

Demographic Shifts and Population Ageing in Nepal (1991–2021): Trends, Gender Dynamics, and Provincial Disparities

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DOI: <https://doi.org/10.3126/sij.v7i7.92555>

Abstract

This study looks at the elderly population of Nepal and its gender and regional differences that are the results of the demographic transition between the years 1991 and 2021. It examines the changes in the population structure of the country using the data of the national census and descriptive statistics analysis, and how the age composition has changed the population structure. According to the findings, the proportion of the population that is 60 years of age or older increased steadily from 5.8% in 1991 to 10.2% in 2021. The population has undergone minor but significant changes. It can be seen that there are regional inequalities, a more aged population in the Gandaki and Koshi Provinces than there is in Madhesh and Karnali. The aged also show a high prevalence of women over men, and this explains the importance of gender ageing policies. The paper emphasises that population ageing has both negative health, employment, and social protection issues, but also covers the way to inclusive and sustainable development in case it is properly managed. Such implications include the necessity of including ageing issues in education, welfare, and the labor system, and interventions that are consistent with regional and gender demands. This study helps the planners and policy-makers of Nepal in formulating evidence-based information about the ageing processes by filling the gaps in the existing empirical data regarding the topic to facilitate optimal promotion of equitable, healthy, and environmentally friendly population policies.

Keywords: Population ageing, demographic transition, gender inequality, regional disparities

Introduction

Nepal has transitioned to a society with low fertility and mortality rates, although global population trend is influenced by its social, cultural, and geographic diversity. The population's aging has become a significant problem as a result of the demographic transition, especially since the percentage of people over 60 in Nepal accounted for 10.21 percent of the country's total population in 2021 and has been increasing annually to 3.29 percent (Chalise, 2023). Moreover,



gender discrepancies and variations in the location of persons where they reside have posed new challenges, hence they can receive varying advantages of services, medical care, and economic security.

The population of Nepal recorded a gain in life expectancy in the period of 1991 to 2021 due to improvement in healthcare services, improved education, and a blooming economy, as the population age increased by five years to seventy-one years (Chalise, 2024). Between 1996 and 2022, there was a decrease in the number of children families that might be expected per woman (4.6 to 2.1) (UNFPA Nepal, 2024), indicating that the country now has fewer young people and more elderly people. This trend demonstrates that the population of young people is dropping while the population of seniors is growing in this century (Bloom et al., 2011; United Nations, 2023). Neo-liberalism has resulted in new problems concerning inequality between the genders, unequal population distribution, and service access due to these population changes and the cultural context of Nepal. The research relies on the information about the aging patterns, prevalent gender roles, and provincial variations to make decisions in the future.

From 1991 to 2021, Nepal's average life expectancy increased from 55 to 71 years due to improved access to healthcare, education, and economic opportunities (Chalise, 2024). A reduction in fertility rates indicates that residents are eschewing large families in favor of households with fewer children (UNFPA Nepal, 2024). As a result, Nepal's young population is declining while its elderly population is increasing (United Nations, 2019). UNICEF Nepal (2023) projects that, like Japan, Nepal will become an aging society by 2028 and an old society by 2054. Inadequate infrastructure and care are among the problems brought on by an aging population (Chalise, 2024). According to Chen et al. (2024), the Decade of Healthy Ageing highlights that we should have age-inclusive policies in place. Because of migration out of Nepal, unfair gender norms, and differences between rural and urban areas, older women facing poverty and little work have higher vulnerability there (Sharma, 2025). More elderly people live in Gandaki, Koshi, and Bagmati, so these areas require particular approaches based on their needs (Chalise, 2023).

In Nepal, gender is a critical factor that determines the experiences of older people. Because women make up 60% of the senior population while men make up 40%, women are more disadvantaged due to the gender inequality that exists in patriarchal society (Chalise & Basnet, 2017). Among some of those issues are the low rates of elderly people on pensions (9.2%), women having lower levels of literacy, and increased rates of physical and mental health issues among the seniors (Shah et al., 2021). According to the 2022 Global Gender Gap Index, economic participation (98th) and health and survival (109th) have shown the lowest scores, which means that women in Nepal experience large inequalities in these aspects (Joshi, 2022).

