

## Economic Independence of Female Elderly in Different Regions of India

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**Abstract:** Indian economy is experiencing the ageing of population recently, due to decline in fertility and mortality rates. The ageing of population creates some socio-economic issues and policy challenges such as - old age dependency, feminization of ageing, crisis in caring for the elderly etc. Actually, the increase in the aged population poses challenges to society and policy makers—how to provide socio-economic support to the elderly? With the erosion of traditional family structures and values and the failure of the state to compensate for such social changes, many aged people participate in the labour market after retirement age. One of the most important issue related to the old age is feminization of ageing. In this paper, I have examined the labour market participation of female elderly in six different geographical zones of India. In particular, this paper examines whether the participation of the female elderly has increased in economic activity. The analysis has been carried out by taking NSS 55th (1999-00) and NSS 68th (2011-12) round data on 'Employment and Unemployment Situation in India'. The analysis consists of two parts — tabular analysis followed by econometric analysis using appropriate models. A simple bivariate analysis shows that the work participation of 60 years and above female elderly people in India has decreased in recent years (2011-12) compared to the period just after globalization (1999-00). However, the female elderly in North and North-east India are participating more in the work in 2011-12 compared to 1999-00. Econometric analysis confirms that in North, Central and East India probability of work participation decreases with increase in age of the aged female but work participation increases among the West, North-east and South Indian female elderly. West, North-east and East Indian economically well off female elderly are having higher probability of participation in work compared to others in the 68th round. Probability of work participation is higher among the rural female elderly. Weaker section female elderly are participating more in the economic activity.

## 1. INTRODUCTION

The United Nations (UN) defines a country as ‘ageing’ where the proportion of people over 60 year reaches seven per cent of total population. Population ageing is one of the most important components of the second demographic transition that has started in the 21st century. Population projections indicate an increasing graying of the world’s population, with the share of persons aged 60 years and above predicted to increase from 9.5% in 1995 to 30.5% in 2150 (United Nations, 2005). Over the last few decades developed countries have experienced significant change in the age composition of their population due to decline in fertility rates and mortality rates. In 2000, Europe had the highest proportion of elderly persons (United Nations, 2002). The growth rate of elderly population varies between countries. In particular, ageing is a major challenge in countries like Germany, France and United Kingdom, Japan etc. (Anderson and Hussey, 2000). In contrast, population ageing in the developing countries like India is a recent rapidly emerging issue. In India, the elderly person exceeded the proportion of seven per cent of population and is expected to reach 12.6 percent in 2025 (Prakash, 1999). In 2050 it is projected to increase to 20 per cent (Subaiya and Bansod, 2011). Population projection indicates that the elderly person in India will increase to 140 million by 2021 compared to 77 million in 2001 (Jeyalakshmi *et al.*, 2011). The demographic transition is expectedly not uniform in all the states of India. More developed states like Punjab, Himachal Pradesh, Maharashtra, etc. are experiencing faster growth of aged population than other states. The ageing of population is particularly acute in Kerala (James, 1994; Subaiya and Bansod, 2011). This accelerating pace of ageing in low income societies represents a mix of complex issues related to social, economic, health, and those related to public policies (Alam, 2006). Jeyalakshmi *et al.* (2011) mentioned that the among the elderly age specific death rate varies across states such as in Kerala, Delhi the age specific death rate of the elderly is relatively lower and higher in the states like Assam, Madhya Pradesh etc.

The liberalizing policies of the 1990s had led to rapid economic growth of over eight percent in the first decade of the new century. However, critics have pointed out that this growth has not been inclusive. Rather, the slow growth of employment opportunities accompanying the spurt in GDP growth implies that basic inequalities and vulnerabilities existing in the economic system would remain and might ultimately act as a brake to economic growth in subsequent years. The issue of ‘jobless growth’ assumes importance in view of the increasing longevity of the population, leading to the phenomenon of ageing. This accelerating pace of ageing may results in a high

level of labours supply because people live longer. Further, in the absence of adequate social security benefit for the elderly persons, the inclusive growth will expand labour market opportunities. This can serve as an important means for survival to the economically vulnerable aged.

In this paper, I have analysed the work participation of the female aged in India disaggregating the sample by six different zones of the country. Feminization of ageing is an important issue for different reasons such as — female members typically do not have any economic resources that will support them in their old age, the social status of elderly women (particularly widows) is very poor. Women are likely to be dependent on others (Kumar, 2003). For instance, about 73 per cent of elderly females were fully dependent on someone else economically in India (Husain and Ghosh, 2010). Higher dependency ratio among the female has also been reported by Bhat and Dhruvarajan (2001). According to Age Well Foundation (2011) the sex ratio for total population in India is almost 940 females per 1000 of male, but for the elderly population the sex ratio is in favor of female elderly i.e. for 60+ population the sex ratio is 1022 female per 1000 of male and with the increase in age the sex ratio increases i.e. the sex ratio becomes 1310, 1590, 1758, and 1980 aged women per 1000 elderly male at age 65, 70, 75 and 80 respectively (Age Well Foundation, 2011). The same study also confirms that the older women suffers in many respect such as emotional alienation although many of them still living with other family members, social insecurity leads to a distress full life of them, financial insecurity is also a major problem, the older women suffer acute health problems due to various reasons such as negligence, lack of awareness, financial support, and religious mindset of them, the aged women are also suffering a lot from emotional insecurity particularly after losing the life partner. Age Well Foundation, (2011) opined that low literacy rate among the elderly women, no ownership of property, majority of them not in labour force during prime age are also the major problems that the older women are having.

Going through the literature it has been observed that the female dependency ratio and the difference between male and female dependency ratio are increasing over time in India (Jeyalakshmi *et al.* 2011). Women are observed to have a little control over their family income and on their own income as well (Rajan *et al.*, 1999; Kumar, 2003). They are more vulnerable because of lower literacy, greater longevity and higher incidence of widowhood etc. (Rajan *et al.*, 1999; Kumar, 2003). Widows experience vulnerability in the domains of residence, inheritance, remarriage, and employment (Chen and Dreze, 1995). It is found that older people without [adult] children and those who are widowed are more vulnerable to poverty (Barrientos *et*

*al.*, 2003). Earlier, joint family system provided social security to the elderly. But such scenario has changed in recent years. Social security actually includes different types of benefits such as medical benefits, sickness benefit, maternity benefit, unemployment benefit, employment injury benefit, old-age benefit, survivor benefit etc. (Rajan, 2008). The coverage of social security is not satisfactory in South Asian countries (Rajan, 2008). The Government of India, has taken some measure to improve the socio- economic conditions of the elderly in the form of policies like *Annapoorna*, National Old Age Pension Scheme, provisioning of housing facilities, enabling public spaces more aged friendly, etc. (Rajan and Mishra, 2011). But only a fraction of the elderly poor are covered under such schemes. As feminisation of ageing is really a big concern of any ageing society, in this paper I will concentrate on the economic independence of them by examining the participation in economic activities by them i.e. I will examine whether labour market is actually a solution for the female elderly to live their life with dignity.

