

# **OLD AGE POVERTY IN THE INDIAN STATES: WHAT THE HOUSEHOLD DATA CAN SAY?**

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Abstract: In the absence of any official measures of old age poverty, this paper uses National Sample Survey household-level data to investigate the extent and nature of living standards and incidence of poverty among elderly in sixteen major states in India. We construct both individual and household-level poverty indices for the elderly and examine the sensitivity of these poverty indices to different equivalence scales and size economies in consumption. In general, these adjusted estimates indicate that households with elderly members have lower incidence of poverty in all of the states, albeit to different degrees. Part of the explanation appears to be related to differences in dependency ratios in households with and without elderly, where a significant percentage of elderly, especially men, continue to work well past the age of sixty. The favourable effect of the presence of elderly on household living standards and incidence of poverty is however weakened once we control for dependency ratio, among other things, with significant inter-state variation noted in our sample.

JEL classification: J14, I31

Key words: Old age poverty, Living standards, Poverty indices, Equivalence scale, Size economies in consumption, Social protection of the elderly, Inter-state disparity in India.

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## **1. Introduction**

Like most developing countries, India has been experiencing population ageing, attributable to the decline in both fertility and mortality over the past 5 decades or so. This phenomenon has important implications for the poverty reduction strategies in the country. Although demographic (Visaria, 1998) and other socio-economic and health (Prakash, 1999; Rajan et al. 1999) aspects of ageing in India have been examined by various social scientists, there are no official measures of old age poverty in India (as in many other developing countries, e.g., Subbarao et al. 2005, Barrientos et al. 2003). With the exception of Deaton and Paxton (1995), who provide estimates of old age poverty in six large Indian states for 1987-88, there has been a general lack of research into an understanding of the extent, magnitude and nature of old age poverty in the Indian states.

In an attempt to bridge this gap in the literature, this paper examines the inter-state disparity in living standards and incidence of poverty among elderly persons in India. The analysis is based on the fifty second round (1995-96) National Sample Survey (NSS) household-level data. This survey is especially suitable for the analysis of old age poverty since it includes additional information on members of the household aged 60 or above.<sup>1</sup> In particular, we consider the distribution of average monthly per capita consumption expenditure (APCE) and poverty head count ratio (HCR)<sup>2</sup> among households with and without elderly members across sixteen major states in India. We also compare our poverty head count ratio estimates with the Deaton and Paxton poverty estimates for the six states common in both studies. Since these two sets of poverty

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<sup>1</sup> See Pal (2004) for further details of the data.

<sup>2</sup> These poverty counts are counts of individuals in poverty as calculated from household-level APCE and state specific poverty lines in 1995-96. In addition, we calculate poverty gap and squared poverty gap indices.

estimates turn out to be quite comparable, the rest of our analysis makes use of the former approach.<sup>3</sup>

The official poverty measures in India do not take account of differences in households with different demographic composition. We, however, examine the sensitivity of APCE as well as poverty HCR to different weights for equivalence scale and size economies in consumption. We compare both unadjusted and adjusted APCE and poverty indices for households with elderly and without elderly members and find that households with elderly members are, on average, better off than those without, a result which holds for all the selected states. The final section of the paper seeks to explain as to why households with elderly are better off than those without and suggests that this is closely related to the economic participation of the elderly as reflected in the lower dependency ratio among households with elderly compared to those without. The favourable effect of the presence of an elderly member in a household is however much weakened in our sample when we control for household size and dependency ratio with some inter-state variation noted in our sample. The paper concludes with a brief summary and shortcomings of our findings and implications for future research.

## **2. Estimates of relative living standards and poverty incidence**

The 52<sup>nd</sup> round NSS survey provides a unique data-set for the analysis of elderly living conditions in the Indian states. It includes additional information on the elderly persons and contains information on their living arrangements, property/financial management and ownership etc. (for further details see Pal, 2004) that the usual round of NSS does not. Our analysis focuses on the extent of old age poverty in the rural sectors of sixteen major states of India.

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<sup>3</sup> Our poverty rates for the year 1995-96, though comparable, are slightly lower than the Deaton and Paxon estimates for the six states available for the year 1987-88. In addition to the effect of income growth over this period, the latter could be attributable to the fact that their estimates are based on an all-India poverty line rather than the state-level poverty lines that we use in our study.

## 2.1. Estimates of unadjusted living standards

Table 1 summarises the key sample properties in the selected Indian states. On an average, about 27% of sample members coreside with elderly members though some inter-state disparity is observed. For example, while 43% individuals in Kerala live with an elderly person, the proportion is only 21% in AP and Tamil Nadu, 24% in Rajasthan and West Bengal and 25% in Assam, Bihar and MP, all below the national average. Average household size also varies with Kerala at 4.9 and UP with more than six members per household compared to a national average of 5.34.

We consider average per capita monthly consumer expenditure (APCE) as an indicator of standard of living that is widely used in the literature. Table 2B summarises the state-level means and standard deviations (s.d.) of APCE for households with different demographic composition. We consider the case of households with elderly (column 1) as the bench mark case and compare this group with those of different demographic compositions (columns 2-7). Our primary observations in this respect are noted here: (a) APCE is always lower for households with old and children. (b) APCE is always higher if there are old, but no children. (c) APCE may be higher or lower in households without old. (d) APCE is always higher if there are no old and no children. (e) APCE for households without old and children is generally higher than those with old but no children (exceptions WB and Gujarat). (f) APCE may be higher or lower if the household is headed by an old though the absolute difference is rather insignificant. (g) APCE may be higher or lower if there is more than one elderly person and again the absolute difference is rather insignificant.

