Living Arrangements of the Elderly in India: Who lives alone and what are the patterns of familial support?

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Introduction

In India, the notion of kinship ties for support through the life course is central to everyday life. It stipulates that it is the duty of a child- particularly a male child- to provide parental support in their old age, traditionally in the form of co-residence. Demographic shifts currently underway will have a substantial impact on the Indian landscape, particularly that of the family (Krishnaswamy et al. 2008; Rajan and Kumar 2003). These shifts will be magnified in the year 2050, by which the United Nations projects that 20 per cent of Indians will be above the age of 60 (UN 2010). Three main shifts are noteworthy. First, mortality reductions and improvement in medical technology mean larger cohorts are surviving to older ages. Second, fertility reductions due to effective family planning and changing social norms indicate that in the long run, there will be fewer children to care for more elderly family members. Finally, migration for employment means children are leaving and will continue to leave residences shared with parents, resulting in elderly having to care for themselves or in the company of a caretaker. Due to a shortage of living space coupled with high the cost of living in urban areas, children often have no choice but to leave their parents behind in the place of origin.

An increase in the older population will lead to an urgent need for elder care and support, at a time, in India particularly where traditional family-based care is becoming less the norm than in the past (Arokiasamy et al. 2012). With weak public pension and social security systems coupled with changing household structures, planning for the elderly especially in terms of living arrangements is critical. Added to this, is the fact that there are more elderly women surviving to older ages than their male counterparts (Davanzo et al. 2011). These women were married at a time when large spousal age gaps were the norm, as were low female literacy and labor force participation. Planning for this feminization of aging is thus very important, as is the need to understand experiences leading to vulnerability in old age- financial, familial, or health-related.

Research Question

The main research question is two partite. First, it is important to understand the characteristics of those elderly living alone versus co-residing to parse out the potential determinants of living alone in old-age. Only after we establish this precedent, are we able to then see varying patterns of familial interactions and care from children. The second part of the research question then is, what are the different types of familial support (monetary, communication, in-person meeting) that flows both ways between non-co-residing children and elderly parents.

Previous Literature on Living Arrangements of the Elderly

The western model of family living arrangements is dominated by a nuclear household setup, wherein the elderly either reside independently of their children or in assisted living facilities. Closer to India, Arab countries seem to be moving toward that model; in Lebanon for example, older individuals are more likely to live alone rather than with their children. As Tohme *et al.* (2011) note, the concept of living alone is not straightforward: It could signify financial ability to live independently, while it might also point to social isolation from one's family (Tohme et al. 2011). In the larger Asian context, Martin (1989) finds that the ability or inability to live alone largely depends on survivorship of one's spouse and living children in a study spanning Fiji, Korea, Malaysia, and the Philippines (Martin 1989). Given that women- especially in older birth cohorts- have a large age gap between themselves and their spouse coupled with longer life expectancy at birth, the underlying gender dimension to ageing in India is noteworthy.

Living Arrangements in India

In India, elderly parents co-residing with their children can serve a dual purpose: children can take care of their parents' health and daily needs, while parents can provide childcare for young grandchildren. These are non-financial aspects of co-residence that typify a joint living arrangement. Other benefits include those to elder health, particularly in terms of the relationship between co-residence and self-rated health, chronic and short-term morbidity (Sudha et al. 2006). Additionally, multigenerational households allow a pooling of finances and resources. This can either relieve the household budget constraint in case of strong pension systems, or

exacerbate poverty when most financial support flow is upwards. For elders that live alone, this financial safety net can disappear, adding a potential poverty dimension to ageing in India (Husain and Ghosh 2011). A longer life span of the elderly implies a longer period of dependency on children in the traditional Indian family setting, and thus higher costs to meet healthcare and other needs. In a move to alleviate the financial cost to co-residence, the Indian Government introduced the National Policy on Older Persons in 1999. This policy has provisions for tax relief or children who co-reside with their parents, allowing rebates for medical expenses and giving preference in the allotment of houses (MOSJE 1999). This policy however, is yet to be adopted and enforced by a majority of states, the locus of such policy execution in India.

There is limited evidence emerging from India on the topic of living and caregiving arrangements. What does exist is largely localized to a region (Panigrahi 2009; Sudha et al. 2006), or a pilot covering two states each in the north and south (Longitudinal Aging Study in India)- which are important contributions. The dataset we employ however covers seven states spread through all the regions in the country, as we will discuss in the next section. Panigrahi (2009) finds that in Orissa, the proportion of elderly living alone is on the rise. Mediating factors that reduce the likelihood of living alone include having a son and being financially dependent, while higher education increases the likelihood of living alone. Using National Family Health Survey (NFHS) data waves from 1992-93 and 2005-06; Sathyanarayana *et al.* (2012) show the change in structure of living arrangements in India. They find that about three-fourths of elderly co-reside either with their spouse and/or children and grandchildren (Sathyanarayana et al. 2012). Remarkably, in the short inter-survey period, the proportion of elders living alone or only with their spouse (thus independently of their children) increased from nine to nineteen percent.

There are emergent trends from the literature that warrant attention. First, that the proportion of widows has increased compared to widowers. Second, the elderly that are most vulnerable come from the two lower wealth quintiles. Finally, the intensity

of elderly living alone is evident in rural as well as urban India, rather than being just an urban phenomenon. While the NFHS is helpful in setting the stage of the magnitude of the changing living arrangements, it does not adequately answer why these changes are taking place, and the implications for elders. The novel dataset we use specifically asks such questions to elders themselves, which has not been done in the Indian setting before in such depth. Understanding the composition of households and living arrangements will help formulate evidence-based policies that will help plan for a burgeoning elder population in India.

Data and Methods

We use the Building a Knowledge Base on Population Aging in India (BKBPAI) Survey for analysis. The UNFPA India along with partners at the Institute for Social and Economic Change, Bangalore (ISEC) and the Institute of Economic Growth, New Delhi (IEG) have created the BKBPAI Survey to understand aging in India. In 2011, this survey included 9,852 men and women aged 60 and above spread throughout seven states with the highest proportion of elderly in the country: Himachal Pradesh and Punjab in the North; West Bengal and Orissa in the East; Maharashtra in the West; Kerala and Tamil Nadu in the South. The objective of this project is to create a knowledge base on different aspects of ageing in India by facilitating a series of thematic studies and disseminating the findings to different stakeholders. Along with living arrangements, each respondent was asked a series of questions on various dimensions of aging: socio-economic characteristics, income/assets, health status, healthcare utilization, social security, role within the household and perceptions on ageing.

The main focus of this paper is on understanding the family structure and living arrangements of the elderly across various important categories: age, sex, marital status, educational level, wealth quintile, rural/urban residence, religion, caste, health status, and social benefits.

The paper is two partite to address two research questions. The first portion of the paper presents descriptive and multinomial logistic regression results to answer the question: Which elderly in India are more likely to live alone or with their spouse only? Once we set the stage as to living arrangements in the country, we can answer the second question: What are the patterns of familial support? For this part, we use three criteria to assess support both to and from elderly: frequency of meeting, frequency of communication, and whether there are any monetary transfers.

Dependent variable: Living arrangements in the descriptive analysis are classified as living: alone, with spouse only, with spouse, children, and grandchildren, and others (other relatives, old-age homes). For the purpose of multivariate analysis, since the focus is on disentangling the characteristics of the elderly who live alone, the dependent variable for the set of multinomial logistic regressions is living arrangement coded as: living alone, living with spouse only, or in co-residence (with spouse, children, and/or grandchildren, other relatives).

