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A COMPARATIVE ASSESSMENT OF DEMOGRAPHIC TRANSITION AND OLD-AGE DEPENDENCY IN UTTARAKHAND AND HIMACHAL PRADESH

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The demography of India is in a period of change with declining fertility and rising life expectancy and an increasing number of elderly population. Uttarakhand and Himachal Pradesh, in this respect, present unique demographic and economic patterns as the geographical and socio-economic conditions are unique in these hill states. The paper will discuss the demographic transition dynamics and the old dependence in these two states in terms of economics. The paper investigates the trends of economic independence, aged sources of finance, and trends of old-age dependency ratio with reference to Census reports, National Sample Survey Office (NSSO) rounds (2004 and 2017-18) as well as other Indiastat data. The findings indicate that the economic self-reliance is declining, and there are rising rates of old-age dependency, particularly in older women and rural regions. To secure economic well-being amidst the demographic change, this paper highlights the importance of state-specific policy responses to ensure promotion of inclusive social security, active aging, and pension cover.

KEYWORDS: ***Demographic Transition, Old-age Dependency, Economic Independence, Aging Population, Uttarakhand, Himachal Pradesh***

INTRODUCTION

India is currently experiencing a deep demographic transition, that is, a systematic change in fertility and mortality rates, initially to high levels and then to lower ones, which results in excessive population growth and finally in stabilization. It is currently at the third stage of the demographic transition model and population projections reveal that there is a high possibility that the population might reach its peak between 2065 and 2070. At the same time, the group aged 1819 will experience its highest proportion at approximately 2030, which will offer a demographic opportunity that can be enormous in terms of economic impact, should it be properly supported by investing in education, health, and work (Lonarkar, 2018; Ram & Ram, 2021; Purohit, 2023). However, the rate and trend of demographic transition is disproportionate amongst the states of India. Although in some regions (Uttar Pradesh, Bihar, Madhya Pradesh, and Rajasthan) fertility and mortality levels remain high, some southern states are approaching or have reached replacement-level fertility, leading to steep regional differences in population growth and age composition (Ram & Ram, 2021; Kumar, 2013; Bongaarts and Sinding, 2011). This demographic change creates both new societal problems and economic prospects. On the one hand, having been accompanied by prudent investments in human capital and the creation of jobs, an increasing share of the working-age population opens the prospect of accelerating the growth of the economy (Bongaarts and Sinding, 2011; Chakraborty, 2020). Nonetheless, these benefits may be offset and lead to the social or political instability due to such problems as gender inequality, increasing populations of the elderly, constant child mortality in certain regions, and unequal access to the benefits of demographic change (Bongaarts and Sinding, 2011; Lonarkar, 2018; Antony et al., 2011). The need to adjust the policies and business practices of India to fit the increased demands of older people and take the full advantage of the presence of the young labor force is supported by comparative evidence of other nations with developed aging populations (Antony et al. , 2011; Chakraborty, 2020). One of the most important consequences of such demographic change is the increase in old-age dependency. The old age dependency ratios (OADR) of the percent of people of age 60 and above to the age 15-59 is around 0. 14, and the old age economic dependency ratios (OAEDR) is even greater at 0. 23 (J. A. & Nair, 2021). Older populations are especially susceptible in the states like Kerala, Punjab and Haryana since the unemployment rates are very high, as well as because the economic readiness there is low (J. A. & Nair, 2021; Rani et al. , 2023). Besides, families with high dependency ratio are exposed to higher risks of

disastrous health spending, especially in rural and low-income areas, and the available health insurance plans are not sufficient to offer adequate financial risk coverage (Mohanty et al. , 2022). Still, because of a low percentage of the population being under official pension schemes, almost three-quarters of all older Indians remain economically dependent on either social support networks or on their families (Kumar & Kumar, 2019; Pandey and Sharma, 2024). The economic factor, however, is not the only factor considered when discussing the physical, psychological, and social aspects of old-age dependency which vary greatly between states and demographic groups (Marbaniang & Chungkham, 2024; Bhagat and Unisa, 2006). With such facts in mind, healthcare, labor market, social security mechanisms of India need to be reinforced as soon as possible to address the multifaceted problems, which compel the aging of the population (J. A. & Nair, 2021; Mohanty et al., 2022; Kumar and Kumar, 2019).