Official poverty measures in India are generally based on the household level data collected by the Indian National Sample Survey Organisation (NSSO) going back to the early 1950's. A person is said to be poor if the average per capita (monthly) consumption expenditure (APCE) is below an officially constructed poverty line (corresponding to a per capita expenditure

required to obtain the minimum caloric levels). Since APCE is household-specific, we shall first construct an indicator of household-level poverty head count ratio for households living with/without elderly members. Using the state-level poverty lines  $z_s$ ,<sup>4</sup> we construct the poverty index for the  $s$ -th state  $P_{s0}$ ,  $s = 1, 2, \dots, 16$  as follows:

$$P_{s0} = \frac{1}{n} \left( \frac{\sum_{i=1}^q (z_s - x_{si})}{z_s} \right) \quad (1)^5$$

where  $x_{si}$  is the per capita expenditure of the  $i$ -th household,  $n$  is the total number of individual members in a selected group of households (e.g., with/without elderly members) and  $q$  is the corresponding number of this group of household members who live below the poverty line. These poverty indices for households with and without elderly members are shown in Table 2B. In general, the HCR is lower in households with elderly members.

Deaton and Paxon (1997) however adopted a slightly different procedure. They divided all household members into elderly (those who are above 60 years of age) and non-elderly (aged sixty or below). Then considering household-specific APCE as the individual consumption expenditure they counted an individual specific poverty rate to be the proportion of people below an all-India poverty line for six large Indian states in 1987-88. Following Deaton and Paxon (1997), we also compute these individual-specific poverty head count ratios for elderly and non-elderly people in all the selected states (see Table 2B). Clearly both individual and household specific poverty head count ratios are quite comparable for all the Indian states in our study. It is however evident that compared to 1987-88, poverty rates are generally lower in 1995-96 for these six states studied by Deaton and Paxon. In addition to economic growth over this

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<sup>4</sup> We take the official 1993-94 state-level poverty line estimates and adjust it by the 1995-96 state-level prices for agricultural labourers to obtain estimates of 1995-96 state-level poverty lines for the rural sectors of these states. Please note that 1993-94 poverty line estimates were not available for Jammu and Kashmir (J&K) and hence we were unable to calculate the poverty HCR for this state. Sarmistha Pal is particularly grateful to P.V. Srinivasan for his help with the calculation of poverty head count ratio.

<sup>5</sup> We could modify this equation to derive the poverty gap and the squared poverty gap indices.

period, the reduction of poverty over the period from 1987-88 to 1995-96, could possibly be attributed to the fact that our estimates use state-specific poverty lines while Deaton and Paxson use all-India poverty lines for rural and urban areas. But as with Deaton and Paxson (1997), our poverty head count ratios are generally lower for the elderly or the population living with the elderly.

Table 2C shows some additional poverty indices, namely, poverty gap and squared poverty gap, for these two groups of population living with and without the elderly. These additional poverty indices too confirm that the incidence of poverty is less among the population living with the elderly.

## **2.2. Estimates of adjusted living standards**

Official poverty estimates in India do not take account of the differences in household size or age/sex composition of household members.<sup>6</sup> Estimates of living standards as discussed in section 2.1 also do not take account of the differences in household size or that in the age/sex composition of household members. In an attempt to address this issue, we shall in this section examine the sensitivity of the indicators of standard of living and poverty head count ratio<sup>7</sup> to differences in age/sex composition of the household members as well as size economies in consumption.

### **2.2.1. Equivalence scales**

Use of APCE to compare different groups of households is problematic since it ignores differences in household age-sex composition (e.g., % of adult/child, male/female etc.). A conventional way of addressing this difficulty is to make use of the equivalence scales that allow us to give different weights to household members in different age/sex composition. Here we

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<sup>6</sup> Without much loss of generality, the rest of our analysis focuses on APCE and poverty head count ratio.

<sup>7</sup> In the rest of our analysis we use the household-specific poverty head count ratio.

examine the sensitivity of the scale adjusted APCE to different choice of weights given to adult male and female (aged above 15 years) and children (aged less than 15 years) respectively: (1,1,0.6), (1,0.8,0.6), (1,0.7,0.5).<sup>8</sup>

The adjusted APCE estimates are shown in Table 3A for the major Indian states in our sample. It clearly follows that these adjusted APCE estimates are higher for households with older persons in all the states, irrespective of the weights chosen. Next using equation (1) we calculate the estimates of equivalence scale adjusted poverty HCR for the selected states. These estimates as summarised in Table 3B mirror those of the adjusted APCE estimates. In particular, as with adjusted APCE estimates, equivalence scale adjusted poverty head count ratios are in general lower in households with elderly persons and this holds irrespective of the choice of weights.

### 2.2.2. Size economies in consumption

The economies of scale adjusted per capita expenditure  $y$  for a household of size  $n$  is defined as:

$$y = \frac{Y}{n^\theta} \text{ where } Y \text{ is the total household expenditure and } \theta \text{ is a parameter lying between 0 and 1.}$$

If  $\theta = 1$ , there are no economies of scale ( $y$  is the per capita expenditure) and if  $\theta = 0$ ,  $y$  is the total household expenditure. The latter corresponds to the case of public goods where one person's consumption does not lower the consumption of others in the household. We have considered 4 possible intermediate values of  $\theta$ , namely, 0.8, 0.6, 0.4 and 0.2 where a weight of 0.2 would indicate higher size economies of consumption compared to 0.8 for example. Economies of scale adjusted APCE estimates are shown in Table 4A. As with equivalence scale adjusted APCE, economies of scale adjusted APCE figures too are higher for households with elderly members in all the selected states irrespective of the choice of weights.

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<sup>8</sup> These choice of weights closely follow those chosen by Drèze and Srinivasan (1997).

