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**Determinants of Living  
Arrangements of Elderly in  
Orissa: An Analysis**

***Akshaya Kumar Panigrahi***

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# DETERMINANTS OF LIVING ARRANGEMENTS OF ELDERLY IN ORISSA: AN ANALYSIS

Akshaya Kumar Panigrahi\*

## Abstract

*India is home to a rapidly growing population of elderly persons. It is among the fastest growing ones in the world. Yet, there are very few studies documenting their welfare or focussing on the factors that determine their living arrangements. Some studies show that the traditional India joint family system is on the decline and more families are becoming nuclear. Given this background, it is important to explore the current nature of the living arrangements and its determinants. Studies focusing on the socio-economic and demographic correlates of living arrangements are rather scanty. Hence, this paper analyses the socio-economic and demographic correlates of the living arrangement choices of older persons in the state of Orissa. The data for the present work was taken from the 60<sup>th</sup> round of the National Sample Survey of the elderly in Orissa. The total sample size for Orissa was 1,238 old persons, with 660 males and 578 females. Both bivariate and multivariate techniques with Pearson's chi-square test statistics were used for the analysis. A majority of the elderly (51.5 per cent), were in co-residence or lived with their spouses and children; roughly, one-third lived without the spouse but with children and a small proportion (2.5 per cent) lived with other relatives and non-relatives. The major demographic factors considered here that determine the living arrangements of the elderly are, age, sex, marital status, and surviving children. The socio-economic factors include place of residence, education, caste, income and economic dependency. The variables like age, sex, marital status, number of surviving children, education, income and economic dependency, play an important role in determining the living arrangements of the elderly in Orissa. In view of the changing socio-economic and demographic scenario, increasing education and income and a simultaneous decline in fertility, there is a likelihood of a higher proportion of elderly Indians living alone in the future. Therefore, the policies and programmes for the elderly have to be appropriately designed to address the needs of those who live alone.*

**Keywords:** elderly, ageing, demographic, socio economic, living arrangements, Orissa, India.

## Introduction

Demographic trends since the second half of the last century in many developing countries have shown an unprecedented increase in the 60-plus population in absolute as well as relative terms. The rapid social and economic change in these countries has potentially profound implications for the future of the elderly. At the global level the number of elderly persons is projected to increase from 606 million in 2000 to 1.9 billion in 2050. The increase is expected to be dramatic in the less developed regions where the number of older people will increase from 375 million in 2000 to 1.6 billion in 2050 (United Nations, 2002).

The magnitude of increase in the population of elderly persons depends upon the pace of demographic transition. World fertility rate has fallen from five children per woman in 1950 to less than three in 2000. There was a continuous decline thereafter to two children per woman (United Nations, 2003). Similarly, life expectancy has also recorded significant improvement over the second half of the last century. This led to a considerable shift in the age structure of the population - shrinking at the younger ages and bulging at the older ones.

India has one of the fastest growing populations of elderly persons in the world (Rajan, Mishra and Sarma, 2000; Alam and Mukherjee, 2005; Gulati and Rajan, 1990; Sengupta and Agree, 2003;

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\* PhD Scholar, Institute for Social and Economic Change, Bangalore – 560 072 .

NSSO, 1998). India's population increased from 361 million in 1951 to 1027 million in 2001 and the number of older people increased from 19 million (5 per cent of the total population) to 77 million (7.6 per cent of the total population) during the same time period (see table-1). It is projected that the elderly population in India will increase to 169 million by 2025 and to 324 million by 2050 (United Nations, 2002).

Such a rapid rise in the elderly population poses several challenges. Lack of guaranteed and sufficient income to support themselves, absence of social security, loss of social status and recognition, non-availability of opportunities for creative use of time and persistent ill health are some of the daunting problems faced by the elderly in the country. Providing a decent and comfortable living arrangement for them continues to be a major challenge.

**Table 1 : India's Demographic Scenario of Ageing from 1950-2050**

Years	Population (60+) (In million)	Percentages of total population	Growth Rate (percentage)	
			Total Population	60+ Population
1950	19	5.6	2.0	2.0
1975	38	6.2	2.1	2.9
2000	77	7.6	1.5	2.7
2025*	169	12.5	0.8	3.2
2050	324	20.6	0.4	2.2

**Source:**United Nations, 2002. World Population Ageing 1950-2050.

\*medium variant

Living arrangements for the elderly was not an issue a few decades ago in most developing countries, including India, because the elderly are expected to be cared for by the family. However, issues concerning household structure and support for older persons in developing countries are becoming increasingly important. Along with an ageing population these countries are also experiencing socio-economic and demographic changes. Since last few decades there has been a rise in economic growth, literacy levels, urbanisation and modernisation, women bearing fewer children and people living longer and healthier lives. All this brought about significant changes in India. The effects of these trends on families, households, kin networks and subsequent support for older persons are complex and not well documented. It is generally accepted that the size and complexity of the households decrease along with industrialisation and urbanisation. In traditional rural societies families are often more extended than in modern urbanised societies where the independent nuclear family is predominant. In the process, extended kinship ties weaken and the nuclear family becomes an independent unit. This weakening of ties with family members reduces social interaction and financial and physical support for the older generation. Separate living arrangements are required for them as countries develop. Therefore in this context, the living arrangement issues of the elderly need attention because their welfare depends on it. Given this backdrop of rapid demographic and family changes, it is important to explore the current nature of living arrangements.

## Living Arrangements of the Elderly : A Review

Although there are many studies on the type of living arrangements for the elderly, the reasons for seeking a particular type of living arrangement by the elderly remain relatively unknown (Palloni, 2001; Kinsella and Phillips, 2005). These studies have identified a number of factors such as age, sex, occupation, education, place of residence, number of children etc., as the important variables that shape the living arrangement (United Nations, 2005; Yadava, Yadava and Sarma, 1996; Jaiprakash, 1999). Velkoff (2001) found that living arrangements are influenced mainly by financial well being, marital status, family size and structure as well as cultural traditions. However, the relative importance of each of these factors has hardly been examined carefully.

