguish elderly population living in poverty. Suppose the fraction of elderly living below poverty is D and the fraction below poverty and living alone and coresiding are D_a and D_c, respectively. Let the probability of living alone among those above and below poverty be B_r and B_p respectively. The following equalities are straightforward:

$$D_a = (1+D/(1-D)(B_r/B_p))^{-1}$$

and

$$D_c = (1+D/(1-D)((1-B_r)/(1-B_p)))^{-1}$$

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[6] The eighth five-year plan in Thailand makes this explicitly a governmental concern (NESDB, 1995 cited in Knodel et al., 1997). See also Reher (1998) for a statement regarding the consequences, and state of affairs they reflect, of coresidence in Europe.

[7] This is one area where improvements via purely descriptive endeavors are feasible and very useful. In fact, we have now available a large number of microcensus data for several areas in the world from which one could compute indicators of levels of well-being for the elderly by household type. These estimates could be compared across countries and over time to assess changes in the joint distribution of elderly by coresidence and levels of well-being. Admittedly, the most difficult task here is to construct comparable indicators of well-being from censal data.

Thus, differences in the values of D_a and D_c over time (or across countries) depend on the overall levels of poverty among the elderly as well as on the relative magnitude of the probabilities of living alone among those above and below poverty. A decrease in poverty among those who live alone could be the result of either a decrease in the overall poverty rate (independently of living arrangements), an increase in the probability of living alone among those who are not poor, or a combination of the two. As a result, even under conditions guaranteeing strict comparability of the poverty measure, changes over time or over units of observations, cannot be interpreted unequivocally. Admittedly, these elementary equalities dilute the analytic problem away since we implicitly assumed that decision making about coresidence--the B's-- is correctly estimated as function of poverty rather than the other way around.

Very few studies provide information on the values of D_a and D_c at one point in time and, even more rarely, over several periods of time. In some cases one can obtain estimates of D but little or no information on anything else. Most studies report estimates of the B's values but say nothing about D, D_a or D_b. In these cases the values of B are usually not directly observed but can be retrieved indirectly by converting estimates of the effects of measures of wealth on the probabilities of living alone while controlling for a host of other quantities. A complicating problem is that measures of socioeconomic conditions--which we proxies for well-being--vary a great deal. Oftentimes it is income, and in some cases researchers use property ownership, or 'soft' proxies such as education levels, occupation and occupational status. Rarely, if ever, are estimates of B obtained using a dichotomous indicator of poverty as we have argued here. In sum, inferences and comparison across studies is hindered by a number of factors, even if one could agree on the rather dubious proposition that levels of well-being are indeed well captured by using only measures of socioeconomic standing.

The longest string of evidence I know is the US microcensus samples starting in 1880. These data appear to corroborate the existence of a direct relation between indicators of wealth for elderly in different coresidential statuses. Indeed, the data show that in the past it was among those better-off that one found the highest probability of coresidence with children or kin whereas living alone was more likely among the poor, the property-less and the destitute. The relation reverses, however, after 1950

or 1960, just at the time of onset of the sharp upturn in the prevalence of living alone. Thereafter the association between probability of living alone and measures of wealth or socioeconomic status among the elderly becomes strong and positive. Upon careful examination of these data Ruggles infers that "...in 1850, for example, there was a strong positive relationship between real property of the elderly and coresidence, and the richest 10 percent lived with their adult children 50 percent more often than the propertyless," and that "...For the post-World War II period, information on income, home value, and years of education verifies the finding that multigenerational families are most frequent among the poorest and least educated" (Ruggles, 1994, pp. 125; Ruggles, 1996).

In another study on conditions in the US, Pampel finds evidence supporting the idea that B_r is higher than B_p (Pampel, 1983). He uses the 1960 and 1970 PUS as well as the March 1976 CPS and confirms the effect of income on the probability of living alone but provides little evidence to support the idea that this has increased at least in the fifteen years or so covered by his data.

The information from these two studies refers to trends in values of B's, not of D's.[8] However, we can combine it with other sources to arrive at cleaner conclusions. The estimated (official) poverty rate among elderly in the US (D) declined from about 27 percent in 1959 to about 12 percent in 1990 (Holtz-Eaking and Smeeding, 1994). A drop in overall poverty rates among the elderly raises the fraction who are above poverty both among those living alone and among those coresiding. However, since we know that B_r increased, it must be the case that levels of poverty among elderly living alone dropped faster than levels of poverty among elderly who coreside. From this very elementary exercise

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[8] In a more recent analysis of the US microcensus samples, Kramarow finds that the effects of home ownership, the most important among a handful of indicators of individual wealth, on the probability of living alone among elderly widows are trivial before 1940 but turn **very strong and negative** between 1960 and 1990 (Kramarow, 1995, p. 343). This is a somewhat surprising results for, as the author recognizes, "...we expect that home ownership reflects wealth which is associated with living alone in the second half of the twentieth..." (Kramarow, 1995, p. 344). Home ownership is a variable that behaves erratically in most analysis of living alone in developing countries, at times depressing the probability of living alone (Agree, 1993 for Brazil) and at times enhancing it (Solis, 1999 for Mexico). To the extent that elderly home ownership encourages children to move in with parents, there will be a positive association between it and probabilities of living alone. Without being able to explicitly address the endogeneity problem associated with the use of this variable, one needs to also examine relations between coresidence and other indicators of wealth. Similarly, it is possible that the relationship between wealth and coresidence, at least as embedded in B's values, is gender-specific and that Kramarow's results only apply to women, not men.

one could conclude that, in the US at least, living alone has not translated into deterioration of levels of well-being. Without a precise time series of B's we cannot say, however, whether one group is now better off than the other, or whether the differential in well-being by coresidence status has increased or contracted.

Although we lack long time trends of levels of well-being among elderly by coresidential arrangements in other countries, some information can be obtained from examination of very recent conditions. In what follows I summarize the main findings.

i. Europe, United States, Canada and Australia

In a study of microdata for nine countries from the Luxemburg study, Smeeding and Saunders find that the fraction of elderly women below the poverty line (50 percent of the median disposable income) is substantially higher among elderly women living alone than among all elderly women in all countries in the sample (Smeeding and Saunders, 1998). The ratio of elderly women who live alone and below poverty to those coresiding who are below poverty ranges from 1.2 in Hungary to about 2.0 in Canada. In the US the ratio is around 1.6, a figure rather difficult to conciliate with our previous conclusion though not necessarily inconsistent with it.[9] Overall this information supports the idea that living alone among the elderly is accompanied by more widespread poverty, although it is not clear whether poverty is triggered by loneliness or vice versa.

In a cross-national study of European countries spanning the years 1975-1989, Pampel (1992) shows that the fraction living alone among the unmarried has increased over time and approximately at the same rate in all countries in his sample. The two proxies for individual socioeconomic conditions, education and occupation, have trivial influence on the probabilities of living alone, suggesting that B_p and B_r are probably quite similar to each other.

The bulk of studies carried out with recent data for the US (Soldo et al., 1990; Bishop, 1986; Wolf, 1990; Wolf and Soldo, 1988; Kramarow, 1995; Kotlikoff and Morris, 1990; Michaels et al.,

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[9] The finding is consistent with Kramarow's findings. As we mentioned in footnote 8, one possibility is that there are sharp gender differentials in the relations between poverty and coresidence, a conjecture that Smeeding's data do not confirm at all. A second possibility is that information regarding the relation between poverty levels and coresidence involve complicated non-linearities not captured by the coarse categorization of poverty level used here.

1980; Ruggles, 1994; 1988) confirm the existence of a positive effect of income on the probability of living alone. Even though qualifications regarding the form of the relation, the appropriate set of control variables, and the existence of contingencies are in order, the finding that the probability of living alone is higher among those who are better off is fairly generalized. Again, these estimates simply refer to the relative magnitude of B_r and B_p (or, better yet, to the ratio $B_r/(1-B_r)/B_p/(1-B_p)$) and are not directly or easily transformed into estimates of contrasts between levels of well-being among those living alone and those coresiding

ii. Asia and Latin America

It is well-known that in Asian countries filial piety and a strong sense of obligation toward parents and elderly alike are still widespread and dominant. These cultural prescriptions translate into norms of support that reinforce intergenerational transfers toward the elderly and produce a robust tendency to live with parents. As documented before, the fraction of elderly living alone is low, and those who do so constitute a population perceived to be much like they were in the US at the beginning of the XXth century, that is, largely composed of the inform, poor and destitute. But the evidence available for the most recent period is remarkably elusive on this score. The summary of various studies that follows shows that the empirical evidence from several countries is not always consistent with this imagery. The first two studies summarized below provide estimates of quantities analogous to D_a whereas all the others only enable us to retrieve values of B_r .

The Luxemburg study cited before includes information for Taiwan where the ratio of women living alone and below poverty to those coresiding and below poverty is in the neighborhood of 2.8. This is by far the largest ratio and its magnitude is all the more remarkable since levels of poverty among all elderly Taiwanese are higher than in countries such as Canada or Germany, two of the countries where we identified high ratios of poverty among those living alone.

In a recent study of nationally representative data in Thailand, Knodel and colleagues uncover a more mixed picture that, although not entirely inconsistent with the belief that elderly living alone may be worse off, suggests that the relations are more complicated. Thus, Knodel and colleagues conclude that "...This image of the elderly being increasingly deserted to live on their own or being neglected if they

do live with their family is reinforced by media conveying the same idea. Unfortunately, it appears to be based more on preconceptions and anecdotal evidence than on hard facts..." (Knodel et al., 1997; p. 14). In fact, their data reveal that while there are some differences in indicators of well-being (income, perceived sufficiency of income, recent financial problems, and household possessions), these are hardly large enough to substantiate the idea that those living alone are a particularly fragile group. It is only in rural areas where the differences are sufficiently strong to merit special attention.

Table 5 summarizes the information regarding the effects of indicators of well-being (socioeconomic status) in a number of Asian and Latin American countries. The best way to characterize these results is that they are somewhat inconclusive, though positive relations are more common than negative ones. The studies define different focal populations (unmarried versus unmarried and married elderly), they differ in terms of the indicators of socioeconomic standing and the types of controls used. Overall, and perhaps unsurprisingly, the estimated effects are somewhat inconsistent with each other. In some cases (Korea, Brazil, Mexico, and Malaysia) the effects of income or home ownership are equivalent to those already verified in the US and Europe. In other countries the effects of indicators of well-being can be in the opposite direction or statistically insignificant at best, as is the case of home ownership in Brazil.

