Trends and transitions in child-coresidence among older adults living in the Beijing Municipality

by

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Abstract

This paper examines first, whether rates of coresidence between older adults and their children in the Beijing municipality region of China have been declining, and second, the determinants of coresidence and coresidence transitions. Reduction in family size expected for China, and concurrent social and economic change, are causing alarm because they may lead to losses in traditional sources of support. Associations with family size and other determinants that fit within categories of availability and need for support, and demographic characteristics, are tested. Data come from a longitudinal study conducted in the Beijing municipality, including urban Beijing and rural surroundings. Results suggest very moderate declines in coresidence from 1992 to 1997. Family size is modestly associated with coresidence, but other determinants are stronger. The use of time-varying covariates in multi-wave transition modeling shows that changes in some need characteristics, for instance, functional health, lead to changes in coresidence. Implications for old-age support within an aging China are discussed.

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INTRODUCTION

A principal concern of those interested in the well-being of older adults in developing societies is the maintenance of material, physical, and psychological support in the face of declining family size and socioeconomic change (Hermalin and Myers 2002; Jones 1993; Martin 1988; Phillips 2000). In most of the developing world, adult children and other family members are considered to be the foundation of support for older adults. A customary system of coresidence between an older adult and a child is often thought to underpin this system (Asis et al. 1995; Bongaarts and Zimmer 2002; Knodel and Debavalya 1997; Logan, Bian and Bian 1998; Sokolovsky 2001). But smaller family size, a consequence of on-going fertility decline, may translate into fewer available children with whom to coreside, and concurrent changes that come with socioeconomic development can lead to higher rates of migration and desires for children to assert their independence, increasing the social, psychological, and physical distance between older adults and their children. As such, a number of writers have expressed apprehension that the support needs of older adults living in societies currently experiencing rapid socio-demographic change will go unmet (Du and Guo 2000; Choi 2000).

The current study addresses these issues by examining recent trends in and determinants of coresidence and transitions in coresidence in China, one of the most rapidly aging and socio-economically developing countries in the world. Reliance on cross-sectional data in most previous studies of this kind has limited tests of causal ordering (Brown et al. 2002). An advantage of a transition analysis, which requires panel data, is the ability to model coresidence state at outcome as a function of a set of determinants and a particular coresidence state measured earlier in time. The current study uses three waves of survey data for this purpose. A particular focus is on how changes in some time-varying determinants that relate to the support needs of older adults, for instance, health status, can trigger certain responses in coresidence transitions.

Population aging, coresidence trends, and support

With about one-fifth of the world's population 60 and older, China currently has the largest number of older adults (Du and Guo 2000). At the same time, this segment of its population is growing rapidly (Zeng and George 2001). About 7% was aged 60 and older in 1950. The proportion has increased to about 10% today, and is projected to reach about 30% by 2050 (United Nations 2002). The population aged 80 and older, nearly non-existent in 1950 and at about 1% today, is expected to increase most rapidly (Zeng et al. 2002). The main cause of this age structure alteration is declining fertility that occurred over the past few decades (Poston and Duan 2000; Jiang and Zhang 2000). Total fertility rates of over 6 children per woman in the 1950's and 1960's have declined to under 2 today. Thus, individuals moving into older age brackets have fewer children than did their predecessors, creating population aging at the country level and fewer children at the family level.

Much has been written about the normative role of filial piety in China and its relationship to child-coresidence. Children are thought to be indebted to their parents and are obliged to secure their well-being through the transfer of physical and material support (Whyte 2003; Yuan 1990). In Confucian writings, duty to and respect for parents is emphasized as a way of proving one's worthiness as well as a way of benefiting the family, the society, and the world (Ebrey 1996). For a variety of reasons, it appears as if the tensions in political structures that occurred since 1949 have done little to reduce the responsibility that the family has in providing for the needs of older adults (Logan et al. 1998; Treas and Chen 2000; Whyte 2003). The role of the family has now been formalized into law, allowing for penalties to those who do not adequate support elderly members of the family (Fricke, Chang and Yang 1994; Leung 1997; Martin 1990).

Coresidence with adult children is considered as the primary way in which contact is maintained and exchange of material and physical resources is facilitated. The role of coresidence in providing support for older Chinese has been verified in a number of studies (Knodel and Ofstedal

2002; Logan and Bian 1999; Logan et al. 1998; Pei and Pillai 1999; Shyte 1997; Whyte and Qin 2003; Yan, Chen and Yang 2003; Yan and Chi 2001; Yuan 1990). Older adults in China tend to state a preference for living with a son and subsequently a daughter-in-law is viewed as the individual within the family most naturally disposed to providing daily assistance to older adults, while, consistent with a patriarchal family structural system, daughters are seen as being responsible for providing care for older adults of the family of their spouse (Logan and Bian 1999; Mason 1992). Hence, the availability of a married son is of particular importance, and those with sons in Chinese societies have been found to be more likely to be in a coresident situation (Knodel and Ofstedal 2003; Logan et al. 1998). Yan et al. (2003) noted that those who coreside with children receive more household help than do others, with those living with a married son getting the most support, while Pei and Pillai (1999) suggested that those with more children and those living with sons and daughters-in-law were happier than others.

The potential that socioeconomic change has for eroding family values has been a long-standing concern (Cowgill and Holmes 1972). Modernization theorists have predicted that urbanization and industrialization serve to alter living arrangement by diminishing the authority of older persons and thus their ability to demand assistance from their family, increasing the desire on the part of children to live independently, and shifting older adult preferences to equally value daughters and sons (Goode 1963; Levy 1966). More recently, it has been the reduction in family size that has been regarded as the most challenging feature of the currently shifting social reality within China (Bannister 1990; Cheung 1988; Hermalin and Myers 2002; Lin 1994; Zeng and George 2001; Zimmer and Kwong 2003). The swiftness of change has, at times, led to a type of 'moral panic' regarding the possibility of unmet needs that could create urgency for public intervention of unprecedented magnitude (Du and Guo 2000; Phillips 2000). Whether or not alarm is justified, it is clear that China is currently experiencing an unprecedented growth in the numbers and proportion at older ages, and given that older adults are among those tending to require the greatest quantity of

support, current and future levels of support for older adults is considered as among the most important academic and policy concerns (Cheung 1988; Gui 2001; Pei and Pillai 1999).