For the second set of regressions, we use three dependent variables: monetary transfers (yes/no) to the elderly, and frequency of communication and meeting between the elderly and their non-co-residing children, both coded as rarely (0=half yearly, yearly, 1-3 years, 3 years, never) and frequently (1= daily, weekly, fortnightly, monthly, quarterly).

Independent variables: The main predictors are demographic: age, sex, place of residence (rural/urban), marital status (currently married, widowed, other- which includes divorced, separated, never married), education, employment, religion (Hindu, Muslim, Sikh, Other), caste (Scheduled Caste/Scheduled Tribe (SC/ST), Other Backward Class (OBC), and upper-caste), and wealth quintile. We also include health and functionality controls such as self-rated health, ADL, IADL, and abuse after age 60 (physical, verbal, or economic) and various social benefits. For the second set of regressions, living arrangement is included as a predictor as well.

Construction of other key variables:

ADL: The Activities of Daily Living are a set of six domains in everyday life that measure disability. These include bathing, dressing, toilet, mobility, continence, and feeding. Each category consists of potential questions and answers to asses independence. We use the Index of Independence in Activities of Daily Living as formulated by Katz *et al* to construct scores. It is a widely applicable instrument that is used in a variety of settings for the diagnosis of disability in all aging populations (Katz et al. 1970). Each answer receives an equal weight of 1 for independence, and 0 for some or complete dependence within each activity, for a minimum total score of 0 and maximum of 6 for ADL (Shelkey and Wallace 2012). The ADL scores provide objective assessments of disability and are important predictors of living arrangements and health expenses in international settings (Palmer and Harley 2012).

IADL: The Instrumental Activities of Daily Living assess independent living skills and functionality in a way that is more complex than the ADL. These questions identify improvement or deterioration of functionality over time (Graf 2013). We use the Lawton Instrumental Activities of Daily Living scale that covers eight domains: ability to use the telephone, shopping, food preparation, housekeeping, laundry, transportation, medication and finances with scores from 0 to 1. The scores range from 0 to 8 to determine lowest to highest functionality (Lawton and Brody 1969).

Self-rated health: Largely defined as the answer to the question, "compared to others your own age, how do you rate your health- excellent, very good, good, fair, or poor?" This is now considered an objective measure of one's health in international settings (Salomon et al. 2004) as well as a good predictor of mortality among elderly (Mossey and Shapiro 1982) from different socioeconomic strata (Burström and Fredlund 2001). Counter to the view that there is a positive association between measures of SES and self-reported health in developing countries, Subramanian and colleagues find that individuals with less education are more likely to report specific morbidities and rate their health accordingly in India (Subramanian et al. 2009) thus making it a valid indicator for our study.

Pensions: There are various pension schemes from the Central government that are targeted to the elderly population, with implementation and matching contribution at the State level. The Indira Gandhi National Old Age Pension Scheme (IGNOAPS) is targeted to older individuals that fall below the national poverty line. Those eligible are compensated Rs. 200[1] per month for those above age 60 and Rs. 500 per month for those aged 80 and above (MRD 2007). The Indira Gandhi National Widow Pension Scheme (IGNWPS) is not confined to only older widows, but for all widow/ers above age 40 and who fall below the national poverty line. The amount for those eligible is Rs. 200 per month (MRD 2009). Finally, the Annapurna Scheme is a poverty alleviation scheme to provide food security to elderly who should, but are not receiving the IGNOAPS. Each individual is eligible for 10kg of food grain per month (MRD 2000). For the purposes of multivariate analysis, we restrict the answers to, "Do you receive *any* social pension" rather than delving into specifics.

Results

Who lives alone?

The traditional co-residential family living arrangement is the most common practice across all survey states; however there are a few trends that are noteworthy as seen from the profile of elderly men and women by their place of residence and living arrangements (Table 1). A majority of elderly are co-residing but a fifth of all elderly are living alone or with their spouse only; a significant 6 percent living alone. A higher proportion of elderly women than elderly men live alone (10 per cent compared to 2 per cent). This is true in both rural and urban areas of the country.

[TABLE 1 HERE]

The main reason for living alone (Figure 1) is not having children or children living elsewhere, most likely due to migration or marriage. What is striking however is that this is more prominent in urban areas with 77 percent of men and 75 percent of women citing this reason for living alone compared to 56 percent each of men and women in rural areas. Family conflict, or a preference to be independent are the

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[1] The approximate exchange rate in 2011 was approximately Rs. 50 to 1 USD.

other main factors responsible for elderly living alone; with more rural elderly citing family conflict (20% men and 21% women) than urban elderly (9% men and 11% women).

[FIGURE 1 HERE]

Once living arrangements are further disaggregated by background characteristics, other patterns emerge (Table 2). The dominant type of living arrangement across all categories remains living with one's spouse, children, and grandchildren. Widowed older women, those with no education, and have never worked seem to live mostly with children and grandchildren. Marital status, particularly widowhood as a potential determinant of living arrangement emerges as an underlying feature, with about 15 per cent of widowed women and men reporting that they live alone. A higher proportion of Hindus live alone compared to their Muslim counterparts, as well as those in the lower caste hierarchy compared to high-caste Hindus. Presence of living children is also key: In the sample, 9,472 respondents answered the question on surviving children at the time of survey, of which 9,339 respondents reported they had at least one surviving child. 20 per cent reported having only male child/ren, while 10 percent reported only female child/ren, while the rest had at least one of both gender. Elderly with no children lived alone more so than those with children (27 per cent), with important differences by gender of child. About 15 per cent of elderly with only female children lived alone compared to 5 per cent with only male children. Those with lower levels of education and those at the lowest ends of the wealth index report higher levels of living alone as do those who have never worked- a category dominated by women.

Notably, more elderly who report good, fair or poor health live alone compared to those in excellent or very good self-rated health. Respondents score high on average in terms of ADL and IADL, with those living alone or with spouse with slightly higher scores than those in co-residence. About 10 per cent of the elderly reported facing any abuse- physical, verbal, economic- after turning 60, of which a higher proportion are in co-residential arrangements. We describe more of

the health analysis in the section that follows. About half of elderly who live with their children receive a pension of any sort, compared to 10 per cent of those that live alone. When it comes to specific national pension schemes, the story is similar, with those living alone on the lower end of receiving the IGNOAPS and Annapurna at 8 per cent each. Interestingly, a higher proportion of those eligible for widowhood pension receive it if they are living alone than any other pension scheme at 16 per cent.

[TABLE 2 HERE]

Health Status

While we cannot determine direction, i.e: whether poor/good health leads to independent living or vice versa, it is evident that health status and living arrangements are inextricably linked, thus warranting some discussion. As Figure 2 shows, there is variation in ADL and IADL scores by sex and age group. As expected, levels of ADL and IADL decrease as age increases, with the decrease in IADL being sharper than that for ADL. Notably, women across the board have lower ADL and IADL scores compared to men, a departure from literature from other countries that finds the reverse (Murtagh and Hubert 2004).