The hilly states of Uttarakhand and Himachal Pradesh are unique in the demographic trends in this wider national context. They are both in the late phases of demographic transition as indicated by the reduction of fertility and mortality rates and the gradual rise in the number of the elderly population. The economic and social impacts of these changes are far-reaching in their implications, especially in regard to the issue of old-age dependency and the sufficiency of the institutional and community-based support systems. An example of this is Himachal Pradesh, which is already registering 10. 2% of the total population of 60 and above as exceeding the national average and is expected to soon become an aged society, just like Kerala (Kumar et al., 2020; Roy et al., 2024). Demographic aging in both states is caused by the reduction of fertility, the improvement of life expectancy, and the high level of out-migration of younger generations, especially in Uttarakhand, where the growing elderly population of villages is caused by depopulation efforts (Sati, 2021; Lal et al., 2021; Awasthi and Mehta, 2020). Even though old age dependency ratio (OADR) is ever-increasing, the standard measures can exaggerate the figure of the economic pressure. Individually, as an example, in Himachal Pradesh, OADR is rather high (0.19), but Economic Adjusted Old Age Dependency Ratio (EAODR) is much lower (8.8), which indicates that many older adults are not retired but not all working-age citizens work (Rani et al., 2023). However, a significant percentage of older people can be partially or completely dependent on others, as they do not always have stable incomes or families (Kumar et al., 2020). The low percentage of the covered by the pension, as well as insufficient institutional care services, also increases economic and social vulnerability (Kumar et al., 2020; Rani et al., 2023). The increasing rate of out-migration, and in particular the Uttarakhand state, and evolving family structures in both states have both increased the pressure on organized systems of elderly care and social protection (Kumar et al., 2020; Sati, 2021; Lal et al., 2021; Awasthi and Mehta, 2020). Also, the concept of feminization of aging, which implies a greater number of older individuals who are women and the illiteracy rates that remain high in the age groups, exacerbate the problem of dependency and care delivery.

METHODOLOGY

The demographic transition and old-age dependency in the hill states of Uttarakhand and Himachal Pradesh are examined in this paper using secondary data and a descriptive research design is adopted. The main objectives of this paper are *to analyse the demographic transition and old-age dependency trends and patterns in Uttarakhand and Himachal Pradesh*, as well as *to look at the elderly populations' sources of financial support and degree of economic independence in both states*. Key indicators such as the old-age dependency ratio (by sex and residence), financial support and economic independence, and the typical activity status of older adults are the focus of the analysis. Secondary data is derived from authentic government sources, including the Census of India (1961–2011) with projections up to 2031, National Sample Survey Office (NSSO) rounds (2004 and 2017–18), and reports from the Ministry of Statistics and Programme Implementation (MOSPI), and the Ministry of Social Justice and Empowerment (MoSJE). Descriptive statistical techniques, trend analysis, tabular and graphical methods are applied to assess variations in elderly dependency and economic activity between 2004 and 2017, while projections up to 2031 are used to anticipate future demographic challenges. The study area, comprising Uttarakhand and Himachal Pradesh, has been selected due to their advanced stages of demographic transition, reflected in declining fertility, rising life expectancy, and substantial out-migration, all of which contribute to increasing old-age dependency and evolving socioeconomic implications.

Operational Definitions and Measures

- **Old-Age Dependency Ratio (OADR)**
$$OADR = \left(\frac{\text{Population aged 60+}}{\text{Population aged 15–59}}\right) \times 10$$
- **Young-Age Dependency Ratio (YADR)**
$$YADR = \left(\frac{\text{Population aged 0–14}}{\text{Population aged 15–59}}\right) \times 100$$
- **Total Dependency Ratio (TDR)**
$$TDR = OADR + YADR$$
- **Economic Independence** is measured using NSS classification into:
    - Economically independent
    - Partially dependent
    - Fully dependent
- **Usual Status** refers to NSS categorization of principal activity status of individuals

