

Stages of Population Ageing: Evidence from Nepal

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Abstract

This paper highlights that the demographic transition of population aging is a significant topic in population studies, referring to the shift in the age distribution of a population towards older age groups, often accompanying broader demographic transitions characterized by declining fertility and mortality rates. In light of the discussion, panel data (1950-1923) on Nepal demonstrated that fertility, mortality, and population growth rates have been declining gradually, suggesting that the demographic transition of ageing is critical for fostering sustainable development and improving the quality of life for older adults at later stages. The latest national population and housing census 2021 is also supporting this social construction of ageing in Nepal.

Keywords: Census, Panel Data, Population Ageing, Population Dynamics, Stages of Ageing

Introduction

Demographic transition generally refers to the transition from high birth and death rates to lower birth and death rates as a country develops economically (Notestein, 1945). This transition leads to changes in population structures, including an increase in the proportion of older adults. Globally, populations are aging due to declining fertility rates and increased life expectancy (UNFPA, 2020). This trend is particularly pronounced in developed countries but is also occurring in many developing nations (UN, 2019). Aging populations can lead to labor shortages and increased pressure on pension systems and healthcare services. Countries may face challenges in supporting a larger elderly population with a shrinking workforce. There can be changes in family structures, with more elderly individuals living alone or depending on social services. This can affect mental health and social cohesion and lead the elderly to silent sufferings (Kuikel et al, 2025). An aging population generally leads to increased demand for healthcare services, particularly for chronic conditions associated with older age (Bloom et al., 2010). Countries need

to adapt their policies to address the challenges of population aging. This includes considerations for retirement age, pension reforms, healthcare infrastructure, and social services for the elderly (Yang, 2020). The pace and impact of population aging differ significantly among regions. For example, while Western Europe and Japan experience rapid aging, African nations may still have youthful populations due to higher fertility rates, though they are beginning to see trends of aging as well (Lutz & KC, 2010).

The theoretical approaches to the stages of aging societies provide complementary perspectives on this complex demographic phenomenon. From the classic demographic transition theory to new measures of prospective aging, these frameworks help us understand not only how populations age but also the implications for health systems, social structures, economic sustainability, and individual well-being. As societies around the world experience population aging at different rates and from different starting points, these theoretical frameworks offer valuable insights for researchers, policymakers, and practitioners seeking to address the challenges and harness the opportunities presented by this profound demographic transformation (UNFPA, 2020).

Understanding the stages of population aging is essential for developing evidence-based policies that promote healthy and active aging, ensure intergenerational equity, reduce elder abuse (Nepal et al., 2023), and maintain economic vitality amid changing population structures. The multidisciplinary nature of these theoretical approaches reflects the complex interplay of biological, social, economic, and policy factors that shape the experience of aging for individuals and societies.

Throughout the literature, seven demographic stages of ageing have been documented. They are demographic transition theory as foundation (Wilson, 2000), population ageing framework (Fernandes et al., 2023), morbidity theory (Fries, 1980; Robine et al., 2004), WHO active ageing approach (WHO, 2002), prospective age approach (Sanderson & Scherbov, 2007, 2017), and family demographic approach (Agree, 2018), economic perspective (Modigliani & Ando, 1963; Warner, 2025). These theories have profound implications for societies worldwide. These studies explore the theoretical frameworks that describe the stages of population aging, drawing on established demographic theories and recent scholarly advancements.

Table 1*Classification of Stages of Ageing Society Globally*

Category	Threshold	Characteristics	Examples	Reference
Young Society	< 7% (65+) or < 10% (60+)	- High fertility rates - Young workforce - Low dependency ratio	Most African countries	UN DESA (2019)
Aging Society	7-14% (65+) or 10-20% (60+)	- Declining fertility - Increasing life expectancy	Brazil, China	WHO (2015)
Aged Society	14-21% (65+) or 20-30% (60+)	- Low fertility - High life expectancy	Most European countries	UNFPA (2020)
Super-Aged Society	> 21% (65+) or > 30% (60+)	- Very low fertility - Highest life expectancy	Japan, Italy	World Bank (2021)

Based on this classification, some countries with features and challenges are presented in Table 2.