[Table 5]

Finally, there are studies focusing on the effects of child's characteristics on the probabilities of coresidence with their parents. If one assumes that indicators of wealth across generations are strongly correlated and that the within-family (across offspring of the same parents) variance in wealth is trivial, then a high probability of not living with parents among children above poverty would suggest that parents above poverty are more likely to live alone. This is obviously a fragile inference, particularly since oftentimes key parental characteristics are not controlled for. One of these studies (Martin and Tsuya, 1991) shows that in a sample of Japanese middle aged individuals indicators of high socioeconomic status correlate negatively with coresidence with parents. Similarly in a study of middle

aged people in Turkey, Aykan and Wolf find that education of children is negatively related to coresidence with parents (Aykan and Wolf, 1998). By contrast, in a study of 10 counties scattered widely throughout Eastern China, Parish and colleagues find that the higher income among sons "... leads not to decreased coresidence in favor of financial aid but to more of both coresidence and aids" (Parish et al., 1995).

What can one conclude from these disparate findings? The most robust inference is that the evidence supporting the claim that living alone among the elderly is associated with lower levels of well-being is not always consistent with the evidence. What we know for sure is that, with a handful of exceptions, there is some support for the contention that the probabilities of living alone are higher among those who are better off, and that in a few countries in Europe and Taiwan, elderly women who live alone experience higher poverty levels than those who coreside, although this contrast is not confirmed by roughly comparable data in other countries (Thailand). Finally, while most of the studies attempt to estimate the effects of measures of economic standing on the probability of living alone, they do not shed light on the complementary, but quite distinct issue, of whether the elderly living alone are better-off than those who coreside or, better yet, they cannot confirm the counter factual that they would be better off if they did.

Given this rather negative conclusion combined with the fact that throughout this exercise we intentionally overlooked endogeneity issues, paid lip service to matters regarding the comparability of social and economic contexts, and systematically dodged considerations regarding the meaning and measurement of well-being, it seems fair to say that, to put it mildly, our state of knowledge in this key area for public policy is fairly primitive.

III. Explaining trends in elderly coresidence patterns

Why did the prevalence of elderly living alone (or with spouse only) rise so much in the US and Europe, and why should one expect that a similar phenomenon will occur in Asia, Latin America and the Caribbean? This question remains important even though the previous assessment does not reveal a close connection between coresidence arrangements and elderly well-being, nor does it justify gloomy scenarios associated with the increased prevalence of living alone. I suspect that research in the area

has not been properly focused to retrieve a connection that indeed exists. Thus, understanding the factors responsible for trends in living arrangements will help us to identify conditions that are, at least in theory, related to elderly well-being, and thus clarify not just on the theoretically interesting issue of family and household transformations, but also some of its more concrete and practical implications.

To identify factors that explain past trends of elderly coresidence and the possible relations to elderly well-being I first locate the theme within the broader and distinguished tradition of studies of families and households. I then discuss a very general framework to sort out conditions that could account for observed trends. Finally, I review some of the empirical evidence available to adjudicate between alternative explanations.

1. Living arrangements of the elderly, living arrangements of children, and household types

The study of levels, patterns and changes of living arrangements among the elderly has been an important though not always central feature of sociology and demography of the family. The literature on transformations of the family and household living arrangements that accompany or follow industrialization and modernization is thick with references to a transition entailing drastic reductions of joint coresidence of families and members of different generations. The debate on whether such a transition did indeed take place, rather than being an illusion created by demographic constraints, generated a vast literature directly or indirectly documenting a number of changes of elderly living arrangements (Wall, 1989a, 1989b; Smith, 1993; Laslett, 1972; Ruggles, 1987; 1988; 1994; Kobrin, 1976; Wachter et al., 1978; Levy, 1965; Berkner, 1972, 1975; Kertzer, 1989; 1991). There is a long tradition in sociology and social history that deals with this effect of industrialization and modernization on the nature of family bonds and on the related issue of household organization. The central problem is whether or not industrialization and modernization triggered a transition from a system largely dominated by extended households and families to one dominated by simple households and nuclear families. As an offshoot of this transition the prevalence of elderly coresidence with children and other kin decreases, and living alone or with a spouse becomes the norm. Early formulations emphasize the existence of such transition while revisionists assert that such transition is just apparent, an outcome created by an effectively low prevalence of extended families in preindustrial societies to begin with.

Such low prevalence could be the product of either a strong adherence to normative patterns inconsistent with more than minimal household extension, or to constraints imposed by the demographic regime characteristic of such societies, regardless of what the cultural norm or individual preferences were. A revision of this revisionist approach, however, makes it clear that, at least in some preindustrial societies, a regime of extension did in fact exist, that it can be identified if proper measures are used, and that there is an observable transition to the elementary household and family forms (Ruggles, 1994).

By and large the empirical evidence brought to bear on this problem is in the form of distributions of households by type, that is, by categories of households defined according to classes of kin (non-kin) relations that members in the household share. In particular, the strength of coresidence of multiple generations is assessed using measures of the proportion of households that include parents and children (Wachter et al., 1978; Ruggles, 1987; King and Preston, 1990). In societies where the distribution of surviving offspring has a high mean, the fraction of all households containing parents and children cannot be too high, even if, for example, a stem family regime prevails (Ruggles, 1994; Kertzer, 1989; 1991). As shown in the previous section, redefining units of analysis and focusing instead on the living arrangements of the elderly (rather than directly on households) leads to clear evidence of a shift from prevalence of coresidence with children to living alone. This shift takes place even in the presence of a powerful demographic tug originating in sharp increases of survival among both parents and children.

This tension between different types of units of observations also exists if one insists that measurement ought to be centered on children rather than parents. In this case the focus is on the distribution of children (rather than of households) by coresidential arrangement with parents. From first principles one can derive a number of relations between the two (Preston, 1976; Freedman et al., 1991), but the key idea is that for some research objectives only one of them will do.

The argument to focus on elderly rather than on children is the same as the one given to prefer a focus on elderly rather than on all households. That is, the assessment based on children--as was the one based on household types-- is subject to confounding effects produced by demographic forces that affect strongly the distribution of surviving offspring. If one is interested in elderly well-being, it is

advantageous to define direct measures that reflect characteristics of the elderly, not those reflected in characteristics of offspring.[10] As I argue later, this does not mean that characteristics of children are unimportant and should be neglected, but rather that they ought to be regarded as affecting outcomes of interest among the elderly. Thus, coresidence among elderly should have theoretical priority over the alternatives of studying household distributions or children coresidence patterns.

2. Frameworks to explain trends in elderly living arrangements

Coresidential arrangements of the elderly are a strategic element of broader patterns of household organization and part of much larger set of intergenerational transfers. It is sensible then to look for interpretative insights using ideas borrowed from the stock of theories and models designed for the study of these two phenomena.

A number of recently developed frameworks link intergenerational transfers to formulations based on evolutionary theories. These suggest that strong kin networks, familial bonds, and the prevalence of household extension were dominant in pre-industrial societies where they operated as mechanisms to spread the high costs of childbearing and sustain a high fertility regime that offset high infant and childhood mortality. These arguments stress the role of the grandparental generation as an important source of support to younger relatives (Turke, 1989; 1991; Fricke, 1990; Lee, 1997; Kaplan, 1994, 1997; Stecklov, 1997; Kobrin, 1976). To the extent that children and grandparents (and other kin) were able to support the care and nurturing of siblings and grandchildren they maximized reproductive potential under precarious conditions. Strong family bonds and household organization are designed to decrease the costs of these activities for everybody involved. Coresidence, and other forms of exchanges largely realized within the household, represent the context in which most support took place. Without invoking evolutionary principles, Caldwell's theory of intergenerational flows (Caldwell, 1976) also links strong multi-generational family ties and support to the maintenance of high fertility. However, while Caldwell chooses to emphasize the importance of transfers from the

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[10] There is another possibility which is to measure expectancies rather than distributions. Thus, for example, Schoeni (1998) shows that the fraction of elderly living alone and the expected duration living alone behave in somewhat different ways. But since the differences between the two are hardly consequential and the latter is harder to compute, I will choose to focus on the distributional measure.

younger to the older generation, recent evidence suggests that even in pre-industrial societies the direction of net transfers is probably from the old to the young and not vice versa (Turke, 1989; Fricke, 1990; Lee, 1997; Kaplan, 1994, 1997; Stecklov, 1997).

Industrialization and modernization subvert the system of transfer flows by concentrating production outside the household and privileging returns to human capital. The fall in mortality makes unnecessary the maintenance of very high levels of fertility and instead gives way to the need for investing heavily in children. Thus, the props for a system of intergenerational exchange–and the household organization that sustained it-- are weakened and, with them, the entire system of family bonds and exchanges. The direction of intergenerational flows reverses and alternative forms of social support acquire importance as compensating mechanisms, simultaneously freeing the younger generation from obligations toward the elderly and securing for them minimal levels of well-being. The whole ideological superstructure is revamped as the nuclear family becomes a legitimate arrangement and ceases to be a deviant behavioral alternative subject to social sanctions. The new arrangements rest on an individualist ideology that replaces strong familistic sentiments and asserts individual welfare and self-development over the kin group or the clan.

This evolutionary interpretation has much to recommend it. But it fails on a number of counts. First, it is not altogether clear that the flow of intergenerational transfers in preindustrial and high fertility societies is upward at all. Utilizing a simple accounting procedure Lee (1994a; 1994b; 1995; Lee and Palloni, 1992; Stecklov, 1997) documents that in some high fertility settings the direction of flows is, unexpectedly, toward the younger generations, with consumption needs of children dominating over consumption needs of the elderly. Instead, in industrialized societies the direction of transfers is upwards, from the younger to the older generations (Lee and Palloni, 1992).[11] Second, as discussed above, the statement that everywhere in the preindustrial world extended coresidential arrangements were pervasive has proved to be incorrect, at least in some key preindustrial societies where the nuclear family was the norm, not the exception. Third, and more importantly, the explanation inspired in

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[11] This statement refers to overall transfers. Family transfers in industrialized societies are still downwards but are more than offset by large social transfers mostly realized through the public sector.

an evolutionary argument is excessively loose as it does not identify precise mechanisms ensuring the persistence of networks, bonds and exchanges that result in a high density of transfers toward the elderly and, as part of these, coresidence with children and kin. As a consequence, it is difficult if not impossible to formulate defensible hypotheses, much less testable ones, accounting for diversity over time and space.