## 2. LITERATURE REVIEW

According to Guilмото and Rajan (2002) economic conditions appeared to be the crucial factor for the elderly across the world, as it underlay all other determinants of living conditions and health status. It has been reported that about 60 per cent of the female elderly and about 30 per cent of the male elderly in India did not possess any valuable assets, indicating their lack of savings and economic vulnerability (Rajan, 2006). Thus, financial insecurity is one of the major problems of the elderly in India, particularly among the female elderly (Rajan, 2008). In India almost four out of five older female either having no income or a very negligible amount of income (Giridhar *et al.*, 2015).

Among the female elderly in India only 14 per cent to 17 per cent aged female are economically independent in rural and urban India whereas the male elderly are relatively more independent as almost 51 per cent to 56 per cent of them are financially independent (Jeyalakshmi *et al.* 2011). Sector wise analysis shows that among urban areas in Himachal Pradesh highest proportion of female elderly were economically independent (30 per cent) and in urban Orissa only six per cent female aged were economically independent. For rural India such highest and lowest figures have been observed in Tamil Nadu (19 per cent) and in West Bengal (six per cent) respectively (Jeyalakshmi *et al.* 2011).

Considering both Census (2001) and National Sample Survey organization's data on Employment-unemployment (2007-08) Jeyalakshmi *et al.* (2011) have

observed that only 40 per cent 60+ population are working, among the male elderly 60 per cent and among the female aged 19 per cent are working. In rural India almost 23 per cent and in urban India almost seven per cent are participating in work (Jeyalakshmi *et al.*, 2011). Giridhar *et al.* (2015) opined that poverty is the main force that drives the aged women to participate in the work with low wages and no post-work benefit.

Analysing Census data, Rajan *et al.* (2003) observed that the work force participation (WFP) of 60+ populations both in rural as well as in urban India has decreased from 1961 to 1991. Disaggregating the analysis by gender, they have found that elderly male participated more in economic activities than the female elderly. Among the male elderly, 62 per cent worked as cultivators; among the female, 70 per cent worked as agricultural labourers.

Using NSS data from 1983 to 2004-05, Selvaraj *et al.* (2011) have also analyzed the elderly work force participation trend in India on the basis of usual activity status (usual principal status<sup>2</sup> and usual subsidiary status<sup>3</sup>). The work participation of male elderly declined from 64 per cent in 1983 to 57 per cent in 2004-05, while female employment trend remains stagnant at 20 per cent in both the years. Disaggregating the analysis by place of residence and gender, Selvaraj *et al.* (2011) found that, for urban male WFPR declined sharply (from 50.2 per cent in 1983 to 36.6 per cent in 2004-05) while for rural male it declined slightly (66.8 per cent to 64.4 per cent). WFP for rural females increased marginally from 22.6 per cent to 25.3 per cent, while WFP of urban females declined from 13.8 per cent to 10 per cent. The analysis also reveals that the work force participation decreases with age—with the rate of decrease being higher for female elderly. Selvaraj *et al.* (2011) also analysed the educational profile of aged workers. More than 70 per cent of elderly workers are illiterate, or do not have any primary education. Among the female workers illiteracy is even higher—almost 93 per cent. Selvaraj *et al.* (2011) also found that the labour force participation of elderly is higher among the poor consumption quintiles than the richer ones, particularly among the female elderly workers.

UNFPA (2012) have carried a survey regarding the socio-economic status, health status, and work participation, social security schemes of the elderly people in seven states (Himachal Pradesh, Kerala, Maharashtra, Orissa, Punjab, Tamil Nadu and West Bengal) in India in 2011. They have observed that the work participation of the male elderly is significantly higher (39 per cent) than the female (11 per cent) and rural elderly people are participating more in the work force.

Giridhar *et al.* (2015) have analysed the economic, social and health condition of aged women considering seven states of India (Tamil Nadu, Kerala, Maharashtra, Orissa, West Bengal, Punjab, Himachal Pradesh). They have observed that 59 per cent aged women have no income and another 26 per cent earns less than 12 thousand rupees per annum. The percentage of aged women with no personal income and no social pension is high in all the seven states mentioned above. Giridhar *et al.* (2015) mentioned that the 36 per cent of the female elderly who are having some income, perceived that they contribute to household expenditure and almost 13 per cent perceived that their contribution covers half of the household expenditure. Among the female elderly, the elderly who are poor, less educated and belongs to SC/ST communities are participating more in the work. Almost 68 per cent of them are working in the informal sector. The same study also confirms that 85 per cent widowed women are fully or partially dependent on others and almost 35 per cent widowed women receive social pension which is the only source of income of them. Among these states in West Bengal the deprivation of the widowed are highest in terms of income, assets, poverty, availing social benefit etc.

The older women are also involving in many non-economic activities such as different household work, taking care of grandchildren etc. Government has implemented many social assistance scheme such as concession in train tickets, tax benefit, higher interest rate in fixed deposit etc. But the awareness regarding such benefit is also very low among the aged women in India.

Most of the literature on ageing focused on the health, residential arrangements etc. There is a dearth of literatures regarding labour market participation of elderly in India, in particular the work participation of female elderly. The above mentioned literatures although focused on the feminisation of ageing but they suffer some limitations such as all the literatures are descriptive. Multivariate analysis helps us to captures the effects of several variables on work force participation of elderly women. All the literatures almost analysed the economic independence at all India respect. Only Giridhar *et al.* (2015) have taken seven states of India and focused mainly on feminisation of ageing. But the economic independence of female elderly should be analysed in much deeper way in India.