[FIGURE 2 HERE]

The country is undergoing the epidemiologic transition, with increases in chronic diseases accompanying decreases in infectious disease. Arthritis, high blood pressure, cataract, and diabetes emerge as the top medical diagnoses for men and women (Table 4), with the prevalence of arthritis higher for those living alone compared to other forms of residence for both sexes. Traditional healers and *ayurvedic* treatments for illnesses are uncommon, with most of the sample of elderly opting for private hospitals or clinics for treatment rather than government hospitals (65% to 27%). The source of payment for various treatments differs by sex and living arrangement, as can be seen in Figure 3. Men are more self-sufficient regardless of living arrangement, while women are heavily reliant on their spouse or children for

payment (Figure 3). This measure can be used as a proxy for financial independence, and the gender difference is thus notable.

[TABLE 3, FIGURE 3 HERE]

Central to our research question is which elderly are more likely to live alone compared to others. For this, we used multinomial logistic regression analysis for 2 categories: Those that report they live alone, and those that report they live with their spouse only. For each of these categories, the reference group was those in any form of co-residence (with their spouse and children, or spouse and grandchildren, or other). The benefit of multinomial logistic regression is the ability to retain polytomous responses rather than pooling into binary categories that lose important nuance.

Table 4 shows this analysis with controls for demographic, socioeconomic, health, and social benefit indicators. First: Who is more likely to live alone? Our results in Column 1 indicate that elder who are: older (age 70+), women, widowed, belonging to lower castes, with no children or female children, with more education, score high on IADL, and who faced abuse after turning 60 are significantly more likely to live alone. Of these, the strongest effects are those for widowed elderly, and those with no or female children. There seems to be a protective wealth gradient, with those at the highest end of the wealth quintile significantly less likely to live alone than those worse off. Elders who reported being homemakers, i.e. those who were in unpaid housework were significantly less likely to live alone. Notably, there was no effect of self-rated health, or any significant differences by religion.

Next: Who is more likely to live with their spouse only compared to co-residence with children? Our results in Column 2 of Table 6 show similar patterns to elderly who live alone, with some important differences. First, elders in urban areas are less likely to live with their spouse only compared to those in rural areas, indicating differential norms for familial structures. Second, religion does seem to play a role, with Muslim elderly significantly less likely to live with their spouse only compared to their Hindu counterparts, while Sikh elderly are more likely to live

with their spouse only. Finally, elderly who have worked before are more likely to live with their spouse only compared to those that are currently working.

What are the patterns of familial support?

The next set of questions related to living arrangements explored the type and extent of interaction between the elderly and their non-co-residing children. In the BKBPAI survey sample of 9,852 elderly respondents, 9,339 (94.7%) had at least one surviving child. Of these, 7,840 elderly (84%) had at least one non-co-residing child. One limitation of the survey is that the questions on interaction and familial support were asked only of elderly with at least one non-co-residing child, thus our analytic sample is restricted to those 7,840 elderly respondents. It is important to note that female children dominate the non-co-residing children category, with 6,778 non-co-residing female children compared to 1,062 male children, largely due to cultural norms that state the son resides with parents while the daughter lives with her husband after marriage. The questions on interaction were bimodal: support from children to elderly, and from elderly to children. We analyze both below.

Table 5 shows bimodal communication and meeting by sex of child and living arrangement of the parent. Two trends are noteworthy: frequent communication and meeting are the norm, with female children doing both more so than male children. This is true for frequent communication from parents to children as well, with female children receiving more interaction. Second, male children on a higher proportion than female children report never communicating or meeting with elderly parents that live alone or with spouse only.

[TABLE 5 HERE]

Interestingly, these patterns of higher involvement by female children hold for monetary transfers as well. About 42% of female children send money to elders living alone, compared to 36% of male children. However, the reverse holds true for all other living categories. Table 6 also shows that elders in all living arrangements have some individuals who send money to their children, thus indicating a

downward flow in addition to what they receive. About 10 per cent of elders who live alone send money to a male child, while 7 per cent send money to female children.

[TABLE 6 HERE]

Children to Elders

Table 7 shows the logistic regression results for frequent communication, meeting, and transfers from children to elderly. Due to sample size constraints for male non-co-residing children, these analyses combine male and female children. Elders who live with their spouse only (versus co-residence), Muslims, those of OBC caste, with higher education, higher wealth index, and higher IADL score are more likely to receive frequent communication from their non-co-residing children. Conversely, those living in urban areas, belonging to the Sikh faith, who have male children only, and those who receive a pension are less likely to receive frequent communication from their children.

Similarly, elders who live alone or with their spouse, aged 80 and over, Muslim, and those in the middle wealth index are more likely to receive frequent visits from their non-co-residing children. Similar to communication, those in urban areas, in upper castes, and with only male children are less likely to meet. Additionally, those who have faced abuse are less likely to receive frequent visits.

Finally, elders who live alone or with their spouse, aged 80 and over, Muslim, have only male children, who reported being homemakers in the past, worked before, report poor or fair health, have higher IADL score, and receive pension are more likely to receive transfers. Conversely, Sikh elderly, those with female children, who score high on ADL, and faced abuse in the last month are less likely to receive transfers.

[TABLE 7 HERE]

Elders to Children

When analyzing the reverse flow of support- that from elders to children, the results are striking, as seen in Table 8. For instance, those in the OBC caste, high education, higher wealth quintiles, higher ADL and IADL score are more likely to communicate with their children. Those that receive pension, report being in fair health, having only male children, belonging to the Sikh religion are less likely to communicate with their children.

Meeting follows different patterns as well, with elderly living with spouse only, higher wealth index, higher ADL and IADL are more likely to meet their children. Those reporting fair or poor health, higher levels of education, higher caste, Sikh, and living in urban are less likely to meet their non-co-residing children. Similarly, elders living with spouse only, those in very good health, higher IADL score are more likely to transfer money to their children while those that have worked before are less likely to transfer money to their children.

Discussion

In sum: older individuals, women, widowers, those with no or female children, those that are highly functional and educated and who faced any abuse in old age are more likely to live alone or with their spouse only compared to co-residential arrangements. Additionally, there is an element of religion that is associated with living arrangement as Muslim elderly are less likely to live with only their spouse, signaling different kinship structures than their Hindu counterparts.

There is a strong wealth gradient that indicates that the richer individuals are, the less likely they are to live alone or with their spouse only- or conversely, economically disadvantaged are more likely to not be in co-residential arrangements, thus indicating that financial status is strongly related to living arrangement in old age. It is not possible to establish the direction of impact between these two indicators due to the cross sectional nature of the survey. It is possible however, as Husain and Ghosh (2011) note that co-residence allows the pooling of resources, thus elevating reported wealth of the individual (Husain and Ghosh

2011). Additionally, since children in India are the main source of old age security in India, then it is likely that coresidence is a way to secure of financial security.

Unlike Panigrahi's findings, our results do not indicate that the presence of male children mitigates the likelihood of living alone; instead, the presence of female children is associated with an increased likelihood of living alone or with spouse only. Our study does confirm that education and living alone are positively related, similar to Panigrahi's study (Panigrahi 2009). Surprisingly, we do not find any significant relationship between self-rated health and living arrangement which may imply that this is a weak objective measure of health among elderly in developing countries. Further study is warranted.