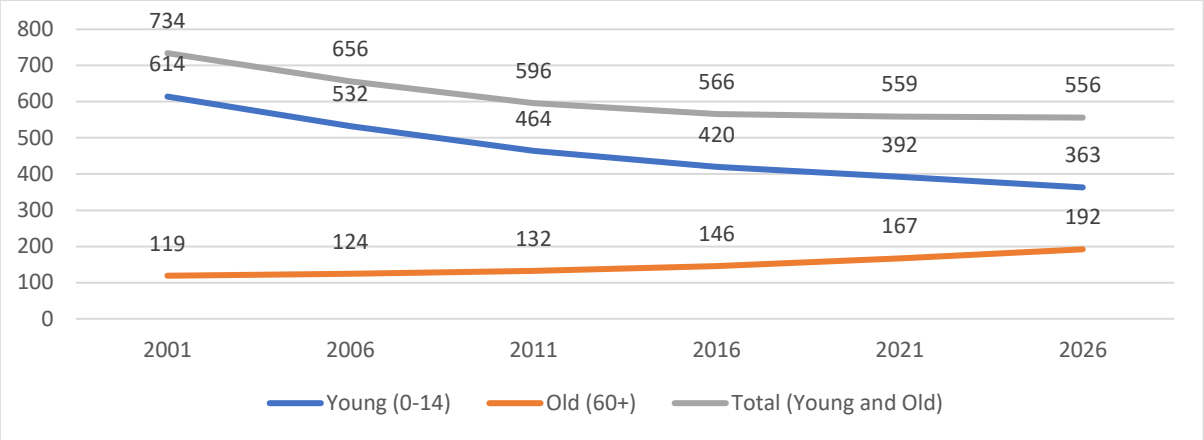
RESULTS AND DISCUSSION

This section of the paper shows the results derived from different data sources. Results and Discussion section is further divided into subsections of Transition in Dependency Ratio, Economic independency of Elderly people and Employment of Elderly People.

A. Transition in Dependency Ratio

Transition in Dependency Ratio is analysed by Old Age (60+) and Young Age Dependency ratio with Projection up to 2026 later it was analysed in Himachal Pradesh and Uttarakhand. And finally old age dependency is analysed in Himachal Pradesh and Uttarakhand based on Sex and Place of Residence.

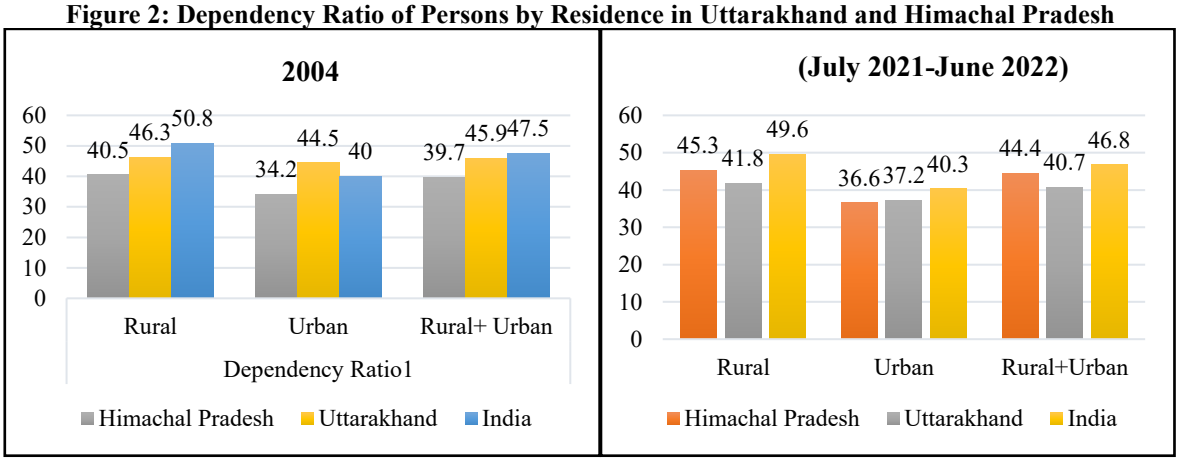
Figure 1: Trends in Old Age (60+) and Young Age (0-14) Dependency Ratio in India



Source: Census of India, 2011; Elderly Care Report, MOSPI.

