

Background:

Population Ageing is indicated by increasing proportions of older persons in the total population. Increased life expectancy is a feature due to the improved health conditions, declining infant mortality and fertility rates (Raymond, Greenberg et al. 2005). Life expectancy at birth is over 80 now in 33 countries; just five years ago, only 19 countries had reached this (UNFPA, 2012). In a phenomenon referred to as the “compression of morbidity”, the length of healthy old-age appears to be increasing. Partly this trend is attributed to increases in the length of life, and part to shorter and later periods of illness. The net effect is an increase in number of years lived at old age without major health problems (Bloom et al., 2010).

There is a gendered nature of ageing, with women living longer than men and thus, are more in number especially in the higher age groups. This predominance of women among the aged population is referred to as the “Feminization of Ageing”. According to Political Declaration and Madrid International Plan of Action on Ageing (MIPAA), Second World Assembly on Ageing, UNDESA, 2002, feminization of ageing refers to the proportion of females constituting greater than 50 percent of the older population and the growth of that proportion.

Good health, economic and social security and adequate housing are essential requirements of aging with dignity, but older women in both developed and developing countries face difficulties in accessing these on a basis of equality with men. A combination of age and sex discrimination also puts older women at increased risk of violence and abuse. Increased longevity is often not matched by a healthy life condition. In most cases, they have less access to health care services. Since female labour force participation rates are lower, a higher percentage of females remain dependent financially than the males. With no paid employment or earning less relative to males, a higher proportion of older women than older men have neither savings nor a contributory pension. Moreover, the older women have lower levels of education than the older men, because as girls, they were denied of the opportunity to avail or complete their education. Illiteracy or lower educational levels have always been a hindrance to personal development and in the case older women, would seriously limit the ability for them to obtain information, access services or take part in decision making. Often, female elderly are more likely to be widowed than the older male and are less likely to remarry. Thus, the loss of spouse makes her more vulnerable and in many societies they are subjected to social exclusion. The increased longevity of women has significant implications for women living alone for extended periods – potentially with less resources and support. The nation has to ensure an enabling and supportive environment to elderly women.

With the rapid changes in demographic indicators over the last few decades, it is certain that India will move from being a young country to an old country over the next few decades. Presently, India has around 90 million elderly and by 2050, the number is expected to increase to 315 million, constituting 20 per cent of the total population as per the BKPAI Report, 2011. States with elders exceeding the national average are many more in number and include the whole of the southern region, and parts of the western, northern and eastern regions of the country. There is also extreme heterogeneity in the demographic transition across states, resulting in vast differences in the demographic scenario across social, economic and spatial groups according to BKPAI Report, 2011. In India, older women are seldom part of the development agenda. The proportion of women and men in the elderly population has important implications for policymakers, as they have different experiences and problems due to their biological differences, social and gender roles and position in the society at large.

The process of ageing itself is a relatively new demographic event for India and the changing sex ratio in the greying years is not much discussed upon. Demographic data on population ageing, sex ratio, life expectancy and socio-economic aspects across gender and region has been analysed, discussed and compared. The focus is specifically on the elderly women population of the country who are generally marginalised and underprivileged on grounds of policies aimed especially for them. The study tries to bring out the trends and pattern of ageing and the process of feminization in the higher age groups for all the states of the country over a period of time. It tries to analyze the general trend of life expectancy especially at and after the age of 60 years of age and relate it with the changing demographic trends.

Objectives:

1. To understand the trend and pattern of Ageing and the process of Feminization of Ageing in India in the last three decades.
2. To analyze the pattern of change in Life Expectancy at 60 years of age between the sexes and according to the place of residence.

Data and Methodology:

The data source for this study is the Census of India over the period of 1981 to 2011 and Appendix SRS Based Life Tables as given by the Office of Registrar General and Census Commissioner 1995-99 and 2007-2011 at a period of five years interval.

Sex Ratio was calculated for the age groups 60 years and above. In India, sex ratio is calculated as the number of females per thousand men.

$$\text{Sex Ratio} = \frac{\text{Total number of females}}{\text{Total number of males}} * 1000$$

This study considers the process of feminization of ageing as the point of time when the female elderly population is equal to or more than the male population for the age group 60 years and above.

Choropleth maps of India for different time periods were created to give a pictorial explanation of the trend of the aged population and the process of changing sex ratio for 60 years and above using ARC GIS Software.