Taking into consideration these limitations in this paper I have analysed the economic independence of female elderly in terms of work participation in six different zones of the country. In this paper I want to analyse whether the workforce participation of female elderly has increased in recent years compared to the period just after globalization. I have also examined the labour market participation of the female aged

across education level and monthly per capita expenditure of them. The bi-variate analysis is followed by the multivariate analysis where I want to examine the effects of several determinants on work participation of female elderly in India. The analysis is disaggregated by six different regions of the country in order to capture region specific behaviour of the female elderly with respect to work participation.

### **3. DATABASE AND METHODOLOGY**

#### **3.1. Database**

For the purpose of analysis, I have taken National Sample Survey (NSS) Organization's unit level data on Employment and unemployment in India. The availability of different socio- economic information in NSS data helps us for richer bi-variate and multivariate analysis. This study uses NSS 55th round (1999-00) and NSS 68<sup>th</sup> round (2011-12) data on Employment and unemployment situation in India. Here I have taken these two rounds in order to capture the recent changes in workforce participation compared to the period immediately just after globalization.

The sampling design adopted for the two surveys were essentially a stratified multi-stage one for both rural and urban areas. The surveys used the interview method of data collection from a sample of randomly selected households. The first stage units (FSUs) were villages (panchayat wards for Kerala) for rural areas and NSS Urban Frame Survey (UFS) blocks for urban areas. The ultimate stage units (USUs) were households.

I have constructed some variables from the unit level data of NSS such as geographical zone, education level, socio-religious identity, monthly per capita expenditure etc. In this paper I have considered six geographical zones —North (Haryana, Himachal Pradesh, Jammu and Kashmir, Punjab, Chandigarh, Delhi etc.), Central (Bihar, Madhya Pradesh, Rajasthan, Uttar Pradesh etc.), West (Goa, Gujarat, Maharashtra, Dadra and Nagar Haveli, Daman and Diu etc.), East (Orissa, West Bengal, Assam, Tripura etc.), North-east (Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim etc.) and South (Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Andaman and Nicobar, Lakshadweep, Pondichery etc.).

Educational attainment of the female elderly has been categorised as illiterate, below primary educated, primary educated, middle educated, secondary educated, higher secondary (HS) educated and above HS educated. Below primary education level includes informal education also. Socio-religious identity of the people is categorised as — Muslim, Hindu Upper Caste (HUC), Hindu Schedule Caste (HSC),

Hindu Schedule Tribes (HST), Hindu Other Backward caste (HOBC), and other caste (Others) etc. NSS data (Schedule 10, section 9) also provides us information of total monthly consumer expenditure. Dividing the total household monthly consumer expenditure by the household size we arrived at monthly per capita expenditure of the household. In this paper for the purpose of analysis I have considered quintile division of monthly per capita expenditure.

In the 68th rounds, data was collected for 4,56,976 individuals, among which there were 38,027 individuals aged 60 years and above. In the 55th round, data was collected for 5,92,816 individuals. Within this sample, there were 42,818 persons aged 60 years and above.

Table 1 summarizes the percentage of female elderly in India in six different geographical zones. Among six zones most of the female elderly may be found in West and South zone in the 55th round of NSS and in the South zone in the 68<sup>th</sup> round of NSS. In comparison, the proportion of female elderly lives in North-East India is very low in both the round of NSS. Over the study period all the geographical zone has registered increase in the percentage of female elderly, however, highest increase in the proportion of female elderly has been observed in South India (by more than two percentage point).

**Table 1: Sample profile of female elderly in India by geographical zone in the 55<sup>th</sup> and 68<sup>th</sup> round of NSS**

<i>Geographical zone</i>	<i>NSS 55th</i>	<i>NSS 68th</i>
North	8.02	9.29
Central	6.81	7.35
West	8.58	10.22
East	6.86	8.39
North-east	4.71	4.86
South	8.58	10.73

*Source:* Calculated from NSS 55th round and NSS 68th round

### 3.2. Some methodological issues

In order to capture the economic independence of the female elderly we can take either labour force<sup>4</sup> participation rate or workforce<sup>5</sup> participation rate. As the number of unemployed elderly in both the rounds are very low, it doesn't matter which measure we choose. But here I have chosen the workforce participation rate as this includes demand condition also.



There are three reference period of the NSS survey. These are: (i) one year (ii) one week and (iii) each day of the reference week. Based on these three periods, three different measures of activity status are arrived at, termed respectively as usual status, current weekly status and current daily status.<sup>6</sup> Usual status is determined on the basis of the usual principal activity and usual subsidiary economic activity of a person taken together. Usual status data is a better indicator regarding the presence in the labour market as it looks at the status of the person over a longer reference period. Here for the purpose of analysis I have taken usual principal status data.

### 3.3. Econometric model

In order to capture the effect of several determinants on work participation of female elderly in different zones of India, I have considered the following model:

$$\begin{aligned} \text{WFORCE} = & \alpha + \beta_1 \text{AGE} + \beta_2 \text{AGE}^2 + \beta_3 \text{LPCME} + \beta_4 \text{LPCME}^2 + \beta_5 \\ & \text{ILLITERATE} + \beta_6 \text{BPRIMARY} + \beta_7 \text{MIDDLE} + \beta_8 \text{SECONDARY} + \beta_9 \\ & \text{HS} + \beta_{10} \text{ABOVEHS} + \beta_{11} \text{MUSLIM} + \beta_{12} \text{HSC} + \beta_{13} \text{HST} + \beta_{14} \text{HOBC} \\ & + \beta_{15} \text{HOTHERS} + \beta_{16} \text{HHSIZE} + \beta_{17} \text{UNEMP} + \beta_{18} \text{URBAN} \quad (1) \end{aligned}$$

where

WFORCE = 1 if the respondent is a worker, = 0 otherwise

AGE = Age of the respondent

LPCME = Log of monthly per capita expenditure

ILLITERATE = 1 if the respondent is illiterate, = 0 otherwise

BPRIMARY = 1 if the respondent is below primary educated, = 0 otherwise

MIDDLE = 1 if the respondent is middle educated, = 0 otherwise  
SECONDARY = 1 if the respondent is secondary educated, = 0 otherwise

HS = 1 if the respondent is higher secondary educated, = 0 otherwise

ABOVEHS = 1 if the respondent is above higher secondary educated, = 0 otherwise  
(PRIMARY, i.e. respondent has primary education, is taken as reference category)