A household of size  $n$  with total consumption  $Y$  is considered to be poor if  $y$  falls below a pre-specified threshold  $z^S(\theta)$  for a given state  $S=1,2,\dots,K$ . For  $\theta =1$ , this is the conventional head-count ratio. However, we need some normalization rule to adjust  $z^S(\theta)$  for the size economies of consumption. Following Drèze and Srinivasan (1997), we consider the following rule:

$$z^S(\theta) \equiv z^S(1)m_s^{1-\theta} \quad (2)$$

where  $m_s$  is the average household size in a given state (see Table 1). This in turn implies that a household of average size in a given state is counted as 'poor' if and only if it has a per capita expenditure below  $z^S(1)$  irrespective of the value of  $\theta$ ,  $S=1,2,\dots,K$ . For consistency with the earlier calculations of HCR, we take  $z^S(1)$  to be the state-specific poverty line expenses. These adjusted HCR measures are shown in Table 4B. Again, incidence of poverty is lower in households with elderly members in all the sample states.

### 3. Factors affecting living standards and incidence of poverty

In general our adjusted measures of poverty and living standards suggest that households with elderly members are better off in most states of India. In this section, we seek to explain this observation. First, we compare the demographic composition of households with and without elderly members and focus on two variables, namely, family size and dependency ratio (see Table 5). The latter is defined as the ratio of number of children aged 0-15 years to number of adults aged 16-99 years. On average households with elderly members are generally bigger in size than those without elderly members; more interestingly, the average dependency (child-adult) ratio is lower for households with elderly members. To some extent, the latter reflects the economic participation and contribution of elderly members (especially elderly men) well past the age of sixty, thus supplementing household incomes. It follows from Table 5 that a significant proportion of the elderly, especially elderly men, continue to supplement family earnings by

participating in various farm and non-farm jobs<sup>9</sup>. Thus economic contribution of elderly members may result in a lower dependency ratio among households with elderly, which in turn may help explaining why households with elderly tend to be better off than those without.

So far our estimates of old-age poverty have not controlled for dependency ratio. In an attempt to understand the effects of presence of elderly on household living standards (APCE and poverty HCR), we shall in this section control for household size and dependency ratio. One way of approaching this problem is to do a multivariate regression analysis to determine (a) APCE and (b) incidence of poverty, with controls for household size and dependency ratio among other possible correlates separately for each sample state.

Table 6A and Table 6B summarise the ordinary least square estimates of APCE. Among the possible covariates, we not only include household size, but also its square; the latter would account for any non-linearity between APCE and household size. In addition, we include dummy variables for presence of an elderly member (WithOld), scheduled caste, scheduled tribe and agricultural labour households.<sup>10</sup> The difference between the two sets of estimates presented in Tables 6A and 6B is that estimates presented in Table 6B includes dependency ratio as an additional covariate. In both cases, larger households have significantly lower APCE and there is evidence of nonlinearity as the coefficient of square of household size is positive and significant for all states. For a given household size, households with elderly are significantly better off (in terms of higher APCE, see Table 6A) in a number of states except Haryana, J&K, Kerala, Orissa, Rajasthan and Tamilnadu (where the effect is not significant). If however, we control for both household size and dependency ratio, the favourable effect of the presence of elderly members on living standards is rather weakened. In particular, Table 6B suggests that households with elderly

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<sup>9</sup> Though in general wages decline sharply with age, an elderly person's presence may benefit the family even otherwise (e.g., ownership of properties, financial assets or contributing to daily household chores, e.g., see Pal 2004.).

<sup>10</sup> Compared to other household groups these households tend to be economically worse off in rural Indian society.

are significantly worse off in AP, Haryana, J&K, Orissa, Rajasthan and Tamilnadu while they are significantly better off only in WB. The effect is however not significant in the remaining states.

Next, we consider if households with elderly are better off in terms of lower incidence of poverty. In this respect, we construct a variable called  $I_0 = 1$  if APCE for a household is less than the state-specific poverty line for 1995-96 and zero otherwise. Given the dichotomous nature of  $I_0$ , we estimate a logit model<sup>11</sup> of incidence of poverty for households in each state. As with APCE, we consider two sets of estimates: (i) Table 6C shows the estimates of a set of explanatory variables including household size, its square and dummy variables for the presence of an elderly member (WithOld), scheduled caste, scheduled tribe and agricultural labour households. (ii) In addition to the covariates included in (i), Table 6D includes dependency ratio. Both sets of estimates suggest that larger households are more likely to be poorer, though the likelihood increases at a less than proportionate rate (since the coefficient of square of size is negative and significant in all states). It is also less likely for households with elderly to be poor residing in any state, though the effect is not significant in AP, Haryana, Kerala, Rajasthan and Tamilnadu (see Table 6C). These results too change as we control for dependency ratio (see Table 6D). In particular, for given size and dependency ratio, the likelihood of being poor among households with elderly is significantly less only in Assam, Bihar, Gujarat and MP and it is significantly higher in Tamilnadu. The effect remains insignificant for the rest of the sample states. Thus household size and dependency ratio help explain state-wise disparities in living standards and poverty incidence among households with and without elderly. While adjusted APCE and various poverty indices indicate that households with elderly are better off in all the Indian states, validity of this result is rather weakened when we control for dependency ratio, among other things, with some significant inter-state variation observed in our sample.

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<sup>11</sup> Note that the corresponding probit estimates yielded very similar results.

#### 4. Policy implications and scope for future research

With the proportion of India's population over age 60 steadily increasing, more attention is being paid to public policy in this area. Currently, only about one in ten workers in India is covered by a formal pension scheme and state coverage levels vary widely (Adiraja and Palacios 2005). The most relevant programs for poverty among the elderly, however, are the non-contributory pensions that are operating throughout the country. The total number of beneficiaries and average benefit level under the state pension programs may however vary among the states with varying eligibility ages and a range of benefits as summarised in Table 7. The differences in outlays and targeting efficiency of these state-level programs, which are in theory aimed at the poorest elderly, may help explain some of the inter-state differences in elderly poverty rates.<sup>12</sup>

In 1995, the National Old Age Pension Scheme (NOAPS) was introduced. This central government program<sup>13</sup> supplements existing means-tested pension schemes administered at the state level. The number of beneficiaries of the NOAPS, which sets 65 as the eligibility age, was around seven million in 2001 with a payment of 75 rupees per month.<sup>14</sup> Research on the impact of non-contributory, state pension schemes and the newer NOAPS on poverty incidence of the elderly would help inform policymakers.