Living arrangements are generally studied as a dichotomous outcome - whether living alone or with others. The studies mentioned attempted to identify the factors responsible for the elderly living alone or in co-residence. Data from western countries shows that more than 60 per cent of the elderly aged 65 and above live either alone or with the spouse (Palloni, 2001). Data from developing countries shows a much smaller number of elderly living alone. However, a general agreement among researchers is that there is an increasing trend of the elderly persons living alone or with the spouse even in India. The NSSO report of the 52<sup>nd</sup> round shows that 15 per cent of the elderly in rural areas and 12.5 per cent in urban areas live alone or with the spouse.

A strong association is usually observed between socio-economic factors and the decision to co-reside among the elderly persons (Chakraborty, 2004; Yadava, Yadava and Sarma, 1996; Jaiprakash, 1999; Sahayam, 1988; Zimmer, Chayovan, Lin and Natividad, 2003). For instance, co-residence is inversely related to the socio-economic background of the family. The decision of the elderly to live alone is often determined by the economic resources available with them. It is generally argued that elders with fewer resources tend to co-reside with their children compared to those with better resources. If the elderly are provided with some form of social security like old age pension, health insurance etc., the probability of them living alone would systematically go up. But empirical evidence does not support this argument fully (Pal, 2004; Bhattacharya, 2005). The contradictory argument is that if the elderly have some economic independence, the children, particularly the unemployed, will be more inclined to reside with them and take advantage of the available resources. Even the NSSO data reveals a higher incidence of the elderly living alone or with the spouse in rural areas. Various small-scale surveys on the elderly also bring out the dismal conditions in which they live alone in the Indian context (NSSO, 1998; Rajan, Mishra and Sarma, 1999<sup>b</sup>).

The education level of the elderly is yet another important variable determining their living arrangement. It was found that with an increase in the level of education, the pattern of co-residence systematically diminishes (Andrade and DeVos, 2002; Bongaarts and Zimmer 2001; Pal, 2004; Zimmer, Hermalin and Lin, 2001).

Yet another important variable of interest is the number of surviving children and its impact on the co-residence pattern. From a broad range of studies, it is known that co-residence of older parents and at least one adult child is a central feature of the filial support system in most of the developing countries (Bongaarts and Zimmer, 2001). Studies generally supported the view that the number of living children is positively related to the probability of elders living with them (Martin, 1989). With a drastic

decline in fertility in many states of India, co-residence with children becomes increasingly difficult. In addition, the educated adult children tend to migrate to urban areas in search of employment leaving behind elderly parents (Rajan, Mishra and Sarma 1999<sup>b</sup>; Bongaarts and Zimmer, 2001). In the Indian context, it is not merely the number of children available but their gender and marital status that also determines the co-residence pattern. In India, unlike in western societies, sons are more likely to co-reside with their parents (Bongaarts and Zimmer, 2001; Chaudhury, 2004; Gulati and Rajan, 1990; Silva, 1994; Zachariah, 2001).

Studies in India also found significant gender differentials in the living arrangements of the elderly, but they are attributed to the higher incidence of widowhood due to the longer life expectancy of women (Chakraborti, 2004; Knodel, 1999; Knodel and Ofstedal, 2003; NSSO, 1998; Rajan, Mishra and Sarma, 2000).

The joint family system that persisted in the country in the past, has given way to nuclear families. As a result, the earlier concept of children providing support to the elderly has also undergone drastic changes. This may also be due to other factors like modernisation, urbanisation and the erosion of traditional cultural values that existed in the country (Bhattacharya, 2005; Mason, 1992; Rajan, Mishra and Sarma, 2000; Sahayam, 1988; Shah, 1999; Sumangala, 2003).

Although it is important to find out the significance of each of these factors in determining co-residence of the elderly, there are certain inherent limitations for such an analysis. The relationship of each of these variables with living arrangements depends mainly upon the cultural context in which such studies are undertaken. For instance, while availability of resources with the elderly may enhance the chances of them living alone in the West, the reverse may not be true in the Indian context because the children might be more willing to co-reside with such parents (Pal, 2004). Therefore, studies on the determinants of living arrangement should also be carried out within a specific cultural context.

### **Why living arrangements of elderly?**

India is still characterised by its traditional ways of living where several generations live jointly within the same household. With improved health infrastructure and increased life expectancy, the elderly are expected to live longer. The joint family system is on the decline and more and more families are becoming nuclear. Apart from this, the elderly in India are facing several other challenges, such as lack of guaranteed and sufficient income to support themselves, absence of social security, loss of social status and recognition, non-availability of opportunities for creative use of their time and persistent ill health. Studies have shown that a higher proportion of the elderly are living miserable lives without any hope. Ensuring a decent and comfortable living arrangement for them continues to be a major challenge. Given this background, it is important to explore the current nature of living arrangements and its determinants. Studies focusing on the socio-economic and demographic correlates of living arrangements are rather scanty. Hence, this paper analyses the socio-economic and demographic correlates of the living arrangements of older persons in Orissa.

## **Objectives of the paper**

The paper, against this backdrop, attempts to examine the following objectives :

1. To examine the determinants of living arrangements of the elderly in Orissa.
2. To examine the socio-economic, demographic and gender differentials in living arrangements among the elderly in Orissa.
3. To study the regional variations in the living arrangements of the elderly in Orissa.

## **Study area**

The study was undertaken in the state of Orissa which is in the eastern part of India and is one of the poorest states in the country. At the same time, Orissa has a larger population of elderly persons compared to the other states. It has the fifth largest population of elderly people in India. Old age dependency ratio is also high in Orissa (NSS, 2006). Studies have shown that disabilities among the elderly are also higher in Orissa (Srivastava and Mishra, 2005). A higher level of poverty combined with larger share of the old age population is a serious challenge in terms of providing a comfortable living arrangement for the elderly in Orissa.