Nearly married girls and scheduling women's independence on husbands and sons normally result in less independence and fewer resources for aged women. These gender issues also influence the difference in population trends, and, for example, Madhesh records 118 boys being born to every 100 girls, showing how such choices favor boys and add new problems to the population statistics (UNFPA Nepal, 2024).

Most of what we know about population aging comes from research, but Nepal's demographic changes are still not well understood. Most studies examine nationwide trends or specific issues, often ignoring differences between men, women, and regions. Shah et al. (2021) do not break down their results by province or gender when analyzing the health and social status of older adults. Similarly, Chalise (2023) focuses on how the population is aging across provinces

without considering gender. The lack of intersectional analysis makes it challenging to identify effective ways to support elderly women in Nepal's diverse regions. Global indexes also overlook what makes Nepal's culture and economy unique.

The article is based on two theories: the Demographic Transition Theory and the Modernization Theory of Aging. Demographic Transition Theory predicts the development of an aging population as a result of declining fertility and death (Dyson, 2010; Notestein, 1945), which may be seen in Nepal between 1991 and 2021. The Modernization Theory of Ageing (Cowgill & Holmes, 1972) brings into the limelight the impact of the social and economic change on the roles and well-being of elderly people. As a group, these models provide an explanation of the trends in ageing in Nepal in terms of gender and space.

This paper closes that gap by examining the ageing patterns in provinces based on census data, 1991-2021, taking into consideration gender-based viewpoints. It seeks to capture the demographic change to ageing, discuss the differences in the gender experience of ageing, and evaluate whether regional settings have an impact on these trends. The evaluation offers opportune proof to the policy makers because the labor force in Nepal is set to reach its peak by 2051 (UNFPA Nepal, 2024). In so doing, the study helps explain the acuity of the ageing issue that must be dealt with in Nepal. The global concern about the impact of older populations of the demographics of Nepal is an urgent problem that is discussed in this article. To address the gap in the research and to establish clear targets, the study on this topic aims to provide more expertise and discussions regarding population ageing in Nepal.

Methods and Procedures

Research Design

The quantitative cross-sectional design was used to discuss the demographic shifts and the increase in the elderly population in Nepal between 1991 and 2021. The research displays the changes in the age compositions, birth and death rates, and provincial and gender variations. Its longitudinal design allows one to see the trends across time, whereas the cross-sectional comparison brings out gender and regional differences. It is a similar approach to demographic research in low and middle-income countries, which usually use secondary census data to secure reliability, coverage, and comparability (Chalise, 2023; MoHP & NSO, 2023).

Data Collection

This study is based on secondary data collected by the National Population and Housing Censuses (1991, 2001, 2011, and 2021) by the National Statistics Office (NSO). The data sets are comprehensive data pertaining to age structure, fertility, death rates, sex ratio, and literacy in the seven provinces of Nepal. The complementary data that was offered by UNFPA Nepal (2024) and UNICEF Nepal (2023) were used to validate and contextualize the data. To fill the gaps in data, the province's widowhood rates after 2001 were included in the data set, and the mean imputation method was employed to ensure the consistency and quality of the findings remained the same as the national and UNFPA estimates. Despite the extensive coverage, the weaknesses of the census data are the possibility of enumeration error, underreporting, and differences in the quality of data in the provinces. These were alleviated with data source triangulation and large-scale pattern orientation as opposed to inference at individual levels.

Data Analysis

Microsoft Excel was chosen as the analytical tool because it is efficient and transparent, and it is appropriate for the management of large longitudinal data without complicating the calculations involved. The Excel helped to organize the data systematically, calculate frequencies, percentages, dependence ratios, and compare trends in all census years. Excel has been selected as suitable to address the descriptive and comparative objectives of the study, instead of performing an inferential model, which is suitable for the analysis of trends, gender comparison of the distribution by region (OECD, 2019). This descriptive statistical method was decided on because it is a broad yet simple description of the ageing trends in the past 30 years. It allows policymakers and researchers to realize demographic changes and gender or regional disparities that are being subject to special interventions.

Results

Age Sex Compositions

Table 1 shows that the population structure of Nepal has significantly experienced a demographic transition over the period between 2001 and 2021. The steady decrease in the child share of the total younger age groups can be explained by the decreasing fertility and postponing marriage, which could be conditioned by the increasing education level, urban migration, and better access to reproductive health services. This decreased dependency of children indicates that Nepal is going into an increased demographic transition phase, where family sizes are smaller, and population rates are lower.