MUSLIM = 1 if the respondent is a Muslim, = 0 otherwise

HSC = 1 if the respondent is a Hindu schedule caste, = 0 otherwise  
HST = 1 if the respondent is a Hindu schedule tribe, = 0 otherwise  
HOBC = 1 if the respondent is a Hindu backward caste, = 0 otherwise

HOTHERS = 1 if the respondent belongs to all others socio-religious identity, = 0 otherwise

(HUC, i.e. Hindu forward castes, is the reference category) HHSIZE = Number of members in the household

UNEMP = State level unemployment

URBAN = 1 if the respondent resides in urban India

(RURAL, i.e. respondent resides in rural India is a reference category)

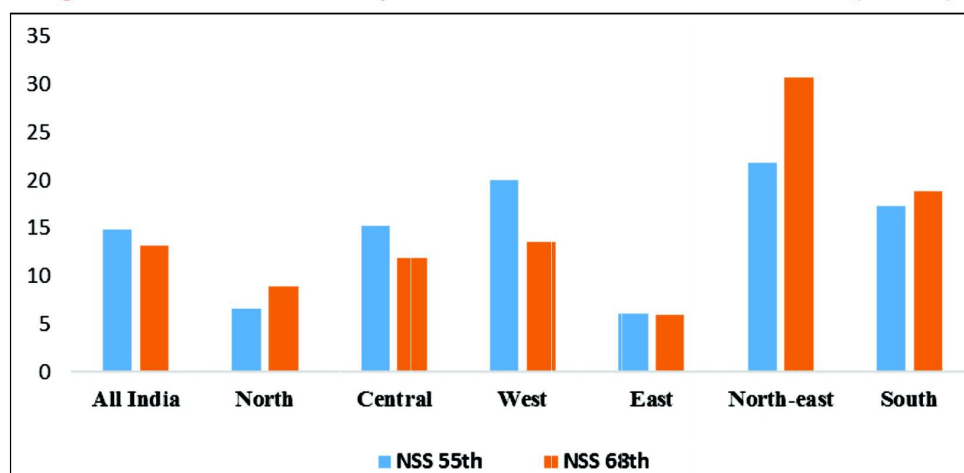
In the above equation the dependent variable is a binary variable. In presence of binary dependent variable, we can use probit or logit model. But here, there is reverse causality between work participation of the elderly female and monthly per capita expenditure of them. So here we have used Arellano's (2008) control function approach which is a two-step probit model<sup>7</sup>.

#### 4. RESULTS AND DISCUSSION

An examination of WFPR of female elderly in India in the 55<sup>th</sup> and 68<sup>th</sup> round of NSS (Figure 1) shows that workforce participation of female elderly decreases from 14.80 per cent in the 55<sup>th</sup> round to 13.15 per cent in the 68<sup>th</sup> round of NSS i.e. they are participating less in the work force in 2011-12 compared to 1999-00.

Disaggregating the sample by six different geographical zones shows that North and North-east and South Indian elderly female are participating more in the workforce in recent years compared to the period just after globalization. However,

**Figure 1: WFPR of female elderly in India in the 55th and 68th round of NSS (Per cent)**



Source: Calculated from NSS 55th round and NSS 68th round

the North-east India Female elderly shows a sharp increase in the participation in the workforce in 2011-12 compared to 1999-00. WFPR of East Indian female elderly remains almost same in both the round of NSS. The increased participation of female elderly may be because of rising cost of living, poor financial condition of them etc. In this context, Alam and Mitra (2012) mentioned that slow growth of productive employment opportunities has forced the elderly people in India to participate in the labour market as young workers are not able to earn enough to support the elderly people as dependents and it is the income insecurities that force many older persons to continue work in highly challenging low paid employment (Alam, 2012).

However, the aged female in the Central India and West India are participating less in the workforce in the 68th rounds of NSS compared to the 55th round of NSS. The decreased participation of them may be because of poor health condition, lack of skill, unfriendly public transport, improved public distribution system, fewer job opportunities of female elderly, increased in earnings of non-elderly members in the family etc. (Pandey, 2009; Himangshu 2011; Khera 2006, 2011).

Two most important determinants of workforce participation are — level of education and monthly per capita expenditure of elderly. Table 2 depicts the WFPR of aged female disaggregating the sample by geographical zone and level of education of female elderly.

**Table 2: WFPR of female elderly by educational achievement and geographical zone in the 55th and 68th round of NSS (percentage)**

Education level	Geographical zone											
	North		Central		West		East		North-east		South	
	NSS 55 <sup>th</sup>	NSS 68 <sup>th</sup>	NSS 55 <sup>th</sup>	NSS 68 <sup>th</sup>	NSS 55 <sup>th</sup>	NSS 68 <sup>th</sup>	NSS 55 <sup>th</sup>	NSS 68 <sup>th</sup>	NSS 55 <sup>th</sup>	NSS 68 <sup>th</sup>	NSS 55 <sup>th</sup>	NSS 68 <sup>th</sup>
Illiterate	6.85	9.73	16.04	13.08	22.00	16.67	6.88	6.35	21.74	31.75	19.55	22.56
Informal/ Below primary	6.09	8.01	7.13	6.29	14.82	7.75	3.47	6.74	24.24	24.61	12.62	12.22
Primary completed	10.16	5.51	5.42	5.54	7.15	7.39	3.69	4.70	9.58	39.81	11.32	11.35
Middle completed	1.67	4.72	6.62	2.06	12.68	5.24	3.61	2.20	22.29	16.20	4.90	14.34
Secondary completed	0.58	11.67	0.24	2.63	6.77	10.49	-	6.40	73.11	28.14	3.72	6.16
HS completed	-	9.62	6.21	0.28	19.60	11.36	-	2.36	-	41.80	10.53	0.52
Above HS	6.24	0.91	3.38	8.38	22.66	1.71	-	4.46	-	24.68	7.59	6.05

Source: Calculated from NSS 55th round and NSS 68th round

Education level of the female elderly shows that in North India primary educated and secondary educated female elderly are participating more in the 55th and 68th rounds of NSS respectively. In both the round, fluctuating trend with respect to work force participation has been observed with the increase in education level of the female elderly. Over the rounds WFPR has increased for all education level except for the primary educated and above higher secondary educated aged female in North India.

Looking at the Central India we can find that the aged female who are not having any educational background are participating more than any other educational category. This may be because of their financial insecurities (Alam, 2012). However, over the study period WFPR of illiterate aged female has decreased but above higher secondary educated female elderly are participating more in the workforce in 2011-12 than 1999-00. This may indicate that availability of white collar job has increased for the Central Indian female elderly or may be due to improved health condition they are participating more in the work force.