In terms of interaction and familial support, there are interesting patterns of note. That elders in urban areas do not have familial support by means of communication and meeting is not surprising, given that support networks tend to be stronger in rural areas. Female children have differential patterns of familial support than male children, with females indulging in more by way of communication and meeting, while male children are more likely to assist monetarily. Health and functionality are important indicators of interaction: those in worse health are more likely to receive monetary support, while those in better health are more likely to send transfers to their children. Pensions do not seem to protect elderly in terms of living arrangements, instead, compound familial support: elderly who receive pensions are also more likely to receive monetary support from their children. This could also mean that these are the most vulnerable elderly who need both public and private transfers. Interaction terms in the multivariate models are needed.

It is possible then, that India is moving toward a more western system of living arrangement, where highly educated, functional elderly in good health are more likely to live independently of familial structures by choice rather than compulsion. There is however the fact that widows and women are the most vulnerable of the survey group, who need better safety nets by way of governmental schemes behind the backdrop of changing household structures in India.

Table 1: Percentage distribution of elderly by type of living arrangement according to residence and sex, 2011 (N=9,852)

	Rural			Urban			Total		
	Men	Women	Total	Men	Women	Total	Men	Women	Total
Alone	2.1	9.3	5.9	1.7	10.5	6.5	2.0	9.6	6.0
Spouse only	21.4	12.9	17.0	19.2	7.0	12.6	20.8	11.3	15.8
Spouse, children, and grandchildren	57.6	25.7	41.0	59.3	22.5	39.3	58.0	24.9	40.6
Children and grandchildren	12.4	43.6	28.6	11.3	50.6	32.7	12.1	45.5	29.7
Others	6.5	8.5	7.6	8.5	9.4	9.0	7.0	8.8	7.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	2,453	2,685	5,138	2,219	2,495	4,714	4,672	5,180	9,852

Table 2: Percentage distribution of elderly by type of living arrangement and background characteristics, 2011 (N=9,852)

	Alone	Spouse only	Spouse, children, and grandchildren	Children and grandchildren	Others	Total	N
Demographic Variables							
Age							
60-69	5.9	15.8	47.3	23.4	7.6	100.0	6,239
70-79	6.5	17.4	33.1	35.4	7.6	100.0	2,601
80+	5.5	11.8	20.9	51.1	10.7	100.0	1,012
Sex							
Men	2.0	20.8	58.0	12.1	7.0	100.0	4,672
Women	9.6	11.3	24.9	45.5	8.8	100.0	5,180
Residence							
Rural	5.9	17.0	41.0	28.6	7.6	100.0	5,138
Urban	6.5	12.6	39.3	32.7	9.0	100.0	4,714
Marital Status							
Married	0.5	26.2	67.3	0.0	6.1	100.0	5,847
Widowed	14.4	0.0	0.0	76.8	8.8	100.0	3,768
Other	15.5	0.0	0.0	44.1	40.5	100.0	237
Religion							
Hindu	6.5	16.7	40.2	29.5	7.2	100.0	7,781
Muslim	4.7	6.9	41.4	34.0	13.0	100.0	804
Sikh	2.7	14.6	46.2	27.2	9.3	100.0	826
Other	7.0	19.7	34.4	29.4	9.5	100.0	441
Caste/tribe							
SC/ST	6.2	15.6	39.7	31.2	7.4	100.0	2,383
OBC	7.6	16.8	39.1	29.4	7.1	100.0	3,353
Other	3.9	15.0	43.5	28.5	9.2	100.0	3,872
Living Children							
None	26.9	23.2	8.2	2.2	39.6	100.0	133
Only a male	5.2	12.2	42.7	35.1	4.8	100.0	1,899
Only a female	15.0	35.9	15.5	18.9	14.9	100.0	911
A male and female	3.8	13.3	45.9	31.7	5.4	100.0	6,529
Socioeconomic variables							
Education							
None	7.3	14.0	32.8	38.0	7.8	100.0	4,588
1-4 years	4.5	13.7	43.3	30.0	8.5	100.0	1,258
5-7 years	5.8	14.0	46.8	25.9	7.5	100.0	1,324
8+ years	4.1	21.9	53.0	12.8	8.2	100.0	2,682
Wealth Index							
Lowest	13.6	22.3	29.5	27.9	6.8	100.0	1,954
Second	6.8	17.6	39.0	29.4	7.3	100.0	1,974
Middle	4.0	13.6	43.0	31.4	8.0	100.0	1,938
Fourth	1.2	11.7	47.2	31.0	8.9	100.0	1,962
Highest	1.4	10.7	49.4	29.0	9.6	100.0	2,018
Employment							
Never worked	10.5	9.1	23.5	46.6	10.3	100.0	529
Housewife/homemaker	6.0	11.2	28.9	45.2	8.7	100.0	3,057
Worked before	5.0	17.5	44.9	25.0	7.6	100.0	4,002

Currently working	6.7	20.4	52.1	13.8	7.0	100.0	2,264
Reasons for current employment							
Choice	2.6	17.9	58.8	13.2	7.5	100.0	660
Economic Need	7.9	21.4	49.8	14.1	6.9	100.0	1,498
Other compulsion	15.2	21.1	45.0	12.2	6.5	100.0	107
Health and Functionality							
Self-rated health							
Excellent	4.8	15.0	52.8	23.5	3.9	100.0	259
Very good	2.9	17.5	50.6	21.6	7.4	100.0	1,345
Good	7.1	18.1	40.7	27.3	6.8	100.0	2,947
Fair	6.0	15.1	39.7	30.8	8.3	100.0	3,592
Poor	6.5	12.4	33.7	37.4	10.0	100.0	1,688
Mean ADL (0-6)	5.9	5.9	5.8	5.6	5.7	-	9,852
Mean IADL (0-8)	5.9	5.5	5.1	4.1	4.7	-	9,852
Abuse history							
Never	5.6	15.7	41.1	29.6	8.1	100.0	8,865
After 60	10.4	20.3	34.7	27.6	7.1	100.0	504
In the last month	8.4	13.4	38.6	33.3	6.4	100.0	483
Social Benefits							
Receive pension	10.1	13.0	24.6	43.6	8.8	100.0	9,852
National Old Age Pension Scheme	7.2	20.7	34.7	29.6	7.9	100.0	7,651
Annapurna Scheme	7.9	15.7	46.2	25.1	5.0	100.0	3,802
Widowhood Pension Scheme	16.9	0.3	1.2	69.9	11.8	100.0	7,025
State							
HP	4.0	18.4	44.1	26.8	6.7	100.0	1,482
Punjab	3.3	13.3	46.5	28.2	8.7	100.0	1,370
WB	6.3	8.8	38.5	32.2	14.2	100.0	1,275
Orissa	2.8	16.5	46.1	30.9	3.8	100.0	1,481
MH	5.7	13.8	45.1	28.7	6.7	100.0	1,435
Kerala	3.6	11.1	38.6	34.5	12.3	100.0	1,365
TN	16.2	27.5	24.9	27.1	4.3	100.0	1,444
Total	6.0	15.8	40.6	29.7	7.9	100.0	9,852