Table 1. *Age-Sex Composition of Nepal by Census Years 2001–2021*

Age Group	2001		2011		2021	
	Male (%)	Female (%)	Male (%)	Female (%)	Male (%)	Female (%)
0–4	7.0	6.6	5.0	4.7	4.4	3.9
5–9	6.7	6.4	6.2	5.9	5.0	4.5
10–14	6.3	6.2	6.7	6.5	5.1	4.9
15–19	5.3	5.5	5.5	5.6	5.1	5.1
20–24	4.4	4.8	3.9	5.0	4.5	5.1
25–29	3.7	4.1	3.5	4.4	3.9	4.6
30–34	3.2	3.4	2.9	3.6	3.4	4.0
35–39	2.8	2.9	2.8	3.3	3.2	3.8
40–44	2.4	2.4	2.5	2.7	2.8	3.2
45–49	2.0	1.9	2.2	2.3	2.4	2.6
50–54	1.7	1.6	1.9	1.9	2.4	2.5
55–59	1.4	1.3	1.6	1.5	1.8	1.9
60–64	1.1	1.0	1.4	1.5	1.6	1.7
65–69	0.8	0.8	1.1	1.0	1.3	1.3
70–74	0.6	0.5	0.8	0.7	1.0	1.1
75–79	0.4	0.3	0.4	0.4	0.6	0.6

80+	0.3	0.3	0.4	0.4	0.5	0.5
All Ages	49.9	50.1	48.5	51.5	48.9	51.1
Total	11,563,921	11,587,502	12,849,041	13,645,463	14,253,551	14,911,027

Source: CBS, 2003; CBS, 2014; NSO, 2023

Table 1 shows that, simultaneously, even the gradual rise in the elderly population categories speaks of a definite tendency towards aging of the population. The increased longevity and reduced mortality rates among the elderly are because there have been an increase in the standards of living, nutrition, and public health. Although this trend in aging is a positive indicator of social development, it also brings about a new policy concern on the topic of elder care, social protection, and preparedness of the healthcare system. The gender structure also indicates the fact of the gradual feminization of the population. The proportion of women has gone up marginally, in line with their long life expectancy and increased participation in education and the labor market. This change has its consequences for the economic and social policies that are gender sensitive.

Changing Pattern of Age Composition

Table 2 indicates that the older population (60+) in Nepal has increased gradually since 5.8 percent in 1991 to 10.2 percent in 2021, with a significant increase in the percentage of elderly population groups that include the 60-64, 65-69, 70-74, and 75-79, as well as the above-75 percent of the total population.

Table 2. *Age Structure of Nepal and Evolving Trends within the Elderly Population*

Age Group	1991		2001		2011		2021	
	Number	%	Number	%	Number	%	Number	%
60–64	431,645	2.30	496,652	2.10	756,827	2.90	955,604	3.30
65–69	270,472	1.50	374,473	1.60	554,449	2.10	771,618	2.60
70–74	183,952	1.00	250,738	1.10	395,153	1.50	609,370	2.10
75–79	89,966	0.50	161,578	0.70	235,135	0.90	353,203	1.20
80+	95,199	0.50	119,070	0.50	212,846	0.80	287,523	1.00
Total (60+)	1,071,234	5.80	1,477,379	6.50	2,154,408	8.10	2,977,318	10.20

Source: CBS, NSO (1991, 2001, 2011, 2023)

Table 2 reveals that a gradual ageing process among older citizens of Nepal occurred between the year 1991 and 2021. The share of the population aged 60 years and above nearly doubled over the past three decades, clearly indicating a demographic transition toward increased longevity. The greatest growth was in the old-old (70+) and the young-old (60–69 years), which means that there was better survival in late age (60 to 99 years). The rising percentage of the aged 75 and above is an indication of the lengthening lifespan and reduced mortality. In general, the data demonstrate that the elderly population in Nepal not only increases in number but also gets

older itself. This ageing within the country indicates an increase in health-care requirements, age-sensitive social protection, and the significance of long-term care planning in the policy framework of nations.