In a much less ambitious attempt but one that contains the specificity that the evolutionary approach lacks, Burch and Matthews (1987) identify a number of factors that could account for the persistence (change) of household arrangements. Their suggestion is to define key principles, stipulate a few axioms, and formulate explicitly a number of testable explanations for observed changes. The main disadvantage of the approach is that it lacks generality as it is intended to account only for household arrangements and overlooks the totality of intergenerational flows of which coresidence is a part. However, this shortcoming may become less relevant to the extent that one can blend their framework with theories of intergenerational transfers

The object to be explained is household status. Coresidence of elderly with children is just one among other possible household statuses. The main axiom in this perspective is that household type is a composite good that can be chosen by individuals. In doing so they choose some combination of a set of goods including privacy, companionship, domestic services, and consumption economies of scales. Household arrangement is thus not a goal in itself but an instrumental good, a means to an end. This departs somewhat from the traditional microeconomic formulations that emphasize household arrangement as an expression of demand for only one of these goods, namely, privacy and independence. A number of other formulations insist on the centrality of the idea of household as a composite good (Ermisch, 1981; Lam, 1983, 1984, 1986). The difference between the Burch-Matthews formulation and these revisionist microeconomic approaches is that the former contains a more thorough identification of the classes and types of goods produced by household sharing.

This axiom is fundamental for it implies a key principle for investigation. This is that, to the extent that household arrangements may produce a variety of goods, it must also be the case that factors explaining the persistence or change of household arrangements will be found among (a) those

that change individual preferences for these goods, (b) those that alter their prices, (c) those that determine individuals' ability to purchase them.

Three qualifications are in order. First, the effect of these factors is tightly related to the nature of each good appropriated or consumed in a household. Shelter, for example, is a public good 'produced' by the household which is very sensitive to changes in private income. Not so domestic service or recreation. Thus, fine-tuning the definition of goods to establish their relations and classifying them as public versus private, complementary or substitutes, and as inferior, superior or mixed, is of some importance to formulate hypotheses explaining change and persistence in household arrangements. As we will see below, this is done in most research of coresidence of elderly, but mostly in an *ad-hoc,* unsystematic fashion.

Second, the ability of individuals to pay for these goods involves income from labor and from income-producing transfers, from household labor, and a number of less tangible modes of payment such as affection, deference, or credits from past services. The intrinsic value attached to each of these payments may wax and wane and will alter conditions of individual decision-making about living arrangements.

Third, the tug of traditional sentiments and the social sanctions reinforcing them may be strong. Thus, although changes in conditions that affect prices, preferences and income could lead to decision-making where nuclearization is the optimal strategy for individuals, the observed household arrangements may not reflect this at all. Instead, they may lag behind, sustained by social sanctions that continue to reinforce more traditional household arrangements. Consequently, time lags are relevant and they will routinely play a role in groups where social sanctions to prevent deviations from a traditional norm operate with some efficiency.

This very simple scheme is sufficient to pose a number of alternative hypotheses to explain the observed trend toward increased prevalence of living alone among the elderly in the US and Europe, and to anticipate what may happen in the rest of the world. What follows is a review of the main factors that have been invoked to explain increasing trends of living alone. Two shortcomings need to be highlighted. First, not all of these factors occupy the same level of abstraction. Thus, for example,

income is a characteristic that can be associated with the elderly or their children. The same applies to preferences or to other social transfers. Health status, on the other hand, is more likely to be relevant when it refers to the elderly rather than to their children. Second, only in a few cases is the evidence derived from time trends, and the bulk comes from cross-sectional studies. These two classes of evidence are not strictly comparable, do not have the same empirical weight, and may and finally do lead to different inferences.

i. The role of income

A number of analyses lead to the conclusion that "....rising real income among older persons no doubt is one of the main reasons that the proportions living alone have reached such high levels, especially among single or previously married women" (Burch and Matthews, 1987; see also Michaels et al., 1980; Kobrin, 1976; Soldo and Lauriat, 1976; Wolf, 1984). As individual real income increases some goods traditionally produced by households become more affordable. Goods produced outside households, such as recreation, become private goods and replace others that are produced by households. Increases in real income are thought to decrease the propensity of individuals to rely on the public good component contained in the basket of household-produced goods.

This explanation implicitly assumes that goods associated with separate living (privacy, independence) are indeed superior and that when budgetary constraints are relaxed individuals tend to consume them instead of those produced by shared living. The assumption is tantamount to stating that preference for these goods preceded the changes that made their consumption feasible, in much the same way as explanations of fertility decline that invoke the importance of knowledge and availability of contraception implicitly assume that a desire for smaller families precede their advent.

The empirical evidence for an income effect on coresidence among elderly does exist but it is not altogether convincing. In a cross-national study based on individual data Pampel (1992) shows that effects of variables proxying for income are in the expected direction, but they are of trivial magnitude, and that the increasing trend in proportions living alone remains largely unexplained by well-identified conditions. In a decomposition analysis of trends in living alone among elderly widows in the US, Kramarow (1995) also finds that proxies for income account for a fraction of all changes during the

XXth century although, as mentioned before, the key variable does not behave as expected. In an important paper advocating a microeconomic framework with income as the key variable, Michaels et al. (1980) attribute increases in prevalence of living alone largely to the increased ability to purchase privacy and to support independent living afforded by higher incomes. Finally, in a study of CPS data for the US from 1965 to 1990, Mancunovich and colleagues (Mancunovich, et al., 1995) find that the effect of retirement income on the probability of living alone among elderly widows is positive and very strong. However, their analysis does not provide estimates of the amount of change (increase) in the proportion living alone attributable to changes in income and to other factors. Estimation using limited time-trends lead Kobrin (1976) and Soldo (1981; see also Soldo et al, 1990) to argue that, although changes in income may have some important influence, it is to the decrease in the availability of children that one should attribute primary responsibility for observed increases in living alone.

Some of the scarce success to explain time trends using income as an explanatory factor can be attributable to poor measures of real income among the elderly, or to inappropriate controls for relevant variables. Furthermore, the effects of income appear to be highly non-linear (Wolf and Soldo, 1988), and only in a few studies do the models allow for non-linearities.

In developing countries the bulk of studies are of the cross-sectional variety and have not shed any light whatsoever on the nature of changes. We do know, however, that cross-sectional data are not always consistent with the hypotheses that higher income promotes living alone (see above), at least in the simplified models used so far.

More serious than the lack of consistence between theoretical expectations and observable regularities is an interpretative problem. Increases in income among the elderly have taken place as a result of large institutional changes that eroded attachment to traditional norms, transformed individual preferences, and reinforced social transfers. These broader social changes have also led to increases in income of children, and this may also have an influence on decisions about shared living.

Finally, the choice of wealth indicators matters, as is the case with property ownership for example. All three situations (settings where ideologies change simultaneously with material conditions, with children's income, and with the meaning of property ownership) lead to a danger of

overinterpreting the effects of parental wealth on coresidential arrangements: it will be hard to establish whether or not the association between income and living alone is a spurious one, making parental income changes endogenous, not an exogenous causal factor.

There is some evidence that effects of income (or other indicators of wealth) do indeed reflect artifacts. For example, in the study by Kramarow above, changes in the effects of variables have more salience than changes in the variables themselves. A similar finding is reported by Chan and DaVanzo (1996) who find that among unmarried individuals in Malaysia, ethnic differentials in living alone are largely attributable to differences in the effects of variables, not to differences on the values of the variables. Patterns of this sort are typically found in the presence of endogenous effects though, of course, this is not the only possible interpretation.[12]

Thus although there are strong reasons to suspect that income affects elderly coresidence, and that increasing income over time may partially explain the large changes in levels of coresidence in the post-World War II era, the empirical evidence is mixed and the interpretation of findings is not always as transparent and straightforward.

ii. The role of social and other alternative transfers

One of the factors responsible for the increase in real income among elderly is the institutionalization of social transfers via pension funds and safety net programs. More generally, it is widely stated in the literature that a central motive for the maintenance of a net flow of family transfers and coresidence with the elderly is associated with needs emerging in social contexts with poorly developed capital markets, precarious private saving rates, high levels of risk and uncertainty, and devoid of institutionalized mechanisms for social transfers. In view of this one would expect that accounting for social changes that alter such contexts and for the presence and strength of social transfers, would provide some leverage to explain observed changes in levels of living alone. But this is not the case. In the study by Pampel (1992) in Europe, his study of US data (Pampel, 1983), and in

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[12] An interpretative problem of a different nature from that posed by endogeneity has to do with model specification. Thus, Kotlikoff and Morris (1990), show that the interpretation of income effects at one point in time is highly sensitive to the nature of the underlying decision process about shared living. They show, for example, that effects of increase of parental income on the probability of coresidence are a function of both parents and children's preferences for shared living.

one by Keilman (1988) on European countries, the role of social transfers is of trivial importance and cannot account for the observed diversity in levels of coresidence across countries in Europe and over time in the US.

Similarly, coresidence and other family transfers from children to parents continue to dominate even in societies such as Malaysia and Taiwan where, albeit in the absence of significant social transfers toward the elderly, the social and economic contexts are conducive to very high levels of private saving rates (Lillard and Willis, 1995; 1997; Lee et al., 1994). In contrast to these negative findings, Chan and Cheung (1997) report that among Singaporean retirees the availability of social transfers significantly decreases the "...propensity to cite children as his/her main source of financial support." They conclude that "...as coverage of CPF [a form of social transfer] widens, reliance on children as main source of financial support will probably decrease" (Chan and Cheung, 1997). Although the main outcome of their investigation is not coresidence, it is likely that the same conclusion applies to it as it does to other forms of transfers.