Figure 1: Main reason for living alone or with spouse (N=9,852)
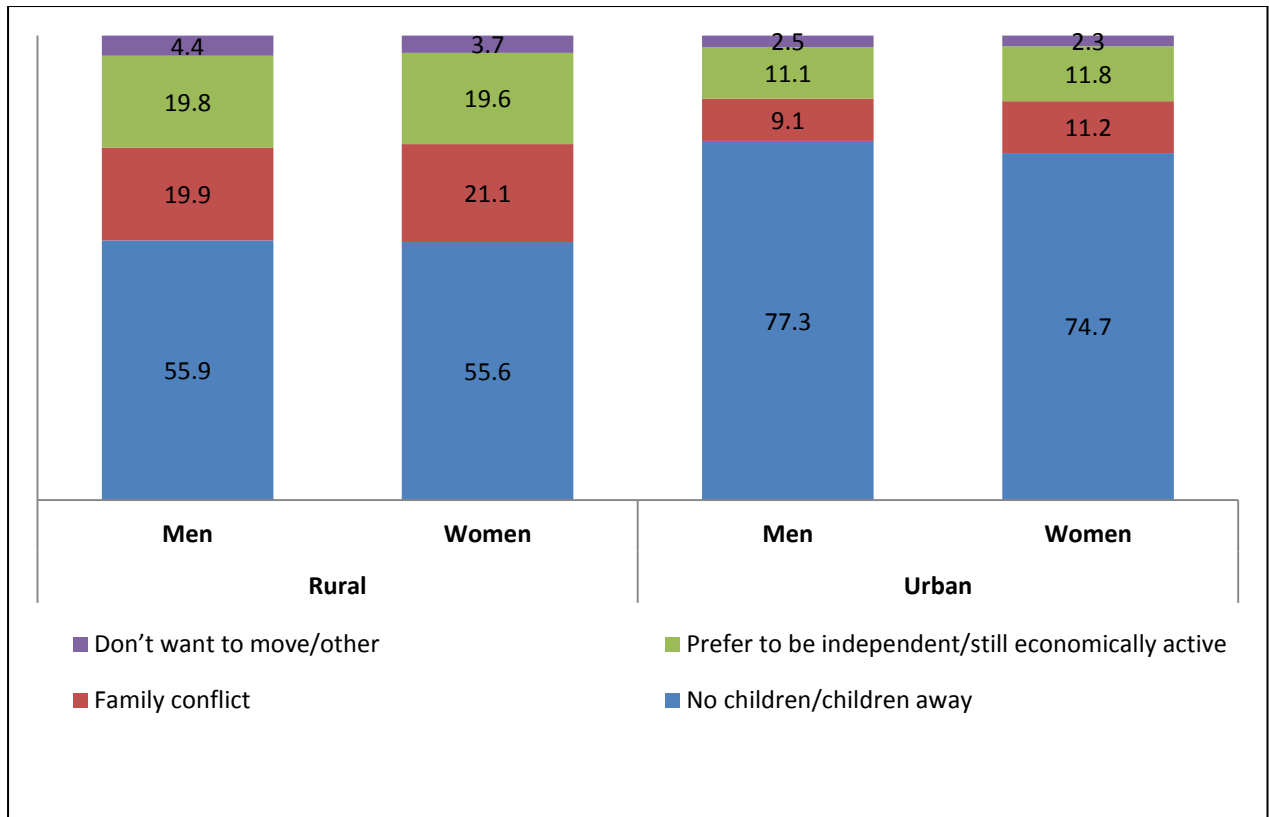
Figure 2: Mean ADL and IADL by Sex and Age Group (N=9,852)
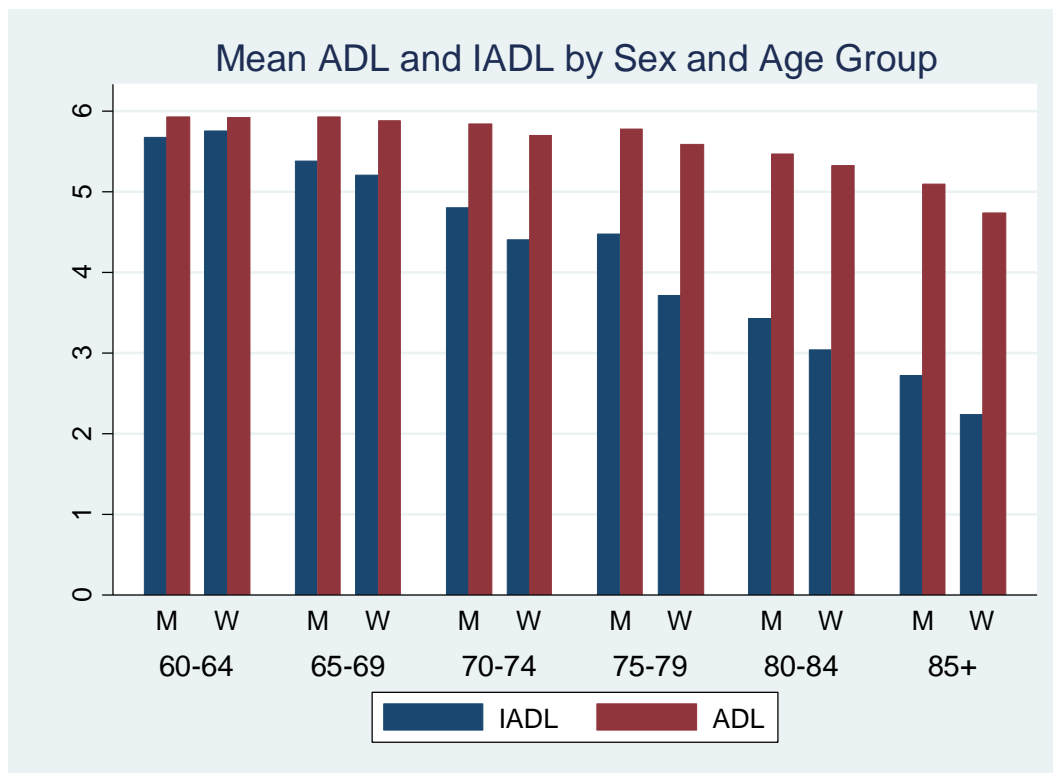
Table 3: Top 10 chronic morbidity indicators (per 1,000) by living arrangement and sex (N=9,852)

			Men			
	Alone	Spouse only	Spouse, children, and grandchildren	Children and grandchildren	Others	Total
Arthritis	348	231	240	267	239	244
High Blood Pressure	119	185	180	140	224	178
Cataract	94	108	113	176	150	122
Loss of Natural Teeth	145	103	107	163	144	117
Diabetes	122	97	105	89	121	103
Asthma	30	78	89	105	116	89
Heart Disease	28	66	66	50	102	66
Renal Disease	26	37	30	28	27	31
Skin Disease	31	29	26	50	31	30
Fall	0	23	33	32	17	29

			Women			
	Alone	Spouse only	Spouse, children, and grandchildren	Children and grandchildren	Others	Total
Arthritis	307	385	332	333	351	338
High Blood Pressure	138	183	235	271	271	239
Cataract	117	100	102	163	156	136
Loss of Natural Teeth	88	101	130	143	161	131
Diabetes	65	93	103	101	132	100
Asthma	69	50	59	74	77	67
Heart Disease	40	43	50	59	47	52
Fall	31	38	41	47	41	43
Osteoporosis	8	38	31	34	30	31
Skin Disease	18	29	21	22	9	21

*As per doctor's diagnosis

Figure 3: Source of Payment for Treatment of Chronic Morbidity by Living Arrangement (N=9,852)

Source of Payment for Treatment of Chronic Morbidity by Living Arrangement

Table 4: Multinomial Logistic Regression for odds of living alone or with spouse only (ref: co-residence)