Empirical evidence on the relationship between social, economic, and demographic change and child-coresidence in the Chinese and Asian context has been mixed. Rates of coresidence between an older adult and an adult child have fallen considerably in South Korea and Japan, and this decline is often attributed to changing values within a rapidly developing socio-economic environment (Kim et al. 1996; Maeda and Shimizu 1992). At the same time, coresidence rates in these countries remain far above those in the Western developed world and studies find a continued desire for coresidence (Budak, Liaw and Kawabe 1996; Kim and Rhee 1999). Elsewhere in Asia, coresidence rates and related norms about traditional support roles of adult children have remained relatively stable (Asis et al. 1995; Knodel and Debavalya 1997; Knodel and Ofstedal 2002). Hashimoto (1991) has suggested that availability of children influences coresidence patterns differently across different countries. For Thailand, a country experiencing rapid fertility decline, Knodel, Chayovan and Siriboon (1992) showed that rates of coresidence are not likely to decline into the future since those with one or two children still coreside with a child. In other words, there may be no linear association between number of children and the chances of coresiding with at least one.

For China, Zeng (1990, 1986) proposes that the reduction in family size will lead to an increase in nuclear families. Du and Guo (2000) are particularly doubtful that current customs related to coresidence will survive and suggest that changes away from extended family living arrangements are already taking place. The decline in fertility already experienced, they say, has created a heavier burden of old-age care amongst a smaller number of family members. Other studies are a bit more sanguine, suggesting that coresidence with older adults and the resultant levels of support are not likely to fall dramatically, or that such support may be facilitated through living near to but not in the same household as children, as long as childlessness does not become widespread, though these studies tend to remain cautious due to the likelihood that other social and

economic changes are liable to alter social life for older adults in unforeseeable ways (Lin 1994; Bian, Logan and Bian 1998; Siriboon and Knodel 1994; Zimmer and Kwong 2003).

Determinants of child-coresidence

In order to develop a framework for studying child-coresidence, we draw upon a series of past studies that have examined determinants of coresidence, as well as some that have considered determinants of other types of support indicators either alone or together with coresidence, among older adults in China and within a number of comparable developing societies, (Albert and Cattell 1994; Anh et al. 1997; Budak et al. 1996; Cameron 2000; Chan 1997; DaVanzo and Chan 1994; DeVos 1998, 1990; Frankenburg, Chan and Ofstedal 2002; Hermalin, Ofstedal and Chang 1996; Knodel and Debavalya 1997; Knodel and Ofstedal 2002; Lee and Xiao 1998; Logan and Bian 1999; Logan et al. 1998; Martin 1989; Natividad and Cruz 1997; Weinstein, Chang and Freedman 1994; Yan et al. 2003; Zeng and George 2001; Zimmer and Kim 2001; Zimmer and Kwong 2003). Although language and terminology differ across these studies, there is general agreement that when it comes to characteristics of an older adult (a number of studies examine characteristics of the older adult and their children, although we only have data on the former), determinants can be partitioned into those that generally relate to *availability* and those that generally relate to *need*. In addition, there are demographic characteristics that relate to the propensity to seek and obtain support. This specific terminology, that is, availability, need, and propensity, borrows most directly from Knodel and Ofstedal (2002) and Zimmer and Kwong (2003), although it is also closely related to the notions of supply-demand adopted by DaVanzo and Chan (1994).

Availability refers to the existence and number of children with whom an older adult may coreside. The fear expressed in the literature is that as the availability of children declines, so too does the tendency to coreside, leaving older adults fending for themselves and creating a need for expensive social programs to make up for losses of traditional support mechanisms (Budak et al.

1996; Choi 2000). The hypothesis derived from this is that less availability of children relates to a lower probability of coresiding.

Need refers to an older adults' requirement of material, physical, and psychological support in order to sustain their daily survival. Material support may be more critical among those who have earned less throughout their lives, have no or limited pensions, and otherwise have limited material resources. Hence, indicators of socioeconomic status would indicate need. Older adults who are in poor health, particularly with respect to physical aspects, require help in conducting functioning tasks, like cooking, shopping, or moving about. This type of assistance may require closer proximity than material assistance, which can be remitted from a distance. The availability of a spouse may decrease this need since spouses are already likely to be providing assistance. If normative ideas about the family and its role in older adult support are accepted, one would hypothesize that those who have greater need would be more likely to coreside with children.

Studies that have examined needs and characteristics of children have indicated that these are also important for modeling coresidence (Frankenburg et al. 2002; Logan and Bian 1999). The data we use has limited information on characteristics of children, such as their age, education, and occupational status and therefore we are unable to estimate their influence on coresidence. However, Logan et al. (1998), show that although children's needs are important to consider, it is mainly the needs of the parent that underlies coresidence. For instance, they found that when child characteristics are controlled, frailer adults and widowed parents are much more likely to live with an adult child. Therefore, it appears as if the older adult's own characteristics are of primary importance.

Demographic characteristics are important in that they may influence the ability or desire to seek coresidential living arrangements. For instance, in some societies, females are seen as being more independent, being more able to, for instance, cook and maintain house, and therefore their desire for living with a child may be less than that of males. As adults age, so do their children, and the probability that children will marry and desire an independent household will increase. Age of

children is in turn related to age of parents, and hence age is related to child-coresidence. A number of studies have related urban residence to higher rates of coresidence due to the scarcity of housing in some cities and the related desire to share the expensive living costs (De Vos 1990; Martin 1989; Zimmer and Kim 2001).

There are clearly associations within and between factors. Functional health is strongly related to individual level socioeconomic characteristics (Huisman, Kunst and Mackenbach 2003; Link and Phelan 1995; Preston and Taubman 1994). Age may indicate a need, since those of older age will generally have more health problems. Higher income might on one hand decrease the need of support, but those with higher income may also be in a better position to demand assistance from their children in exchange for material resources. Thus, the domains outlined for the current framework are considered as general guidelines for the selection of covariates.