## **Data and Methodology**

The data for the present paper was taken from the 60<sup>th</sup> round (Schedule no. 25.0) of the National Sample Survey of the elderly for Orissa; this survey was conducted by the National Sample Survey Organisation (NSSO) of India, which primarily focused on the health care, education and on the problems of the elderly (persons aged 60 years or above). This survey provides information on the older members of the households, the number of surviving sons, daughters and dependents, economic status, usual activities, living arrangements, whether physically immobile, disabilities, self-reported health status, chronic health conditions, ownership and management of assets, management of social and religious matters, daily chores and on the availability of food, clothing and medicine. The total sample size for Orissa was 1,238 old persons, with 660 men and 578 women.

Bivariate and multivariate statistical tools were used to establish the determinants of living arrangements for the elderly in Orissa. In the first part of the data analysis the paper used the bivariate cross tabulation with chi-square test statistics to find out the relevant significant differences in living arrangements for the elderly given their background characteristics. To establish the strong association an attempt was made to use the logistic regression analysis by controlling some of the important variables such as age, sex, number of surviving sons, economic independency etc.

## **Analysis and Discussion**

The determinants that influence the likelihood of the elderly living alone form the focus of this paper. The elderly are considered to be 'living alone' if they live alone or with the spouse and no other kin. 'Co-residence' or 'not living alone' is when the elderly person lives with any one kin, including children. The NSSO's data provided information on whether or not the older individual lived alone, with spouse only, with spouse and children, with children only or with other relatives and non-relatives. The socio-

economic and demographic factors were studied to find out the significant co-variates in the living arrangement choices.

Table 2 shows the different living arrangements of the elderly in Orissa. It is clear from this table that 15.6 per cent of the elderly live alone in Orissa and the rest (84.4 per cent) are in co-residence. It is interesting to note that the proportion of elderly persons who live alone in Orissa was slightly higher than the Indian average of 14.5 per cent (Chaudhuri and Roy, 2007). However, studies have shown that the proportion of elderly who live alone in most of the European countries is much higher (Grundy, 2000). Studies in other South East Asian countries too have shown that a much higher proportion of elderly live alone (Martin, 1989).

**Table 2 : Distribution of Living Arrangements of Elderly by Demographic Variables in Orissa**

Demographic Variables	Living Arrangements of Elderly (%)				Total	Observations (N)	Percentage
	Living Alone	Living with Spouse and other Members	Living without Spouse but with Children	Living with others			
<b>Age*</b>							
60-69	<b>17.3</b>	<b>54.0</b>	<b>26.7</b>	2.0	100	860	69.5
70-79	<b>11.9</b>	43.9	40.5	3.6	100	300	24.2
80 and above	7.3	<b>46.8</b>	<b>40.7</b>	<b>5.2</b>	100	78	6.3
<b>Sex*</b>							
Male	<b>18.6</b>	<b>68.3</b>	12.2	1.0	100	660	53.3
Female	11.9	32.0	<b>51.6</b>	<b>4.5</b>	100	578	46.7
<b>Marital Status*</b>							
Never married	12.9	NA	65.1	22.0	100	7	0.6
Currently married	<b>18.9</b>	<b>76.9</b>	3.7	0.5	100	820	66.2
Widowed	8.7	2.7	<b>82.0</b>	6.5	100	407	32.9
Divorced/separated	24.8	NA	75.2	0.0	100	4	0.3
<b>Surviving Children*</b>							
0	<b>50.5</b>	16.6	8.5	<b>24.3</b>	100	49	4.0
1	<b>12.4</b>	<b>35.3</b>	<b>46.8</b>	5.5	100	129	10.4
2	25.2	<b>42.6</b>	29.2	3.1	100	173	14.0
3+	<b>11.9</b>	<b>57.6</b>	29.7	0.8	100	887	71.6
<b>Surviving Sons *</b>							
0	<b>42.9</b>	27.4	16.2	<b>13.5</b>	100	149	12.0
1	<b>12.4</b>	48.4	36.8	2.4	100	366	29.6
2	12.2	<b>61.0</b>	26.4	0.5	100	368	29.7
3+	<b>11.1</b>	<b>54.0</b>	34.4	<b>0.5</b>	100	355	28.7
<b>Surviving Daughters*</b>							
0	<b>18.8</b>	33.3	41.8	<b>6.1</b>	100	230	18.6
1	15.1	54.0	27.8	3.1	100	348	28.1
2	13.6	56.4	29.0	0.9	100	339	27.4
3+	15.1	56.6	27.1	<b>1.1</b>	100	321	25.9
<b>Observations (N)</b>	193	638	376	31		1238	100
<b>Percentage</b>	15.6	51.5	30.4	2.5	100	100	

\*p < 0.001      \*Pearson's chi-square test statistics

Source: Author's calculation

A majority of the elderly (51.5 per cent), who were in co-residence, live with their spouses and children; roughly, one-third lived without spouse but with children and a small proportion (2.5 per cent)

lived with other relatives and non-relatives. These findings were almost in line with the expected behaviour of elderly Indians - most elders lived with their children because of strong traditional value systems. However, the proportion of the elderly living alone is likely to increase in the near future because of the various socio-economic and demographic changes taking place in Indian society. Therefore, it is interesting to analyse the important factors that determine the living arrangements of the elderly in Orissa.

## **Demographic Determinants of Living Arrangements of the Elderly in Orissa**

The major demographic factors considered here that determine the living arrangements of the elderly in Orissa are age, sex, marital status, and their surviving children.

### **Age and Living Arrangements**

Studies have shown that age of the elderly was one of the important determinants of living arrangements. For the present analysis, the age of the elderly has been categorised as *younger old*, *older old* and *oldest old*, in the age groups of 60-69, 70-79 and 80 and above, respectively. The corresponding percentage of younger old, older old and oldest old in the sample was 69.5, 24.1 and 6.3 per cent respectively.