An important finding of this study is that there is significant variation in poverty incidence among the elderly across states both in absolute terms and relative to the poverty incidence of all households.<sup>15</sup> Interestingly, the outlier in Figure 1 which shows the ratio of poverty in households with elderly compared to all households, is Kerala, the Indian state at the most advanced stage of its demographic transition. The latter may be closely related to the fact

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<sup>12</sup> A case study for the program in Uttar Pradesh found major leakages and diversion of funds (HelpAge (2003)). The World Bank is conducting research on the program in Karnataka and Tamil Nadu.

<sup>13</sup> The Ministry of Rural Development oversees the program.

<sup>14</sup> See Rajan (2004).

<sup>15</sup> Note that the formula used to allocate resources for the NOAPS to states assumes that elderly poverty rates are the same as those for all households. The program allocates funds for one half of the estimated number of poor elderly based on this assumption times the benefit level of 75 rupees. Alam (2004) correctly points out the arbitrary nature of this formula, but assumes that the target figure should always be higher. Our results suggest that except for Kerala, the formula would produce a figure greater than the number of households with an elderly member falling below the poverty line. A more significant problem in our view is the low disbursement rate in many states.

that compared to other states, Kerala has successfully reduced the adult mortality rate. Thus the Kerala outcome in our sample (where the elderly poverty rates are relatively higher than in other states) is actually a positive outcome because in the other states, the lower poverty rate is likely to be attributable to the fact that the lifetime poor die earlier.

Finally, our basic result with regard to the relative living standards and poverty incidence of households with and without elderly could be extended in at least three other areas. First, our results do not shed light on intra-household consumption patterns that could place the elderly in a less advantageous position than what is implied here. This is an area where more research is needed. Second, our results do not take into account of the differential mortality by income levels. The fact that the distribution of per capita expenditures is more skewed in the households with elderly may reflect higher adult mortality among the poor. In other words, our results may reflect a kind of survivorship bias that could change in future should income gains translate into more rapid reduction in adult mortality among the poor. Third, in light of the high growth rates of income per capita that India has experienced in the decade since 1995, it would be useful to update our results and identify any patterns that may be arising.

### **5. Concluding Comments**

In the absence of any official measures of poverty among the elderly, the present paper investigates the extent and nature of old age poverty in 16 major states in India. The analysis is based on the 1995-96 National Sample Survey household-level data which is a special round of the NSS focusing on the living conditions of the elderly members of the household in India. Using state-specific poverty lines, we constructed and compared household and individual level poverty head count ratios. We also constructed poverty gap and squared poverty gap indices. Official poverty measures in India do not adjust for the differences in household age/sex composition or size economies of consumption. It is however difficult to interpret the unadjusted

levels of household standards of living or poverty indices. This is because households differ in age/sex composition and larger households may be able to derive economies of consumption. In an attempt to redress these problems, we also examine the sensitivity of the poverty indices to different choices of equivalence scale and size economies in consumption.

In general, our estimates are in line with Deaton and Paxon (1995) estimates of six Indian states, but indicate a decreasing trend in the incidence of poverty in these states over the period 1987-88 and 1995-96. In addition to economic growth over this period, a possible reason for the difference could be that Deaton and Paxon estimates are based on all-India poverty lines while our estimates make use of state-specific poverty lines. These adjusted estimates also suggest that households living with elderly are better off though the extent differs among the Indian states. This result could be partly explained by different dependency ratios of households with/without elderly because of the higher labor force participation rates among the elderly people, especially elderly men. When we control for household size and dependency ratio, the result that households with elderly are better off is however sufficiently weakened with some pronounced inter-state variation noted in our sample. The variation that is observed across states is not explained here but may partly be due to coverage rates and the operation of non-contributory pension schemes for the elderly. Assessing these programs for their actual and potential impact on elderly poverty rates would appear warranted.

These results hold implications for policymakers and raise questions for future research. While the general result holds across states, the dynamics of elderly poverty are not well understood and may change over time. Mortality differentials among the states may explain some of our results including the higher incidence of poverty in India's most demographically advanced state, Kerala. Also, the relative position of the elderly may be affected by unknown patterns of intra-household consumption. Finally, more recent data that reflects the dramatic growth in incomes since the 1995-96 survey was conducted may reveal patterns with important implications for state and central government policies in the context of an aging India.

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**Table 1. Selected sample characteristics**

<b>States</b>	<b>Number of households</b>			<b>Number of individuals</b>		<b>Average family size</b>
	<b>Without old</b>	<b>With old</b>	<b>Total</b>	<b>Total popn [2]</b>	<b>popn. living with old</b>	
AP	4025	932	4957	22705	0.21	5.34
Assam	2626	661	3287	17452	0.26	5.31
Bihar	5249	1419	6668	38819	0.26	5.82
Gujarat	1926	568	2494	13710	0.25	5.5
Haryana	774	291	1065	6272	0.31	5.89
J&K	1461	484	1945	11538	0.40	5.93
Karnataka	1939	619	2558	14366	0.30	5.62
Kerala	1798	1052	2850	13990	0.43	4.91
MP	4085	1076	5161	28822	0.26	5.58
Maharashtra	3019	1267	4286	22458	0.34	5.24
Orissa	2387	832	3219	16301	0.32	5.06
Punjab	1666	561	2227	12592	0.30	5.65
Rajasthan	2497	615	3112	17594	0.24	5.65
Tamilnadu	3417	821	4238	17856	0.21	4.21
UP	6215	2436	8651	52292	0.33	6.04
WB	3701	911	4612	24095	0.24	5.22
All India [1]	54927	16357	71284	380885	0.27	5.34

Note:[1] 52<sup>nd</sup> round NSS also includes households from other Indian states as well. [2] This is simply the sum total of all household members in a state.