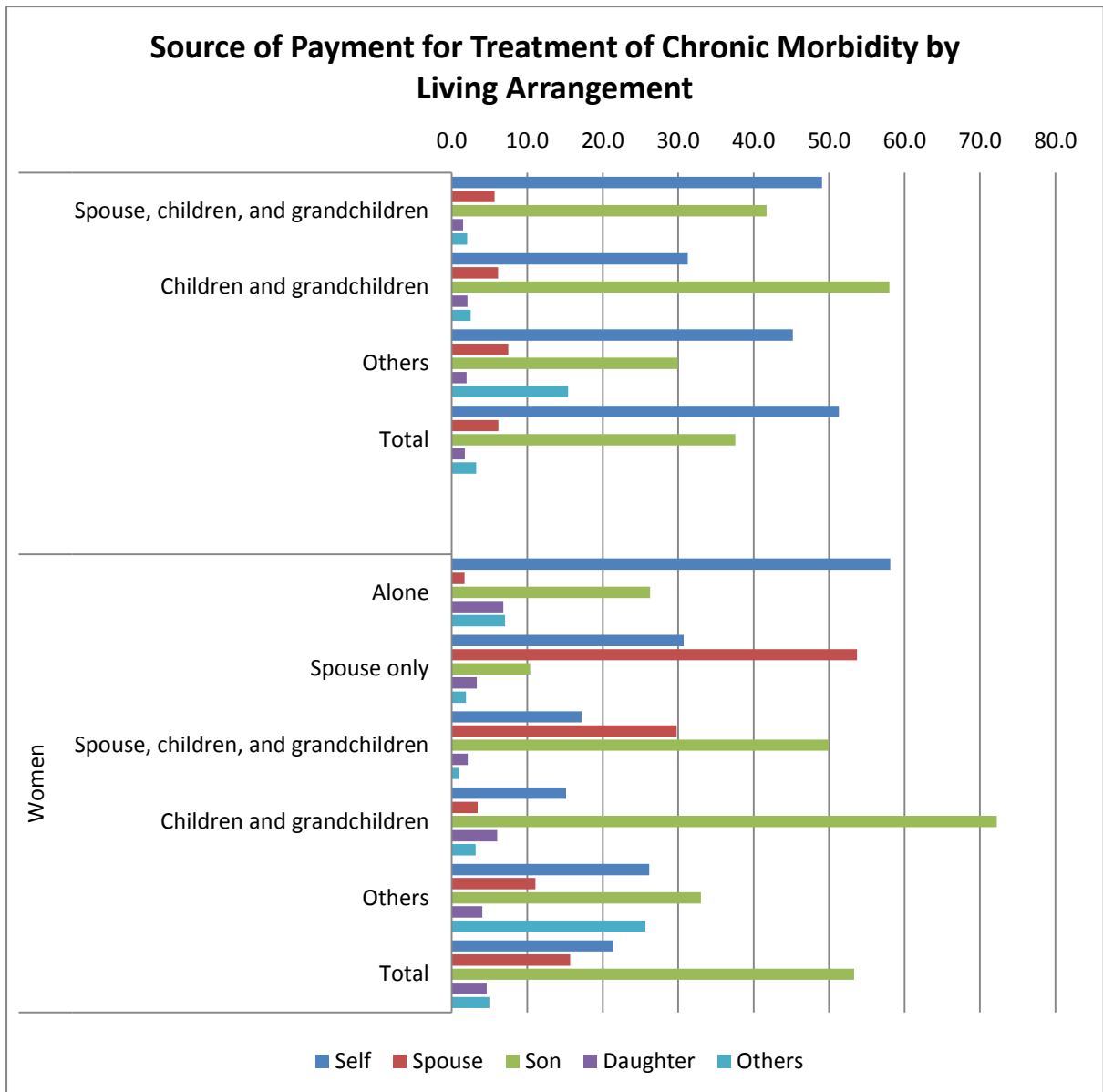| Demographic Variables	Living Alone					Living with Spouse Only				
	RRR	SE		CI	CI	RRR	SE	Significant	CI	CI
Age (ref: 60-69)										
70-79	1.92	0.26	***	1.47	2.51	1.88	0.16	***	1.59	2.22
80+	1.96	0.40	***	1.32	2.92	2.31	0.36	***	1.70	3.14
Women (ref: Men)	1.70	0.30	***	1.20	2.39	1.81	0.21	***	1.45	2.26
Urban (ref: Rural)	1.12	0.14		0.88	1.44	0.76	0.06	***	0.65	0.89
Marital Status (ref: Married)										
Widowed	16.85	3.48	***	11.23	25.26	0.00	0.00		0.00	.
Other	9.09	3.47	***	4.30	19.21	0.00	0.00		0.00	.
Religion (ref: Hindu)										
Muslim	0.77	0.20		0.45	1.29	0.41	0.08	***	0.28	0.60
Sikh	0.88	0.27		0.48	1.60	1.42	0.21	*	1.07	1.88
Other	1.26	0.35		0.74	2.17	1.23	0.21		0.88	1.72
Caste/tribe (ref: SC/ST)										
OBC	2.07	0.32	***	1.53	2.80	1.30	0.13	**	1.07	1.59
Other	1.72	0.29	***	1.24	2.39	1.19	0.12		0.98	1.45
Living Children (ref: One boy and one girl)										
None	6.85	2.02	***	3.85	12.21	4.90	1.35	***	2.86	8.41
Only a male	1.15	0.17		0.86	1.53	0.88	0.08		0.73	1.06
Only a female	4.02	0.63	***	2.96	5.46	5.68	0.60	***	4.61	6.99
Socioeconomic variables										
Education (ref: None)										
1-4 years	1.00	0.20		0.68	1.47	0.90	0.11		0.71	1.14
5-7 years	1.75	0.34	**	1.20	2.55	1.07	0.13		0.84	1.36
8+ years	3.86	0.77	***	2.62	5.70	2.06	0.23	***	1.66	2.55
Wealth Index (ref: Lowest)										
Second	0.25	0.04	***	0.19	0.34	0.47	0.05	***	0.38	0.59
Middle	0.10	0.02	***	0.07	0.15	0.29	0.04	***	0.23	0.37
Fourth	0.03	0.01	***	0.02	0.05	0.19	0.03	***	0.14	0.25
Highest	0.02	0.01	***	0.01	0.04	0.14	0.02	***	0.11	0.19
Employment History (ref: Currently working)										
Never worked	1.06	0.26		0.66	1.70	1.21	0.27		0.79	1.87
Housewife/homemaker	0.62	0.11	**	0.44	0.88	0.89	0.13		0.67	1.17
Worked before	0.86	0.14		0.63	1.18	1.28	0.11	**	1.07	1.52
Health and Functionality										
Self-rated health (ref: Good)										
Excellent/Very Good	0.93	0.18		0.63	1.37	0.90	0.09		0.73	1.10
Fair	0.96	0.13		0.73	1.26	0.90	0.08		0.76	1.06
Poor	1.06	0.19		0.75	1.49	0.85	0.10		0.67	1.07
Mean ADL (0-6)	1.07	0.12		0.86	1.33	0.99	0.06		0.88	1.11
Mean IADL (0-8)	1.52	0.05	***	1.42	1.62	1.22	0.03	***	1.17	1.27
Abuse history (ref: Never)										
After 60	2.63	0.53	***	1.77	3.90	1.74	0.27	***	1.29	2.35

In the last month	1.00	0.24	0.62	1.59	1.06	0.18		0.76	1.48
Social Benefits									
Receive pension	0.88	0.12	0.67	1.15	1.07	0.13		0.85	1.34

all models include controls for state of residence.