Table-2 presents the association between the age of the elderly and their living arrangements in Orissa. It is quite evident from this table that as they got older, the proportion of elderly living alone decreased. The proportion of elderly living alone was highest in the age group 60-69 years (17.3 per cent). This proportion reduced to 11.9 per cent when the elderly moved to the age group 70-79 years and it reduced further to 7.3 per cent when the elderly reached 80 years and above, indicating lesser chances of the elderly living alone when they grow older. This may be due to their declining capacity for self-care as they grow older. Studies conducted elsewhere also reported similar findings (Shah et al. 2002; Liang, Gu and Krause, 1992; Ramashala, 2001; Zimmer and Kim, 2002). Further, irrespective of the age, living with spouse and children was the most common living arrangement observed in Orissa. It was also interesting to observe that a positive relationship existed between the age of the elderly and living without spouse, but with children. As their age increased, the proportion of the elderly living without spouse but with children also increased. This could be because of the fact that as they got older there was a higher chance of widowhood. They lived with their children, but without the spouse. Similarly, the proportion of elderly living with others also increased with age. As in many other countries, age turned out to be an important determinant of living arrangements in Orissa also. Higher the age of the elderly lesser was their chance of living alone. Pearson's chi-square test statistic also confirmed that the age and living arrangement relationship was statistically significant.

This relationship may however be quite complex because there was a negative relationship between age and living alone; this may not be solely due to age alone, but due to reasons of an economic nature as well. As the elderly grow older they may depend economically on others and therefore they co-reside with others when compared to the younger old who are economically active. Hence, the relationship between age and living arrangements may be due to economic reasons rather

than age, per se. Therefore, further analysis was required to deduce the exact relationship between age and living arrangements considering other economic variables.

### **Gender and Living Arrangements**

The gender of the elderly was another important demographic indicator that determined their living arrangements. Table -2 presents the relationship between the gender of the elderly and their living arrangements. The table shows that in Orissa the proportion of elderly men who lived alone (18.6 per cent) was higher than that of elderly women who lived alone (11.9 per cent). This is in contrast with the pattern observed elsewhere in the world where more elderly women lived alone than elderly men. Nevertheless, it may be quite possible in the Indian context, because traditionally, women were not expected to live alone and therefore this proportion was lower.

Among those who were in co-residence, majority of the males (68.3 per cent) lived with spouse and children; majority of the females (51.6 per cent) lived without spouse but with children. Studies conducted elsewhere have also shown that more males, rather than females, lived with their spouses (Bian, et al. 1998; Chan, 1997; Bongaarts and Zimmer, 2001; Knodel and Ofstedal, 2003; Panda, 1997; Shah, et al. 2002; Zimmer, 2005). As mentioned earlier, this may be due to higher incidence of widowhood among elderly females than among elderly males (Chan, 1997; Sobieszczyk, Knodel and Chayovan, 2003; Lee and Palloni, 1992; NSS, 1998; 2006, United Nations, 2005; Shah et al. 2002). Here again, it may be difficult to establish the relationship between gender and living arrangements unless the marital status was controlled. The next attempt therefore is to look at the differentials in living arrangements according to marital status.

### **Marital Status and Living Arrangements**

Unlike other countries, the association between marital status and living arrangements may not be very prominent here, mainly because, marriage is almost universal in India. However, an attempt was made to look into the relationship between marital status and living arrangements. The marital status of the elderly was divided into four categories: never married, currently married, widowed, and divorced/separated. In this sample, majority of the elderly were either currently married (66.2 per cent) or widowed (32.9 per cent) while a small proportion was divorced/separated (0.3 per cent). The proportion of never married (0.6 per cent) was negligible in this sample.

Table 2 also presents the association between marital status and living arrangements of elderly persons in Orissa. Since the number of persons who were never married and divorced/separated was very small, comparisons were made only for those who were currently married versus widowed. It can be seen from the table that a relatively higher proportion of currently married elderly lived alone (18.9 per cent) compared to the elderly who were widowed (8.7 per cent). However, majority of the widowed (82.0 per cent) lived with their children. It could be true in the Indian traditional context that the widowed elderly are generally looked after by their children. The  $\chi^2$  test also confirmed the existence of a significant difference in living arrangements of elderly according to their marital status.

## **Surviving Children and Living Arrangement**

Another important demographic factor that determines the living arrangements of the elderly is the presence of surviving children. It is generally believed that, in traditional societies including India, children are considered as security during old age. In this sample, the percentage of elderly, with no children, one child, two children, and three or more children was 4.0, 10.4, 14.0, and 71.6 per cent respectively.

Table 2 presents the association between number of surviving children and living arrangements of elderly in Orissa. Majority of the elderly with no surviving children either lived alone (50.5 per cent) or with others (24.3 per cent). It was possible that some of them had no children. As expected, the number of children was negatively associated with living alone. For example, only 12.4 per cent of the elderly lived alone when they had one surviving child whereas 50.5 per cent of the elderly lived alone when they did not have any children. Studies conducted elsewhere also generally supported the view that the number of children positively related to the probability of living with them (Bian, et al. 1998; Burch and Mathews, 1987; Martin, 1989; Rajan and Kumar, 2003; Zimmer and Kwong, 2003). More the number of surviving children better are the chances of the elderly to co-reside with them. It is possible that when there are more children, at least one of them will take care of the elderly. Migration in search of livelihood may be another reason. The break-down of the joint family system is also a factor. The  $\chi^2$  test also confirmed a significant difference in living arrangements for the elderly based on the number of surviving children.

## **Surviving Sons and Living Arrangements**

Apart from the number of surviving children, the gender composition also determined the living arrangements of the elderly. In India, the son is considered as the most important care provider for parents in their old age. In the study sample, it was found that 12.0 per cent of the elderly did not have a surviving son, 29.6 per cent had only one, 29.7 per cent had two, and 28.7 per cent had three and more.

Table 2 presents the distribution of the elderly with the number of surviving sons. It is evident from the bi-variate analysis that the number of surviving sons is negatively associated with elderly living alone in Orissa. For example, 42.9 per cent of the elderly with no surviving son lived alone compared with 12.4 per cent of the elderly with one surviving son. The proportion of elderly living alone further declined with an increase in the number of surviving sons. Similarly, the proportion of elderly living with other members also declined with an increase in the number of surviving sons. The result of Pearson's chi-square test was also significant with respect to number of surviving sons.