Analysis of WFPR of aged female in Western part of India shows highest WFPR among the above higher secondary educated female elderly in the 55th round of NSS. However, in the 68th round highest participation has been found among the illiterate female elderly. Over the study period, unlike Central Indian female elderly, a sharp decline in work participation has been found among the above higher secondary educated aged female. Only the secondary educated aged female in West India are participating more in the work force in the 68th round of NSS compared to the 55th round of NSS. In West India, most of the educational category of female elderly are participating less in 2011-12 compared to 1999-00 may be because of the increase in earnings of non-elderly people or may be savings during young age or may be due to the extension of non-economic support to the young members in the family. (Barrett, 2013; Kohli and Kunemund, 2013). Like Central India, in Eastern part of India illiterate aged female are participating more than the other in both the round of NSS. Over the round WFPR has increased among the primary educated and below primary educated female elderly. In North-east India highest participation has been observed among the secondary educated and higher secondary educated female elderly in the 55th and 68th round of NSS respectively. According to Aggarwal *et al.* (2013) educational attainment increases the propensity to be in work. Over the study period WFPR has increased among the illiterate, primary educated female elderly in North-east India. A sharp decline in WFPR has been found among the secondary educated female elderly. In South India in both the round, highest

participation is observed among the illiterate female elderly and over the study period the illiterate aged female are participating more in the workforce like North-east Indian female elderly. This may also indicate economic vulnerability forces the aged female to participate in work in South India. In the next part I am going to analyse the WFPR of elderly female across expenditure quintiles.

Here we have taken quintile division of monthly per capita expenditure of female elderly.

**Table 3: WFPR of female elderly by expenditure group and geographical zone in the 55<sup>th</sup> and 68<sup>th</sup> round of NSS (percentage)**

Expenditure level	Geographical zone											
	North		Central		West		East		North-east		South	
	NSS	NSS	NSS	NSS	NSS	NSS	NSS	NSS	NSS	NSS	NSS	NSS
	55th	68th	55th	68th	55th	68th	55th	68th	55th	68th	55th	68th
Poorest	5.59	12.78	16.66	12.31	28.70	11.04	8.97	7.04	22.62	28.19	21.19	20.77
Poor	7.93	11.41	17.59	14.00	23.20	17.45	5.59	5.67	27.39	23.33	18.69	19.76
Middle	7.02	16.32	16.26	11.61	18.05	19.19	6.56	9.33	18.52	33.56	18.72	26.74
Rich	8.39	5.84	11.12	11.34	18.54	13.32	3.25	3.44	22.07	36.83	15.50	17.81
Richest	4.34	5.90	8.92	6.47	12.15	6.83	1.89	2.02	21.24	26.79	11.86	10.01

Source: Calculated from NSS 55th round and NSS 68th round

Analysis by monthly per capita expenditure of the female elderly in North India shows a fluctuating trend in both the round of NSS. However, over the round the participation in the workforce has increased for all, except the rich female elderly in North India. If we look at the Central India, we can observe an inverse 'U' shape relation between the study variables in both the round. Unlike North India, in Central India WFPR of the aged female has decreased for almost all expenditure level in the 68th round of NSS compared to 55th round of NSS. In West India we can find a negative relation between quintile division of monthly per capita expenditure and WFPR of the female elderly. Except the middle expenditure group female elderly WFPR has decreased for all expenditure group in the 68th rounds of NSS compared to the period just after globalization in Western part of India. East and North-east India depict a fluctuating trend between WFPR and quintile division of monthly per capita expenditure of elderly in both the rounds of NSS. A sharp increase in work participation has been found among the middle expenditure group female elderly in East India in recent years compared to the period just after globalization.

In North-east India except the poor expenditure group the participation in the workforce has increased for all in 2011-12 compared to 1999-00. If we look at the WFPR of female elderly in the Southern part of India, we can observe negative relation between the study variables in the 55th round of NSS and fluctuating trend in the 68th round of NSS. In South India, except the lower end and upper end for all other expenditure group WFPR has increased in recent years compared to the period just after globalisation.

#### 4.1. Econometric analysis

After analysing the bi-variate part, in the next section we are focusing on the multivariate part of our analysis. In this part, I will concentrate on the econometric analysis.

Table 4 depicts the effects of predictor variables on work participation of female elderly in six different zones of India in the 55<sup>th</sup> and 68<sup>th</sup> round of NSS. It has been observed that the LR  $\chi^2$  statistic is significant at 1 per cent level in all the geographical zone in both the rounds. The pseudo R<sup>2</sup> statistics show that the independent variables explain 15 percent, 23 per cent of the variation in the dependent variable for North Indian female elderly; 12 per cent, 17 percent variation in the dependent variable for Central Indian female elderly; 18 per cent, 19 per cent variation in the dependent variable for West Indian female elderly; 12 per cent, 9 per cent variation in the dependent variable for East Indian female elderly; and 16 per cent, 16 per cent variation in the dependent variable for South Indian female elderly in the 55<sup>th</sup> and 68<sup>th</sup> round respectively. These are acceptable in cross section analysis.

Here we can observe that probability of WFP increases at a decreasing rate among the North, Central and East Indian female elderly with the increase in age in the 55th rounds of NSS. However, in these three regions in the 68th round of NSS we can observe a different scenario i.e. WFPR of the female aged decreases with increase in age of the female but at an increasing rate. The positive relation between the study variables in the 55th rounds may be because of poverty, lack of social security and pension, rapid growth of health care cost, nuclear family, migration of younger generations etc. (Auer and Fortuny, 2000; Milbourne and Doheny, 2012; Singh and Das, 2012).; however, poor health condition, enough savings during young age, well economic condition of the non-elderly members in the household, extending familial support to the non-elderly members in the family, success of different Government programmes like mid-day meal scheme, loan waiver scheme, MNREGA, public distribution system (Himangshu, 2011; Khera, 2006, 2011) may be the possible

reasons for the negative relation between the study variables in the 68th round of NSS. Ironically, WFPR of the female aged in West, North-east and Southern part of India depict an inverse relation with the age in the 55th round of NSS, however, in 2011-12 work participation of the aged female increases with age but at a decreasing rate. The increasing participation of West, North-east and South Indian female elderly in the work may be because of better health condition, to avoid loneliness (due to out migration of young members in the family), increasing health expenditure etc. It has been observed by many researchers that labour market participation by the elderly have positive impact on their physical and mental health and life satisfaction of them (Husain and Ghosh, 2010; Chang and Yen, 2011).