In Latin American countries the (aggregate) relation between, for example, levels of coverage and proportion of elderly living alone is close, but it is so partly because countries with a well developed social security system are also those where fertility is lower, where industrialization and modernization have advanced the most, and where changes in the traditional norms may be further ahead. In such conditions, aggregate data will tell us very little about the mechanisms actually involved (Palloni et al., 1999). Deterioration in the real value of social transfers and drastic changes in the mechanisms to enforce them have already led to erosion of wages and pension among the elderly. Future trends are anticipated to get only much worse (Margulis, 1993; Barrientos, 1997). If these changes are indeed accompanied by a decrease in the fraction of elderly living alone, one would have a better case to argue for income effects. This is so because it is unlikely that changes in preferences could operate fast enough to be responsible for the potential decrease in coresidence.[13]

Social transfers are not the only source of alternative support for elderly. So are within-family

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[13] However, see the study by Lesthaeghe and Meekers (1986) where the authors find that short run oscillations in the inflation rate has visible impact on value judgements associated with preferences.

transfers consisting of actual flows of cash or services provided by the younger generations. The institutional changes that facilitate increases in elderly income are also responsible for increasing real income among their children, and for changes in their consumption priorities. If income of adult children rises it is more likely that coresidence with parents could be substituted for other private transfers. Admittedly this requires the relaxation of a regime where stigma or disapproval are attached to children living away from their parents.

In order to test this hypothesis we must examine **jointly** patterns of coresidence and the entire array of family transfers toward parents. As a rule, however, this is not done in studies I surveyed.[14] Instead, researchers focus on either the probabilities of coresidence among the elderly, without considering other transfers from their children, or on the flow of transfers from children to elderly, without considering coresidence. And if they do, coresidence is a control variable, not an outcome variable. For example, in an interesting paper on intergenerational transfers in the US, Hogan et al. (1993) identify three latent patterns of transfers toward the elderly among younger adults. But since coresidence is not considered as an explicit transfer, the patterns identified in their latent class model are subject to measurement error. It would have been desirable to identify latent classes using coresidence as well as other family transfers. The point is that both ought to be modeled simultaneously for they are complementary to and may substitute for each other. Whether this occurs or not and to what an extent may, of course, vary across social and economic settings.

Although not explicitly designed to deal with coresidence, the accounting framework elaborated by Lee (1994a; 1994b) could in principle take account of both coresidence and other transfers. For example, in the estimation exercise performed by Stecklov (1997) for the Ivory Coast one could decompose family transfers into those associated with shared living and those originating in other sources. Weights could be assigned to coresidence as a function of the nature of consumption of household goods. This lead to identification of the relative magnitude of all family transfers. If this

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[14] A noteworthy exception is the analysis of Malaysian data carried out by Haaga and colleagues (1993) where they indeed verify that at least among those in poor health, family transfers are larger in the absence of coresidence. Similarly, Rosenzweig and Wolpin (1993) explictly develop a model where coresidence and other transfers are considered simultaneously. The estimates they derive from US data, however, do not provide a basis for assessing the relations between one and the other since they do not investigate the latter stages of the life cycle.

exercise is carried out with different social groups it is possible to describe the variability in coresidential arrangements simultaneously with variability in other transfer flows (social and family related).

iii. The role of preferences

The role of preferences is a thorn in the side of research on coresidence arrangements for their effects can rarely be identified when they are not measured directly (Myers, 1996). The idea that changes in tastes for privacy and independence are causing rapid changes on living arrangements of the elderly is a plausible one. But there are very few studies that measure preferences directly. For the most part preferences are assumed away, as happens in most research that focuses on changes on the role of income.

Lesthaeghe has argued in favor of the hypothesis that a number of demographic changes, including low fertility, are attributable to individualism. This emerges as an ideological consequence of the advent of a post-modern society, the spread of affluence and the availability of enhanced social transfers and government sponsored safety nets (Lesthaeghe and Meekers, 1986; Inglehart, 1981; Lesthaege, 1983).

An individualistic superstructure, however, may not suffice without subverting the household as a unit of production of goods, a consideration that is especially important in rural areas of the developing world. Growth of individualism is facilitated by reorganization of production and by technological developments that make possible an ample supply of goods, such as recreation and companionship, traditionally produced by households. Other goods, such as personal care for children and the elderly, housekeeping and meal preparation, also become available outside the household, and the opportunity costs for production of these goods by individuals within a household become steeper. If, as some empirical research shows (Lesthaeghe and Meekers, 1986), this connection between individualistic ideology and technological and material development is a plausible one, we face, here again, an endogeneity problem for both income and preferences for living alone are similarly responsive to other factors without necessarily influencing each other.

Despite these massive changes, traditional ideas appear to die hard. Investigations on attitudes of young adults toward the elderly and of elderly people toward their children, the data show an

important regularity, namely, a strong sense of reciprocity and altruism on the part of both young adults and elderly alike. In a study not directly focused on coresidence but on motives for intergenerational exchanges, Logan and Spietze (1995) find that in the US at least, there is a high degree of consensus across ages on responses that favor older persons' interests. They conclude that, in contrast to a public image of selfishness and self-interest, "... age differences in the attitude studied here highlight intergenerational solidarity: older people's attitudes seem to give greater weight to the needs of younger generations, and vice versa. Relations across age groups apparently have an altruistic character--not only in the family, where economists...have come to expect it, but also in the interpersonal realm of governmental programs" (Logan and Spitze, 1995). These findings are not necessarily inconsistent with higher probabilities of living alone among the elderly, provided that the 'losses' incurred by establishing separate living arrangements are indeed compensated by other transfers, either social or familial. But they give less credence to arguments pointing toward a shift in ideology as the main causal factor responsible for trends in living arrangements.

In an analysis of attitudes expressed in focus group interviews in four Asian countries (Philippines, Singapore, Taiwan, and Thailand), Ingersoll-Dayton and Saengtienchai (1997) report that while expressions and manifestations of bonds of solidarity with the elderly are changing, respect remains a central value. While strict obedience is on the decline, focus group participants acknowledge that deference and respect are embedded in many other behaviors. Their findings suggest that, far from being neglected, traditional feelings for the elderly are very much in place.

Similar work with focus groups by Knodel and colleagues in Thailand points to a widespread norm of support for the elderly and elderly preferences of coresidence with children. They conclude that fertility decline, and the entire ethos that accompany the change, may have limited effects on coresidence, "...largely owing to the relative flexibility among Thais with respect to the gender of coresident adult children and particularly with respect to the gender of the child who eventually remains with the elderly parents once all others have left the parental household" (Knodel et al., 1992; p. 96). Opinions by participants in their focus groups reflect well the fact that young adults and elderly alike seem to hold coresidence and other forms of support in high esteem, and they are not about to abandon

them even if smaller families are accepted as the norm.

In apparent stark contrast, a study of elderly in the city of Sao Paolo (Brazil) carried out by Ramos finds that multigenerational arrangements are not necessarily appreciated by the elderly. In fact, he confirms the existence of a positive gradient between probability of living alone and levels of poverty but also discovers "... that the perception of those living in three-generational households, in particular, were often negative. They expressed less satisfaction with life and with family relations, and referred to fewer confidants and people to visit than the average for the sample..." (Ramos, 1994; p.69). This despite the fact that "... they were receiving more personal and nursing care..." (ibid; p.69). On the other hand, those in living arrangements with children (but not jointly with grand children) appear to be more satisfied. It is unclear from this whether lack of satisfaction is a result of overall living conditions in three generational families or the outcome of an inconsistence between actual living arrangements and elderly (or children's) preferences. In a comparison of conditions among Dutch and Tuscan elderly, de Jong-Gierveld and colleagues (de Jong-Gierveld et al., 1997) find that those living alone were more likely to feel isolated and lonely. Isolation and loneliness are two important indicators of emotional dissatisfaction and depression among the elderly. However, living with children was less protective against loneliness than was the presence of a spouse, and having a wide social network and other sources of emotional support helped protect against loneliness independently of living arrangements. This suggests that shared living with children may not always lead to a higher likelihood of emotional satisfaction.

This is all very sketchy and fails to address the main point, namely, whether preferences for living alone--rather than respect for the elderly--have indeed changed. However, these findings cannot be ignored for, if anything, they suggest that there is no compelling and convincing proof of the admittedly more general hypothesis that individualism and self-centeredness could be eroding norms of coresidence. If it changed, preferences for coresidence with the elderly is unlikely to be the product of an overhaul of the ideological foundation of family solidarity. Even if verified on a massive scale, ideological changes are not sufficient proof as it would be difficult to reject the alternative hypothesis that new values regarding coresidence are more a rationalization of new behavioral patterns than their

cause.

iv. The multiplying effect of diffusion

An idea that has attracted remarkably little attention is that norms of living arrangements among the elderly may be diffused and adopted even when the whole set of material conditions that led to their emergence elsewhere are not yet realized in a particular place and time.

The sudden and large fertility decline that takes place in developing countries after 1970 cannot be explained without recourse to a diffusion explanation. The key is not the diffusion of the availability of contraception but of the social acceptance of a low fertility norm. Similarly, it could well happen that under a minimum set of conditions regarding social transfers, for example, the norm of living alone becomes accepted and practiced among groups that have not yet completely developed all conditions that lead to higher prevalence of living alone in other places. The lure of what is 'western' is generalized and powerful, and is not just manifested in completed fertility but family size as well. It may turn out to be even stronger under the onslaught of rapid aging itself (Wolf, 1994a). It is not implausible, then, to think that one of the components of Westernization, nuclearization of families, becomes embedded even in local traditional cultures, much as the low fertility norm is absorbed wholeheartedly by those whose material living conditions lag behind the behavioral innovation.

Admittedly, testing this hypothesis is difficult for it requires long time series, or, alternatively, microdata for different social groups at two or more points in time, simultaneous assessment of material conditions, and knowledge of coresidential preferences.

v. Demographic availability of kin

A constraint on the observed prevalence of coresidence with children is the availability of surviving children. In theory, only one surviving child suffices for coresidence to occur. Thus, the fertility decline experienced in Western societies, Asian countries, and in the majority of developing world should not, in principle at least, precipitate higher levels of living alone since it takes place simultaneously, with an equally sharp increase in child survival. Admittedly the distribution of children surviving per mother has shifted toward lower values and contains much less dispersion than in the past. But declines in fertility could exert immediate pressure on coresidence only if it is accompanied by

widespread childlessness. This is a scenario which could become fact in industrial societies but it is not yet so, and it is far from the reality in developing countries. With a few exceptions, the observed desired family size in many countries and across all cohorts of women does not suggest a future of sharp increases in voluntary childlessness.