## **Surviving Daughters and Living Arrangements**

The number of surviving daughters is also equally important in determining the living arrangements of the elderly. In this sample, 18.6 per cent of elderly did not have any surviving daughters, 28.1 per cent had one, 27.4 per cent had two, and 25.9 per cent had 3 or more. It is interesting to note that only 18.8 per cent of the elderly without any daughters lived alone whereas 42.9 per cent of the elderly with no sons lived alone, indicating the importance of living sons in determining the living arrangements of

the elderly. Further, the proportion of elderly living alone did not vary much with respect to number of surviving daughters, indicating the importance of sons in determining their living arrangements.

From the above discussion, it is clear that the demographic variables like age, gender and number of surviving sons affect the living arrangement choices of the elderly. In Orissa, younger olds, males, and elderly with no surviving sons lived alone compared with their counterparts elsewhere.

**Table 3: Distribution of Demographic Indicators and Living Arrangements of Elderly across Geographical Regions within Orissa**

	Coastal		Southern		Northern		Total	
	Living alone (%)	N						
<b>Age</b>								
60-69	16.1	419	20.9	144	17.5	297	17.3*	860
70-79	10.6	173	20.1	26	12.1	101	11.9	300
80 and above	0.3	42	38.4	7	9.6	29	7.3	78
<b>Sex</b>								
Male	16.5	337	24.0	89	19.7	234	18.6*	660
Female	10.4	297	19.2	88	11.1	193	11.9	578
<b>Marital Status*</b>								
Currently married	16.1	431	26.7	117	20.5	272	18.9	820
Widowed	8.1	198	11.9	58	8.0	151	8.7	407
<b>No. of surviving children*</b>								
0	49.1	15	62.3	19	38.2	15	50.5	49
1	27.2	49	7.1	34	3.3	46	12.4	129
2	20.9	85	29.2	30	30.0	58	25.2	173
3+	9.8	485	15.9	94	14.1	308	11.9	887
<b>No. of surviving son*</b>								
0	50.5	56	48.5	34	34.9	59	42.9	149
1	11.3	174	14.2	62	13.2	130	12.4	366
2	10.0	201	11.5	45	15.8	122	12.2	368
3+	10.7	203	23.3	36	7.6	116	11.1	355
<b>Surviving daughters</b>								
0	16.8	86	25.3	59	16.2	85	18.8*	230
1	17.9	185	24.9	48	6.6	115	15.1	348
2	11.3	188	18.1	44	15.9	107	13.6	339
3+	9.8	175	11.9	26	23.6	120	15.1	321
<b>Total</b>	13.7	634	21.5	177	15.8	477	15.6	1238

N= no. of observations      p\* < 0.001

Source: Author's calculation

### Regional variations in living arrangement

Geographically, Orissa is divided into three regions - northern, southern and coastal. An attempt was also been made to see whether the living arrangement pattern was different in these three regions. Table-3 presents the living arrangement pattern of the elderly according to these geographical distinction. The table clearly shows that the proportion of elderly living alone was much higher in the southern region (21.5 per cent) than the northern (15.8 per cent) and coastal regions (13.7 per cent). Here again, in all the three regions a higher proportion of younger olds lived alone compared to those elderly who are 80 and above, but at each age, the southern region had a higher proportion of elderly living alone compared to the northern and coastal regions. Similarly, in all these three regions, the proportion of elderly living alone was higher among males and elderly with no surviving children.

Further, in every category, the proportion of elderly living alone was higher in the southern region than the northern and coastal regions. Hence, irrespective of the demographic characteristics, the proportion of elderly living alone was much higher in southern region than in the other two regions.

### **Socio-Economic Determinants of Living Arrangements of Elderly in Orissa**

The socio-economic and cultural factors have the strongest impact on the living arrangements of the elderly in any part of the world. The major socio-economic variables considered for the analysis were place of residence, education, occupation, caste and income of the elderly. Since the income of the elderly is not directly available from the NSS data, other variables like monthly expenditure pattern, land ownership, state of economic independence and number of dependants were taken as proxy variables that determine the economic status of the elderly.

### **Place of Residence and Living Arrangements**

Table-4 presents the living arrangements of the elderly according to their place of residence. In the sample, 80 per cent of the elderly were from rural areas and 20 per cent from urban areas. The data showed that, although co-residence was the most common living arrangement in both areas, a slightly higher proportion (15.6 per cent) of the elderly from rural areas lived alone compared to their urban counterparts (14.5 per cent). Similar findings were recorded in studies conducted in India and elsewhere also (Knodel and Chayovan, 1997; NSS, 2006; Panda, 1997; Zimmer and Kim, 2002). As expected, among the elderly who were in co-residence, the most common arrangement irrespective of their residence was living with spouse and children. Further, a small proportion of the elderly lived with other relatives or non-relatives. Here, the Pearson's chi-square test statistics was not significant suggesting that there was no marked difference in the living arrangements of elderly in Orissa on the basis of their place of residence.

### **Education and Living Arrangements**

The education level of the elderly also plays an important role in determining their living arrangements. It was found that with increase in their educational level, the pattern of co-residence systematically diminished (Andrade and De Vos, 2002; Bongaarts and Zimmer, 2001; Pal, 2004; Martin, 1989; Shah, *et al* 2002). Generally, older persons with less education were more likely to live in traditional extended family households than those with better education. However, contradictory findings were observed across various countries. Studies show that the average proportion living with children was higher among those with some education in Africa, Latin America and the Caribbean, and among those in Asia with no education.

In Table-4, it can be seen that the highest proportion living alone (32.3 per cent) was among the elderly with the highest (more than higher secondary) level of education compared to elderly who were illiterate (15.5 per cent) or had education up to the secondary level (14.3 per cent). Hence it is evident that a certain level of minimum education was necessary for people to decide about living alone. The Pearson's chi-square test statistic was significant here too, meaning that there was a significant difference in the living arrangements of elderly based on the level of education.