Table 2*Status, Features, and Challenges of Some Countries*

Country	Status	Features	Challenges
Japan	Super-Aged	- 28.7% (65+) - Declining population	- Labor shortage - Healthcare costs
Italy	Super-Aged	- 23.2% (65+) - Low fertility	- Economic growth - Healthcare system
South Korea	Aged	- Rapid aging - Low fertility	- Pension sustainability - Social security
China	Aging	- One-child policy impact - Uneven aging	- Healthcare reform - Pension system

Germany	Aged	- Immigration impact - High life expectancy	- Labor market - Social integration
France	Aged	- Higher fertility than EU average - Immigration	- Pension reform - Healthcare costs
USA	Aging	- Baby boomer impact - Immigration	- Healthcare costs - Social security
Canada	Aging	- Immigration policy - Healthcare system	- Regional disparities - Long-term care
Brazil	Aging	- Rapid transition - Regional variations	- Healthcare access - Pension reform

Countries like South Korea and Singapore are experiencing a very rapid demographic transition, with their elderly population doubling in less than 25 years. This necessitates urgent policy responses to address the challenges associated with rapid aging. Countries such as China and Brazil are undergoing a rapid transition, taking 25-35 years to double their elderly population. This allows for moderate adaptation time. France and Sweden are examples of countries with a gradual transition, taking more than 35 years to double their elderly population. This provides better preparation time for policy adjustments (UN, 2019).

The shrinking workforce due to aging populations can be addressed through immigration and automation, although skill gaps remain a challenge. Rising healthcare expenditures require insurance reform to manage fiscal pressure. Sustainability issues in pension systems can be mitigated by reforming retirement age, though political resistance is a significant hurdle. Potential economic slowdown can be countered by enhancing productivity and fostering innovation. Smaller families necessitate the development of care systems to prevent social isolation. Changing dynamics between generations call for support programs to maintain social cohesion. Increased demand for social services requires expansion and efficient resource allocation. Weakening traditional support systems need new models to adapt culturally. In the light of the discussion, the prime objective of paper is to explore the stages of population ageing in Nepal.

Methods and Materials

The article is based on secondary sources of data. Two types of data are used to define stage of demographic transition of ageing in Nepal. In this context, panel data on Nepal is downloaded from the website of UNDESA (<https://population.un.org/wpp/downloads?folder=Standard%20Projections&group=Population>).

The World Population Prospects is the official United Nations population estimates and projections that have been prepared by the Population Division of the Department of Economic and Social Affairs of the United Nations (UN DESA, 2024) Secretariat. It presents population estimates from 1950 to the present for 237 countries or areas, underpinned by analyses of historical demographic trends. This latest assessment considers the results of 1,758 national population censuses conducted between 1950 and 2022, as well as information from vital registration systems and from 2,890 nationally representative sample surveys. Another data source is the National Population and Housing Census 2021 (<https://censusnepal.cbs.gov.np/results>). It marked the twelfth national census in Nepal, carried out by the Central Bureau of Statistics. Initially planned from June 8 to June 22, 2021, the census was delayed until November 2021 in response to a rise in COVID-19 cases (NSO, 2023).

Results and Discussion

Panel Data and Trend of Ageing Population in Panel Data (1950-2023)

Table 3 presents essential demographic and health indicators from 1950 to 2023, highlighting significant trends in Nepal's population ageing. The indicators examined include population size, population growth rate (PGR), age distribution (percentages of those aged 0-14, 15-59, and 60+), crude death rate (CDR), life expectancy at birth (LEB), total fertility rate (TFR), infant mortality rate (IMR), under-five mortality rate (U5MR), and adult mortality rate (AMR).

Nepal's population has grown from 8.397 million in 1950 to 29.695 million in 2023. This substantial growth trajectory has experienced fluctuations in the annual population growth rate (PGR), peaking in the early 1990s and gradually declining to near-zero rates in recent years.