The dependency ratios in India, as illustrated in Figure 1, reveal a significant demographic transition between 2001 and 2026. The young-age dependency ratio (0–14 years) shows a consistent decline from **615 in 2001** to **392 in 2026**, indicating a reduction in the proportion of children dependent on the working-age population. However, the old-age dependency ratio (60+ years) exhibits a steady increase from **119 in 2001** to **192 in 2026**, reflecting the gradual ageing of the population. Although the total dependency ratio decreases from **734 to 556** during the same period, suggesting a reduced overall dependency burden, the rising share of elderly dependents underscores a structural shift toward an ageing society.

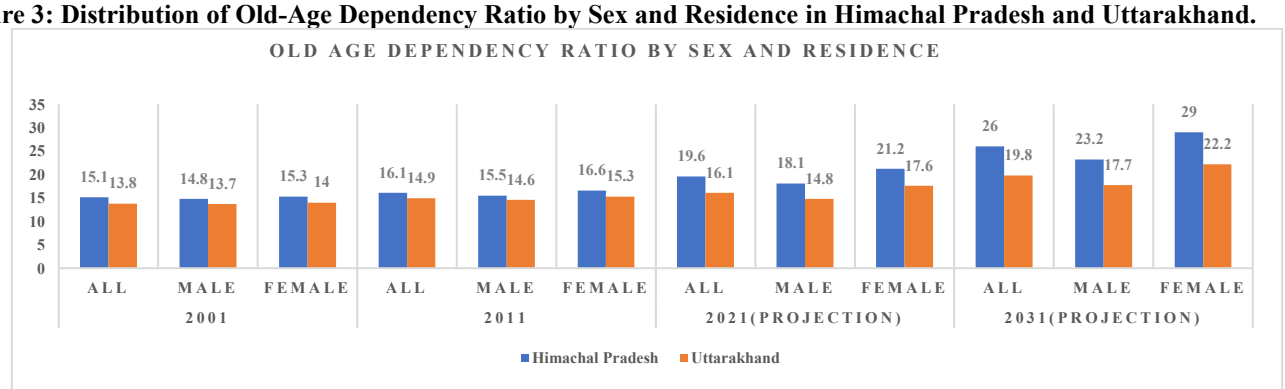
Figure 2: Dependency Ratio of Persons by Residence in Uttarakhand and Himachal Pradesh



Source: India Ageing Report.

Figure 2 illustrates that Rural Dependency Ratio in Himachal Pradesh is significantly increased from 2004 to 2021 whereas in Uttarakhand it has been decreasing in nature. Similarly Urban Dependency Ratio has also shown increasing trends and in Uttarakhand it has also shown decreased. Hence, overall trends also shown similar results. This is probably due to more migration trends in Uttarakhand than Himachal Pradesh.

Figure 3: Distribution of Old-Age Dependency Ratio by Sex and Residence in Himachal Pradesh and Uttarakhand.



Source: Elderly in India Report, Ministry of Statistics and Programme Implementation, Government of India, 2021

The old-age dependency ratio by sex and residence, as shown in Figure 3, exhibits a gradual but consistent increase in both Himachal Pradesh and Uttarakhand, indicating the advancing pace of population ageing in these hill states. In 2001, the

overall old-age dependency ratio was 15.1% in Himachal Pradesh and 13. 8% in Uttarakhand, with minimal gender differences 14.9% for males and 15.3% for females in Himachal Pradesh, and 13.7% for males and 14.0% for females in Uttarakhand. By 2011, the ratio increased slightly to 16. 1% and 14. 9% in the two states, respectively. The projected estimates for 2021 show a sharper rise, reaching 19. 6% in Himachal Pradesh and 16. 1% in Uttarakhand, and are expected to further increase to 26% and 19. 8% by 2031. Notably, female old-age dependency remains higher than that of males in both states, with the gap widening over time by 2031, female dependency is projected to reach 29% in Himachal Pradesh and 22. 2% in Uttarakhand, compared to 23. 2% and 17. 7% among males, respectively.