Log of monthly per capita expenditure of the elderly shows that work participation of the aged female decreases with increase in monthly expenditure level in North, Central and South India in both the rounds. This implies that economically well off aged female are participating less in the workforce in this three regions in the 55<sup>th</sup> and 68<sup>th</sup> round of NSS. Although the economically well off aged female are participating less in the work force in the 55<sup>th</sup> round of NSS in the West, North-east and East regions of India, but participation in the workforce increases with increase in monthly expenditure of the elderly female in the 68<sup>th</sup> round of NSS. In West, North-east and East regions, the poorer female elderly are participating less may due to the poor health condition of them (Alam and Mitra, 2012).

Table 4 also illustrates that work participation of the female elderly decreases with increases in family size in both the rounds for all the geographical zones. Comparing rural and urban area in each zone it has been observed that rural female elderly are participating more than the urban female in both the rounds in all the regions except the female elderly in Central India in the 68<sup>th</sup> round and East, North-east Indian aged female in the 55<sup>th</sup> round of NSS. With the increase in state level unemployment rate the participation in the work decreases for all elderly female in both the rounds except the West Indian female in the 55<sup>th</sup> round and South Indian Female in the 68<sup>th</sup> round of NSS.

The regression coefficients of the education dummies indicate that the work participation of female elderly in the North India decreases with increase in education level in the 55<sup>th</sup> round of NSS. and in the 68<sup>th</sup> round of NSS with the increase in education level from middle educated elderly onwards the participation increases up to higher secondary educated female elderly and a substantial decrease in work participation has been found there after. Among the North India aged female, primary

educated are participating more than the other education level in the 55th round of NSS, however, in the 68th round of NSS the illiterate female elderly, middle, secondary and higher secondary educated are participating more than the primary educated female elderly. In Central India the highest participation in the workforce has been found among the illiterate female elderly in the 55th round of NSS but in the 68th round we can observe a different scenario i.e. highest participation has been found among the above higher secondary educated female elderly. In both the round in Central India illiterate and above higher secondary educated female elderly are participating more in the workforce than the primary educated. In West India the female aged for all education level are participating more than the primary educated in the 55th round of NSS and in the 68th round except the middle educated and above higher secondary educated female aged, all other participating more than the primary educated aged female. The highest participation has been found among the higher secondary educated aged female and illiterate aged female in West India in the 55th and 68th round of NSS respectively. The female elderly who are having primary level of education in East India are participating more than the other in the 55th round of NSS, however, in the 68th round except the higher secondary educated female aged all other education dummies show that primary educated are participating less than the other in East India. In the 68th round the highest participation has been found among the below primary educated female elderly in east India. Over the study period the participation has increased among East Indian female elderly who are having lower level of education. Among the North-east India female elderly, most of the educational group are participating more than the primary educated in the 55th round of NSS but in 2011-12 except illiterate and higher secondary educated, all others are participating less than the primary educated. The highest participation has been observed among the secondary educated and higher secondary educated North-east Indian female in the 55th and 68th round of NSS respectively. In South India the female elderly who are having no educational background are having highest participation in both the round of NSS. In South India the lower educated are participating more but the higher educated are participating less than the primary educated in both the rounds of NSS.

Socio religious identity of the female elderly in different regions of India depicts that the Muslim elderly female are participating more in the work force compared to the Hindu upper caste female elderly in Central, West, and East India in both the round of NSS and in North- east India in the 68th round of NSS. The North Indian and South Indian Muslim aged female are participating less than the upper caste



Table 4: Effects of predictor variables on work participation of female elderly in the 55th and 68th round of NSS

Variable	North		Central		West		East		North-East		South	
	NSS 55 <sup>th</sup>	NSS 68 <sup>th</sup>	NSS 55 <sup>th</sup>	NSS 68 <sup>th</sup>	NSS 55 <sup>th</sup>	NSS 68 <sup>th</sup>	NSS 55 <sup>th</sup>	NSS 68 <sup>th</sup>	NSS 55 <sup>th</sup>	NSS 68 <sup>th</sup>	NSS 55 <sup>th</sup>	NSS 68 <sup>th</sup>
	Z value	Z value	Z value	Z value	Z value	Z value	Z value	Z value	Z value	Z value	Z value	Z value
AGE	0.15	-0.25	0.06	-0.24	-0.02	0.14	0.32	-0.24	-0.20	0.54	-0.10	0.02
AGE2	-0.001	0.001	-0.0009	0.0013	-0.0005	-0.001	-0.003	0.001	0.001	-0.004	0.0003	-0.001
LPCME	-0.14	-0.12	-0.09	-0.05	-0.04	0.23	-0.09	0.02	-0.08	0.09	-0.05	-0.01
LPCME2	0.00	0.04	-0.06	0.04	0.00	-0.07	-0.03	0.03	-0.01	0.00	-0.0003	-0.06
HHSIZE	-0.18	-0.03	-0.08	-0.04	-0.09	-0.12	-0.18	-0.11	-0.05	-0.15	-0.14	-0.13
URBAN	-0.30	-0.55	-0.19	0.11	-0.73	-0.49	0.26	-0.03	0.12	-0.02	-0.27	-0.38
UNEMP	-0.16	-14.87	-4.47	-6.72	1.55	-7.26	-4.07	-2.35	-4.40	-1.30	-1.01	0.09
Education level (Ref.Cat. PRIMARY)												
ILLITERATE	-0.16	0.43	0.30	0.35	0.52	0.44	-0.03	0.43	0.61	0.14	0.20	0.32
BPRIMARY	-0.22	-0.06	0.09	-0.04	0.35	0.07	-0.13	0.59	0.63	-0.27	0.10	0.07
MIDDLE	-0.57	0.20	0.02	-0.25	0.52	-0.16	-0.04	0.03	0.70	-0.53	-0.33	0.13
SECONDARY	-1.08	0.35	-1.29	0.02	0.16	0.20	0.53	0.53	2.23	-0.04	-0.60	-0.30
HS	0.61	0.12	-1.12	-1.12	1.05	0.38	-0.13	-0.13	0.00	0.21	0.09	-1.32
ABOVE HS	-0.05	-0.55	0.03	0.40	0.80	-0.64	0.09	0.09	0.00	-0.14	-0.34	-0.22
Socio-religious identity (Ref. Cat. HINDU forward caste)												
MUSLIM	-0.12	-0.91	0.15	0.46	0.01	0.11	0.40	0.39	-0.27	0.10	-0.06	-0.13
HSC	0.07	-0.10	0.43	0.46	0.04	0.38	0.63	0.22	0.50	0.39	0.15	0.18
HST	-0.44	0.61	0.71	0.82	0.24	0.29	0.92	0.64	-1.03	1.55	0.35	0.86
HOBC	0.19	-0.22	0.24	0.56	0.22	0.12	0.55	-0.12	0.14	0.67	0.19	0.21
HOTHERS	-0.54	-0.37	0.52	0.34	0.13	0.39	0.77	0.11	0.33	0.73	-0.05	0.01
N	939851705	3136455	4579561376	13794232	2182219066	7315156	1605235607	5643643	48246824	191841	3350043776	11502847
LR c2	6.64E+07	426963.49	5.01E+08	1177264.63	3.78E+08	1029351.73	1.43E+08	320264.9	4704068.78	30758.94	4.94E+08	1790463.79
PSEUDO R2	0.15	0.23	0.13	0.12	0.17	0.18	0.19	0.12	0.09	0.13	0.16	0.16