## **Caste and Living Arrangements of Elderly Persons**

It may be of some interest to see whether caste plays any important role in determining the living arrangements because many authors have pointed out that the living arrangements of elderly were determined more by cultural rather than by economic consequences. Since most of the cultural variables have not been collected in this survey data, a detailed analysis of the impact of cultural variables on living arrangements cannot be carried out at this stage.

An attempt was made to assess whether or not caste played any important role in determining the living arrangements of the elderly in Orissa. Table-4 presents the caste and living arrangements of elderly in Orissa. It can be seen from the table that, although major differentials in living alone are perceptible in different caste groups, a slightly higher proportion of other caste (upper caste) groups lived alone compared to scheduled castes, schedule tribes and other backward castes. However, these findings are not sufficient to draw major conclusions. The chi-square test statistic was found to be insignificant with the association of caste and living arrangements of elderly persons in Orissa. From this analysis, it is evident that there was no difference in the living arrangements of elderly in Orissa based on caste.

## **Income and Living Arrangements**

The income of the elderly is one of the important determinants of their economic status. Studies in developed countries have concluded that majority of the elderly with higher income prefer to live alone than those with lower incomes for various reasons. However, results from developing countries give a mixed picture. As already pointed out, the direct income of the elderly was not collected through the NSSO survey. Instead, per capita monthly expenditure, ownership of land and information on economic independence can be used as the best proxy to determine the economic status of the elderly persons.

Table-4 provides the pattern of living arrangements of elderly based on the monthly per capita expenditure. It is generally presumed that, higher the per capita expenditure, higher the income. Unlike the findings in the developed countries, there was no clear-cut evidence to support the notion that elderly persons with higher expenditure (presumably people of higher income) lived alone. Pearson's chi-square test statistics was not significant; it means that, the living arrangements of the elderly did not change according to their income.

## **Possession of Land and Living Arrangements**

Although the per capita monthly expenditure pattern did not seem to have any effect on the choice to live alone, what is attempted next is to look at the association between land ownership and living arrangements. Possession of land is another important variable that determines the economic status of the elderly. Table-4 shows that the ownership of land did not influence the living arrangement because the proportion of elderly living alone did not show any clear pattern and the majority lived in co-residence irrespective of whether or not they possessed land. It was found that the association between possession of land and living arrangements was not significant. It means that there was no significant difference in the living arrangements based on possession of land. The possible reason could be that to

ensure inheritance of the land and household property the surviving children were forced to live with their parents.

Therefore, it is clear that economic variables, such as monthly per capita expenditure and ownership of land, did not influence the living arrangements of the elderly in Orissa because the cultural variables were shaping the living arrangement choices. Yet another reason could be that these variables did not really measure the economic status of the elderly individual. It measured only the economic status of the household. It is probable that the economic status of the individual may be more important in shaping their living arrangements rather than that of the household. In order to assess the economic status of the elderly per se, the variable state of economic dependence was considered next.

**Table 4 : Distribution of Socio-Economic Determinants of Living Arrangements of Elderly in Orissa**

Socio economic Variables	Living Arrangements of Elderly (%)				Total	Total	
	Living alone	Living with spouse and other members	Living without spouse but with children	Living with others		Observations (N)	Percentage
<b>Place of Residence</b>							
Rural	15.6	50.8	31.1	2.6	100	984	79.5
Urban	14.5	55.7	27.3	2.5	100	254	20.5
<b>Social Caste</b>							
ST	13.3	42.7	38.8	5.2	100	217	17.5
SC	15.3	57.5	25.1	2.1	100	232	18.7
OBC	15.0	53.5	29.8	1.7	100	483	39.0
Upper Class	18.6	48.9	29.9	2.6	100	306	24.7
<b>Level of Education*</b>							
Not literate	15.5	40.6	40.3	3.6	100	808	65.3
Literate up to secondary	14.3	75.4	9.8	.5	100	396	32.0
More than secondary	32.3	65.9	1.8		100	34	2.7
<b>Monthly PP Expenditure(Rs.)</b>							
Less than Rs.250	13.4	49.7	33.5	3.4	100	250	20.2
Between Rs. 251 to 500	17.6	52.4	27.4	2.6	100	645	52.1
Between Rs. 501 to 1000	11.8	46.4	40.1	1.7	100	267	21.6
Greater than 1001	14.8	65.7	17.3	2.1	100	76	6.1
<b>State of Economic Dep*.</b>							
Not dependent on others	28.0	60.6	9.8	1.6	100	338	27.3
Partially dependent on others	12.6	68.0	17.9	1.5	100	209	16.8
Fully dependent on others	10.0	41.6	45.0	3.5	100	691	55.8
<b>No. of Dependants*</b>							
0	58.0	41.0	1.0		100	17	5.0
1	43.2	48.8	7.5	.5	100	100	29.6
2	32.9	52.8	9.6	4.7	100	104	30.8
3 and above	2.7	83.1	14.0	.2	100	117	34.6
<b>Land Ownership (hectors)</b>							
Less than 0.2	15.4	50.9	31.7	2.0	100	610	49.4
Between 0.2 to 1	16.6	49.1	31.0	3.2	100	411	33.3
Between 1.01 to 3.0	12.4	58.0	26.8	2.8	100	184	4.9
Above 3.01	11.6	49.4	33.3	5.7	100	30	2.4
<b>Observations (N)</b>	193	638	376	31		1238	100
<b>Percentage</b>	15.5	51.2	30.7	2.6	100	100	

\*P < 0.001

Source: Author's calculation

## State of Economic Dependence and Living Arrangements

The state of economic dependence of the elderly is categorised as those who are not dependent, partially dependent, and fully dependent on others. The main aim of linking the state of economic dependence with living arrangements was to find out how economic dependence decided the living arrangements of the elderly in Orissa. Table-4 presents the data on living arrangements based on the state of economic independence. The data shows that only about 28 per cent of the elderly were economically independent in Orissa. Majority of the elderly either depended fully (55 per cent) or partially (17 per cent) on others. This table clearly shows that the decision to live alone often depended on economic independence. Nearly 28 per cent of the economically independent elderly lived alone; this proportion was much less for elderly who were fully (10 per cent) or partially dependent (12.6 per cent) on others. The effect of economic independence on living alone was strong even after controlling for their age. Even among the older olds (those who were 70 and above) 31.1 per cent lived alone when they were fully independent compared to those who were fully or partially dependent on others (Table-5). This finding confirmed the fact that the income of the elderly per se was more important than the income of the household in determining the living arrangement. Pearson's chi-square test statistics was significant, which implies that there was a clear difference in the living arrangements with reference to the state of economic independence.