An additional consideration is that some of the determinants outlined above vary with time, and changes in these time-varying determinants may elicit certain types of responses in living arrangement. Most studies have been unable to speculate on these 'transitional' effects since data used to examine living arrangements tends to be cross-sectional (Brown et al. 2002). Given the panel data we will use in the current study, we can identify three types of changes that may impact on coresidence: health, marital status, and income. Each of these can increase, or for that matter decrease, the need for the support and thus causally trigger a response in coresidence. For instance, an older adult may develop chronic health disorders or experience improvements or deteriorations in functional capacity thus changing their need for daily assistance in carrying out functional tasks (Crimmins and Saito 1993). A spouse may die leaving an older adult without coresidential sources of support, or an older adult may marry decreasing their need. The older adult may stop or start working for pay, thus changing their material needs. Hence, we can hypothesize that those who do not coreside with a child and experience a deterioration in health, loss of a spouse, or loss of income, will be more likely than others to move in with children after the change in need has occurred.

Alternatively, becoming healthier, gaining a spouse, or gaining income, should have the opposite effect.

METHODS

Data

Trends and transitions in child-coresidence are examined using data from the first three waves of the Beijing Multidimensional Longitudinal Study of Aging. This study is planned, administered, and carried out under the direction of Dr. Zhe Tang of the Capital University of Medical Science in Beijing. It involves a series of panel surveys of individuals who were aged 55 and older in 1992. The general purpose of the study is to understand population aging in the Beijing municipal area with specific reference to societal, cultural, economic, functional, and environmental influences. The three waves of data were collected in 1992, 1994, and 1997. A 2000 follow-up was conducted, but the instrument in that year did not include a number of items necessary for the current analyses.

The Beijing municipality, where the study takes place, includes eighteen administrative areas (called districts in metropolitan areas and counties in the rural areas) that encompass three geographic regions: metropolitan Beijing (8 districts), rural plains (5 counties), and rural mountains (5 counties). The rural counties can be more than 100 kilometers from the metropolitan districts. Sampling for the study began by choosing one area from each of the three regions: Xuan Wu (Beijing), Da Xing (rural plains), and Huai Ruo (rural mountainous). These were chosen based on their representativeness to the total Beijing municipal region with respect to a number of socioeconomic and demographic characteristics. The initial sample included 3,257 individuals and the response rate was 90%. Subsequent waves involved returning to original households. Non-respondents included those who moved out of the area within which they were originally interviewed, or those who otherwise could not be found. Survival was determined through interviews with those still living in the household or others living nearby. A non-response for the second wave did not mean a non-

response for the third, as third-wave re-interviews were attempted for all original respondents deemed to have survived. The second and third waves had a combined response rate of 90%. Older individuals and those living within the metropolitan Beijing area were oversampled, but a weighting scheme was established so that the final sample is representative based on age, sex, and within-county population. More details on the data and the sampling techniques can be found in several publications (Department of Social Medicine 1995; Jiang et al 2002; Tang et al. 1999).

The current analyses consider those reporting having at least one living child. Childlessness is not common in China, and this criterion brings the initial sample down to 3,104. Because the current analyses considers transitions across time, those that did not respond in Wave 2 must be considered as non-respondents for Wave 3 even if they re-entered the sample. Figure 1 is presented in order to show the number of individuals responding, dying, and not responding. In total, 1,951 individuals survived the observation period and responded at each wave.

Although response rates are high, it is probable that non-respondents are a select group differing with respect to important social and demographic characteristics from those who do respond. In order to account for non-random non-response when estimating coresidence rates, an additional weighting procedure that adjusted for non-response was conducted for second and third waves. This weighting involved calculating an adjustment factor based on the inverse of the probability that an individual with a specific set of characteristics responded to the survey. The characteristics used included sex, age, rural/urban residence, health, marital status, and living arrangement. Because of the rapid changes taking place to the metropolitan area of Beijing, respondents originally living in Xuan Wu were more likely to move than those originating in Da Xing or Huai Ruo, and as such rural/urban residence is by far best able to distinguish responders from non-responders. Thus, those from Xuan Wu were more likely than others to be non-respondents and their weights are adjusted upwards.

Measures

The outcome in the study is coresidence with at least one child. This information is provided through the use of a household roster that was administered to each respondent at each wave. Those living with a child are coded as 1 and others as 0.

Covariates used in multivariate equations include those representing domains of availability, need, and demographic characteristics. The availability domain includes measures of number of living children and the existence of a son. Number of children is categorized into 1, 2, 3, 4, 5 and 6 or more children. For estimation purposes, we create a series of dichotomous variables that contrast having one versus other numbers of children. Treating number of children categorically is necessary since effects may be nonlinear and there may be thresholds above which additional children do not make a difference. Having a son is coded 1 and those without sons are coded as 0.

The need domain includes two measures of health, three measures of socioeconomic standing, and a single measure of whether an individual lives with a spouse. The latter is coded 1 if a spouse is present in the household and a 0 if not. This indicator is a proxy for marital status, but it relates more directly to need than would marital status since it is possible for an individual to be married with the spouse living elsewhere.

The first health measures is a single dichotomous indicator for whether individuals report a functional limitation or difficulty with an Activity of Daily Living (Katz et al. 1963), that is, an inability to perform one of the following functional tasks: eating, grooming, dressing, getting in and out of bed, bathing, moving around the house, cooking, managing money, shopping, walking 300 meters outside, and walking up and down a flight of stairs. Those that have such limitations are likely to be in greater need of assistance in conducting daily tasks. The second measure is the existence of a chronic condition. Respondents were read a list of possible health conditions and were asked whether they have ever had any of these (stroke, arthritis, glaucoma, cataract, coronary heart disease, chronic bronchitis, and emphysema). We consider an affirmative response to any of these as indicating a chronic health condition. There are two difficulties in using this measure. First, many chronic health conditions are asymptomatic and may require extensive medical examinations to

be identified. Unfortunately, regular medical exams are not necessarily conducted routinely in China, particularly among those living in rural areas. Second, individual conditions relate to differing levels of need. Someone with arthritis, for instance, may require physical assistance much more regularly than might someone with coronary heart disease, even though the latter is more life threatening. It is, however, difficult to analyze the influence of chronic conditions individually given the current sample size. We therefore observe caution when interpreting these results.