B. Status of Economic Independence in Uttarakhand and Himachal Pradesh.

Table 1: Percentage distribution of persons aged 60 years & above by state of economic independence (2004)

		Male			Female			Person		
	Residence	Not dependent	Partially dependent	Fully dependent	Not dependent	Partially dependent	Fully dependent	Not dependent	Partially dependent	Fully dependent
Himachal Pradesh	Rural	59	29	11	16	36	47	36	33	31
	Urban	82	14	3	13	26	62	43	21	36
Uttarakhand	Rural	65	20	15	6	24	69	34	22	43
	Urban	68	8	24	3	33	64	37	20	43

Source: Elderly in India Report, Ministry of Statistics and Programme Implementation, Government of India, 2021

Table 2: Percentage distribution of persons aged 60 years & above by state of economic independence (2017)

		Male			Female			Person		
States	Residence	Not dependent	Partially dependent	Fully dependent	Not dependent	Partially dependent	Fully dependent	Not dependent	Partially dependent	Fully dependent
Himachal Pradesh	Rural	58	18	22	18	15	64	38	17	43
	Urban	72	8	20	30	14	55	50	11	38
Uttarakhand	Rural	62	5	28	35	5	59	50	5	42
	urban	83	6	11	19	7	71	47	7	45

Source: Elderly in India Report, Ministry of Statistics and Programme Implementation, Government of India, 2021

The comparative analysis of economic independence among persons aged 60 years and above in Himachal Pradesh and Uttarakhand between 2004 and 2017, based on data from the *Elderly in India Report (2021)* published by the Ministry of Statistics and Programme Implementation, Government of India, reveals a general decline or stagnation in financial autonomy, with pronounced gender and rural–urban disparities. While elderly males, particularly urban males in Uttarakhand, exhibited relatively higher levels of economic independence—with urban male independence increasing from 68 per cent in 2004 to 83 per cent in 2017—most other groups experienced either marginal improvement or worsening conditions. Female elderly remain the most economically vulnerable category; for instance, fully dependent rural females in Himachal Pradesh increased from 47 per cent to 64 per cent, and urban females in Uttarakhand remained highly dependent at 71 per cent in 2017. Rural areas in both states show persistently high or rising levels of full dependency, reflecting limited access to pensionable employment, continued reliance on informal agriculture, and weakening family support due to migration. At the aggregate level, the proportion of fully dependent elderly persons increased in several categories, particularly in rural Himachal Pradesh, indicating growing financial vulnerability. Overall, the findings suggest that demographic ageing, gender inequality in lifetime employment opportunities, and inadequate social security coverage have contributed to the increasing economic dependence of the elderly population, underscoring the need for targeted pension reforms and inclusive social protection policies in hill states.

Table 3: Percentage distribution of economically dependent aged persons financially supported by (Rural)

		Rural-2004			Rural 2017		
		Uttarakhand	Himachal Pradesh	India	Uttarakhand	Himachal Pradesh	India
Male	Spouse	10	3	7	0	1	4
	Own Children	84	86	85	93	89	92
	Grand Children	4	2	2	0	6	1
	Others	2	9	6	7	3	3
	All	100	100	100	100	100	100
Female	Spouse	21	18	16	41	31	21
	Own Children	75	75	75	52	59	72
	Grand Children	3	3	3	7	6	3
	Others	1	4	6	0	4	5

	All	100	100	100	100	100	100
Person	Spouse	17	13	13	35	22	15
	Own Children	72	79	78	58	68	79
	Grand Children	2	2	3	6	6	2
	Others	8	6	6	1	4	4
	All	100	100	100	100	100	100

Source: Elderly in India Report, Ministry of Statistics and Programme Implementation, Government of India, 2021

Table 4: Percentage distribution of economically dependent aged persons financially supported by (Urban)

		Urban -2004			Urban-2017-18		
		Uttarakhand	**Himachal Pradesh**	**India**	**Uttarakhand**	**Himachal Pradesh**	**India**
Male	Spouse	0	0	6	0	1	4
	Own Children	93	94	87	93	66	91
	Grand Children	0	0	2	0	25	1
	Others	7	6	6	7	8	4
	All	100	100	100	100	100	100
Female	Spouse	41	23	19	41	31	24
	Own Children	52	73	71	52	63	70
	Grand Children	7	2	3	7	4	2
	Others	0	2	7	0	1	4
	All	100	100	100	100	100	100
Person	Spouse	35	17	15	35	27	18
	Own Children	58	79	76	58	64	76
	Grand Children	6	1	3	6	7	2
	Others	1	3	6	1	2	4
	All	100	100	100	100	100	100

Source: Elderly in India Report, Ministry of Statistics and Programme Implementation, Government of India, 2021