**Table 2A. Descriptive statistics (Means and Standard Deviations) of APCE**

State	(1) With old	(2) With old & child	(3) With old & no child	(4) Without old	(5) Without old & child	(6) Headed by old	(7) More than one old
<b>AP Mean</b>	336.5	297.6	383.4	331.3	456.8	325.4	335.3
s.d.	178.5	135.4	211.4	186.4	253.5	181.9	191.5
Nobs	932	1091	376	5778	1154	571	162
<b>Assam Mean</b>	313.3	296.3	366.8	317.3	381.9	308.0	330.1
s.d.	105.8	92.4	133.1	112.0	124.4	108.0	108.9
Nobs	661	455	146	1433	243	330	80
<b>Bihar Mean</b>	282.4	265.8	347.8	278.1	365.8	281.5	289.8
s.d.	114.2	98.5	144.9	136.1	209.3	129.6	460
Nobs	1419	803	266	3384	475	864	117.4
<b>Gujarat Mean</b>	412.5	356.2	541.6	391.7	539.2	396.3	410.0
s.d.	228.0	136.0	323.4	201.5	287.8	189.1	221.4
Nobs	568	275	179	1327	272	332	164
<b>Haryana Mean</b>	462.0	447.8	531.1	481.1	794.6	454.1	452.4
s.d.	246.3	249.0	298.4	549.6	1363.1	220.6	204.5
Nobs	291	148	63	461	64	178	115
<b>J&amp;K Mean</b>	402.7	396.1	457.1	442.9	555.0	436.3	388.1
s.d.	169.7	190.1	151.4	244.4	246.0	342	129.0
Nobs	484	281	95	1074	146	188.2	139
<b>Karnataka Mean</b>	331.4	299.1	437.7	333.2	473.0	321.9	331.3
s.d.	177.2	135.9	238.5	202.0	336.0	108.8	176.4
Nobs	619	366	160	1180	238	367	126
<b>Kerala Mean</b>	455.7	398.7	554.3	492.7	594.3	484.5	470.3
s.d.	328.6	165.1	500.1	316.9	370.4	288.9	276.0
Nobs	1052	531	339	1679	486	824	278

<b>MP Mean</b>	314.9	289.9	403.4	304.6	421.0	306.7	323.2
s.d.	150.1	105.0	223.0	139.2	198.3	176.3	145.8
Nobs	1076	564	252	3980	621	638	346
<b>Maharashtra Mean</b>	345.1	302.5	444.35	337.0	457.1	353.2	344.0
s.d.	179.7	125.3	373	168.6	241.1	738	130.1
Nobs	1267	691	247.2	2219	440	156.6	315
<b>Orissa Mean</b>	279.1	256.2	322.1	271.6	358.6	289.5	290.8
s.d.	127.2	93.3	158.7	137.7	193.4	129.6	152.2
Nobs	832	442	254	2364	534	502	210
<b>Punjab Mean</b>	549.1	532.6	635.9	512.5	674.7	529.6	544.2
s.d.	280.2	303.9	306.4	243.9	322.0	218.2	230.9
Nobs	561	262	136	1592	311	334	224
<b>Rajasthan Mean</b>	378.4	359.9	450.3	383.6	515.3	395.4	379.7
s.d.	139.5	128.5	162.7	173.5	224.1	184.8	143.3
Nobs	615	336	142	1804	272	330	195
<b>Tamilnadu Mean</b>	341.5	288.1	392.1	332.1	409.0	332.3	357.4
s.d.	161.0	122.7	174.2	159.1	197.7	136.0	185.6
Nobs	821	350	408	2813	835	567	176
<b>UP Mean</b>	330.3	304.8	412.2	328.8	459.9	321.2	327.8
s.d.	175.7	136.1	235.6	175.5	257.0	164.4	179.3
Nobs	2436	1164	604	4723	708	1564	900
<b>WB Mean</b>	334.5	300.2	424.2	302.4	395.1	319.6	357.0
s.d.	156.4	113.0	213.1	124.4	150.2	129.8	155.6
Nobs	911	583	241	2160	345	513	130
<b>All India Mean</b>	357.4	323.4	439.5	350.7	476.3	361.6	364.1
s.d.	199.5	156.1	265.3	208.6	323.6	196.0	190.2
nobs	16357	8712	4589	54927	7885	10222	4406

**TABLE 2B. Household and individual level rural poverty head-count ratio**

STATES	Household-level poverty			Individual level poverty			
	Our estimates			Our estimates 1995-96		Deaton & Paxon estimates 1987-88	
	All [1]	With old	No old	Elderly	Non-elderly	Elderly	Non-elderly
AP	0.20	0.18	0.20	0.17	0.20		
Assam	0.47	0.45	0.49	0.40	0.48		
Bihar	0.56	0.52	0.58	0.45	0.57		
Gujarat	0.21	0.20	0.21	0.16	0.21	0.31	0.43
Haryana	0.18	0.15	0.19	0.13	0.18		
Karnataka	0.32	0.32	0.31	0.23	0.32	0.49	0.54
Kerala	0.15	0.18	0.14	0.15	0.15	0.26	0.31
MP	0.36	0.33	0.37	0.28	0.36	0.55	0.62
Maharashtra	0.28	0.28	0.28	0.21	0.29	0.49	0.54
Orissa	0.48	0.41	0.51	0.39	0.49		
Punjab	0.09	0.06	0.11	0.05	0.10		
Rajasthan	0.20	0.20	0.20	0.17	0.20		
Tamilnadu	0.29	0.29	0.29	0.23	0.30	0.50	0.55
UP	0.44	0.42	0.45	0.37	0.44		
WB	0.49	0.41	0.52	0.37	0.50		

Notes: These figures show the proportion of total people in each category who live below the state-specific poverty lines. [1] These estimates are the same whether we consider household-level or individual level approach.