The first socioeconomic characteristic is education, coded as having or not having any formal schooling. The second is whether an individual (that is, the older adults themselves) currently receives any income from work or from pension. Specific occupation codes are difficult to determine given the current data, but two survey questions asked respondents to classify the occupation they had had for most of their lives in broad categories (for example, professional, administrator, agricultural worker), and whether this occupation included heavy labor. We dichotomize the measure by first separating the 'white collar' occupations from others, then determining whether the non-white-collar occupation involved heavy labor. We refer to this measure with the terms heavy and non-heavy labor occupations. Some individuals indicated that their occupation for most of their lives was housework. These individuals were also asked the question about heavy labor and thus they are included in one of these two categories. It should be recognized that labor participation rates are relatively high for women in China and only about ¼ reported housework as their occupation.

Demographics characteristics include sex, with females coded as 1, rural/urban residence, with rural coded as 1, and five categories of age (55 to 59, 60 to 64, 65 to 69, 70 to 74, and 75 and older). Multiple categories of age are used because the probability of support is not likely to be linear with increasing age.

Table 1 provides descriptive information on covariate measures used in the current study for the three waves using the original weights for Wave 1 and weights adjusted for non-response for Waves 2 and 3.

Analytical techniques

The analysis proceeds in two stages. In the first, we examine trends in child-coresidence by presenting the percent of individuals living with a child over the three waves. In order to adjust for changes in population composition that may have occurred over time, and in order to examine determinants of coresidence from cross-sectional data, we conduct a logistic regression that pools data across the three waves and controls for the various covariates discussed above, entering observation year into the equation. If there have been changes in child-coresidence trends, then the coefficient for observation year will be significant. The outcome for this procedure is whether an older adult lived with a child in the year of observation. The total pooled sample size is 7,670. This procedure considers robust standard errors that adjust for multiple observations of the same individuals over time.

In the second stage, we examine a three-wave logistic regression model of transitions in child-coresidence. The outcome is child-coresidence status at Wave 3 and we examine associations with characteristics observed at baseline (Wave 1) and, where appropriate, Wave 2. The addition of coresidence status in Waves 1 and 2 means that these results can be interpreted as effects of the covariates on changes in coresidence over time (Brown et al. 2002). This procedure includes only those surviving and responding to all three waves. However, as seen above, a certain proportion of the baseline sample will not survive or will be lost, and deaths and losses are not random. Hence, we also show how the covariates are associated with competing risks of dying versus surviving and responding and surviving and not responding by conducting a multinomial logistic regression.

One of the advantages of the multi-wave approach for analyzing transitions is that it allows us, with greater causal certainty, to examine whether changes in some determinants at an earlier point in time induce changes in child-coresidence. For instance, we would expect that an individual who is healthy at the first wave but unhealthy at the second has a greater chance of moving in with a child, if they do not coreside with one already, or a greater chance of remaining living with a child, if they do

live with one already, than does someone remaining healthy. Hence, the multi-wave analysis considers two types of determinants: those that only remain stable over time, like education and sex, which are measured at baseline only; and those that are at risk of changing over time, like health and spouse-coresidence, which are measured at both Waves 1 and 2. For instance, an individual may have no functional limitations at Wave 1 but may report limitations at Wave 2, and both of these covariates are included in the transition model. Since we control for coresidence status at Waves 1 and 2, we can determine what effect the change in functional limitation has on the probability of changing coresidence status. Since change in time-varying covariates can generally be in two directions, (except for chronic conditions which is an incidence measure), we tested for interaction effects between the determinant at Wave 1 and 2, but none of these were significant, signifying that the effect on coresidence is similar regardless of the direction of the change in the time-varying covariates.

RESULTS

Trends and cross-sectional determinants

Table 2 shows distributions of child-coresidence across waves (1992, 1994 and 1997). The first row provides the percent living with at least one child. This proportion is 64% at Wave 1 and declines to about 61% by Wave 2 and 57% by Wave 3. This change is statistically significant. However, since mortality is not random, and since those in the sample aged over time, it is quite possible that there were changes in the characteristics of older adults that subsequently relate to child-coresidence and that might account for the decline. To illustrate the point, the table shows the percent coresiding in the three years by demographic characteristics. The decline in coresidence remains evident across categories of sex and residence. The same is not true for age. By Wave 2 the sample is aged 57 and older and by Wave 3 it is aged 60 and older, so the 55 to 59 year age group, which shows a decline in coresidence rate from Wave 1 to 2, does not reflect change in coresidence

over time a t the same age due to within-category aging. Within other age groups, there is no statistically significant decline.

Table 3 presents the results of logistic regressions predicting child-coresidence at a given point in time using pooled cross-sectional data. Shown here are log odds ratio coefficients. The significant bivariate associations between year of observation and living with children seen in Table 2 are mostly accounted for by the addition of covariates. There is virtually no significant decline in coresidence between Wave 1 and 2, and there is a slight decline between Wave 1 and 3 that is significant to a .10 level.

As for the cross-sectional determinants of coresidence, there is some but not a substantial amount of association with number of children. Specifically, those with two or three children are more likely to be living with a child than are those with one. But, the chances of living with a child do not increase for those with more than two children. In fact, there appears to be a slight, though insignificant, decline in coresidence for those having more than three children. This pattern suggests that having two living children maximizes the chances of child-coresidence at any given point in time. Having a son is positively associated with coresidence, although the magnitude of the coefficient is small and the result is not statistically significant. It should be noted that the bivariate association between having a son and coresidency is somewhat larger, but the effect becomes minimal when account is taken for other covariates. However, this result is contrary to expectations.

The need characteristics generally relate in expected directions. Those with functional disabilities are more likely than those functionally healthy to be living with a child. Converting the log-odds ratios shown in the table to odds-ratios, having a functional limitation increases the chances of living with a child by a factor of $e^{.278}$ or about 32%. Chronic conditions have no significant effect. Those with education, receiving income, and whose main occupation in life did not involve heavy labor, are less likely than others to be living with a child at any given point in time, although the education coefficient is not statistically significant. Finally, those living with a spouse are much less

likely to coreside with a child than are others. Overall, then, the results indicate that those with higher need are more likely to be coresiding with a child.