For comparing the Life Expectancy for two different groups of population according to sex (males and females) and according to place of residence (rural and urban) *Index of dissimilarity in length of life (IDLL)* was used. It was used as given by Shkolnikov et al. (2001) and is defined as

$$\text{IDLL (relative terms)} = \frac{\sum_i |LE_x - LE_x^i| \theta_x^i}{LE_x}$$

$$\text{IDLL (absolute terms)} = \text{IDLL} * LE_x$$

where, i is a group such as; male-female or rural-urban etc., x is age, LE represents Life Expectancy and θ_x^i represents weights which permit to present the life expectancy of the overall population as a weighted average of the group-specific life expectancies. In this case, there were only two population groups each time (according to sex and according to place of residence), $\theta_x^i = l_x^i / l_x$ where, l_x^i and l_x are derived from individual life tables. To understand the population characteristics in terms of marital status percentage distribution have been

used. Work participation and literacy rates have been measured by Work Participation Rates, Unemployment Rates and Literacy Rates.

$$\text{Work Participation Rate} = \frac{\text{Number of workers in the specified age group}}{\text{Total Population}} * 100$$

For calculating the total workers, the main workers and marginal workers were considered for the given period for the specified age group.

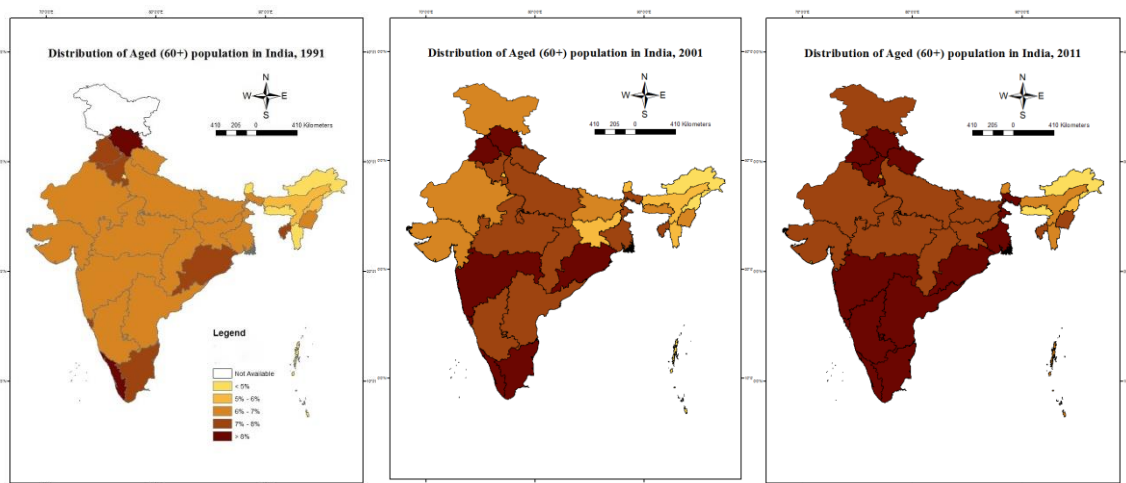
$$\text{Unemployment Rate} = \frac{\text{Numbers of Non – workers seeking or available for work}}{\text{Total Non – workers in the age group}} * 100$$

$$\text{Literacy Rate} = \frac{\text{Number of literates in the age group}}{\text{Total Population in the age group}} * 100$$

Findings:

Trend and Pattern of Ageing in India:

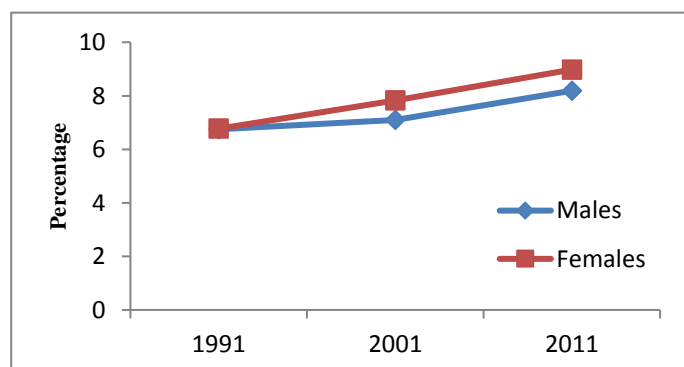
In India, the proportion of the population of the aged 60 years and above has been increasing consistently over the last few decades. Leaving a few states from the northeast, the rest have around 6 percent of their population as aged. The percentage share of aged population has increased tremendously in the last three decades and India is slowly trending towards having an enormous amount of population above the age of 60 years in the near future. The total population of the elderly changed from 6.76% in 1991 to 8.58% in 2011 in the country of India.