**TABLE 2C. Other household-level rural poverty indices**

STATE	Population living with elderly		Population living without elderly	
	Poverty gap index	Squared poverty gap index	Poverty gap index	Squared poverty gap index
AP	.0051	.0013	.0059	.0015
Assam	.0118	.0036	.0187	.0057
Bihar	.0140	.0043	.0222	.0070
Gujarat	.0043	.0011	.0060	.0017
Haryana	.0032	.0008	.0044	.0010
Karnataka	.0076	.0023	.0105	.0033
Kerala	.0042	.0010	.0038	.0010
MP	.0069	.0019	.0119	.0033
Maharashtra	.0062	.0016	.0097	.0031
Orissa	.0118	.0035	.0219	.0071
Punjab	.0012	.0003	.0024	.0006
Rajasthan	.0033	.0008	.0044	.0011
Tamilnadu	.0098	.0028	.0101	.0028
UP	.0108	.0033	.0142	.0043
WB	.0109	.0030	.0201	.0059

**Table 3A. Equivalence scales adjusted APCE**

	Households with old persons			Households without old persons		
States	(1,1,0.6)	(1.0.8,0.6)	(1,0.7, 0.5)	(1,1,0.6)	(1.0.8,0.6)	1,0.7, 0.5)
AP	471.9	516.7	567.6	409.0	448.9	492.6
Assam	531.5	572.1	626.5	401.1	431.5	471.7
Bihar	496.8	535.8	590.2	388.4	421.9	465.1
Gujarat	601.2	654.4	718.4	520.4	565.6	618.8
Haryana	730.8	783.8	857.7	601.7	646.8	710.7
J&K	695.1	743.3	814.3	565.4	606.1	663.2
Karnataka	582.8	639.4	702.2	422.7	461.5	507.3
Kerala	684.2	749.6	819.1	590.2	650.3	714.7
MP	554.4	598.8	656.0	407.8	441.0	483.3
Maharashtra	544.6	598.9	660.1	450.3	492.5	540.8
Orissa	492.7	535.8	588.8	361.1	392.4	428.9
Punjab	921.6	997.3	1091.6	649.3	700.4	765.3
Rajasthan	645.9	695.7	765.1	529.7	571.3	627.1
Tamilnadu	478.0	527.9	578.3	440.2	486.3	532.4
UP	586.4	631.7	691.6	451.0	486.2	532.4
WB	566.5	613.2	675.3	390.4	423.6	465.0
All India	588.6	638.3	700.0	464.2	503.2	551.2

Note: It clearly follows that the equivalence scale adjusted APCE is higher for households with older persons in all states, irrespective of the weights chosen.

**TABLE 3B. Equivalence scale adjusted poverty head count ratio**

STATES	All households			Households with elderly			Households without elderly		
	1, 1, 0.6	1, 0.8, 0.6	1, 0.7, 0.5	1, 1, 0.6	1, 0.8, 0.6	1, 0.7, 0.5	1, 1, 0.6	1, 0.8, 0.6	1, 0.7, 0.5
AP	.14	.12	.09	.03	.03	.02	.15	.12	.09
Assam	.27	.23	.19	.06	.05	.04	.31	.26	.21
Bihar	.29	.26	.21	.06	.06	.04	.32	.29	.24
Gujarat	.14	.12	.10	.03	.02	.02	.16	.14	.12
Haryana	.13	.11	.09	.04	.04	.03	.15	.12	.09
Karnatak	.19	.16	.13	.06	.04	.03	.22	.19	.15
Kerala	.13	.10	.07	.08	.06	.04	.15	.11	.08
MP	.21	.18	.15	.04	.03	.03	.24	.21	.18
Maharash	.18	.15	.12	.06	.05	.04	.21	.18	.14
Orissa	.29	.25	.20	.08	.06	.05	.34	.30	.24
Punjab	.10	.08	.07	.02	.02	.01	.12	.10	.08
Rajasthan	.14	.12	.09	.03	.02	.02	.16	.13	.10
Tamilnadu	.20	.16	.13	.04	.03	.03	.20	.17	.13
UP	.24	.21	.17	.08	.07	.06	.27	.24	.19
WB	.27	.23	.19	.05	.04	.03	.31	.27	.22

Note: These estimates are not available for J&K as we were unable to find a poverty line for the state in 1995-96. It is clear that the poverty head count ratio declines as we adjust for the equivalence scale and also that these adjusted poverty rates are less for households with elderly in all the Indian states.

**TABLE 4A. Size economies of scale adjusted APCE**

State	Households with elderly members				Households without elderly members			
	0.8	0.6	0.4	0.2	0.8	0.6	0.4	0.2
AP	429.3	578.1	789.8	1094	402.8	530.8	705.6	945.7
Assam	448.2	647.0	941.5	1381	420.8	571.1	780.5	1073
Bihar	403.1	584.1	858.0	1276	374.9	515.6	716.9	1007
Gujarat	564.6	785.6	1109	1587	526.9	718.5	988.8	1372
Haryana	658.4	948.3	1379	2023	658.9	911.9	1271	1783
J&K	581.3	848.1	1250	1858	603.2	835.6	1165	1636
Ktaka	464.7	661.6	955.2	1397	441.5	595.5	811.5	1117
Kerala	622.1	858.6	1197	1686	654.5	859.0	1137	1516
MP	442.3	632.5	918.4	1353	410.8	559.4	769.3	1068
Maharra	469.5	649.8	913.4	1302	455.3	610.9	826.9	1128
Orissa	387.5	546.5	781.5	1132	356.9	473.8	636.2	863.3
Punjab	782.7	1128	1642	2411	696.4	954.6	1319	1835
Rajasthan	532.8	761.4	1103	1616	527.1	720.4	994.5	1386
Tamilnadu	441.0	578.1	768.9	1036	433.6	564.1	740.0	978.4
UP	465.3	667.9	974.8	1445	443.5	611.2	851.5	1198
WB	467.4	661.6	947.9	1374	404.2	545.9	743.4	1020
All India								

Note: We find that scale adjusted APCE is always higher among households with older persons.