Table 5: Interaction between non-co-residing child and Elderly parent by living arrangement (N=7,840)

	By Male Child					By Female Child					To Male Child					To Female Child			
	Never	Rarely	Frequently	Total		Never	Rarely	Frequently	Total		Never	Rarely	Frequently	Total		Never	Rarely	Frequently	Total
								Meeting											
Alone	9.8	14.1	76.1	100.0		2.7	9.5	87.9	100.0		17.0	14.3	68.7	100.0		16.0	12.3	71.8	100.0
Spouse Only	3.8	10.4	85.8	100.0		1.3	9.6	89.1	100.0		18.9	10.9	70.2	100.0		9.3	11.1	79.7	100.0
Spouse and Children	5.5	23.3	71.2	100.0		1.1	18.3	80.7	100.0		22.3	15.0	62.7	100.0		6.6	22.0	71.4	100.0
Children and Grandchildren	9.2	13.8	77.1	100.0		1.1	16.5	82.4	100.0		23.9	11.1	65.0	100.0		14.5	18.4	67.1	100.0
Others	2.5	27.5	70.0	100.0		0.8	15.5	83.7	100.0		26.8	9.0	64.3	100.0		16.7	15.4	67.9	100.0
Total	6.3	17.5	76.2	100.0		1.2	15.6	83.2	100.0		21.9	12.5	65.6	100.0		10.6	18.1	71.4	100.0
								Communication											
Alone	30.6	7.9	61.4	100.0		16.5	2.7	80.9	100.0		38.5	7.1	54.3	100.0		30.2	3.6	66.2	100.0
Spouse Only	24.5	1.8	73.7	100.0		7.9	2.9	89.3	100.0		34.8	2.5	62.7	100.0		17.3	3.4	79.4	100.0
Spouse and Children	8.9	5.3	85.8	100.0		8.2	4.0	87.9	100.0		24.1	2.9	73.0	100.0		15.5	5.3	79.2	100.0
Children and Grandchildren	19.7	4.1	76.1	100.0		9.9	3.7	86.4	100.0		32.8	2.5	64.8	100.0		25.4	4.8	69.9	100.0
Others	15.4	5.4	79.2	100.0		5.1	1.9	93.0	100.0		25.0	9.7	65.4	100.0		14.0	4.9	81.1	100.0
Total	17.7	4.5	77.9	100.0		8.9	3.5	87.6	100.0		30.1	3.6	66.3	100.0		19.5	4.7	75.9	100.0
N	58	211	793	1,062		92	1,161	5,525	6,778		58	211	793	1,062		92	1,161	5,525	6,778

Table 6: Monetary transfers between non-co-residing child and elderly by living arrangement (N=7,840)

Living Arrangement	Transfer to Elderly				Transfer by Elderly		
	By Male Child	By Female Child	Total		To Male Child	To Female Child	Total
Alone	36.6	41.1	40.2		9.5	7.1	7.6
Spouse Only	34.0	29.1	29.9		17.8	9.1	10.5
Spouse and Children	30.5	15.4	17.1		6.2	7.3	7.2
Children and Grandchildren	31.5	22.0	23.2		6.6	6.2	6.3
Others	35.7	31.0	31.7		7.4	6.6	6.7
Total	32.5	22.2	23.5		9.1	7.2	7.5
N	715	347	1,062		5,321	1,451	6,772

Table 7: Logistic Regression for Frequent Interaction from Children to Elderly (N=7,840)

Demographic Variables	Communication						Meeting						Transfers				
	OR	SE		CI	CI		OR	SE		CI	CI		OR	SE		CI	CI
Living arrangements Ref: Co-residence																	
Living Alone	0.94	0.14		0.71	1.25		1.43	0.21	**	1.08	1.91		2.20	0.27	***	1.73	2.79
Living with Spouse Only	1.30	0.15	*	1.04	1.62		2.06	0.21	***	1.70	2.51		2.02	0.17	***	1.71	2.39
Age (ref: 60-69)																	
70-79	1.11	0.10		0.94	1.32		1.13	0.08		0.98	1.30		1.10	0.08		0.96	1.26
80+	1.07	0.14		0.83	1.37		1.32	0.15	*	1.06	1.64		1.24	0.13	*	1.02	1.52
Women (ref: Men)	0.95	0.10		0.77	1.18		1.05	0.10		0.87	1.25		1.12	0.10		0.94	1.33
Urban (ref: Rural)	0.75	0.06	***	0.64	0.88		0.77	0.05	***	0.68	0.87		0.92	0.06		0.82	1.04
Marital Status (ref: Married)																	
Widowed	0.98	0.10		0.81	1.19		1.05	0.08		0.90	1.22		1.08	0.08		0.93	1.26
Other	0.73	0.21		0.41	1.27		0.80	0.19		0.50	1.29		1.49	0.36		0.93	2.39
Religion (ref: Hindu)																	
Muslim	1.89	0.33	***	1.34	2.67		1.91	0.27	***	1.45	2.51		1.65	0.17	***	1.35	2.02
Sikh	0.51	0.08	***	0.38	0.70		0.83	0.10		0.66	1.04		0.53	0.08	***	0.39	0.71
Other	1.28	0.25		0.87	1.89		0.77	0.10		0.59	1.01		1.04	0.14		0.81	1.35
Caste/tribe (ref: SC/ST)																	
OBC	1.31	0.13	**	1.08	1.58		1.05	0.09		0.88	1.24		1.04	0.09		0.88	1.22
Other	1.06	0.10		0.87	1.28		0.78	0.06	**	0.66	0.91		1.01	0.08		0.86	1.19
Living Children (ref: One boy and one girl)																	
Only a male	0.54	0.06	***	0.44	0.67		0.83	0.08	*	0.69	1.00		1.63	0.14	***	1.38	1.93
Only a female	0.89	0.12		0.69	1.15		0.82	0.09		0.66	1.01		0.56	0.06	***	0.45	0.69
Socioeconomic variables																	
Education (ref: None)																	
1-4 years	0.96	0.11		0.77	1.19		0.85	0.08		0.70	1.02		1.17	0.10		0.98	1.39
5-7 years	1.05	0.13		0.83	1.33		0.82	0.08	*	0.68	0.99		1.12	0.10		0.93	1.34
8+ years	1.48	0.20	**	1.14	1.91		0.96	0.09		0.80	1.16		0.92	0.09		0.77	1.11
Wealth Index (ref: Lowest)																	
Second	1.82	0.18	***	1.50	2.20		1.12	0.11		0.92	1.36		0.93	0.09		0.77	1.11
Middle	3.49	0.42	***	2.75	4.43		1.23	0.13	*	1.00	1.52		1.06	0.11		0.87	1.29
Fourth	4.21	0.59	***	3.19	5.55		1.23	0.14		0.98	1.54		1.20	0.13		0.97	1.49