Percentage distribution of Elderly (60+) population in India, 1991-2011

(Source: Census of India, 1991-2011)

The proportion of women is higher than men in the aged population. Of the total female population of the country, almost 9 percent belong to the aged population whereas the proportion of the male population of the country is about 8 percent according to the Census of India 2011. On the contrast, the aged population in urban areas was about 8.10 percent compared to 8.79

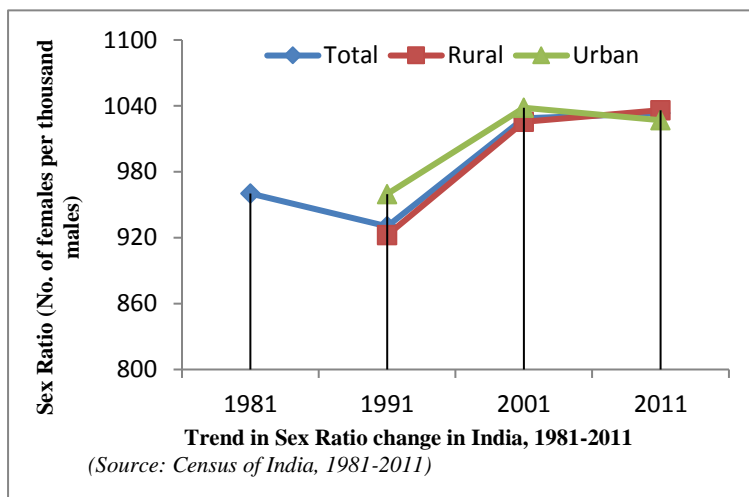


Percentage of aged (60+) population, according to sex, India, 1991-2011 (Source: Census of India, 1991-2011)

percent in the rural areas for the whole of India according to the same data. The trend and pattern of this process of ageing has shown a significant increase over the last thirty years. Except for a few north eastern states of India, there has been an overall growth of about 2 percent of the elderly population of the country with occasionally higher increase in some cases. Arunachal Pradesh is one state that has the least aged population as well has less proportion of female aged population also.

The percentage of aged population distribution is more in the rural areas compared to the urban areas of the country. States like Andhra Pradesh (10.84%), Gujarat (8.31%), Haryana (9.16%), Himachal Pradesh (10.51%), Karnataka (10.40%), Kerala (12.58%), Maharashtra (11.32%), Odisha (9.84%), Punjab (11.29%), Tamil Nadu (10.82%) and Uttaranchal (9.61%) have aged population more than 8 percent distributed in the rural areas of the states. On the contrast, the aged population in urban areas was about 8.10 percent compared to 8.79 percent in the rural areas for the whole of India according to the Census of India 2011.

Trend and Pattern of Feminization of Ageing in India:



The sex ratio in the age group of 60 years and above shows an increasing trend over the years from 960 females per 1000 males in 1981 to 1033 females per 1000 males in 2011 with a sudden decrease in 1991 to 930 females per 1000 males. It is observed that Andhra Pradesh (1119), Gujarat (1132), Karnataka (1108), Kerala (1226) and Maharashtra (1114) were some of the first states that have experienced the concern of

increasing number of women in the older ages than men. The number of states experiencing the process of feminization was nine in 1981 which decreased to six states among the twenty five states in 1991. It again increased to sixteen states and seventeen states in 2001 and 2011 respectively. A few states like Madhya Pradesh (969), Mizoram (951), Odisha (978) and Rajasthan (975) experienced a decrease in the sex ratio for elderly females in the year 1991. States like Arunachal Pradesh, Assam, Bihar, Jammu and Kashmir, Mizoram, Nagaland, Punjab, Sikkim and Uttar Pradesh are yet to reach the situation of favourable sex ratio in favour of elderly females in the country.

The sex ratio differentials can be observed according to the place of residence. In 1991, the rural sex ratio for the elderly population was 922 females per thousand males in the country which has increased to 1026 females in 2001 followed by 1036 females per thousand males in 2011. However, in the urban areas, initially in 1991, the sex ratio in this age group was more than their rural counterparts as of 960 females per thousand males that rose to 1038 females in 2001 which again decreased to 1027 females per thousand males.