Provincial and Gender Distribution of the Elderly Population

In 2021, the proportion of women compared to men among the aged in Nepal was 51.5 vs. 48.5, and Gandaki and Sudurpashchim Provinces had the highest numbers of women. Regional variations in patterns of ageing are found in Bagmati and Koshi, topping the old population, with Karnali and Sudurpashchim having smaller proportions.

Table 3. *Distribution of Older Population (60 Years and Over) by Sex and Provinces, Nepal 2021*

Area	Men			Women		Sex Ratio
	Total	Number	%	Number	%	
Nepal	2,977,318	1,443,907	48.5	1,533,411	51.5	94.2
Koshi Province	556,464	272,795	49.0	283,669	51.0	96.2
Madhesh Province	559,107	287,284	51.4	271,823	48.6	105.7
Bagmati Provinc	653,849	312,857	47.8	340,992	52.2	91.7
Gandaki Provinc	329,107	153,361	46.6	175,746	53.4	87.3
Lumbini Province	489,759	238,114	48.6	251,645	51.4	94.6
Karnali Province	134,482	64,823	48.2	69,659	51.8	93.1
Sudurpashchim Province	254,550	114,673	45.0	139,877	55.0	82.0

Source: NSO,2023

Table 3 shows the provincial and gender variances in the population of the elderly in Nepal in 2021. The Bagmati Province has the greatest number of older people due to urbanization and increased access to health care services. Karnali and Sudurpashchim, in turn, are the least represented, which is also in line with their more youthful and ruralized population composition. The elderly population exhibits a sex ratio of 94.2, meaning there are fewer men than women nationwide. This trend can be best seen in Gandaki and Sudurpashchim, where over fifty percent of older adults are women, which points to the survival benefits of being a woman. Madhesh is the only place where there is a slight male majority, likely due to labor migration and sociocultural issues. The figures indicate spatial and gender aspects of the ageing of the population. There is a likelihood of more demand for gender-sensitive social and health-care services in the provinces that have a higher percentage of elderly women. On the contrary, areas that have less elderly population stand a chance of getting ready in advance of the imminent ageing transition.

Trends in Broad Age Group Composition

Trends in the composition of broad age groups. Between 1991 and 2021, Nepal's age structure underwent significant change: the proportion of children aged 0–14 years declined from 42.4 % to 27.8 %, while the working-age population (15–64 years) increased to around 65 % of the population, and the older population (60+ or 65+ depending on classification) rose notably, reflecting slower population aging, increased life expectancy, and lower fertility.

Table 4. *Population Structure and Growth Trends of Major Age Groups in Nepal, 1991–2021*

Age Group	1991		2001		2011		2021	
	Number	%	Number	%	Number	%	Number	%
0–14	7,840,771	42.4	8,948,587	39.4	9,248,246	34.9	8,115,575	27.8
15–59	9,579,092	51.8	12,310,968	54.1	15,091,848	57.0	18,071,685	62.0
60+	1,071,234	5.8	1,477,379	6.5	2,154,410	8.1	2,977,318	10.2
Total	18,491,097	100	22,736,934	100	26,494,504	100	29,164,578	100

Source: Nepal Population and Housing Census (NPHC) 1991, 2001, 2011, and 2021.

Table 4 demonstrates the demographic transition of Nepal to an ageing population that has occurred in the last three eras. The child (0-14) population fell drastically, with more than 42 percent in 1991 reduced to less than 28 percent in 2021, indicating a drop in fertility and a decline in family formation. On the contrary, the working-age population (15-59 years) grew continuously to 62 per cent, as it is the highest demographic dividend phase in Nepal. The proportion of aged persons (60+) nearly doubled in this time, which proves the fact that there is a gradual yet steady process of ageing. Such an expansion is a positive indicator of a longer life span and of improved health, but it also represents an increase in dependency burden in the future. Generally, the data portrays how Nepal has shifted to a more ageing and balanced demographic structure, which requires investments in employment creation, social security, and old age care systems to be made in due time to continue the socio-economic growth.

Dependency Ratios and Ageing Index

The total dependency ratio in Nepal in 2021 was 61.4, with child dependency being the highest, yet old-age dependency increased to 16.5. The ageing index at 36.7 shows that the elderly has become more important as compared to the children. Uneven demographic transitions in the various regions imply that there is increased ageing in Bagmati and Gandaki, and Madhesh and Karnali are still younger.