The demographic characteristics are significant. Increasing age decreases the chances of living with a child, although there is a leveling off of the age effect after 70. The leveling off at older ages is likely due to the association between the age of the older adult and the age of their children. That is, the older the child, the greater the probability that they will marry and perhaps the greater the tendency to desire independence (Casterline et al. 1991). The greatest chance of living with a child exists among those 55 to 59 years of age. Females and those in rural areas are less likely than are men and those in urban areas to live with a child.

Transitions in child-coresidence

For descriptive purposes, we begin by presenting, in Table 4, the percent of respondents coresiding with a child at Wave 3 by coresidence status at Waves 1 and 2. For instance, the first column of results shows that there were 1,020 individuals coresiding with at least one child at both Waves 1 and 2. Among those who survived, 83.1% were still coresiding at Wave 3 while the other 16.9% changed coresidence status. The second column shows that among the 584 individuals who did not coreside at either Waves 1 or 2, 13.6% changed status. The last two columns present results for those who experienced a change of status between Waves 1 and 2 and it indicates that, first, these individuals were more likely to change coresidence status between Waves 2 and 3 than were those whose status was stable between Waves 1 and 2, and second that these individuals were also more likely to change status by Wave 3 than were the others. In total, about 31% of individuals changed coresidence status at least once between Waves 1, 2 and 3, suggesting a fair amount of fluidity in child-coresidence. Of course, this pattern can only be an underestimate of the actual number of changes taking place since we observe coresidence status at a limited number of fixed points in time.

Also shown are distributions of competing risks by coresidence status at Waves 1 and 2. The most striking finding here is that those who moved from not coresiding at Wave 1 to coresiding

at Wave 2 were the group most likely to have died prior to Wave 3. Specifically, 13.6% of these individuals did not survive. In contrast, only 6.8% of those who moved from coresiding to not coresiding, and 9% to 10% of those whose coresidence status was stable between Waves 1 and 2, did not survive. These numbers might suggest that a change in coresidence is impelled by poor health and the need to be taken care of in the latter years of life. In addition, those moving from coresidence to non-coresidence are likely a younger group of individuals and would be at lower risk of dying.

Table 5 presents the results of the transition analysis and competing risks. For the first column of results, the outcome is living with a child at Wave 3. The results are logistic regression log odds coefficients for covariates measured at Wave 1 and, for variables that may change over time, at Wave 2. Although individuals age as time passes, everyone ages by the same amount, and therefore age is measured at Wave 1 only. In addition, we control for coresidence status at Wave 1 and 2. Controlling for earlier coresidence status allows coefficients to be interpreted as effects on transitions in coresidence. For instance, for an individual who did not coreside at Wave 1 or Wave 2, the coefficient tells us about the influence of a covariate on the probability of living with a child at Wave 3, which is also the probability of making a change in coresidency status. In a similar fashion, for an individual who did coreside at Waves 1 and 2, the coefficient tells us about the probability of remaining in a coresident living situation. For covariates that do not change over time, like education, the results can be interpreted as the effect of the characteristic measured at Wave 1 or Wave 2 (since the characteristic is constant) on transitions in coresidence status. For covariates that can change, the result can be interpreted as the effect of the characteristic at Wave 2 adjusted for the characteristic at Wave 1. In addition, the time-varying effects are additive. For instance, the first column of the table shows that effect of having a functional limitation at Wave 2 on coresidence at Wave 3 for those without a limitation at Wave 1 is .863. The effect of having a functional limitation at Wave 2 for those with a limitation at Wave 1 is .863 + .351 = 1.214.

The latter two columns show the multinomial results for competing risks. Here we show the log odds effects of covariates on the probability of dying versus responding at Wave 3 and of not responding to responding at Wave 3.

Where having two or more children was shown to increase the chances of coresiding at a given point in time, number of children does not significantly influence coresidence transitions, although it is clear from the coefficients that those with three children still have the greatest chance of moving in with a child by Wave 3. Having a son, however, decreases these chances.

The need characteristics again are generally associated as expected, although fewer are significant. Functional limitations, chronic conditions, receipt of income, and living with a spouse, are time-varying. Those with functional limitations at Wave 2 have a much higher probability of living with a child at Wave 3 accounting for functional limitation status at Wave 1 and previous coresidence status. Similarly, those receiving income at Wave 2 are much less likely to live with children than are those not receiving income. Those living with a spouse at Wave 2 are much less likely to live with children at Wave 3. Of the time-varying covariates, only having a chronic condition is not significant. Although education is not significantly associated with coresidence status at Wave 3, the effect is in the expected direction. Those whose lifetime work was in non-heavy labor occupations are, however, significantly less likely to coreside at Wave 3 accounting for earlier coresidence status. These results again suggest that need is most strongly associated with both coresidence and transitions in coresidence over time, with those in greater need being more likely to live with and move in with children.

Although the effects of the demographic characteristics are weaker when it comes to transitions than they were in the cross-sectional results, some age effects remain, with those in the oldest age group being most likely to live with a child at Wave 3 when accounting for earlier coresidence status. Of course, residence status at Waves 1 and 2 are highly associated, with those who coresided earlier being most likely to remain coresident at Wave 3, as was seen in Table 4.

Competing risk results show that those with functional limitations and chronic conditions are more likely to die than are their healthier counterparts. Those with lifetime non-heavy occupations and those living with a spouse at Wave 2 are significantly less likely to die. Higher age is associated with a greater chance of dying, while women are more likely to survive than are men. Only three covariates are significantly associated with non-response. When controlling for spousal-coresidence at Wave 1, those living with a spouse at Wave 2 are less likely to be non-respondents relative to respondents. Rural residents, and those living with children at Wave 2, are also more likely to respond to the Wave 3 survey.