**Table 5: Age, State of Economic Dependence and Living Arrangements of Elderly in Orissa**

State of Economic Dependence	60-69 (%)			70 + (%)		
	Living in co residence	Living alone	Total (N)	Living in co residence	Living alone	Total (N)
Not dependent on others	72.6	27.4	100 (284)	69.0	31.0	100 (56)
Partially dependent on others	87.4	12.6	100 (160)	87.0	13.0	100 (48)
Fully dependent on others	88.1	11.9	100 (416)	93.0	7.0	100 (274)
<b>Total</b>	<b>82.7</b>	<b>17.3</b>	<b>100 (860)</b>	<b>89.1</b>	<b>10.9</b>	<b>100 (378)</b>

**Source:** Author's calculation

The co-residence of elderly with their children is often visualised as a unidirectional relationship where the elderly needs support and therefore co-residence ensures maximum benefits to the elderly. However, studies have shown that the economically active elderly make a substantial contribution to the household (Chan, 1997; Hermalin, 1997). Studies have also shown that the presence of dependents on the elderly also encouraged co-residence. In this context, it is interesting to see whether or not the elderly supported others economically. In order to estimate the number of dependents on the elderly, a question was asked in the survey to the non-dependents of the elderly.

It is of interest to note that, nearly 95 per cent of the economically independent elderly had dependents. Roughly, 30 per cent of the elderly had one or two and nearly 35 per cent had three or more. Pearson's chi-square test statistics was significant; there was a marked difference in the living arrangements of elderly based on the number of dependents. This establishes the fact that in co-residence, the elderly may not always be the recipient of care and support; they also supported others in multiple ways.

**Table 6: Distribution of Socio Economic Indicators and Living Arrangements of Elderly across Geographical Region with in Orissa**

Socio Economic Variables	Coastal		Southern		Northern		Total	
	Living alone (%)	N	Living alone (%)	N	Living alone (%)	N	Living alone (%)	N
<b>Place of residence</b>								
Rural	12.7	495**	20.8	148	17.5	341*	15.6	984
Urban	21.8	139	33.7	29	0.4	86	14.5	254
<b>Social caste</b>								
ST	9.0	20	18.6	73	10.8	124	13.3	217
SC	15.1	146	30.4	20	11.4	66	15.3	232
OBC	10.8	257	18.4	55	20.2	171	15.0	483
Upper Class	17.1	211	31.4	29	17.9	66	18.6	306
<b>Level of education</b>								
Not literate	12.1	398*	23.6	141**	16.5	270	15.5*	808
Literate up to secondary	14.3	215	9.6	34	15.1	147	14.3	396
More than secondary	51.7	21	0.0	2	0.0	10	32.3	34
<b>Per capita exp. (Rs.)</b>								
Less than Rs.250	7.8	70	16.2	83	15.2	97	13.4	250
Between Rs. 251 to 500	14.6	351	29.0	75	19.1	218	17.6	645
Between Rs. 501 to 1000	13.2	169	15.0	14	8.8	84	11.8	267
Greater than 1001	19.2	44	20.3	5	7.3	28	14.8	76
<b>Possession of land (hectares)</b>								
Less than 0.2	14.1	338**	29.6	80*	12.9	192	15.4	610
Between 0.2 to 1	14.0	214	24.4	58	17.8	139	16.6	411
Between 1.01 to 3.0	13.0	72	7.3	35	17.7	78	12.4	184
Above 3.01	0.0	10	0.0	4	21.0	18	11.6	30
<b>State of eco. Dep.*</b>								
Not dependent on others	25.2	168	40.2	47	27.5	125	28.0	338
Partially dependent on others	8.6	104	22.6	51	11.3	53	12.6	209
Fully dependent on others	9.6	362	10.3	79	10.4	249	10.0	691
<b>No. of dependents*</b>								
0	48.4	10	97.7	4	51.5	3	58.0	17
1	48.6	45	20.8	10	42.0	45	43.2	100
2	20.5	53	64.5	21	34.8	30	32.9	104
3+	2.9	59	0.0	12	3.1	46	2.7	117
<b>Total</b>	13.7	634	21.5	177	15.8	477	15.6	1238

N= no. of observations p\* < 0.001 p\*\* < 0.05

Source: Author's calculation

The regional variations (Table-6) in the living arrangements with respect to the socio-economic variables has shown that the overall pattern of living alone was almost the same across socio-economic categories, except in the case of place of residence. In the earlier analysis, it was found that a slightly higher proportion of rural elderly lived alone unlike the urban elderly. However, the regional analysis has shown that in coastal and southern regions, a much higher proportion of urban elderly live alone.

It is clear that irrespective of the region, place of residence, education and state of economic independence play important roles in determining the living arrangements of the elderly. The regional variation in living alone was also observed in the southern regions where a higher proportion of elderly lived alone compared to the coastal and northern regions. However, the relationship between demographic and socio economic factors and living arrangements of elderly could depend on several

other factors. Therefore a multivariate analysis is necessary to find out the determinants of the living arrangements of the elderly.