Table 5. *Dependency Ratio and Index of Ageing, 2021*

Area+	Based on (age 60+)				Based on (age 65+)			
	Total Dependence ncy Ratio	Child Dependence ncy Ratio	Old-Age Dependence ncy Ratio	Index of Agei ng	Total Dependence ncy Ratio	Child Dependence ncy Ratio	Old-Age Dependence ncy Ratio	Index of Agei ng
Nepal	61.38	44.91	16.48	36.69	53.28	42.65	10.63	24.91
Provinces								
Koshi	59.25	41.38	17.86	43.16	50.38	39.08	11.3	28.92
Madhesh	73.35	57.5	15.85	27.57	65.23	54.81	10.42	19.01

Bagmati	48.85	32.94	15.91	48.3	41.55	31.33	10.22	32.63
Gandaki	59.27	38.02	21.25	55.9	49.41	35.67	13.75	38.54
Lumbini	61.51	46.06	15.44	33.53	53.82	43.87	9.95	22.69
Karnali	69.68	56.17	13.52	24.06	61.88	53.58	8.29	15.48
Sudurpashchim	67.95	52.09	15.86	30.46	60.17	49.67	10.5	21.14

Source: NSO,2023

Table 5 shows the shifting dependency trends in Nepal in 2021. The total dependency ratio (61.4) indicates that there are 61.4 dependents for every 100 people of working age. While old-age dependency is progressively rising, child dependency still predominates. The ageing index of 36.7 and the national old age dependence ratio of 16.5 percent show that Nepal is in a stage where senior dependents are more important than children. The provincial difference is also clear, as Bagmati and Gandaki exhibit greater ageing indices (above 48), which reflects high ageing and low fertility, whereas Madhesh and Karnali have greater child dependency ratios, which represent a younger population. These geographical disparities demonstrate the unequal changes of the demography by dissimilarity in fertility, migration, and socio-economic growth. The statistics verify that Nepal is slowly moving towards child dependency to old age dependency. The rise in the index of ageing is a clear testimony to the urgency in having policies that support productive employment, sustainable pensions, and health care systems that are capable of supporting the needs of the growing elderly population.

Discussion

This study tracked population variations among Nepal's regions, changes in the proportion of men to women, and changes in people's ages between 1991 and 2021. From the findings, it is evident what has happened in Nepal's demographic shift, thus giving guidance for social, health, and economic policies. The data shows that Nepal's population is getting older over the years. From 1991 to 2021, the share of the population over the age of 60 increased from 5.8% to 10.2% (NSO, 2023). Simultaneously, global population increase is associated with fewer children per couple and higher life expectancies in general (United Nations, 2019).

According to the most recent data, the proportion of persons aged 0 to 14 has decreased from 42.4% to 27.8%, while the proportion of people aged 15 to 59 has increased from 51.8% to 62%. Experiencing an aging population structure is consistent with what others identify as low- and middle-income nations undergoing a similar demographic shift (Bollyky et al., 2022).

The proportion of Nepal's population aged 60 years and above increased from 5.8 % in 1991 to 10.2 % in 2021, reflecting a marked rise in the share of older adults over time. Simultaneously, global population increase is associated with fewer children per couple and higher life expectancies in general (United Nations, 2019). According to the most recent data, the proportion of persons aged 0 to 14 has decreased from 42.4% to 27.8%, while the proportion of people aged 15 to 59 has increased from 51.8% to 62%. Experiencing an aging population structure is consistent with what others identify as low- and middle-income nations undergoing a similar demographic shift (Bollyky et al., 2022).

It is evident from the 10.63 (65+ years) old-age dependency ratio in the country at present that more support is being asked from today's workers to assist older adults (NSO, 2023). It is clear from the data that Gandaki and Koshi Provinces have relatively higher indices and statistics

for old-age dependency, indicating that ageing is not even throughout Nepal. These differences in regions might be because of different migration trends, levels of health care access, and growth in the economy (Schafer et al., 2025). In some regions, increased numbers of adults working or moving to cities elsewhere or other nations can speed up ageing in the local population and place more demands on younger people.