We present a more intuitive understanding of the influence of changes in need on changes in coresidence status in Table 6. Here we show selected predicted probabilities, calculated by using coefficients from Table 5, highlighting effects of the three time-varying covariates that were found to be significant, holding other things constant. The upper part of the table shows probabilities for those coresiding with a child at both Waves 1 and 2. The probabilities shown are for living with a child at Wave 3, hence the upper part displays the chance of maintaining this living arrangement over time. For instance, among those who have no limitations at either Wave 1 or 2, the probability of maintaining coresidence with a child by Wave 3 is .832. However, the probability increases to .919 among those who change functional status from no limitations to limitations. In other words, becoming functionally limited over time increases the probability of remaining in a coresident living arrangement. In the same fashion, losing income and losing spousal-coresidence between Waves 1 and 2 increase the probability of remaining with a child by Wave 3.

The lower part shows probabilities for those who do not live with a child at either Wave 1 or 2 and hence the probabilities here translate into the chances of changing living situations and moving in with a child. Functional health has the greatest net effect, nearly doubling the chances of moving in with a child from, .149 among those remaining functionally healthy to .279 among those becoming functionally unhealthy. Loss of income increases the chances of a change to coresiding with a child from .135 to .203, and loss of spousal-coresidence increases the chances from .137 to .236.

CONCLUSION

We began this paper suggesting that the fertility decline experienced by China over the last several decades, coupled with concurrent changes in socioeconomic structure, lead to challenges for older adults. In particular, there is concern that traditional sources of support will dissipate. This concern is based upon the belief that older adults receive support in large part from adult children who coreside with their older parents, and that fewer children will mean lower rates of coresidence. Using data from the Beijing municipal area, the current analysis first examined whether coresidence rates declined over a five-year period, between 1992 and 1997, and second studied determinants of coresidence at a given point in time and transitions in coresidence using three-wave panel data. The framework adopted suggested that coresidence is determined by a set of characteristics representing domains of availability and need of support, and other demographic characteristics. Availability refers to the supply of children, need refers to the requirement for physical and material support, while demographic characteristics may relate to either of these two domains and also may shape the propensity to seek and obtain support.

By 1997 the older adults in our sample were less likely to be living with their children than they were in 1992. Still, coresidence rates remained high, at nearly 60%. The decline was also found to be of borderline significance once account was taken of confounding changes in sample characteristics. Most probably, increasing age appears to be associated with declining rates of coresidence, likely a function of a life course effect. Older age means that children are also older and may be more likely to marry and set up independent residences of their own. Thus, the aging of the sample explains some of the unadjusted decline in coresidence. Still, a slight decline is noteworthy given the very short duration of the current study.

Our analysis of the determinants of child-coresidence and transitions in child-coresidence suggested that factors that relate to the needs of older adults tend to be highly associated with the chances of coresiding, with those in greater need being most likely to coreside. Three types of need

factors were included, health, socioeconomic, and spousal-coresidence. We found older adults with higher education, earning an income, and those who had occupations throughout their lives that could be categorized as 'white collar' and not involving heavy labor, to be less likely to be living with children and less likely to change coresidence status. Having functional limitations, that is, being unable to perform tasks necessary for daily survival, greatly increase the probability of living with a child and the probability of moving in with a child. In contrast, having a chronic condition was not found to be very strongly associated with coresidence. Although the chronic conditions included in this analysis certainly have some association with functional status, and thus with support needs, the link may not be as clear-cut as is our functional limitations measure. In addition, we have the problem of accurately measuring the existence of a chronic condition in China.

With respect to availability, there was no linear association between number of living children and the probability of coresidence. Instead, we found that having two children as opposed to one was a critical threshold. In one way, this finding has some possibly deleterious implications given China's policy that tends to strongly discourage having more than one child. Although the current generation of older adults, and those that are in the current sample, may have any number of children, older adults belonging to future generations are more likely to have one only, and hence rates of coresidence may decline. But there are other interpretations as well. The results indicate that two children is a good number to maximize the chances of coresidence, and that the decline in fertility, in and of itself, is not the factor that will not lead to catastrophic declines in coresidence. Given the changes taking place to the socioeconomic structure of the country, future generations of older adults are likely to have improved socioeconomic standing, which may also reduce the need for coresidence. Moreover, these results are not inconsistent with the work of Logan and Bian (1999) and Bian et al. (1998) who found that more children translates into more contact regardless of need and that contact and exchange between non-coresident parents and children is high. This suggests that having more children may spread the burden of support and increase the overall level of support from those not coresiding, subsequently lessening the need for coresidence as a form of support. In

a similar vein, Knodel et al. (1992) suggest, for Thailand, that children with fewer siblings feel greater obligation to support parents, while parents with fewer children may invest more in each child, increasing the quality of support from a single child.

Descriptive findings for rates at which changes in coresidence occur are in one way in contrast to those of Frankenburg et al. (2002) for Indonesia, Singapore and Taiwan who found transitions into coresidence to be more frequent than transitions out of coresidence. In our sample, for instance, about 14% of those not coresiding at Waves 1 and 2 moved in with a child by Wave 3, while about 17% of those coresiding at Waves 1 and 2 moved out of the coresidence arrangement. Given that coresidence tends to decrease with age, the aging of the sample over Waves in part accounts for this finding. At the same time, we found almost one of three individuals to have changed coresidence status at some point between the three waves, suggesting a high rate of movement among our sample of older Chinese.

Multivariate analyses of these multi-wave transitions suggested that changes in need indeed trigger changes child-coresidence. For instance, we found that those who had no functional limitations at Wave 1, but had functional limitations at Wave 2, were much more likely to move from not living with a child to living with a child than were those who remained functionally unlimited. This finding in particular lends support to our common understanding of filial support within the Chinese family. That is, adult children are responsible for the older generation's well-being. Physical support, unlike material support, must be provided at close proximity, and moving in with a parent who cannot perform necessary daily functions is a legitimized way of attending to that parent's needs. The finding also suggests that changes in family size may not result in a complete abandonment of the older generation who have the highest need. It also provides some further measure of doubt to modernization perspectives that assume wholesale changes in family structure accompanying socioeconomic development of the economy (Goode 1963; Levy 1966). We see here that the move away from traditional living arrangements is progressing very slowly in China, while at the same time families are continuing to accommodate the older generation.

Similarly, changes in spousal-coresidence and income result in expected changes in coresidence. Logan et al. (1998) showed widowhood to be highly associated with coresidence at a fixed point in time, a finding that is supported by the former result. Clearly, the loss of a spouse, who may be the single most frequent provider of support, raises the level of need for an older adult. The latter finding is, in this case, in agreement with Frankenburg et al. (2002) who suggested that the maintenance of independence is a preference of those continuing to work at older ages.