Source: Calculated from NSS 55th round and NSS 68th round

Note: All the coefficients are significant at 1% level.

Hindu aged female in both the round of NSS. Table 4 also depicts that that Hindu Schedule Caste, Schedule Tribes, and other backward caste elderly female are participating more than the upper caste Hindu female elderly almost in all the regions in both the rounds.

## 5. SUMMING UP

From the above discussion we have come to know that population ageing in India is a recent phenomenon unlike developed countries. Among many issues related to the old age, one of the important issue is 'Feminization of ageing' as female elderly person in many society is in vulnerable situation in terms of different socio-economic parameters compared to male elderly. In this paper, I have focused on the female elderly in India particularly on the economic independence of them as family support is declining now-a-days due to nuclearisation of family and coverage of social security is extremely low. The participation in the labour market has been analysed considering NSS 55th (1999-00) and 68th (2011-12) round data disaggregating the sample by six geographical regions of the country.

The analysis confirms that at all India level the WFPR of the female elderly people decreases in 2011-12 compared to 1999-00. But zone wise analysis depicts that female elderly in North and North-east India are participating more in the work force in the 68th rounds of NSS compared to the 55th rounds. For the bi-variate analysis, the two most important determinants of WFPR of the aged female has been taken into account i.e. level of education and monthly per capita expenditure of the female elderly has been considered. The illiterate aged female in North, and South India are participating more but the above higher secondary educated are participating less in the work in the 68th round compared to the 55th round of NSS. However, in Central India a totally different scenario has been noticed. Like North and South Indian aged female elderly, the higher educated aged female in Western part of India also participating less in the work in recent years compared to the period just after globalization. Although the WFPR of Est Indian 60+ illiterate female elderly increases in the 68th rounds compared to 55th rounds of NSS but the same has decreased for the North-east Indian illiterate elderly female. The quintile division of monthly per capita expenditure of the female elderly shows an inverse 'U' shape relation in Central India, a negative relation in West India with respect to WFPR of the 60+ aged female. The WFPR of aged female in North, North-east and East India depicts a fluctuating trend between the study variables. Over the study period WFPR has increased for most of the expenditure quintile among the

North, North-east, and South Indian female elderly. Opposite scenario has been noticed among the Central, West Indian 60+ aged female

Econometric analysis reveals a positive relation between the probability of work participation and age of the North, Central and East Indian female elderly in the 55th round of NSS and negative relation in the 68th round of NSS. With the increase in age the participation in the work has decreased in 1999-00 among the West, North-east and South Indian female elderly but participation increases in 2011-12. The economically better off 60+ female in North, Central and South India are participating less in both the rounds. However, the East, North-east and West Indian economically well off female elderly are participating more than other expenditure group in the 68th round of NSS. Comparing rural and urban sector, it has been found that in most of the geographical zone rural female elderly are participating more than their counter part in urban area. Education dummies confirms that in 2011-12, illiterate female elderly in all the geographical zones are participating more than the primary educated 60+ aged female. The above higher secondary educated female elderly in North, West, North-east and in South India are participating less than the primary educated female elderly in 2011-12. Socio-religious identity of the female elderly depicts that all most in all the zones the Schedule Caste, Schedule Tribes and Other Back Ward Caste are participating more in the workforce compared to Upper Caste Hindu.

A study by Help Age International argues that public policy should enable older people to support themselves and remain independent for as long as possible (Help Age International, 1999: 15). So the policies for the elderly must have to be reformed. In order to incorporate the aged female in the development process we have to remove the structural rigidities obstructing entry of elderly workers into the labour market (Pandey 2009). Policies are required to provide aged-friendly health sector, transport sector, training for the elderly female to facilitate their participation in the labour market.

### *Notes*

1. Growing number of women in older ages compared to men is known as feminization of ageing. Sex ratio in India is expected to increase from 94 women per 100 men in 1991 to 105 by 2026 (Registrar General and Census Commissioner of India, 2006).
2. If an individual is identified as a worker for the major part of the year, he/she is categorized as a worker on the basis of the usual principal status.
3. If an individual is identified as a worker only for a minor part of the year he/she is categorized as a worker on the basis of subsidiary status.

4. Labour force includes persons who are working and those who are willing to work but may be currently unemployed. LFPR is number of persons in the labour force divided by population in the relevant age group.
5. Work force includes persons who are currently working. WFPR is number of persons in the work force divided by population in the relevant age group.
6. This activity status for a person is determined on the basis of his/her activity status on each day of the reference week.
7. In our study, we have found that LPCME and WFPR are the functions of the following variables:

$$\text{LPCME} = f(\text{WFPR}, \text{other explanatory variables})$$

$$\text{WFPR} = g(\text{LPCME}, \text{LPCME2}, \text{other explanatory variables})$$

Following the Arellano's control function approach we have to identify an instrumental variable (IV) that affects LPCME but not WFPR of female elderly. In our model the instrumental variable is number of non-aged working members of the family. We first regress LPCME on the instrument and other variables. Based on this model, we estimate predicted residual and we form standardize residual (SRES). As WFPR is the function of LPCME and LPCME2, we have calculated SRES and square of SRES (SRES2). We then estimate WFPR on SRES, SRES2 (in place of LPCME and LPCME2) and other variables to obtain unbiased consistent estimates. This model is estimated for only the age sample.