The proportion of the population aged 0-14 remained relatively stable at around 40% in the earlier decades, but has decreased to approximately 29% by 2023. In contrast, the share of individuals aged 60 and older has increased significantly, rising from 5% in 1950 to roughly 62% in 2023, indicating an aging population.

Table 3

Trend of Population Ageing, 1950-2023

Year	POP	PGR	0-14	15-59	60+	CDR	LEB	TFR	IMR	U5MR	AMR
1950	8,397	2.10	0.41	0.55	0.05	26.00	37.56	6.06	227.52	340.39	452.48
1951	8,573	2.05	0.41	0.55	0.05	25.90	37.61	6.06	226.93	339.55	452.55
1952	8,747	1.98	0.41	0.55	0.05	25.90	37.65	6.06	226.34	338.70	452.58
1953	8,918	1.89	0.41	0.54	0.05	25.80	37.69	6.07	225.75	337.87	452.85
1954	9,088	1.88	0.41	0.54	0.05	25.70	37.81	6.07	225.18	336.95	450.93
1955	9,258	1.84	0.41	0.54	0.05	25.60	37.86	6.07	224.44	335.90	451.23
1956	9,428	1.80	0.41	0.54	0.05	25.50	37.90	6.06	223.60	334.75	451.85
1957	9,598	1.78	0.41	0.54	0.05	25.40	38.01	6.05	222.41	333.07	451.32
1958	9,766	1.70	0.41	0.54	0.05	25.20	38.14	6.05	221.09	331.35	450.20
1959	9,939	1.80	0.41	0.54	0.05	24.90	38.41	6.03	219.20	328.49	446.87
1960	10,124	1.88	0.41	0.54	0.05	24.70	38.65	6.07	216.87	325.33	445.03
1961	10,318	1.93	0.41	0.54	0.05	24.50	38.97	6.09	214.06	321.20	442.62
1962	10,521	1.96	0.41	0.54	0.05	24.20	39.33	6.08	210.80	316.53	439.55

1963	10,730	1.97	0.41	0.54	0.05	23.90	39.61	6.06	207.36	311.93	438.89
1964	10,946	2.03	0.40	0.54	0.05	23.40	40.23	6.04	203.18	305.30	432.05
1965	11,173	2.08	0.40	0.54	0.05	23.00	40.69	6.01	198.97	299.20	428.83
1966	11,409	2.09	0.40	0.54	0.05	22.50	41.24	5.98	194.53	292.63	423.94
1967	11,653	2.14	0.40	0.54	0.05	22.10	41.71	5.95	190.12	286.06	421.44
1968	11,906	2.16	0.40	0.54	0.05	21.80	42.17	5.94	186.01	279.89	418.52
1969	12,167	2.17	0.40	0.54	0.05	21.30	42.72	5.89	181.66	272.87	414.79
1970	12,436	2.21	0.40	0.54	0.05	21.00	43.15	5.87	177.55	267.10	412.20
1971	12,710	2.15	0.40	0.54	0.05	20.60	43.62	5.85	173.23	260.73	409.79
1972	12,989	2.19	0.40	0.54	0.05	20.20	44.07	5.80	169.32	254.89	406.90
1973	13,275	2.17	0.40	0.54	0.06	19.80	44.49	5.70	165.52	249.12	404.85
1974	13,568	2.20	0.41	0.54	0.06	19.50	44.92	5.75	161.69	243.43	402.24
1975	13,871	2.21	0.41	0.54	0.06	19.10	45.50	5.73	157.88	237.72	396.14
1976	14,178	2.17	0.41	0.54	0.06	18.70	45.99	5.72	154.08	232.31	391.74
1977	14,499	2.31	0.41	0.54	0.06	18.30	46.63	5.69	150.22	226.19	385.09
1978	14,840	2.33	0.41	0.54	0.06	17.80	47.20	5.68	146.35	220.21	379.71
1979	15,191	2.34	0.41	0.53	0.06	17.40	47.77	5.64	142.34	213.76	375.37
1980	15,553	2.38	0.41	0.53	0.06	17.00	48.33	5.60	138.43	207.25	371.07