One curious finding in the transition results is that those with sons were found to be less likely to experience a change in coresidence. Perhaps the existence of a son means that support is more likely being provided from a distance, decreasing the need to be in a coresident arrangement. Yet, this finding is in contrast to Logan et al. (1998) who found those with at least one son living in the urban areas of Shaghai and Tianjin are more likely to coreside with a child. We suggest further research is necessary to clarify the longitudinal influence of son preference on support of older adults. For instance, those with a son may be better off financially without and therefore there is less need for a change in coresidence. In addition, it may still be the case that living with a son affords a greater level of support for older adults. In any case, research has shown that a son preference still exists within the Chinese family (Logan and Bian 1999).

What does the current study add to the issue of the potential of declining support for older adults in China in temporal sequence with the population aging taking place in that country? We see a moderate influence of declining family size itself on the provision of support. But, we suggest that a two-child maximum would be a reasonable policy. However, the net of our findings suggest that changes in other socioeconomic and demographic characteristics, many of which are also in flux in China, may have effects that are much greater than the effect of a reduction in family size alone. The future may bring with it greater levels of rural/urban migration. There are a number of other changes that will take place, the effects of which are more difficult to predict given current data. For instance, there is currently still a strong son preference in China, and a daughter-in-law who lives with their spouse's parent is often the one providing functional support. A reduction in family size

could change the availability of support through the availability of sons. Yet, this is possibly complicated by our relatively insignificant findings related to the existence of a son when account was taken of other characteristics. Education is on the rise, particularly among older cohorts, and this tends to reduce needs for support while increasing desires for independence. There is also likely to be serious reform of pension systems in China that might influence older adults in unforeseen ways. It is difficult to conjecture on how these and other factors will come together to influence coresidence for the growing numbers of older adults, but given the rapid aging taking place, it would seem that social scientists interested in the elderly have some obligation to continue to explore determinants of support.

For the time being, and contrary to some previous literature suggesting a dire situation for older adults has already come to pass (for instance, Du and Guo 2000), our results suggest that family support structures for older adults, if they are indeed facilitated through coresidence, remain relatively intact, particularly for those who require the greatest amount of support. This point requires some elaboration, since it suggests, as others and we have, that there is a close link between the existence of a child in the household and the quality and quantity of support being provided to an older adults. As Hermalin (1995) aptly notes, "coresidence in itself may not mean an active or substantial level of support of the elderly. Conversely, older parents living alone may still have frequent contact and receive substantial support from their children" (p. 5). At the same time, socioeconomic development may provide adult children with a greater array of resources at their avail in the form of money, knowledge, and access to health care, which may be used to assist in the support of aging parents without the proximity afforded by coresidence. Coresidence has been commonly used as a proxy for support in studies in the developing world, partly due to the availability of household roster data from social surveys. But, further research is clearly required to elucidate of the effects of availability, need and demographic characteristics on actual provision of support regardless of coresidence status.

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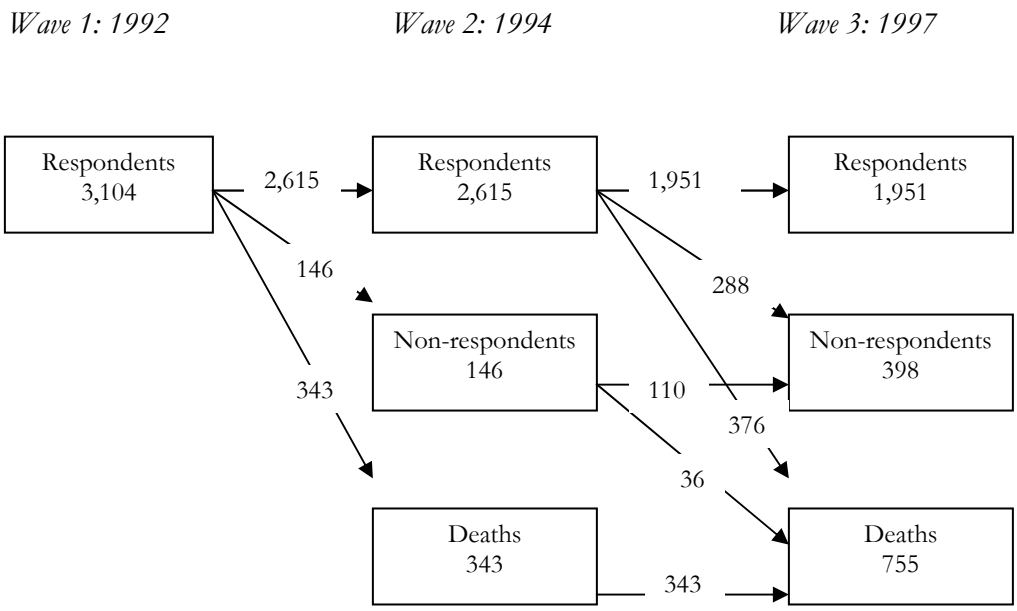
Figure 1: Number of respondents, non-respondents, and deaths in the Beijing Multidimensional Longitudinal Study of Aging[a]



a Numbers omit 153 respondents reporting no living children at any time during observation period. 40 individuals who were non-respondents at wave 2 but re-entered the sample at wave 3 are still considered non-respondents at wave 3.