	OR	SE	sig	CI low	CI high		OR	SE	sig	CI low	CI high		OR	SE	sig	CI low	CI high
Highest	4.97	0.80	***	3.63	6.82		1.04	0.13		0.82	1.32		1.10	0.13		0.87	1.39
Employment History (ref: Currently working)																	
Never worked	1.05	0.19		0.73	1.51		1.26	0.21		0.91	1.74		1.08	0.16		0.80	1.45
Housewife/homemaker	1.09	0.14		0.85	1.40		1.17	0.13		0.94	1.46		1.36	0.15	**	1.11	1.68
Worked before	1.00	0.10		0.82	1.21		0.97	0.08		0.83	1.13		1.35	0.11	***	1.15	1.59
Health and Functionality																	
Self-rated health (ref: Good)																	
Excellent/Very Good	1.07	0.13		0.84	1.37		0.99	0.09		0.83	1.19		1.02	0.10		0.85	1.23
Fair	0.94	0.09		0.79	1.12		0.91	0.07		0.79	1.05		1.35	0.10	***	1.17	1.56
Poor	1.03	0.12		0.82	1.28		0.99	0.10		0.82	1.20		1.52	0.14	***	1.27	1.81
Mean ADL (0-6)	1.04	0.04		0.97	1.13		0.96	0.04		0.89	1.03		0.90	0.03	**	0.84	0.96
Mean IADL (0-8)	1.08	0.02	***	1.04	1.12		1.03	0.02		1.00	1.06		1.05	0.02	**	1.02	1.08
Abuse history (ref: Never)																	
After 60	0.90	0.13		0.67	1.21		0.72	0.09	**	0.57	0.92		0.93	0.12		0.72	1.21
In the last month	0.90	0.13		0.67	1.20		0.85	0.12		0.65	1.11		0.55	0.08	***	0.41	0.74
Social Benefits																	
Receive pension	0.75	0.07	**	0.62	0.90		1.24	0.11	*	1.05	1.48		1.25	0.10	**	1.07	1.47

*p <0.05, ** <0.01, *** <0.001

*all models include controls for state of residence.

Table 8: Logistic Regression for Frequent Interaction from Elderly to Children, N= 7,840

Demographic Variables	OR	SE		CI	CI		OR	SE		CI	CI		OR	SE		CI	CI
	Communication						**Meeting**						**Transfers**				
Living arrangements Ref: Co-residence																	
Living Alone	0.92	0.12		0.72	1.18		1.18	0.14		0.93	1.50		1.13	0.23		0.76	1.68
Living with Spouse Only	1.20	0.11		1.00	1.43		1.64	0.14	***	1.39	1.93		1.35	0.16	*	1.07	1.71
Age (ref: 60-69)																	
70-79	1.04	0.07		0.90	1.19		1.10	0.07		0.98	1.24		0.81	0.09		0.66	1.01
80+	0.96	0.10		0.79	1.17		1.01	0.09		0.85	1.22		1.06	0.18		0.76	1.47
Women (ref: Men)	0.94	0.08		0.79	1.11		0.95	0.08		0.81	1.11		0.83	0.11		0.63	1.09
Urban (ref: Rural)	0.89	0.06		0.78	1.01		0.89	0.05	*	0.79	0.99		1.00	0.10		0.83	1.21
Marital Status (ref: Married)																	
Widowed	0.93	0.07		0.80	1.08		1.00	0.07		0.88	1.14		0.98	0.12		0.78	1.24
Other	0.55	0.13	*	0.35	0.87		0.75	0.16		0.50	1.15		1.84	0.59		0.98	3.45
Religion (ref: Hindu)																	
Muslim	1.22	0.13		0.98	1.51		1.08	0.11		0.88	1.31		0.99	0.18		0.70	1.41
Sikh	0.47	0.06	***	0.36	0.61		0.65	0.07	***	0.53	0.79		0.68	0.13		0.46	1.01
Other	0.95	0.13		0.73	1.24		0.58	0.07	***	0.46	0.73		0.92	0.19		0.62	1.37
Caste/tribe (ref: SC/ST)																	
OBC	1.21	0.10	*	1.03	1.41		0.93	0.07		0.80	1.08		0.85	0.11		0.66	1.08
Other	1.07	0.09		0.91	1.25		0.77	0.06	***	0.67	0.89		0.83	0.10		0.65	1.05
Living Children (ref: One boy and one girl)																	
Only a male	0.65	0.06	***	0.55	0.78		0.89	0.08		0.76	1.05		1.10	0.15		0.84	1.44
Only a female	1.06	0.11		0.86	1.30		0.85	0.08		0.71	1.02		0.95	0.14		0.70	1.27
Socioeconomic variables																	
Education (ref: None)																	
1-4 years	0.98	0.08		0.83	1.16		0.85	0.07	*	0.72	1.00		0.80	0.12		0.59	1.09

	OR	SE		CI	CI		OR	SE		CI	CI		OR	SE		CI	CI
5-7 years	1.11	0.10		0.92	1.33		0.85	0.07	*	0.72	1.00		1.01	0.15		0.76	1.34
8+ years	1.83	0.19	***	1.50	2.23		0.95	0.08		0.80	1.11		1.26	0.17		0.96	1.64
Wealth Index (ref: Lowest)																	
Second	1.30	0.11	**	1.10	1.53		1.19	0.10	*	1.01	1.40		0.84	0.13		0.63	1.14
Middle	1.84	0.18	***	1.52	2.22		1.07	0.10		0.89	1.27		0.89	0.14		0.65	1.22
Fourth	2.12	0.23	***	1.72	2.62		1.12	0.11		0.92	1.35		1.21	0.20		0.87	1.67
Highest	2.25	0.27	***	1.78	2.86		0.82	0.09		0.67	1.01		1.34	0.24		0.95	1.91
Employment History (ref: Currently working)																	
Never worked	1.09	0.16		0.82	1.44		1.28	0.18		0.98	1.68		0.78	0.19		0.48	1.25
Housewife/homemaker	1.04	0.11		0.85	1.28		1.17	0.11		0.97	1.41		0.91	0.15		0.66	1.24
Worked before	1.02	0.08		0.87	1.20		1.04	0.07		0.90	1.19		0.71	0.08	**	0.57	0.89
Health and Functionality																	
Self-rated health (ref: Good)																	
Excellent/Very Good	1.15	0.11		0.94	1.39		0.95	0.08		0.80	1.11		1.36	0.17	*	1.07	1.74
Fair	0.83	0.06	**	0.72	0.95		0.72	0.05	***	0.64	0.82		1.11	0.12		0.89	1.37
Poor	0.92	0.08		0.77	1.10		0.70	0.06	***	0.60	0.83		1.02	0.15		0.77	1.37
Mean ADL (0-6)	1.07	0.03	*	1.01	1.14		1.06	0.03	*	1.00	1.12		0.97	0.06		0.86	1.10
Mean IADL (0-8)	1.12	0.02	***	1.08	1.15		1.08	0.02	***	1.05	1.11		1.08	0.03	**	1.03	1.14
Abuse history (ref: Never)																	
After 60	0.96	0.12		0.74	1.23		0.96	0.11		0.77	1.20		0.70	0.16		0.45	1.09
In the last month	0.92	0.11		0.72	1.17		1.12	0.14		0.88	1.42		0.83	0.19		0.53	1.30
Social Benefits																	
Receive pension	0.74	0.06	***	0.64	0.86		1.12	0.08		0.97	1.30		0.85	0.12		0.65	1.13

*p <0.05, ** <0.01, *** <0.001

*all models include controls for state of residence.

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