### **Analysis of Logistic Regression**

The analysis and discussions of the previous sections clearly indicate that there are differentials in living arrangement based on socio-economic and demographic factors. But the relative contribution of these variables cannot be studied using the bivariate tables presented earlier, although they have provided fruitful insight into the nature of the relationship. Since the living arrangement is governed by a host of socio-economic and demographic variables, it is necessary to control the effect of other variables in order to find out the net effect of each of the individual variables. Clearly there is a need for multivariate analysis to find out the net effect of each variable. In order to quantify the net effect of the background variables on living arrangements the logistic regression analysis was carried out. Since in the present analysis the dependent variable was dichotomous by nature [whether living alone (1) or in co residence (0)] the logistic regression model was the appropriate technique to assess the influence of explanatory variables on the dependent variable. The independent variables in the model were split it into three categories - demographic, social and economic. Under demographic variables age, sex, marital status, number of surviving sons and daughters were included as explanatory variables. The social and economic variables included place of residence, level of education, caste, monthly per capita expenditure (as proxy of income), possession of land and state of economic independence were the explanatory variables.

The results of the logistic regression analysis are presented in Table 7. The results confirmed that after controlling different background variables, the number of surviving sons, level of education and state of economic independence and region turned out to be the most significant variables in determining the living arrangements of the elderly in Orissa. Although the bivariate analysis showed the existence of differentials in living arrangements with respect to the demographic variables such as age, sex and marital status, they were not significant in predicting the living arrangement choices when the effect of other variables was controlled.

### **Conclusion**

It was observed that as the number of surviving sons increased, significantly fewer elderly lived alone. The presence of sons was an important variable that determined co-residence. However, in order to get a more detailed picture, characteristics of children, their marital status, location and income would also be useful to determine the living arrangements. Unfortunately, it was not available.

Similarly, the likelihood of the elderly with higher education living alone was much higher compared to those who were either illiterate or had a few years of schooling. Economic independence was also an important variable in determining the chances of living alone. There was less likelihood of the elderly living alone when they were fully or partially dependent on others indicating the significance of individual income over household income in determining the living arrangement. Similarly, the region was also a significant variable that determined the chances of living alone. In Orissa, a significantly

higher proportion of elderly residing in southern region lived alone compared to their counterparts in the northern and coastal regions.

**Table 7 : Binary Logistic Regression of Living Alone vs. Co-residence among Elderly in Orissa.**

Variables in the Equation	Co efficient (β)	S.E.	Sig.	Odds ratio Exp(β)
<b>Age</b>				
60 – 69 (ref.)			0.391	
70 – 79	0.043	0.217	0.844	1.044
80 and above	-0.654	0.499	0.190	0.520
<b>Sex</b>				
Male (ref.)				
Female	0.011	0.221	0.959	1.011
<b>Marital Status</b>				
Never married (ref.)			0.000	
Currently married	1.459	1.170	0.212	4.300
Widowed	0.411	1.179	0.727	1.509
Divorced/separated	1.917	1.670	0.251	6.802
<b>No. of surviving sons*</b>				
0 (ref.)			0.000	
1	-1.547	0.246	0.000	0.213
2	-1.767	0.260	0.000	0.171
3 and above	-1.775	0.265	0.000	0.170
<b>No. of surviving daughters</b>				
0 (ref.)			0.813	
1	-0.127	0.253	0.614	0.880
2	-0.247	0.260	0.341	0.781
3 and above	-0.180	0.263	0.494	0.835
<b>Place of residence Rural (ref.)</b>				
Urban	-0.358	0.277	0.197	0.699
<b>State Region**</b>				
Coastal (ref.)			0.098	
Southern	0.521	0.261	0.046	1.685
Northern	0.012	0.207	0.953	1.012
<b>Social group</b>				
ST (ref.)			0.864	
SC	0.218	0.304	0.472	1.244
OBC	0.217	0.267	0.417	1.242
Upper class	0.209	0.310	0.501	1.232
<b>Level of education**</b>				
No education (ref.)			0.007	
Upto secondary	-0.516	0.216	0.017	0.597
Secondary and above	0.562	0.463	0.225	1.753
<b>Per capita Expenditure</b>				
	0.000	0.000	0.573	1.000
<b>Land holding (in hectors)</b>				
Less than 0.2 (ref.)			0.263	
0.2 – 1.0	-0.140	0.197	0.476	0.869
1.01 – 3.0	-0.430	0.277	0.121	0.650
Above 3.0	-1.080	0.767	0.159	0.340
<b>State of economic dependence**</b>				
Not depend on others (ref.)			0.007	
Partially dependent	-0.456	0.250	0.068	0.634
Fully dependent	-0.690	0.224	0.002	0.502
<b>Constant</b>	-0.926	1.180	0.432	0.396

p\* < 0.001 p\*\* < 0.05

Source: Author's calculation

In view of the changing socio-economic and demographic scenario in India (increasing education and income with simultaneous decline in fertility) there is a likelihood of a higher proportion

of elderly Indians living alone in the future. Therefore, the policies and programmes for the welfare of the elderly have to address the needs of those who live alone.

## Policy and Suggestions

Following are some of the policy and suggestions be taken into consideration for the wellbeing of the elderly:

1. The family as the natural fundamental unit of society has to be strengthened as a support system for the provision of care and protection for older persons. It was observed that the emotional, social, physical and economic support provided by the family was indispensable and cannot be replaced by any other institution. For this reason attention should be given to promote co-residence through housing policies and financial incentives for those households where the elderly are family members.
2. The traditional institution for the care of older persons, the family is undergoing a transformation in response to demographic changes. The support systems for older persons need to be re examined with a view to improving their scope and effectiveness.
3. Special attention should be given to vulnerable older persons such as the poor, the widows, the childless, the minorities, the disabled and the sick whose families are unable to support them and those who are destitute and have no family.
4. Ensuring a proper living condition is a national concern. Policies and programmes should ensure that older persons have a reasonable and adequate living environment. For this reason incentives should be given to facilitate home up gradation and initiate appropriate housing schemes for older persons who live alone either by choice or by circumstances.
5. To bring active older persons into the economic and social mainstream.
6. Strengthen the service infrastructure to meet the social, emotional, health, financial and development needs of the elderly population.

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Phone: 0091-80-23215468, 23215519, 23215592; Fax: 0091-80-23217008  
E-mail: lekha@isec.ac.in; Web: www.isec.ac.in