### *References*

- Age Well Foundation (2011). "Older women in India", Available at: <http://www.agewellfoundation.org> [Accessed on 01/11/2020].
- Aggarwal, A. and Freguglia, R. and Johnes, G. and Spricigo, G. (2013). "Education and labour market outcomes: Evidence from India", *The Indian Journal of Labour Economics*, 56(3): 331-347.
- Arellano, M. (2008). "Binary models with endogenous explanatory variables", Available at: <http://www.cemfi.es/~arellano/binary-endogeneity.pdf>, [Accessed on 01/04/2013].
- Alam, M. (2012). "India's elderly: Challenges to inclusive growth", *Geography and you*, 12(74): 29-33.
- Alam, M. and Mitra, A. (2012). "Labour market vulnerabilities and health outcomes: Older workers in India", *Journal of Population ageing*, 5(4): 241-256.
- Alam, M. (2006). "Ageing in India: Socio-economic and health dimensions", Delhi: Academic Foundation.
- Anderson, G. F. and Hussey, P. S. (2000). "Population aging: A comparison among industrialized countries", *Health Affairs*, 19(3): 191-203.
- Auer, P. and Fortuny, M. (2000). "Ageing of the labour force in OECD countries: Economic and social consequences", Geneva: International Labour Office, Employment Paper.

- Barrientos, A. and Gorman, M. and Heslop, A. (2003). "Old age poverty in developing countries: Contributions and dependence in later life", *World Development*, 31(3): 555-570.
- Barrett, A. (2013). *The Economic Contribution of Older Londoners*, GLA Economics, London.
- Bhat, A.K. and Dhruvarajan, R. (2001). "Ageing in India: Drifting intergenerational relations, challenges and options", *Ageing and society*, 21(5): 621-640.
- Chen, M.A. and Dreze, J. (1995). "Widowhood and well-being in rural north India". In Dasgupta, M. and Chen, L.C. and Krishnan, T.N. (eds.): *Women's health in India: Risk and vulnerability*, Bombay: Oxford University Press, 245-288.
- Chang, H.H. and Yen, S.T. (2011). "Full time, part time employment and life satisfaction of the elderly", *The Journal of Socio-Economics*, 40(6): 815-823.
- Giridhar, G. and Subaiya, L. and Verma, S. (2015). "Older women in India: Economic, social and health concerns", New Delhi: UNFPA, Thematic Paper 2.
- Guilmoto, C.Z. and Rajan, S.I. (2002). "District level estimates of fertility from India's 2001 census", *Economic & Political Weekly*, XXXVII (7): 665-672.
- Help Age International (1999). "The ageing and development report: Poverty, independence and the world's older people", Earthscan, London.
- Himangshu (2011). "Employment trends in India: A re-examination", *Economic and Political Weekly*, XLVI (37): 43-59.
- Husain, Z. and Ghosh, S. (2010). "Economic independence, family support and perceived health status of elderly: Recent Evidence from India", *Asia-Pacific Population Journal*, 25(1): 47-77.
- James, K.S. (1994). "Indian elderly: Asset or liability", *Economic & Political Weekly*, XXIX (36): 2335-2339.
- Jeyalakshmi, S. and Chakrabarti, S. and Gupta, N. (2011). "Situation Analysis of The Elderly in India", New Delhi : Central Statistics Office.
- Khera, R. (2006). "Mid-Day meals in primary schools, Achievements and challenges", *Economic and Political Weekly*, XLI(46): 4742-4750.
- Khera, R. (2011). "Revival of the Public Distribution System: Evidence and explanations", *Economic and Political Weekly*, XLVI (44 - 45): 36-50.
- Kohli, M. and Kunemund, H. (2013). *The Social Connections of Older Europeans*, In Field, J. and Burke, R.J. and Cooper, C. L. (eds.), *The SAGE Handbook of Ageing, Work and Society*, SAGE publications, London, 347-63.
- Kumar, S.V. (2003). "Economic security for the elderly in India", *Journal of Ageing and Social Policy*, 15(2-3): 45-65.
- Milbourne, P. and Doheny, S. (2012). "Older people and poverty in rural Britain: Material hardships, cultural denials and social inclusions", *Journal of Rural Studies*, 28(4): 1-9.
- Pandey, M.K. (2009). "Labour force participation among Indian elderly: Does health matter?", ASARC, Working paper 2009/11.

- Prakash, I.J. (1999). "Ageing in India", Geneva: World Health Organization.
- Rajan, S.I. and Mishra, U. S. and Shankara Sarma, P. (1999). "India's elderly burden or challenge?", New Delhi: Sage Publications.
- Rajan, S.I. (2006). "Population ageing and health in India", Mumbai: Centre for Enquiry into Health and Allied Themes.
- Rajan, S.I. and Sarma, P.S. and Mishra, U.S. (2003). "Demography of Indian aging, 2001-2051", *Journal of Aging and Social Policy*, 15(2-3): 11-30.
- Rajan, S.I. (2008). "Ageing, pensions and social security in south Asia". In Rajan S.I. (eds.): *Social security for the elderly: Experiences from South Asia*, New Delhi, 1-38.
- Rajan, S.I. and Mishra, U.S. (2011). "The national policy for older persons: Critical issues in implementation", New Delhi: UNFPA, Working Paper 5.
- Selvaraj, S. and Karan, A. and Madheswaran, S. (2011). "Elderly workforce participation, wage differentials and contribution to household income", New Delhi: UNFPA, Working paper 4.
- Singh, A. and Das, U. (2012). "Determinants of old age wage labour participation and supply in india: Changes over the past two decades", Available from: <http://ssrn.com/abstract=2196183> [Accessed on 27/03/2013].
- Subaiya, L. and Bansod, D.W. (2011). "Demographics of population ageing in India", New Delhi: UNFPA, Working paper 1.
- UNFPA (2012). "Report on the status of elderly in selected states of India, 2011", New Delhi: United Nations Population Fund.
- United Nations Population Division, (2002). "World population ageing: 1950- 2050", New York: UN Population Division.
- United Nations Population Division (2005). "Population challenges and development goals", New York: UN Population Division.