The literature on coresidence, however, systematically shows that number of surviving children does matter for the probability of elderly to coreside. In particular, it suggests that elderly with a larger number of surviving children are more likely to coreside. In a thorough review Wolf (1994a) shows that in most studies carried out before 1993 in the US and European countries the probability of living alone is negatively related to the availability of children. Similarly, in an interesting study of US historical patterns the authors venture a prediction of future increases in living alone based solely on oscillations in the number of surviving children (Mancunovich et al., 1995). But these large effects are also seen in Asia (Casterline et al., 1991; Knodel et al., 1997) and in Latin America (Solis, 1999; Agree, 1993). How can this regularity be interpreted?

One explanation is that families with higher number of children surviving are selected for characteristics that motivate stronger adherence to the traditional norm of coresiding with parents. In this scenario the explanatory variables (availability) are endogenous and their effects cannot be interpreted as liberally as is frequently done in the literature (Myers, 1992). A second explanation requires us to invoke auxiliary elements that are, strictly speaking, not part of demographic availability per se. A higher number of children surviving implies a larger and more diverse pool of resources so that either the costs (for children) associated with coresidence can be spread over a larger number of individuals or, alternatively, parents are more likely to find a desirable set of choices (Wolf, 1994a). If only one child is available, the brunt of the costs has to be absorbed by one person, and the range of options narrows down to only two. When the number of surviving offspring is higher there is far more room for adjustment, including the possibility of rotating coresidence. And if there is variance in the characteristics of children, it is more likely that a desirable choice can be at least approximated. This argument assumes a number of conditions regarding bargaining among children which, for the moment, I intentionally overlook.

A third explanation suggested by Knodel is that larger number of children surviving is likely to be associated with higher variance in the ages of children. In particular, families with higher number of surviving children are more likely to contain relatively young ones when their parents are older than, say, 60 or 65. To the extent that younger children are less likely to be encumbered by parental responsibilities, they are more likely to coreside. It follows from this that it is not the availability of children per se that matters, but the characteristics of those available. Although Knodel suggests that the key feature is the age of the youngest, this is but a proxy for the relevant target conditions, namely, those associated with the stage of the life course experienced by all relevant children. Knodel's conjecture finds support in other Asian countries as well (DaVanzo and Chan, 1994; Casterline et al., 1991).

This finding has a few implications. The most important is that as the length of generations rises--childbearing becomes increasingly concentrated at older ages--the proportion living alone will systematically vary by age of parents: it should be lower at younger ages (young-old) and will increase thereafter (oldest old). Thus, the overall proportion living alone will depend strongly on the age distribution of the elderly. In developing countries at least, the cohorts who reach age 60 or 65 by the year 2020 are relatively large cohorts, a result of transient increases in fertility in the fifties and sixties and of steadily declining mortality. But these are the same cohorts adopting norms of concentrated childbearing. Therefore, one would expect that, if everything else is constant, the proportion living alone will decrease for a period of time after 2020 but then increase steadily as these larger cohorts age and their children reach stages in their life cycle that make coresidence with parents increasingly difficult.

If extensively verified, the effects of age of the youngest child need to be interpreted by examining life course characteristics of available children, an idea that has been posed and pursued by Wolf in several papers (Wolf, 1994a).

In addition to their age distribution, a characteristic of surviving children systematically omitted from analyses is their composition by migrant status. A demographic measure of availability only reflects a potential for coresidence but conceals unavailability of those who are migrants. Migration of children from rural to urban areas or from one country to another may reflect household strategies whereby

coresidence is replaced by income transfers in the form of remittances. If this is so, controlling for children' migration status will attenuate the effects of pure availability. This is because migrant children are more likely to come from households with a higher number of children among which migration and other income generating strategies are pursued simultaneously.[15]

The idea that it is not sheer availability that matters has a flip side that has not gone unnoticed. This is that spatial proximity and the ability to establish frequent and easy contact with children and kin may ultimately matter more than shared living in the same dwelling (Wolf, 1994a; Choe, 1987; Florentina, 1991; Cai, 1991; Kendig, 1987; Knipsheer et al., 1995). It may also solve some of the potential problems of coresidence that may lead to elderly dissatisfaction (Ramos, 1994). Spatial proximity to children and the elderly's density of social networks involving children (and other kin) and friends or acquaintances could be considered as substitute transfers, just as are help with income or with provision of services.

Finally, it is worth considering another characteristic of children, namely, their composition by marital status. Although in some extant research a measure of availability of children is the number of unmarried surviving children, the bulk of investigations uses number of children, frequently controlling for their marital status. At least in the US the effects are unequivocal: availability of unmarried children matters more than sheer availability (Wolf and Soldo, 1988). Recent work has begun to explore this theme in depth but from the point of view of parents, namely, assessing effects of parental marital history on the patterns of exchanges flowing toward from children to parents (Pezzin and Schone, 1999). In most other countries in Asia and Latin America marital status matters less as coresidence seems to take place equally among parents and unmarried and married children.[16]

The issue has importance if trends toward a new form of family organization involving high levels of divorce and consensual unions materializes throughout the developing world. This is because

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[15] In reference to our previous discussion on the relation between coresidence and well-being, note that areas of high migration may be among those where parent and children coresidential status is a misleading indicator of quality of living and well-being of the elderly.

[16] In their study in Malaysia, however, DaVanzo and Chan (1994) find that there are important differentials according to marital status **and** gender.

the budgetary, spatial and social constraints imposed by these new types of family arrangements of children are bound to affect their (and their parents') preferences for coresidence, and constrain (or enhance?) shared living even more than the reduction in sheer availability of surviving children.

vi. The health status of the elderly

In virtually all cross-sectional studies of the probability of living alone (or coresiding with children or kin) there is mention of the role of the health status of the elderly. The conjecture is very simple: since the needs of elderly who are disabled or ill are steeper, coresidence ought to be more likely (keeping everything else constant). The empirical record is not at all clear on this score for although the effects are usually in the expected direction (for example, Haaga et al., 1993), their magnitude pales relative to the magnitude of other determinants. In a few studies, the findings are inconsistent with those expected and no relation at all is found (Martin, 1989). In yet others the effects are as expected for some elderly (married) but not for others (unmarried) (DaVanzo and Chan, 1994).

If health status and disability status do have an independent impact, their role in the overall reduction of the probability to coreside should be investigated. In view of the conjecture posed above about the possible increase in disability and chronic illnesses among the elderly in Latin America, one would expect that the trend toward solitary living promoted by other factors would be counterbalanced by the expected deterioration of health status.

Finally, most studies that use health measures rely heavily on self-reports. These are subject to some measurement error but, more importantly, may reflect a state achieved as **a result of coresidence**. That is, some elderly among those who coreside may have been ill and temporarily disabled in the recent past, but recovered after the onset of a coresidence spell.

3. Residential arrangements as a coping mechanism

As is plain from the theoretical framework reviewed before, patterns of elderly coresidence have traditionally been studied with excessively static lenses, as if they were part of inflexible social arrangements or exchanges and lacking in plasticity. As a consequence, we know very little about the social use of coresidence as a **transient adjusting mechanism** to cope with crises, however short lived, triggered by income or property loss, death of spouse, or health deterioration, or as a defensive

resource to offset deleterious consequences of shifts in social conditions that suddenly alter demographic profiles, institutional settings, or property regimes. In all these cases, living arrangements may be temporarily adjusted and tinkered with until conditions in existence before the adjustment are restored, a point in which they may return to their initial state.

An important example of this type of phenomenon is taking place in countries in Africa, as a consequence of the HIV/AIDS epidemic. About ten years ago, simple simulation models suggested that a major adjustment in patterns of coresidence would need to occur to accommodate not just the steep increases in adult mortality, but also the completely changed adult health profile that would ensue (Lee and Palloni, 1992). This has proven to be true but I know of only one effort to assess what the adjustments are for the elderly in the case of Thailand (Wachter et al., 1999a) and none in the case of Africa.

A second example of short-term changes in coresidence patterns of the elderly in response to social shifts may be occurring in a number of countries in Latin America. The most demographically advanced among them (Argentina, Chile, Uruguay), are also the ones where the aging process is proceeding most rapidly and where currency and inflationary crises and draconian restructuring programs have undermined the earnings of the elderly population. They are also those in which reforms of traditional pension systems and publicly funded health insurance programs have been thoroughly dismantled. Although there is abundant anecdotal evidence indicating that there are significant increases in elderly coresidence, I know of no study assessing the impact that these changes have had on elderly' living arrangements. This may undermine our ability to predict what will inevitably occur in other countries, such as Brazil and Mexico, that could rapidly join the ranks of countries such as Argentina, Chile and Uruguay.

IV. Modeling living arrangements of the elderly

This section reviews several classes of models for the study of living arrangements of the elderly. Some of them have been conventionally used in the literature and will continue to be used for a time to come. Others are less developed and their use is much less widespread, but offer a great deal of promise and their properties and implications should be studied further. The section also contains a

discussion of the role of simulation and data needs to shed light on issues that remain poorly understood.

The review is necessarily selected and driven by two rather narrow concerns. First, as mentioned above one of the central motivations for studying living arrangements of the elderly is a practical one, namely, the belief that they have a bearing on levels of elderly well-being. We are normally content with assessments about what the prevalent living arrangements are, examination of the nature of time trends, and the identification of key factors that determine them. Most of the time, however, we neglect to consider related issues regarding residential preferences of parents and children alike, or whether they suffice for satisfying basic necessities. It seems fair to ask whether our models enable us to pass judgements about the extent to which welfare of the elderly is affected by living arrangements.

Second, as reiterated several times in this paper, living arrangements of the elderly are just one among many other alternative resources, and may not even be the most important one. Furthermore, availability of other resources may condition the role played by living arrangements, when they play a role at all. Yet, as I noted before, living arrangements are studied as an outcome in itself, neglecting the entire bundle of resources that the elderly 'consume', including savings, bequests, assets and rents, wages, and family and social transfers. Thus, an important question to ask is whether the models we use enable us to understand complementarities, substitutability and contingencies of living arrangements and other resources, particularly those associated with other family and social transfers.

1. Types of models

I distinguish five classes of models: reduced forms for coresidence (simple and complex), structural forms for coresidence (conditional and unconditional), and structural forms for intergenerational transfers.

i. Reduced forms for coresidence: simple representations

The conventional way of studying elderly living arrangements is to use observable information at one point in time or from a pooled time series data, and then to model the observed probabilities of living alone versus a number of alternative options. If the alternatives are just two, a logit (or probit)

model is used. If there are more than two, a multinomial logit is the preferred choice.