**Table 4B: Size economies of scale adjusted poverty head count ratio**

	All households				With old				Without old			
	0.8	0.6	0.4	0.2	0.8	0.6	0.4	0.2	0.8	0.6	0.4	0.2
AP	0.2	0.21	0.24	0.26	0.04	0.04	0.04	0.05	0.23	0.26	0.29	0.21
Assam	0.45	0.43	0.41	0.4	0.12	0.1	0.08	0.07	0.48	0.47	0.46	0.49
Bihar	0.54	0.5	0.48	0.46	0.16	0.13	0.11	0.1	0.55	0.54	0.53	0.57
Gujarat	0.18	0.17	0.17	0.17	0.05	0.04	0.04	0.04	0.18	0.19	0.2	0.19
Haryana	0.17	0.16	0.16	0.17	0.06	0.05	0.05	0.05	0.19	0.19	0.2	0.19
Karanata	0.28	0.26	0.25	0.25	0.1	0.08	0.07	0.06	0.3	0.29	0.3	0.3
Kerala	0.13	0.1	0.1	0.11	0.1	0.07	0.06	0.06	0.11	0.12	0.14	0.12
MP	0.33	0.32	0.31	0.31	0.08	0.07	0.06	0.05	0.36	0.36	0.36	0.36
Maharas	0.24	0.23	0.22	0.22	0.1	0.08	0.07	0.07	0.26	0.26	0.27	0.26
Orissa	0.44	0.42	0.42	0.41	0.14	0.12	0.11	0.11	0.5	0.5	0.5	0.51
Punjab	0.09	0.09	0.1	0.11	0.02	0.02	0.02	0.02	0.11	0.12	0.14	0.1
Rajasthn	0.16	0.15	0.16	0.18	0.04	0.03	0.03	0.03	0.17	0.18	0.2	0.17
Tnadu	0.26	0.23	0.22	0.21	0.07	0.05	0.05	0.05	0.23	0.22	0.22	0.26
UP	0.4	0.37	0.35	0.35	0.17	0.14	0.12	0.12	0.41	0.41	0.41	0.42
WB	0.47	0.44	0.42	0.41	0.11	0.09	0.08	0.07	0.5	0.48	0.47	0.51

**Table 5. A Comparison of demographic composition of households with and without elderly members**

	Household size		Current economic participation of elderly	Dependency ratio	
	With old	Without old	With old	With old	Without old
AP	5.14	4.45	0.41	0.28	0.73
Assam	6.75	4.95	0.35	0.36	0.85
Bihar	7.16	5.46	0.52	0.48	0.98
Gujarat	6.14	5.31	0.39	0.32	0.75
Haryana	6.75	5.57	0.32	0.39	0.93
J&K	7.19	5.52	0.51	0.39	0.88
Karnataka	6.94	5.19	0.41	0.39	0.81
Kerala	5.73	4.43	0.35	0.27	0.59
MP	6.84	5.25	0.45	0.40	0.88
Maharashtra	6.01	4.92	0.48	0.36	0.83
Orissa	6.19	4.67	0.43	0.33	0.75
Punjab	6.73	5.29	0.31	0.34	0.80
Rajasthan	6.72	5.39	0.45	0.44	0.96
Tamilnadu	4.47	4.15	0.51	0.21	0.61
UP	7.08	5.64	0.52	0.44	0.96
WB	6.39	4.94	0.39	0.34	0.85
All India	6.38	5.03	0.45		

**Table 6A. OLS estimates of APCE in selected states**

	Ols estimates of			Goodness of fit	
	Size	(Size) <sup>2</sup>	WithOld	R <sup>2</sup>	F-Stat
AP [1]	-0.71**	0.42**	0.03*	0.19	189.6**
Assam	-0.63**	0.36**	0.07**	0.14	86.06**
Bihar	-0.61**	0.39**	0.04**	0.16	204.2**
Gujarat	-0.89**	0.58**	0.06**	0.23	122.5**
Haryana	-0.39**	0.25**	0.01	0.16	111.9**
J&K	-0.73**	0.46**	0.02	0.12	44.5**
Karnataka	-0.75**	0.42**	0.06**	0.22	120.8**
Kerala	-0.62**	0.39**	-0.004	0.10	54.2**
MP	-0.93**	0.62**	0.05**	0.25	281.8**
Maharashtra	-0.87**	0.53**	0.02*	0.24	227.9**
Orissa	-0.62**	0.37**	0.02	0.22	150.6**
Punjab	-0.71**	0.47**	0.08**	0.22	101.0**
Rajasthan	-0.94**	0.62**	0.002	0.20	132.5**
Tamilnadu	-0.67**	0.36**	-0.02	0.17	147.6**
UP	-0.68**	0.42**	0.04**	0.14	237.2**
WB	-0.73**	0.47**	0.11**	0.21	207.5**
All India [2]	-0.60**	0.36**	0.03**	0.19	1626.7**

Note: [1] Other control variables include dummy variables for scheduled caste, scheduled tribe, agricultural labourer households. [2] Here, in addition to other control variables as noted in [1], we control for regional dummies as well. \* denotes significance at least at 10% and \*\* denote that at 1% or lower level.