There are interesting gender differences when it comes to sex ratios among the elderly. It has been found in other studies that elderly women have more disadvantages than men because they tend to be both poorer and less supported (Tausig & Subedi, 2022). As a result, special programs need to be set up for elderly women's health, financial support, and greater involvement. What has been discovered correlates with and builds upon the most recent studies on aging populations in Nepal and similar places. Acharya et al. (2023) drew attention to the fact that the ageing process in Nepal is happening faster in both major cities and highly developed provinces, just as observed in the study's provincial maps. Their study of how much care the elderly population showed that local policies are necessary, pointing to how a standard method will not work in Nepal's different areas. Elderly people's well-being further points out that aging women face more difficulties, such as poverty, having less education, and taking care of others. Similarly, the findings on sex ratio and gender inequality suggest it is important to implement special social efforts that help improve women's experiences of aging (Sharma, 2024).

In many countries, both the demographic transition theory and epidemiology prove that challenges from an aging population are widespread in the social security and health industries (Jakovljevic et al., 2021). Similar to what is happening in other low-income countries going through population changes, we see similar trends in Nepal's growing share of old people (Kamholz et al., 2022). These propose proactive measures such as alterations to pension schemes, increasing community care, and provision of better health services to address the demands of the ageing population. Nepal is experiencing a demographic dividend, which is emphasized by the decline in the population of the youth, among other things. Subedi (2020) indicates that the political demography in Nepal implies that a sufficient number of education and employment opportunities for the working-age population can result in economic development in a nation. Nonetheless, this increasing number of the elderly will create more dependency and hence, one should plan for the long run to favor the economy.

Researchers found that several useful results can be obtained from this research. As the elderly population continues to grow, the state must expand geriatric health services and strengthen pension provisions, particularly in Gandaki and Koshi provinces, where population ageing is most pronounced. Greater policy autonomy at the provincial level can enable locally responsive strategies, improve administrative effectiveness, and enhance the capacity to address region-specific ageing challenges (Paudel, 2024). Furthermore, the fact that women tend to age faster shows the need for ageing policies that address gender-related problems. It is advised by Weinberger et al. (2025) that supporting elderly women through strong pension schemes, the law, and community networks helps to lower their extra risks. The number of youths falls in favor of those working; the country can gain a demographic advantage, but it needs to pay more attention to education, vocational education, and job generation (Kumar et al., 2021).

This study depended on data from the census for three decades, yet some issues have been found. It is possible that data collected in remote areas fails to record everyone, so the age and sex breakdown may be mistaken, according to the CBS (2022). Besides, since census data covers only

a one-time frame, it is not suitable for looking at cause and effect. By using longitudinal surveys and qualitative research, researchers can learn more about the experiences of elderly people, mainly in relative to migration, health, and receiving support from others. A discussion of socio-economic factors that cause the variations in population aging, including work mobility, urban development, and health amenities, can provide a idea useful to those required to react. The other strategy would be to do gender-sensitive research more intensively on the dangers to older women to come up with ageing policies that apply to everyone.

Conclusion

The findings reveal that Nepal's population structure has changed substantially over time, marked by a clear rise in the proportion of older adults. Provincial variation is evident, with Gandaki and Koshi exhibiting relatively more advanced population ageing, underscoring the importance of territory-specific policy responses. In Gandaki, where youth out-migration is particularly pronounced, policy priorities should focus on community-based elderly care, strengthening local health service delivery, and improving access to pension and social protection schemes to address the growing care needs of the ageing population (Paudel, 2024; NSO, 2023). The age-friendly infrastructure and urban health programs should be of priority in Koshi since the elderly population has a greater concentration in the urban areas. It is evident that women are the majority of the elderly and thus their vulnerability is more apparent when they are confronted by economic and health problems.

This paper demonstrates that proper policies are to be developed that consider numerous aspects and are sensitive to the issues that women have. Likewise, an increasing population in the working age groups presents us with a great opportunity to help bridge the education gap and develop the economy. Nevertheless, the policy space is declining due to the growing number of the elderly population who demand fresh approaches in the social security system and healthcare. Further research must endeavor to investigate the process of living old age over time, using stories of people. The grey population in Nepal is a problem, yet there are certain opportunities in it; hence, one must respond to it intelligently by responding to it properly and in time.

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