The specification of the models usually proceeds by including covariates in the model that are considered to be good indicators of properties identified in a number of alternative theories about coresidence (old age security hypothesis, parental repayments, risk and insurance, altruism, exchange motive, etc...). In addition, appropriate controls are also included. Oftentimes empirical specifications include characteristics of the elderly but only on rare occasions do they also include selected characteristics of a sample of their surviving children.

The estimation of these models results in a set of regression coefficients, usually in the form of estimates of effects on the log-odds of living alone (versus one or a number of alternative coresidential arrangements). The validity of a theory is then judged by examining the statistical significance of the regression coefficients of the set of indicators associated with it.

The shortcomings of this kind of modeling are many. I focus on three of them that are closely related to the two main concerns stated at the outset of this section.

i.1. Lack of a decision-making model

Perhaps the most important drawback of these models is that they never explicitly pose a representation of what the decision-making process for coresidence is. Even if one neglects the existence of other transfers and ignores their influence on coresidence, the estimated coefficients are largely uninterpretable since we do not know what they refer to, other than to an empirically found association. It is certainly not enough to say, for example, that the effects of the variable income or property ownership are statistically significant and properly signed for we have no theoretical model within which they are assigned some meaning. One consequence of this lack of theoretical specificity is that endogeneity problems plague these studies and, frequently, the researcher pays only passing attention to them. Second is that to the extent that the decision-making process leading to observable coresidential patterns is opaque, comparability of estimated effects over time or over units of analyses is impossible for one does not know at all how differences in estimates should be interpreted. They may simply reflect changes in the importance of the degree to which a variable is endogenous to the process, or be the result of shifts in the social contexts where decisions about coresidence are made. Finally,

individual preferences are never explicitly introduced, and frequently the whole issue of preferences is hardly mentioned at all. The result is that these models cannot even begin to address whether or not elderly residential arrangements increase, decrease, or are neutral with respect to their well-being.

i.2. Absence of representation of entire set of options

An equally troublesome feature of these models is that, more often than not, there is no consideration of alternative coresidence options offered by the array of children and kin available to the elderly. This is not just a difficulty that can be solved by controlling for the demographic availability of children (using the number of children surviving) or kin (using frequencies of available close kin). The problem is that what matters for coresidential arrangements has more to do with the joint characteristics of children vis à vis their parents than with the sheer number of surviving children. Their marital status, their labor force status, their education, and their income are all of considerable importance and ought to be taken into account in suitable ways.

i.3. Lack of consideration of other family and social transfers

A final shortcoming is that the role of other family and social transfers is overlooked. In the rare examples when this is not the case, they are represented as covariates that enter the specification of the model in the same way as any other covariate. Instead, the actual utilization of other transfers could be a function of coresidence (rather than the other way around) as children and elderly may substitute one for the other. More generally, the availability and feasibility of alternative transfers may be an integral part of the decision making process that leads to living alone or to coreside. They should then be considered as joint outcomes about which individuals make decisions. The lack of a solution to this problem leads to difficulties analogous to those described before regarding the availability of children. This is not surprising since they are tightly related to each other. For example, accounting for children's educational effects on the probability of elderly coresidence has relevance for assessing the validity of the hypotheses according to which increased coresidence with the more highly educated among children reflects the existence of repayment of parental investments in children's education.

ii. Reduced forms for coresidence: complex representations

To resolve the problem summarized in (i.2) above, Wolf and Soldo (1988) formulate a more

nuanced model that incorporates all co-residential arrangements that are possible with surviving children. This formulation consists of a multinomial model simultaneously considering all options available to the elderly and making them functions of both the elderly's and, potentially, all of their children's characteristics. It can be applied in cases where there is substantial simultaneous coresidence with children, or when the prevailing rule is one of coresidence with a single child. Estimates of such models can be interpreted more freely than the conventional reduced logit (or probit) approach as they are potentially informative about the influence of all possible parent-children pairings and about their relevant characteristics. So far, however, the actual estimation of these models has been carried out in the absence of a theoretical formulation that makes explicit the underlying decision-making process, and that considers the non-additive influence of alternative forms of transfers.[17]

An important advantage of the model proposed by Wolf is that, with appropriate information, one could include explicit consideration of other family transfers (as associated characteristics of children), as well as other social transfers. In this sense, the model also opens the door to solve problem (i.3). However, since it still does not solve (i.1) it is unlikely that one could interpret meaningfully the effects of variables measuring the existence of other family (via child) transfers.

iii. Structural forms for coresidence: conditional model

To my knowledge, Kotlikoff and Morris (1990) were the first to derive an estimable model of coresidence from a stylized yet informative and potentially rich decision making framework for coresidence between parents and one available child (or kin). The detailed description of the framework is beyond the scope of this paper but its core aspects can be briefly summarized. One starts from first principles, namely, two utility functions, one for a child, U(c) and one for the parent, U(p). Each of them depends on levels of consumption, C, housing services, H, and a pair of coefficients capturing preferences for shared living arrangements, A and B, for the child and parent respectively. In addition, there is a utility function that applies when they choose to live together. This is a weighted average of U(c) and U(p) where the weight is a parameter 2 chosen jointly by the pair. This parameter

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[17] In a generalization of this approach to continuous but truncated variables, Wolf and colleagues suggest using a simultaneous Tobit equation model (Wolf et al., 1997).

reflects the bargaining process between parent and child. However, knowledge of the particular value of 2 chosen by the pair if they decide to live together is not necessary at all to infer their preferences for shared living arrangements. All that is needed is that there be a set of possible values of 2 such that in each case parent and child are better-off living together than living apart. This property is key since it means that the analyst can separate the preferences of elderly parent and adult children from the unknown dynamics of the bargaining process that makes shared living possible.

A final step in the construction of the model is the formulation of a pair of equations for A and B, the unmeasured preferences for the child and the parent. These are made functions of measured characteristics and associated effects, and of individual heterogeneity:

$$A = "_c X_c + g_c$$
$$B = "_p X_p + g_p$$

where A and B are the child and parent preferences for shared living, X_c and X_p are vectors of child and parental characteristics, $"_c$ and $"_p$ are effects, and g_c and g_p are child and parent unmeasured factors.

Coresidence is an event that will occur if and only if a simple condition, K, is met. Condition K can be expressed as a function of A and B and, therefore, determined by the vectors of measured characteristics, associated vectors of estimable effects and, lastly, by unmeasured individual heterogeneity. The precise form of the function on which shared living depends is contingent on the precise parameterization of the g's. The important point is that, under a normal approximation, the final formulation is a model quite different from a conventional reduced form probit or logit.

There are a number of advantages to this approach. The first is that the final functional form for the probability of coresidence that the analyst needs to estimate empirically is entirely determined by the decision making model. This is in contrast to the reduced form models researchers usually use, where the functional form is defined *a priori* as probit or logit or tobit. The second advantage is that the way in which covariates affect the decision about coresidence is not arbitrarily specified but depends on the

nature of the decision-making model. To the extent that the assumptions and properties of this model are altered, so will the form in which individual characteristics or social settings affect the probabilities of finding coresidence for a particular parent-child pair.

Kotlikoff and Morris's model is elementary since it only allows for effects of a limited set of characteristics and their utility functions are, perhaps intentionally, excessively simplistic. However, neither of these shortcomings is fatal as the model can be expanded to accommodate, for example, more complex utility functions and to include the effects of numerous parental and child characteristics omitted in their first application. It is because of this that I believe their model solves problem (i.1). It does not, however, solve problem (i.2) and, consequently, cannot solve problem (i.3).

iv. Structural forms for coresidence: unconditional model

The most important disadvantage of the Kotlikoff-Morris model is that it is limited to one pair, the parent and one available child. In this sense the model is **conditional** on the choice of one pairing. For most interesting cases, this will not do since within each family there might be a number of possible pairs that could lead to shared living between parents and children.

The solution to this shortcoming consists of extending Kotlikoff and Morris model to multiple pairs and then adopting the Two Sided Logit model proposed by Logan (1996) and Logan et al. (1999) to determine the empirically observable coresidence pairs. The resulting model is **unconditional** (on pair chosen for coresidence). An outline of the solution follows.   First, we extend the Kotlikoff-Morris model to consider every possible pair that can be formed between parents and each surviving (available) child. This means that there will be as many U(c) functions as there are children and as many total (family) utility functions as there are possible pairs.[18] As a consequence there will be as many parameters 2 as there are possible pairs for shared coresidence. Each of these captures the bilateral bargaining between a child and the parent, as well as the dynamic of any between-sibling bargaining process.

The second step consists of the implementation of the Two Sided Logit approach proposed by

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[18] A more complicated alternative is to consider a unique but composite family utility function including all children and parents.

Logan et al. (1999) to determine both the equilibrium (stable) solution to the matching problem and to estimate the effects of vectors of parental and children's characteristics. The TSL approach was designed to increase tractability of problems involving a match between two sides. Each side is assumed to have preferences that are functions of characteristics of each member of the pair. The empty set option (no pair formed) is equivalent in our case to choosing the option of living apart.

Estimation of the TSL model is numerically very difficult when the set of pairs that can be formed is very large. However, in the case of coresidence we have a rather small number of possible pairs per family, unless the number of surviving children is extremely large. Therefore the numerical estimation problems should be considerably reduced.

v. Structural forms for intergenerational transfers

The main disadvantage of the extension of Kotlikoff-Morris type models is that they are not designed to deal with the totality of intergenerational transfers, of which coresidence is a part. An admittedly an ad hoc solution that preserves the main properties of the model is to include family or social transfers as part of the vector of parent-child characteristics. However, this is unappealing and unlikely to get us too far in assessing theories regarding joint motives for coresidence and other transfers between parents and children.

The only feasible solution is to build models for overlapping generations such as those proposed by Lillard and Willis (1995), and the richer ones suggested and estimated by Rosenzweig and Wolpin (1993). They are, in principle at least, well designed for addressing the problem of decision-making about coresidence as part of the bundle of intergenerational exchanges, but are difficult to specify, are data demanding, and complicated to estimate, all of which limits their more generalized application.