Comparative survey of rural and urban dependency patterns has depicted some alterations on the provision of support systems to the seniors in India. In cities the change in the type of dependency based on children is gradually replaced by a more diversified system of dependence on children and spouses, based on the changing family norms, greater female labor participation and availability of formal sources of retirement income. In 2004-2017-18, dependency on children fell to 63-70% of old women and 66% of men, the spousal support grew significantly (23 to 41) as a grandparent and a grandchild share income and material assets, signaling the appearance of the two-income and shared-resource families. Conversely, child-dependence is still high in rural regions, 85-86% of elderly in 2004 and 68-79% in 2017-18 are dependent on their children, and spousal support is relatively low (peaking only at 22-35%). Such continuity of traditional support systems is explainable by the low financial inclusion, low pension coverage, and preponderance of informal employment. The gender differences are also reflected, as the older male generation is more dependent on children because the earning power of the female gender was less in the previous generations and females are on an increasing trend in spousal support, which is an indicator of increasing longevity and eligibility to the pension schemes. These results highlight the importance of policy interventions to increase rural pension programmes, stimulate retirement savings and pension literacy, increase the labour participation of women, and improve social nets. It is important to address these concerns in order to have equitable and sustainable economic security of the ageing population, both in rural set-ups and in urban set-ups.

Table 5: Percentage distribution of elderly persons by usual status(ps+ss)

Year	Residence	Sex	60–64 Employed	60–64 Unemployed	60–64 Not in LF	65+ Employed	65+ Unemployed	65+ Not in LF
2011–12	Rural	Male	82.8	0	17.8	53.4	0	46.6
		Female	31.8	0	68.2	14.1	0	85.9
		Person	56.7	0	43.3	33.9	0	66.1
	Urban	Male	49.4	0	50.6	28.6	0	71.4
		Female	11.5	0	88.5	5.4	0	94.6
		Person	29.9	0	70.1	16.8	0	83.2
	Rural + Urban	Male	73.3	0	26.6	46.3	0	53.7
		Female	26.2	0	73.8	11.5	0	88.5
		Person	49.3	0	50.6	28.9	0	71.1
2018–19	Rural	Male	71.8	0.1	28.2	37.3	0.2	62.5
		Female	21.2	0	78.8	9.9	0	90.1
		Person	45.6	0	54.3	24.3	0.1	75.6
	Urban	Male	51.1	0.3	48.6	23.1	0.2	76.6

		Female	10	0	89.9	5.9	0	94.3
		Person	29.8	0.2	70	14.3	0.1	85.6
	Rural + Urban	Male	65.5	0.1	34.3	33.1	0.2	66.8
		Female	17.8	0	82.1	8.5	0	91.5
		Person	40.9	0.1	59.1	21.2	0.1	78.8

Source: Key Indicators of Employment and Unemployment of India- 2011-12, PLFS- 2018-19

According to the Periodic Labour Force Survey (PLFS) 2018–19, a significant gender disparity exists in the economic participation of the elderly population in India. Among individuals aged 60–64 years, about 65% of elderly men and only 18% of elderly women were engaged in economic activities. The rural–urban divide is also pronounced 72% of rural elderly men and 21% of rural elderly women participated in the workforce, compared to just 51% of urban elderly men and 10% of urban elderly women. In the older age group of 65 years and above, the level of participation declines considerably for both sexes, indicating that advancing age and socio-economic factors further restrict the economic engagement of the elderly, particularly women and those living in urban areas.

Key Findings

The analysis reveals significant demographic and socio-economic variations in ageing patterns, dependency ratios, and economic independence across Himachal Pradesh and Uttarakhand.