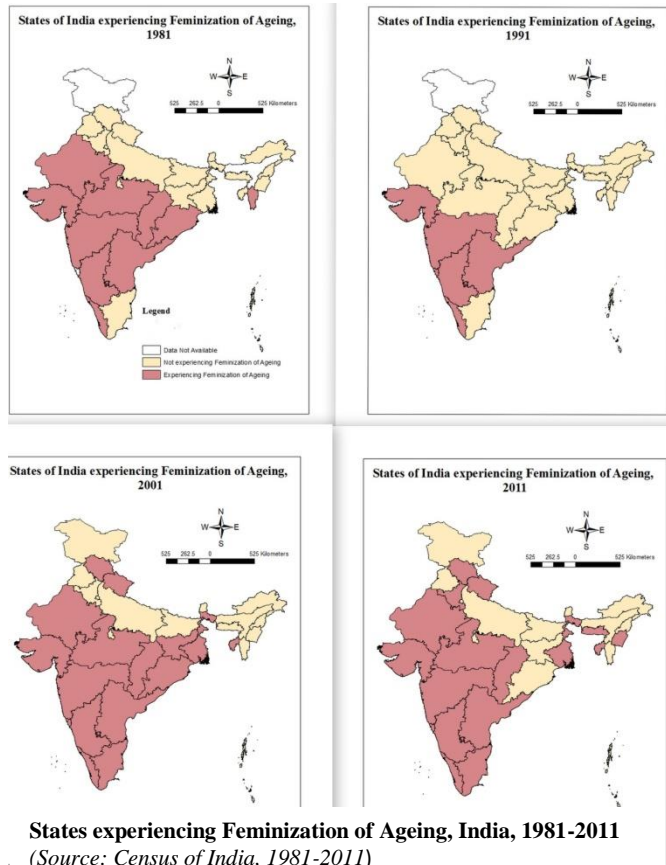
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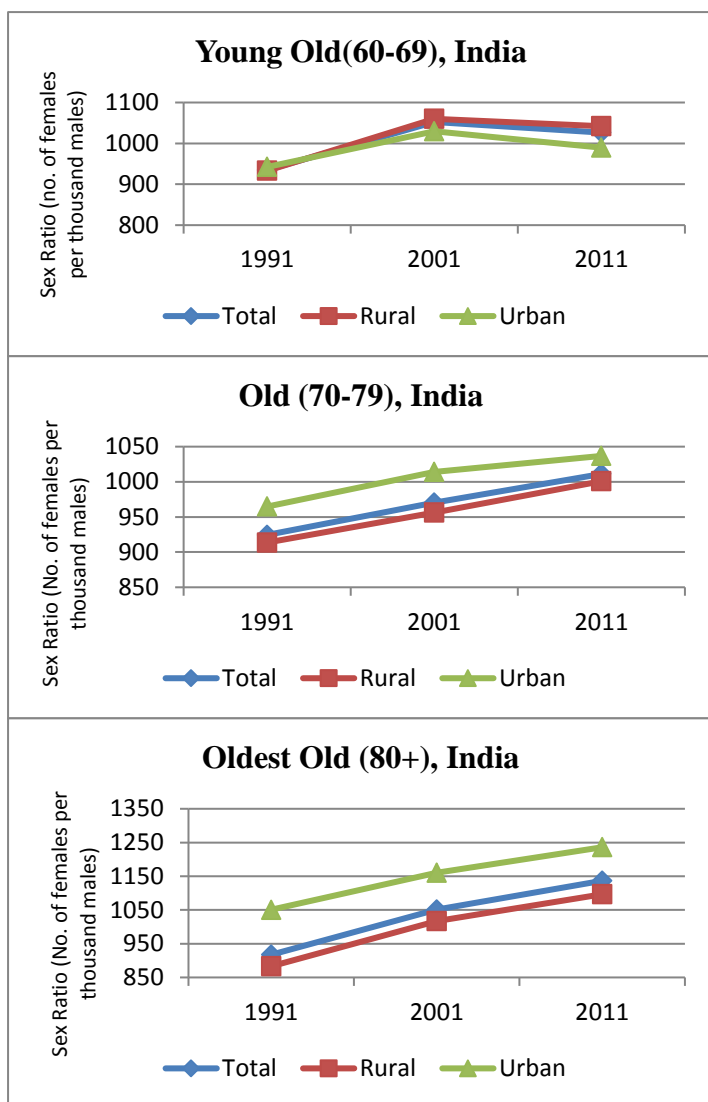
Around five states; Goa (1334), Gujarat (1075), Karnataka (1011), Kerala (1127) and Maharashtra (1034) started experiencing this concern for growing elderly females in their rural areas and eight states experienced the same in the urban parts, in 1991. In the next decade the number of states undergoing the process of feminization of ageing rose and around fifteen states had the sex ratio of their rural aged