Table 1: Descriptive information for covariates

	Wave 1 1992	Wave 2 1994	Wave 3 1997
Availability			
Number of living children			
- % with 1 child	5.8	5.8	5.6
- % with 2 children	15.9	15.9	16.5
- % with 3 children	22.1	22.6	21.9
- % with 4 children	23.4	23.7	24.9
- % with 5 or more children	32.9	31.9	31.0
% having a living son	92.4	92.6	92.4
Need			
Health			
% with functional limitation or disability	10.6	8.8	14.5
% with chronic condition	35.2	39.2	55.4
Socio-economic			
% with education	50.4	51.6	53.6
% receiving income from work or pension	64.9	59.6	64.2
% lifetime work was non-heavy labor occupation	43.7	44.4	46.1
% living with a spouse	77.0	75.2	73.2
Demographics			
% 55 to 59	32.1	18.3	0.0
% 60 to 64	24.6	31.7	36.2
% 65 to 69	18.4	19.7	26.3
% 70 to 74	12.1	15.2	18.2
% 75 and older	12.9	15.1	19.2
% female	50.6	51.3	51.0
% living in rural area	49.8	48.5	47.0
N	3,104	2,615	1,951

Table 2: Trends in child-coresidence, showing coresidence distributions across waves (1992, 1994 and 1997) for the total sample and by demographic characteristics

	Wave 1 1992	Wave 2 1994	Wave 3 1997	Significance[a]
% coresiding with at least one child	64.0	60.6	56.5	**
% coresiding by Gender:				
- Males	63.8	59.5	54.6	**
- Females	64.2	61.7	58.4	**
% coresiding by age:				
- 55 to 59	73.4	67.0	---	**
- 60 to 64	63.2	60.3	58.1	ns
- 65 to 69	55.7	54.5	55.1	ns
- 70 to 74	55.0	56.7	49.4	ns
- 75 and older	62.4	65.7	62.1	ns
% coresiding by residence:				
- Rural	62.5	58.7	57.9	*
- Urban	65.5	62.5	55.3	**

** $p < .01$ * $.01 < p < .05$ ^ $.05 < p < .10$ ns $p > .10$

a Based on chi-square test across years.

Table 3: Determinants of living with children at Waves 1, 2 or 3 showing log odds ratios (N=7,670)

	Log-Odds Coefficient
Year of observation or year of original observation (Wave 1, 1992, is comparison)	
- Wave 2 (1994)	-.073
- Wave 3 (1997)	-.110^
Availability	
Number of living children (comparison is 1 child)	
- 2 children	.320^
- 3 children	.332*
- 4 children	.190
- 5 or more children	.236
Has a living son	.018
Need	
Has functional limitation/disabilities	.278**
Has chronic condition	-.107
Has education	-.176
Receives income	-.264**
Non-heavy labor occupation	-.291**
Lives with spouse	-1.028**
Demographics	
Age (comparison is 55-59)	
- 60 to 64	-.506**
- 65 to 69	-.823**
- 70 to 74	-1.016**
- 75 and older	-1.004**
Is female	-.228*
Lives in rural area	-.590**
Constant	1.594
LL	-4881.8
Model χ^2	208.0**

** $p < .01$ * $.01 < p < .05$ ^ $.05 < p < .10$

Table 4: Transitions in child-coresidence, showing coresidence distributions at Wave 3 (1997) by coresidence status at Waves 1 and 2 (1992 and 1994) and competing risks by coresidence status Waves 1 and 2

WAVE 1 STATUS →	**Coresides with child**	**Does not coreside**	**Coresides with child**	**Does not coreside**
WAVE 2 STATUS →	**Coresides with child (N=1020)**	**Does not coreside (N=584)**	**Does not coreside (N=192)**	**Coresides with child (N=155)**
Among survivors responding at Wave 3				
% living with at least one child	83.1	13.6	39.6	53.3
% not living with children	16.9	86.4	60.4	46.7
Competing risks				
% surviving and responding at Wave 3	82.0	81.1	80.6	78.4
% dying prior to Wave 3	9.7	9.0	6.8	13.6
% surviving but not responding at Wave 3	8.3	9.9	12.6	8.0

Table 5: Determinants of transitions in child-coresidence and competing risks

		Competing Risks	
	Effects on Living With a Child at Wave 3	Dying versus Responding	Not responding versus Responding
Availability			
Number of living children (comparison is 1 child)			
- 2 children	.256	-.506	-.027
- 3 children	.401	-.211	-.044
- 4 children	.212	-.248	-.298
- 5 or more children	-.038	-.232	-.248
Has a living son	-.471^	-.164	
Need			
Has functional limitation/disability at Wave 1	.351	.317	-.227
Has functional limitation/disability at Wave 2	.863**	1.272**	.406
Has chronic condition at Wave 1	.172	-.428	.043
Has chronic condition at Wave 2	-.404	1.073**	-.294
Has education	-.301	-.183	.063
Receives income at Wave 1	-.037	-.389	-.475
Receive income at Wave 2	-.530*	-.245	-.192
Non-heavy labor occupation	-.410*	-.455*	-.235
Lives with spouse in at Wave 1	.096	.419	.805*
Lives with spouse at Wave 2	-.719*	-.890**	-1.324**
Demographics			
Age (comparison is 55-59)			
- 60 to 64	.353^	.562	-.065
- 65 to 69	.137	.797*	-.134
- 70 to 74	.374^	.939**	-.009
- 75 and older	.586*	1.693**	.038
Is female	-.083	-.681**	-.025
Lives in rural area	-.218	-.319	-1.477**
Lives with at least one child at Wave 1	1.560**	-.205	.134
Lives with at least one child at Wave 2	2.076**	.142	-.523**
Constant	-1.135	-2.382	-2.009
LL	-878.3	-1398.1	
Model χ^2	430.5**	379.2**	

Notes: Chronic conditions can only change in one direction since measure is incidence. Covariates that are not measured at both Wave 1 and Wave 2 are measured at Wave 1.
** $p < .01$ * $.01 < p < .05$ ^ $.05 < p < .10$

Table 6: Predicted probability of living with a child at Wave 3 by coresidence status at Waves 1 and 2 and selected time-varying characteristics at Waves 1 and 2, holding other covariates constant

Coresidence status at Waves 1 and 2	Wave 1 Characteristic	Wave 2 Characteristic	Predicted probability of coresiding with a child at Wave 3
Coresides with child at both waves			
	No functional limitation/disability	No functional limitation/disability	.832
		Has functional limitation/disability	.919
	Receives income	Receives income	.819
		Receives no income	.883
	Lives with spouse	Lives with spouse	.822
		Does not live with spouse	.902
Does not coreside with child at either wave			
	No functional limitation/disability	No functional limitation/disability	.149
		Has functional limitation/disability	.279
	Receives income	Receives income	.135
		Receives no income	.203
	Lives with spouse	Lives with spouse	.137
		Does not live with spouse	.236