1. Gender Disparity in Dependency:
   Table 1 illustrates a sharp gender gap in the dependency status between the two states, all the time indicating that females have been more dependent compared to the males in all the residential categories. The level of female total dependency is much higher but Table 2 shows that female dependency, though also high, is slightly lower indicating the need to differentiate datasets in regards to certain age or economic indicators. Also, the dependency rates, on the one hand, tend to be lower in urban regions of both genders and the population in general, and, on the other hand, Himachal Pradesh has a slightly better dependency profile than Uttarakhand, which is why it serves as a valuable case study of which factors foster elderly independence.
2. Rising Old-Age Dependency:
   The old-age dependency ratio shows a steady upward trend in both states, rising from 15.1% in Himachal Pradesh and 13.8% in Uttarakhand in 2001 to projected levels of 26% and 19.8% respectively by 2031. Female dependency remains consistently higher, projected to reach 29% in Himachal Pradesh and 22.2% in Uttarakhand, reflecting the growing feminization of ageing.
3. Declining Young-Age Dependency:
   The old age dependency in both states is steadily increasing with a dependency rate of 15.1 and 13.8 years respectively in the year 2001 and is projected to rise to 26% and 19.8% respectively by the year 2031. The level of dependency amongst women is steadily increasing with an estimated dependency of 29, 22.2 in Himachal Pradesh and Uttarakhand respectively, as a result of feminizing ageing.
4. Gender and Regional Disparities in Economic Independence:
   Economic independence among the elderly varies sharply by gender and residence. In Himachal Pradesh, 61.8% of rural and 59.2% of urban men are economically independent, compared to 34.6% of rural and 37.3% of urban women. In Uttarakhand, male independence stands at 54.3% (rural) and 55.4% (urban), while female independence is markedly lower at 33.4% (rural) and 35.6% (urban). Rural men, particularly in Himachal Pradesh, remain more engaged in informal or agricultural work, while women continue to exhibit higher dependency levels.
5. Sources of Financial Support:
   The elderly are largely dependent on family as the major source of finance. In Himachal Pradesh, the dependency ratio is 63.2, 24.7 and 12.1, respectively, on family, self-earned income and pensions or other transfers. In Uttarakhand, 60.8 depend on family, 22.4 depend on self-income and 16.8 depend on other sources. Men aged over 60 claim to be more self-reliant, whereas women aged over 60 years depend on family members way more, which indicates that the gender gap in financial independence remains to be persistent.
6. Labour Force Participation and Ageing:
   As per PLFS (2018–19), about 65% of elderly men and 18% of elderly women aged 60–64 years were engaged in economic activity. The rural–urban divide is striking—72% of rural men and 21% of rural women participated, compared to 51% and 10% in urban areas. Participation declines significantly beyond age 65, reflecting the combined effects of ageing, informal work structures, and inadequate pension coverage.
7. Changing Family Support Patterns:
   Between 2004 and 2017–18, urban India witnessed a transition from traditional child-based dependence toward mixed dependency. Reliance on children declined from 87–94% to 63–70% among elderly females and around 66% among males, while spousal support increased from 23% to 41%. This indicates the emergence of dual-income and resource-sharing households in cities. Rural areas, however, continue to show predominant child-dependence (68–79%) and limited spousal support (22–35%), due to weak pension systems and informal economic dominance.
8. Policy and Gender Implications:
   The findings highlight that feminization of ageing, weak rural pensions, and low female workforce participation are key challenges in ensuring old-age security. Expanding pension coverage, improving retirement savings literacy, enhancing women's economic opportunities, and strengthening health and social protection frameworks are critical policy priorities for both states. Himachal Pradesh's relatively better performance in independence and pension coverage offers useful insights for developing targeted interventions in Uttarakhand and similar states.

Conclusion and Policy Implications

The paper shows a distinct demographic and socio-economic shift in the ageing of Himachal Pradesh and Uttarakhand, which is characterised by a consistent increase in the old-age dependency and increasing gender and regional inequality. As the total dependency burden is decreasing through low dependency at the young age, the percentage of the aged dependents is increasing at a high rate especially among women. The greater dependency ratio of females in old age with their less economic self-sufficiency highlights the gendering weaknesses inherent in the ageing process in the population. The rural-urban disparity is also strong: rural elderly are still on the high dependency on children and informal sources of income, whereas, urban elderly is also slowly becoming a mixed dependency, where children and spouses are involved, due to the shifts in family models and growing involvement into the formal sector. Economically, the results indicate that Himachal Pradesh is a little bit better in the case of older-adults self-sufficiency and pension access, and Uttarakhand has more problems, as financial inclusion is lower, and formal retirement benefits are less extensive. The Periodic Labour Force Survey (2018-19) also substantiates these inequalities whereby only 18 percent of the elderly women against 65 percent of men aged 60-64 years and even less against 65 years that are economically active.

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