2. Further developments

While the modeling issues just discussed and their implications for data collection could mean significant advances in the field, more modest undertakings can also improve our understanding of living arrangements of the elderly. I conclude this section at a lower level of abstraction with a brief discussion of desirable analyses of easily obtainable aggregate data. I also identify some improvements in our existing analytic schemes and their application to extant longitudinal data.

i. Aggregate data analysis

A number of interesting issues discussed before could be studied with data already available to us, particularly those in the form of microsamples from national censuses. For example, it is not difficult to create comparable (across time and social settings) measures of poverty from censal data, and to cross tabulate the elderly population by poverty status and a number of relevant characteristics. This will enable us to establish levels of poverty by living arrangements and, when two or more censuses are available, to assess time trends. Modeling of these data for causal inferences is difficult but a subordinate goal, that of understanding the status quo as well as of anticipating where future trends are heading, could be attained.

Similarly, cross-classification of elderly by living arrangements and number of surviving children is a useful exercise to understand patterns of living arrangements by demographic availability, and according to life cycle stages of children. The goal is not to produce precise causal inference but only a detailed demographic accounting to establish whether theoretically interesting relations conjectured by researchers are at least weakly supported.

Finally, cross national studies of microsamples linked to contextual data pertaining to institutional contexts can be useful to identify the variability of elderly living arrangements according to conditions that normally constrain observed patterns of social and family transfers.

ii. Analytic improvements

The plea for collecting and using individual longitudinal data is customary at the end of many papers on living arrangements. There are many reasons for this plea, including the enhanced ability to identify the existence and quantify past transfers and living arrangements. There is a different reason to focus on longitudinal data (even if only in the form of limited panels), namely, the enhanced ability to assess the influence, however transient, of changes in individual or social conditions on coresidential arrangements.

A very simple example is the one regarding the relation between elderly health status and his/her living arrangements. With access to longitudinal data we can estimate reduced form multistate hazard models that, with all their limitations, will shed light on the issue of plasticity of living arrangements. It

could well be, for example, that although the norm of shared living loses its appeal, another norm remains in effect, namely, one that calls for coresidence if and when the health status of a parent deteriorates. Under what conditions associated with individual characteristics (parents and children) and their social context (existence of health insurance schemes, etc...) this occurs, and under which ones is less likely to materialize is of relevance for understanding how levels of well-being of the elderly may fluctuate. These studies can also support the projection of future living arrangements as a function of the health status of the elderly.

The plea for using microsimulation models is also well-known but less frequent. For the most part microsimulation is a tool sparsely used to quantify the effects of demographic conditions on availability (DeVos and Palloni, 1989; Wachter et al., 1999a; Wachter et al., 1999b; Wolf, 1999). The outcomes of microsimulation, however, are silent on issues regarding preferences and propensities and without them their application is of limited reach.

However, as suggested and implemented by Wolf in several papers (1994b; 1999), microsimulation models can be combined with empirical estimates of the probabilities of coresidence, given characteristics of the parent-child pair. If models regarding coresidence were designed to deal with other transfers, there is no reason why microsimulation could not incorporate modules designed to represent jointly the effects of demographic availability, the effects of individual characteristics, and the interplay of coresidence and other transfers. This is a powerful tool that can make tractable thorny issues regarding feedbacks and may, if properly used, provide the needed link between micromodels of intergenerational transfers (including coresidence), and aggregate demographic accounting of the sort promoted by Lee and colleagues.

V. Conclusions

Throughout this paper I insist on the important point that our concern with living arrangements of the elderly ought to be subordinate to the larger concern for welfare among them. This requires that we pose the problem differently from the way in which it has been treated historically. To do so we need to address three interrelated problems. The solution to each of these problems presents its own demands in terms of theories, model formulations, and data collection protocols.

The first problem is to link living arrangements more tightly to levels of well-being of the elderly. This requires that we emphasize as much the precise measurement of elderly (and children's) preferences and desires as we do observed living arrangements. Simultaneously, our data collection efforts should also include objective assessments of levels of well-being by compiling lists of goods consumed and needs that may depend on health status, residential location, and other individual or contextual characteristics. Making inferences about elderly living arrangements that have indeterminate implications for their levels of well-being is a somewhat empty exercise.

The second problem is to understand how living arrangements change as a function of the increase in the aged population itself, the improving (deteriorating) health status of the elderly and the processes that alter the opportunities and constraints of their children (or other kin). In concluding a review of the literature on living arrangements Wolf (1994a) conjectured that perhaps the largest concern of all has to do with feedback effects: as aging of societies proceeds, the growth of the elderly population itself could create conditions for changes in the norms of coresidence and of relations between generations. If they occur, these feedback effects will require time before they can percolate and influence observable living arrangements and other social and familial transfers. Although some of them may be interpretable via diffusion-like models where trends in one social context directly affect trends in others, their full understanding will require fine-tuning of our frameworks, as well as collecting much more detailed information on actual preferences and characteristics of the social, political, and economic settings than what we do now.

By the same token, larger demographic changes that include but are not restricted to rapid aging will influence the characteristics of the life cycle of adult children. Higher prevalence of divorce and consensual unions, shifts in the timing of marriage and of first birth cannot occur without having an impact on patterns of relations between generations. What influences, for example, will massive prevalence of divorce and disrupted families of adult children have on opportunities and desire to coreside with parents?

Finally, a major part of the prospective changes in modern demographic regimes could be substantial increases in longevity. The conditions under which this will occur will necessarily differ by

countries. In some, increased longevity may go hand in hand with better health and longer duration lived as healthy at older ages. In others this may not be the case at all. The consequence could be an increasing demand for care among a much larger stock of elderly people living much longer. What changes will this bring on patterns of living arrangements and what effects will they have on the levels of well-being of the elderly?

The third and final problem has to do with locating elderly living arrangements within a larger context constituted by other family and social transfers. Changes in education and technology will affect productivity and human capital and thus alter the basis of within family transfers. The diffusion of Western-like institutions will provide opportunities for materializing social transfers in societies that did not have them, and globalization of the economy will offer numerous opportunities for changing the nature of capital markets, altering the levels of risks and uncertainties in local economies, and modifying private and governmental savings patterns. Decisions about living arrangements of elderly will be affected by these changes that will surely alter the likelihood, magnitude, and direction of family and social transfers made possible by the new or reshaped institutional contexts. Without considering coresidence and other transfers simultaneously, as complements or substitutes for each other, our knowledge about levels and patterns or elderly living arrangements will continue to lag behind their historical transformations.

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Table 1: Proportion of the population over age 60 (P) and availability ratios (AR):1990-2025 [a]

	Year			
	1990		2020-25	
Region	P	AR	P	AR
Sub-Saharan Africa	.047	12.8	.048	11.8
Eastern Africa	.044	12.3	.048	13.6
Middle Africa	.049	10.9	.046	12.7
Northern Africa	.059	10.4	.093	7.9
Southern Africa	.055	11.5	.066	10.6
Western Africa	.047	11.6	.051	12.1
Eastern Asia	.103	7.2	.178	4.6
South Central Asia	.067	9.4	.101	7.3
South Eastern Asia	.067	9.9	.112	6.8
Western Asia	.068	9.3	.097	7.2
Eastern Europe	.171	4.6	.236	3.6
Northern Europe	.202	4.0	.204	3.2
Southern Europe	.206	4.1	.278	3.1
Western Europe	.202	4.1	.278	3.1
Caribbean	.093	7.4	.141	5.4
Central America	.062	10.1	.106	6.9
South America	.077	8.7	.126	6.0
Northern America	.163	4.8	.235	3.5
Oceania	.132	5.6	.184	4.2

(a) AR is the ratio of population aged 15-59 to the population aged 60+. A more precise indicator of availability requires establishing average length of generations, t(x), between elderly aged x and their children aged x-t(x). One can the form the age specific availabilityratio for age x, AR(x), as the ratio population aged x to the population aged x-t(x). The adjusted availability ratio is the weighted average of the AR(x).

Source: United Nations, World Population Prospects, 1998 Revision.

Table 2: Proportional distribution of population 60+ according to self-reported health status. Selected countries in Latin America and the Caribbean, 1980-95

	Panel A: Unabbreviated categories			
	Males			
Country	Poor	Fair	Good	Very Good
Argentina	3.4	33.6	53.4	9.7
Brazil	22.2	-	62.2	15.6
Chile	20.2	37.9	36.3	5.6
Costa Rica	17.7	38.5	33.1	10.6
Mexico	19.6	47.0	27.8	5.6
Trinidad&Tobago	26.6	32.6	32.6	7.9
USABlacks(HRS)	12.6	22.5	30.6	39.3
USABlacks(AHEAD)	20.4	30.0	28.0	21.6
USAWhites(HRS)	7.7	12.3	28.8	51.2
USAWhites(AHEAD)	12.5	21.0	32.0	34.6

Country	Females			
Argentina	10.0	42.7	40.8	6.6
Brazil	34.9	-	50.6	14.5
Chile	27.6	42.9	34.7	4.9
Costa Rica	20.7	42.8	27.8	8.7
Mexico	22.6	48.5	24.8	4.1
Trinidad&Tobago	37.6	37.1	19.8	5.3
USABlacks(HRS)	12.0	22.7	33.1	32.2
USABlacks(AHEAD)	19.7	29.7	27.6	22.9
USAWhites(HRS)	6.7	14.3	25.8	54.6
USAWhites(AHEAD)	11.5	22.5	30.4	35.8

Sources:
Pan American Health Organization 1989a, 1989b, 1989c, 1990, 1993, except Brazil and Mexico (see Palloni et al., 1999).
For Brazil: Ramos et al. (1997); for Mexico: Gutierrez (1998); for US: Smith and Kingston (1995).

Table 2 (cont.)

Panel B: Abbreviated Categories

Males

Countr	Poor/Fair	Good/Very Good
Argentina	37.0	63.0
Brazil	61.4	38.6
Chile	58.1	41.9
Colombia	55.3	44.7
Costa Rica	56.2	43.7
El Salvador	78.8	22.2
Mexico	66.6	33.4
Jamaica	79.7	20.3
Trinidad&Tobago	59.2	40.8
Venezuela	82.7	17.3
USABlacks(HRS)	35.1	64.9
USABlacks(AHEAD)	50.4	49.6
USAWhites(HRS)	20.0	80.0
USAWhites(AHEAD)	33.5	66.6

Females

Country	Poor/Fair	Good/Very Good
Argentina	52.7	47.4
Brazil	72.8	27.2
Chile	70.5	29.6
Colombia	66.7	33.3
Costa Rica	63.5	36.5
El Salvador	77.6	18.4
Jamaica	86.0	14.0
Mexico	71.1	28.9
Trinidad&Tobago	74.7	25.3
Venezuela	77.3	22.7
USABlacks(HRS)	34.7	65.3
USABlacks(AHEAD)	49.4	50.5
USAWhites(HRS)	21.6	80.4
USAWhites(AHEAD)	34.0	66.0

Sources: See Table 2, panel A.