population in favour of women and the number rose to seventeen in the next decade. On the other hand, the sex ratio for this age group in the case of urban areas increased and fifteen states were calculated to have growing female aged population than the opposite sex in the decade of 2001. The number of states remained consistent for the decade of 2011 without inclusion of any new state in this category. The trend shows that there is a chance that the rural areas of the country might experience the dilemma of a huge female elderly population faster than their urban counterpart.

The proportion of women rises further with age and India is not any exception to this situation. The ageing population has been classified according to the age groups as “Young Old” (60-69), “Old” (70-79) and “Oldest Old” (80+). The feminization of ageing is particularly relevant for the Oldest Old population, which has relatively a large proportion of women. In India, this group has a sex ratio of 1137 females per thousand males. There is a strong urban-rural differential that shows that gender differential is more relevant in the urban areas for the Oldest Old population than the rural parts. But, it is surprising to observe that, the Young Old population in the urban regions do not experience feminization of ageing as per the Census data of 2011.

For the Young Old group, the sex ratio was 933 in 1991 that rose to 1042 females per thousand males in 2011 for the rural areas of the country whereas, for the urban regions it was 942 in 1991 that increased to 1030 in 2001 but again decreased to 989 in 2011. For the Old group of population the sex ratio has been at a constant rise over the decades irrespective of the place of residence though it remained higher in the urban areas than the rural parts of the country. The Oldest Old population has always a significant number of females than the males and for both the rural and urban areas; it has been high for the country. It increased from 883 in 1991 to 1017 in 2001 to 1096 in 2011 for the rural areas while it increased from 1051 in 1991 to 1161 in 2001 to 1263 in 2011 for the urban counterparts. States like Andhra Pradesh (1130), Chhattisgarh (1153), Goa (1123), Gujarat(1068), Haryana (1015), Himachal





Pradesh (1012), Jharkhand (1010), Karnataka (1084), Kerala (1112), Madhya Pradesh (1045), Maharashtra (1129), Meghalaya (1016), Odisha (1002), Punjab (1007), Rajasthan (1057), Tamil Nadu (1045), and Uttaranchal (1017) have higher proportion of females than males in the Young

Old (60-69) category in 2011. Except the states of Haryana (994), Jharkhand (953) and Punjab (914) the states also have a favourable sex ratio towards female for the Old (70-79) group. Manipur (1029), Tripura (1071) and West Bengal (1035) have a higher percentage of females than males in the Old (70-

79) category. All the states have a high population of female elderly in the Oldest Old age group except Odisha that has a sex ratio of 943 females per thousand males in this age group. Assam (1027) and Mizoram (1106) have a favourable sex ratio of women for the Oldest Old age group for the decade of 2011.

One significant observation is that more states experience the process of feminization of ageing in the rural areas compared to the urban areas. Also, the urban population of the states having a favourable sex ratio of females have maximum female population in the higher age groups than the younger age groups. The rural areas of the states have great fluctuations and there are even instances like Jharkhand and Orissa which have more proportions of females in the Young Old age group than the older age groups.

The sex ratio of the aged population was compared to the total sex ratio of the state and also the child (0-14 years) sex ratio, but they had no direct effect on the aged (60+) sex ratio. Females were found to be more even for states with unfavourable sex ratio for the total population and the child population. This deduces that the number of females in the population increases after the commencement of 60 years of age even if the population experiences a low female count than the males before that age.