**Table 6B. OLS estimates of APCE (with control for dependency ratio)**

	OLS estimates of				Goodness of fit	
	Size	(Size) <sup>2</sup>	Dependency	WithOld	R <sup>2</sup>	F-stat
AP [1]	-0.49**	0.29**	-0.21**	-0.02*	0.21	188.5**
Assam	-0.48**	0.26**	-0.18**	-0.007	0.16	89.5**
Bihar	-0.47**	0.29**	-0.16**	-0.008	0.18	202.1**
Gujarat	-0.76**	0.48**	-0.14**	0.02	0.24	114.2**
Haryana	-0.26*	0.14**	-0.14*8	-0.05*	0.08	13.04**
J&K	-0.64**	0.40**	-0.13**	-0.06**	0.14	43.3**
Karnataka	-0.62**	0.34*8	-0.16**	0.005	0.24	116.9**
Kerala	-0.55**	0.35**	-0.08**	-0.03	0.10	47.2**
MP	-0.77**	0.51**	-0.15**	0.01	0.26	262.9**
Maharashtra	-0.75**	0.45**	-0.14**	-0.03	0.26	209.1**
Orissa	-0.48**	0.28**	-0.16**	-0.03*	0.25	143.2**
Punjab	-0.58**	0.37**	-0.18**	0.02	0.24	100.5**
Rajasthan	-0.76**	0.48**	-0.17**	-0.05*	0.23	128.9**
Tamilnadu	-0.54**	0.27**	-0.14**	-0.06**	0.19	141.9**
UP	-0.54**	0.33**	-0.16**	-0.02	0.16	235.3**
WB	-0.52**	0.33**	-0.22**	0.03*	0.25	217.4**
All India [2]	-0.49**	0.29**	-0.14**	-0.01**	0.20	1620.4**

Note: [1] Other control variables include dummy variables for scheduled caste, scheduled tribe, agricultural labourers. [2] In addition to other control variables as noted in [1], here we control for regional variation as well. \* denotes significance at least at 10% and \*\* denote that at 1% or lower level.

**Table 6C: Logit estimates of incidence of poverty**

	Coefficient estimates of			LR chis-square statistic
	Size	(Size) <sup>2</sup>	WithOld	
AP [1]	0.82**	-0.04**	-0.09	566.6**
Assam	0.53**	-0.02**	-0.50**	412.3**
Bihar	0.41**	-0.02**	-0.39**	970.4**
Gujarat	0.58**	-0.02**	-0.25**	368.3**
Haryana	0.90**	-0.04**	-0.26	172.2**
Karnataka	0.48**	-0.01**	-0.40*	356.8**
Kerala	0.53**	-0.02**	0.11	167.1**
MP	0.65**	-0.03**	-0.41**	924.5**
Maharashtra	0.67**	-0.02**	-0.20**	670.3**
Orissa	0.52**	-0.02**	-0.28**	704.3**
Punjab	0.70**	-0.03**	-0.54**	217.2**
Rajasthan	0.53**	-0.02**	-0.12	348.9**
Tamilnadu	0.66**	-0.02**	-0.02	526.5**
UP	0.38**	-0.01**	-0.26**	993.2
WB	0.72**	-0.04**	-0.45**	768.5**
All India [2]	0.48**	-0.02**	-0.24**	16243.6**

Note: [1] Other control variables include dummy variables for scheduled caste, scheduled tribe, agricultural labourer households. [2] Here, in addition to other control variables as noted in [1], we control for regional dummies as well. \* denotes significance at least at 10% and \*\* denote that at 1% or lower level.

**Table 6D: Logit estimates of incidence of poverty (with control for dependency ratio)**

	Coefficient estimates of				LR chisquare statistic
	Size	(Size) <sup>2</sup>	Dependency	WithOld	
AP [1]	0.57**8	-0.03**	0.77**	0.38**	689.3**
Assam	0.41**	-0.01**	0.56*	-0.14**	497.8**
Bihar	0.29**	-0.01**	0.51**	-0.09*	1138.2**
Gujarat	0.50**	-0.02**	0.34**	-0.07*	381.3**
Haryana	0.76**	-0.03**	0.51**	0.08	189.5**
Karnataka	0.39**	-0.01**	0.58**	-0.07	417.4**
Kerala	0.49**	-0.02**	0.31**	0.23*	173.3**
MP	0.51**	-0.02**	0.52*	-0.10*	1099.7**
Maharashtra	0.57**	-0.02**	0.52**	0.12	736.8**
Orissa	0.33**	-0.01**	0.77**	0.13	806.6**
Punjab	0.52**	-0.02*	0.64**	-0.10	250.0**
Rajasthan	0.41**	-0.01**	0.55**	0.23	418.1**
Tamilnadu	0.48**	-0.01*	0.63**	0.28**	606.2**
UP	0.30**	-0.01**	0.39**	-0.001	1130.8**
WB	0.49**	-0.02**	0.75**	-0.007	930.2**
All India [2]	0.37**	-0.01**	0.50**	0.07**	17361.1

Note: [1] Other control variables include dummy variables for scheduled caste, scheduled tribe, agricultural labourer households. [2] Here, in addition to other control variables as noted in [1], we control for regional dummies as well. \* denotes significance at least at 10% and \*\* denote that at 1% or lower level.

Table 7. Old Age Pension amounts given by different States

<b>S. No.</b>	<b>Name of the State</b>	<b>Current amount of Pension (Rs. p.m.)</b>	<b>Minimum Age of Eligibility (in Yrs.)</b>
1.	Andhra Pradesh	75	65
2.	Arunachal Pradesh	150	60
3.	Assam	60	65 (males) 60 (females)
4.	Bihar	100	60
5.	Gujarat	200 275	60 to 65 65 +
6.	Haryana	100	60
7.	Himachal Pradesh	150	60
8.	Jammu & Kashmir	125	60
9.	Karnataka	100	65
10.	Kerala	110	65
11.	Madhya Pradesh	150	60 (males) 50 (females)
12.	Maharashtra	100	65 (males) 60 (females)
13.	Mizoram	100	65 (males) 60 (females)
14.	Orissa	100	65
15.	Punjab	200	65 (males) 60 (females)
16.	Rajasthan	200 300	58 (males) 55 (females)
17.	Tamil Nadu	150	60
18.	Uttar Pradesh	125	60
19.	West Bengal	300	60
20.	Chandigarh	200	65 (males) 60 (females)
21.	Delhi	200	60

Source: Help Age India : <http://www.helpageindia.org/scg2.php>

Figure 1