Table 3a. Proportions of unmarried elderly (65+) living alone in the US: 1910-1990

Year	Unmarried Elderly Living Alone	
	White	Non-White
1910	.12	.16
1940	.21	.15
1960	.39	.30
1980	.66	.47
1990	.70	.49

Sources: Ruggles (1994). Estimates for 1990 calculated from Kramarow (1995)

Table 3b: Proportions of unmarried elderly (60+) living alone in Europe: 1975-1990[a]

	Year	
Country	1975	1990
France	.74	.86
Belgium	.72	.85
Netherlands	.72	.87
West Germany	.60	.77
Italy	.46	.66
Luxemburg	.55	.73
Denmark	.84	.92
Ireland	.37	.56
Great Britain	.75	.87
Northern Ireland	.49	.68
Finland		.70
Czech Republic (1991)		.66
Estonia (1989)	.51	
Romania (1992)		.51
Bulgaria (1992)		.50

(a). No comparable time trends available for Eastern Europe. Estimates for Eastern Europe refer to elderly population 60+.

Sources: Figures for Western Europe calculated from Pampel (1992). Figures for Eastern Europe from Devos and Sandefur (1999)

Table 3c: Proportion of elderly populations living alone in other countries: 1970-1990

Brazil: unmarried elderly 55+   Mexico: all elderly 65+

1960	.11		1976	.07
1980	.20		1994	.07

Chile: all unmarried elderly 60+   Argentina: unmarried elderly 60+

1970	.06		1970	.10
1982	.08		1982	.11

Japan: all unmarried elderly 65+   Thailand: all elderly 65+

1970	.15		1986	.06
1980	.27		1994	.08
1990	.35			

Taiwan: all elderly 65+ (living alone OR with spouse)

1976	.09
1989	.23

Sources:

1. For the US, see Ruggles (1994) and Kramarow (1995)
2. For European countries see Pampel (1992) and DeVos and Sandefur (1999)
3. For Japan see Hirosima (1997).
4. For Taiwan see Hermalin et al.(1996)
5. For Brazil see Agree (1993)
6. For Mexico see Solis (1999)
7. For Canada see Legare (1998) and Kinsella (1990)

Table 4. Proportion of All and Unmarried Elders (60+)[a] Living Alone by Sex - Selected Latin American Countries 1970-1985.

	Total			Unmarried		
	Total	Men	Women	Total	Men	Women
Argentina 1970	10	10	11	21	31	17
1980	11	9	12	22	29	20
Bolivia 1976	12	10	13	23	28	21
Brazil 1970	7	5	9	17	24	14
1980	8	7	10	21	31	17
Chile 1970	6	7	6	12	18	9
1982	8	7	8	15	22	13
Colombia 1973	6	6	6	10	15	8
1985	6	6	6	12	19	9
Costa Rica 1973	6	5	6	12	18	9
1984	8	8	8	17	25	13
Dom. Rep. 1970	7	8	6	12	21	8
1981	7	9	6	15	26	9
Ecuador 1974	8	8	7	15	23	12
1982	9	9	8	19	27	14
Guatemala 1981	5	5	6	12	20	9
Mexico 1970	8	6	10	17	23	15
Nicaragua 1971	8	9	7	14	27	10
Panama 1970	12	15	9	21	35	13
1980	12	15	9	24	38	15
Paraguay 1972	7	7	8	14	23	11
1982	7	5	8	14	20	12
Venezuela 1981	8	9	7	14	23	9

(a) Unmarried refers to individuals not in a union
Source: Micro samples of decennial censuses

Table 5

**Effects of indicators of well-being on the probability of living alone:
Asia and Latin America**

Study	Country (year)	Indicator of well-being[a]	Direction of effect[b]
Martin (1989)	Korea(1984)	ownership	positive
	Malaysia(1984)	ownership	positive
	Philippines(1984)	ownership	(notsignif.)
	Fiji(1984)	ownership	(notsignif.)
Casterline et al (1991)	Philipines(1984)	education	(notsignif.)
	Singapore(1986)	education	(notsignif.)
	Taiwan(1989)	education	positive
	Thailand(1986)	education	(notsignif.)
Chan and DaVanzo (1996)	Malaysia(malays)[c]	income	positive
	Malaysia(chinese)	income	positive
	Malaysia(indian)	income	positive
	Malaysia(malays)	education	(notsignif.)
	Malaysia(chinese)	education	(not signif.)
	Malaysia(indians)	education	(notsignif.)
Da Vanzo and Chan (1994)	Malaysia(1988-89)	income	positive
Solis	Mexico (1994)	income/education	(notsignif.)
Agree	Brazil(1960)	income	positive
	Brazil(1960)	ownership	negative
	Brazil(1980)	income	positive
	Brazil(1980)	ownership	negative

(a) Ownership refers to home ownership
(b) Unless explicitly noted, all effects are statistically significant
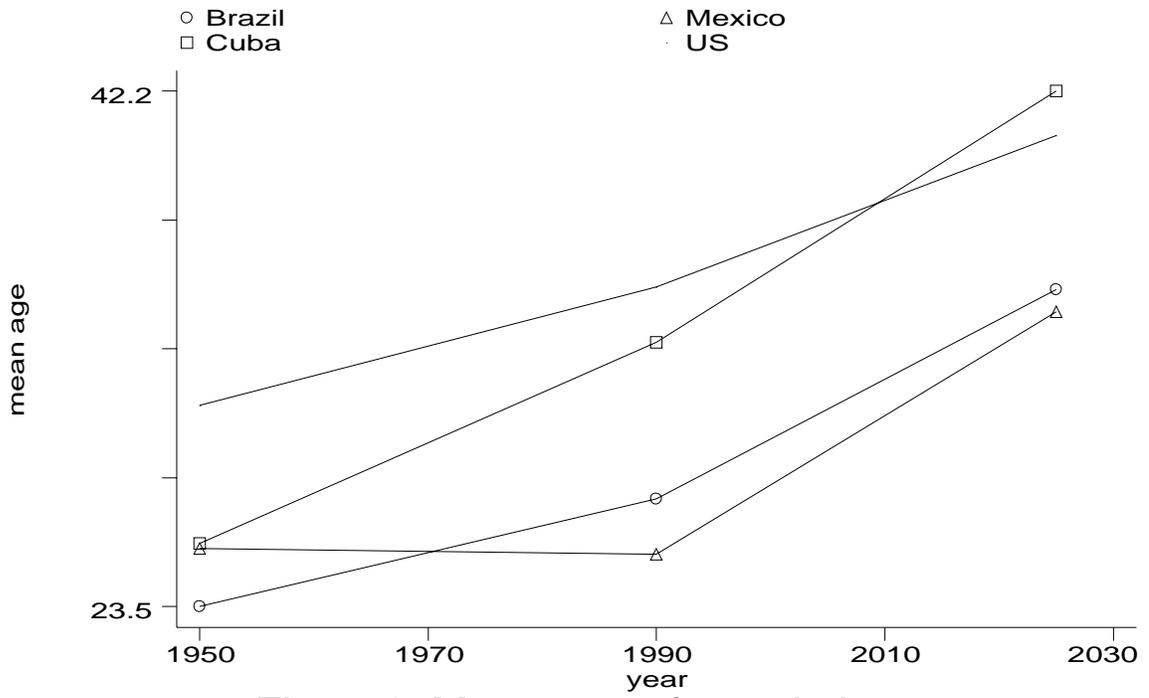(c) Data of survey for Malaysia is 1988-89
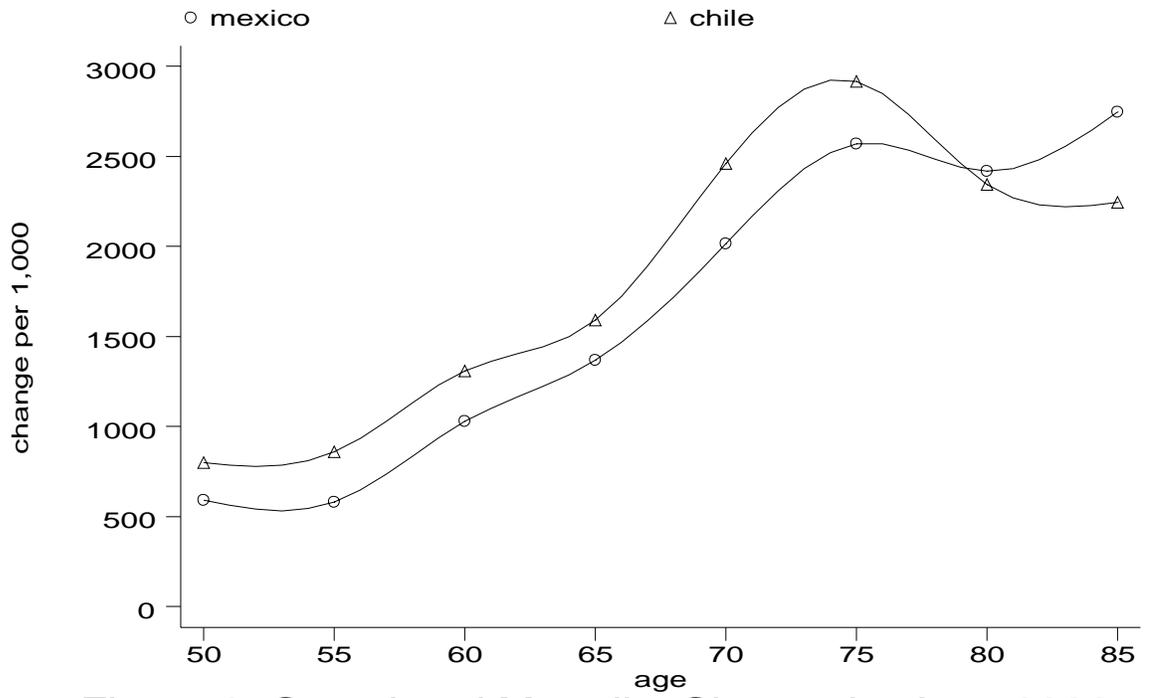
Figure1: Mean age of populations

Figure 2: Cumulated Mortality Change by Age, 2020

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