Area	1981			1991			2001			2011		
	Total	Child	Aged	Total	Child	Aged	Total	Child	Aged	Total	Child	Aged
India	934	938	960	928	931	930	933	919	1029	943	916	1033
Andhra Pradesh	975	978	1026	973	959	1016	978	955	1099	993	945	1119
Arunachal Pradesh	862	959	850	859	955	825	894	961	890	938	977	917
Assam	--	--	--	923	969	812	935	957	949	958	959	971
Bihar	946	924	954	914	911	832	920	906	883	918	923	877
Chhattisgarh	--	--	--	--	--	--	989	970	1181	991	971	1159
Delhi	808	895	841	827	897	855	821	870	964	868	856	989
Goa	--	--	--	967	963	1309	961	949	1260	973	939	1200
Gujarat	940	925	1092	935	928	1072	921	886	1149	919	879	1132
Haryana	870	886	726	865	871	933	861	841	992	879	823	1015
Himachal Pradesh	973	965	782	976	956	890	969	921	1022	972	899	1062
Jammu & Kashmir	--	--	--	--	--	--	892	940	846	889	880	912
Jharkhand	--	--	--	--	--	--	941	944	1005	949	949	994
Karnataka	1045	987	1012	960	973	1014	965	954	1112	973	946	1108
Kerala	1032	977	1131	1036	970	1156	1059	962	1247	1084	963	1226
Madhya Pradesh	942	947	1055	933	940	969	919	918	1047	931	925	1063
Maharashtra	937	953	1038	934	939	1018	922	916	1150	930	896	1114
Manipur	971	978	980	959	977	866	979	958	986	986	940	1004
Meghalaya	954	983	834	955	988	815	972	975	948	989	973	1075
Mizoram	920	987	1026	922	989	951	936	967	977	976	967	998
Nagaland	863	963	792	887	969	705	901	936	780	931	934	875
Odisha	981	995	1066	972	978	978	973	958	1022	979	958	998
Punjab	879	891	770	882	882	828	876	828	971	895	818	985
Rajasthan	886	927	1000	911	905	975	921	899	1083	928	891	1102
Sikkim	835	964	827	879	972	745	875	969	772	890	509	813
Tamil Nadu	977	969	944	974	957	923	988	947	1013	996	943	1051
Tripura	946	972	921	945	965	974	948	960	1064	960	957	1040
Uttar Pradesh	885	878	829	881	893	787	898	893	887	913	897	921
Uttarakhand	--	--	--	--	--	--	963	920	1003	963	894	1039
West Bengal	911	966	992	918	963	954	934	953	1047	950	957	1010

Comparison of Sex Ratio for Total Population, Child Population (0 – 14 years) and Aged Population (60+ years), 1981-2011

Increasing gap in the Life Expectancy at the age of 60 years between the sexes:

The Life Expectancy of a population gives a good idea about the general health status of the population. At a particular age (say 60 years), it is the expected number of years the person is supposed to survive on an average after attaining that particular age. It also takes into consideration the morbidity experience till that age with the availability of health facilities, nutritional level etc. Sex-wise differentials are perceptible from the index of dissimilarity. It is calculated to estimate the remaining years of life at the age of 60 years that needs to be distributed between either of the sexes to produce equality. For the present study IDLL was calculated at age 60 years between the sexes from 1995-99 to 2007-11.

In 1995-99, for India 10.33 percent of remaining years of life among the total population had to be redistributed to have male-female equality; however this percentage increased in 2007-2011 to 12.38 percent suggesting that the gap between the life expectancies of the two sexes have increased over time. Computing at the state level, it is found that the

dissimilarity index for life expectancy has decreased consistently for most of the states like Karnataka, Kerala, Maharashtra and West Bengal with sex ratio in the elderly population in favour of women for 2007-2011. This pattern can be observed even in some states like Uttar Pradesh and Orissa, which are yet to reach the state of feminization of ageing. On the other hand, in states of Gujarat and Himachal Pradesh, the index has increased by 1 percent - 2 percent that implies the remaining years of life among the total population needed to be redistributed to have male-female equality has increased over the time. The state of Assam has observed the highest increase from 4.73 percent IDLL in 1995-97 to 12.53 percent IDLL in 2007-11 in relative terms among the not feminized states in India of the aged population.

Area	Relative Terms (%)		Absolute Terms	
	1995-99	2007-2011	1995-99	2007-2011
<i>India</i>	10.33	12.38	1.70	2.18
Gujarat	15.43	16.26	2.70	2.96
Himachal Pradesh	11.61	13.84	2.10	2.66
Karnataka	13.99	13.18	2.41	2.34
Kerala	20.18	17.18	3.69	3.36
Maharashtra	11.37	9.99	1.90	1.84
West Bengal	14.42	12.71	2.31	2.25
Assam	4.73	12.53	0.70	1.98
Bihar	4.35	6.09	0.70	1.05
Odisha	5.90	3.44	0.90	0.58

Index of Dissimilarity in Life expectancy (IDLL) at age 60 by sexes for selected states of India

Area	Females				Males			
	Relative Terms (%)		Absolute Terms		Relative Terms (%)		Absolute Terms	
	1995-99	2007-2011	1995-99	2007-2011	1995-99	2007-2011	1995-99	2007-2011
<i>India</i>	8.13	6.4	1.41	1.2	8.1	10.69	1.27	1.77
Gujarat	3.84	3.09	0.72	0.61	4.49	8.26	0.72	1.38
Himachal Pradesh	0.55	18.11	0.1	3.57	7.59	15.94	1.3	2.85
Karnataka	12.17	5.44	2.24	1.03	14	11.25	2.24	1.86
Kerala	3.47	6.78	0.7	1.43	8.46	3.56	1.39	0.63
Maharashtra	18.78	0.73	3.3	0.14	17.74	4.72	2.78	0.83
West Bengal	10.17	7.84	1.75	1.35	9.03	9.9	1.35	1.65
Assam	25.72	17.35	3.94	2.94	13.78	22.54	2.01	3.37
Bihar	7.53	7.46	1.24	1.33	6.24	1.21	0.98	0.2
Odisha	11.79	5.76	1.86	0.99	9.76	0.97	1.45	0.16
Uttar Pradesh	0	0.002	0	1.54	1.29	13.07	0.21	2.01

Index of Dissimilarity in Life Expectancy (IDLL) at age 60 (rural-urban disparity) for females and

In 1995-99, 8.13 percent of remaining years of life were required to be re-distributed to have rural-urban equality for females, but this percentage has decreased to 6.40 percent in 2007-11, implying that the rural female longevity at age 60 has improved faster than the urban resident in the recent past. Similarly, for males, in 1995-97, 8.10 percent of the remaining years of life had to be redistributed in rural and urban areas to maintain equality whereas, this has increased about 2 percent in 2007-11. The urban-rural dissimilarity has decreased for females in most states of India from 1995-97 to 2007-11. It is evident that the disparity in longevity according to place of residence is higher for males than females in the later time period.

The urban-rural dissimilarity has decreased for females in most states of India from 1995-99 to 2007-11. Gujarat, Maharashtra, Karnataka, West Bengal, Assam, Bihar, and Odisha are some of them. States like Himachal Pradesh and Kerala has observed a significant increase in the parity between rural and urban areas in life expectancy at age 60 for females. For the males, Karnataka, Kerala, Maharashtra, Bihar and Odisha have observed a decrease in the rural-urban dissimilarity index. States like Gujarat, Himachal Pradesh, Uttar Pradesh and Assam among the given states have observed an increase in rural-urban differentials of life expectancy for males at age 60.

Discussion and Conclusion:

The feminization of ageing, representing the intersection of age and gender, is a two edged sword. On one hand, it is the victory of women to overcome mortality from reproductive, communicable and chronic health conditions over a long time period while on the other hand it is a period of social isolation and economic instability. The opportunities and vulnerabilities of older women reflect not only current gender roles and levels of women's empowerment in a society, but those going back at least sixty years. Older women warrant special attention not only because of the size of the population, but also because of their special vulnerabilities and capacities. Increases in life expectancy have led to more women living beyond the menopause, increasing the risk of conditions such as osteoporosis which is associated with higher risk of fractures in older women. Elderly women, especially widows, face many disadvantages, like a substantial gender differential exists in the ownership of property and assets and in role and participation in the family as compared to aged men in both urban and rural India, which consequently affects their access to various basic necessities like food, housing and health. Although work participation rate for the female elderly remains low, practically a large proportion of women in this age group work but their contribution remain invisible because of unpaid work. Pension and social security is restricted to those who have worked in the public sector or the organised sector of industry. There is an absence and/or limited coverage of social security schemes aimed only for these women.

The number of years lived need not be a challenge from the standpoint of income protection, if earnings levels are sufficient, if the duration of working life can be extended, or if there are mechanisms by which any savings accrued during an individual's productive working years can be effectively invested to yield adequate income following exit from the workforce. However, the vast majority of India's elderly face challenges on all of these fronts. (Bloom et al., 2010).

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