1981	15,922	2.32	0.41	0.53	0.06	16.80	48.66	5.58	134.81	201.38	371.46
1982	16,298	2.34	0.41	0.53	0.06	16.40	49.18	5.55	130.28	194.19	369.45
1983	16,689	2.40	0.41	0.53	0.06	16.00	49.68	5.54	126.11	187.48	367.25
1984	17,085	2.29	0.41	0.53	0.06	15.70	50.23	5.51	121.98	180.72	363.96
1985	17,478	2.25	0.41	0.53	0.06	15.20	50.92	5.46	117.84	173.66	358.02
1986	17,868	2.17	0.41	0.53	0.06	14.80	51.59	5.40	113.56	166.65	352.63
1987	18,251	2.07	0.41	0.53	0.06	14.30	52.38	5.35	109.42	159.70	344.62
1988	18,639	2.14	0.41	0.53	0.06	13.80	53.11	5.31	105.04	152.75	337.82
1989	19,058	2.30	0.42	0.53	0.06	13.20	54.01	5.26	100.43	145.34	328.24
1990	19,525	2.53	0.42	0.53	0.06	12.80	54.77	5.21	95.97	138.45	321.05
1991	20,037	2.64	0.41	0.53	0.06	12.20	55.65	5.15	91.63	131.62	311.47
1992	20,610	3.00	0.41	0.53	0.06	11.60	56.69	5.07	87.21	124.40	299.31
1993	21,180	2.47	0.41	0.53	0.06	11.20	57.60	5.04	83.47	118.71	287.56
1994	21,717	2.54	0.41	0.53	0.06	10.60	58.63	4.96	79.09	111.56	275.56
1995	22,245	2.27	0.41	0.53	0.06	10.30	59.32	4.87	75.36	105.71	269.06
1996	22,742	2.15	0.41	0.53	0.06	9.80	60.04	4.67	71.83	100.18	261.85
1997	23,219	2.01	0.41	0.53	0.06	9.30	60.82	4.44	68.05	94.03	254.30
1998	23,680	1.92	0.41	0.53	0.06	8.90	61.53	4.28	64.93	89.00	246.50

1999	24,125	1.80	0.41	0.53	0.06	8.70	62.04	4.13	61.59	83.95	242.99
2000	24,547	1.66	0.41	0.53	0.06	8.40	62.64	3.98	58.57	79.40	236.80
2001	24,947	1.58	0.41	0.53	0.06	8.00	63.29	3.79	55.82	74.87	230.10
2002	25,329	1.47	0.40	0.53	0.06	7.90	63.51	3.60	53.40	71.00	232.21
2003	25,689	1.36	0.40	0.54	0.06	7.60	64.23	3.44	50.86	67.21	222.39
2004	26,017	1.18	0.40	0.54	0.06	7.40	64.74	3.28	48.63	63.75	217.11
2005	26,309	1.06	0.39	0.54	0.07	7.20	65.28	3.12	46.64	60.58	210.61
2006	26,565	0.88	0.39	0.55	0.07	7.00	65.89	2.97	44.94	57.77	201.90
2007	26,788	0.79	0.38	0.55	0.07	7.00	66.17	2.86	43.38	55.25	199.70
2008	26,990	0.71	0.37	0.56	0.07	7.00	66.44	2.74	41.45	52.71	197.74
2009	27,173	0.65	0.37	0.56	0.07	7.00	66.60	2.63	39.75	50.49	197.54
2010	27,342	0.60	0.36	0.57	0.07	7.00	66.77	2.54	38.14	48.20	197.14
2011	27,464	0.30	0.35	0.57	0.08	7.00	67.12	2.46	36.65	46.02	193.24
2012	27,535	0.21	0.35	0.58	0.08	7.00	67.36	2.42	35.26	43.91	191.42
2013	27,590	0.19	0.34	0.58	0.08	7.10	67.60	2.36	34.02	41.99	189.45
2014	27,672	0.41	0.34	0.58	0.08	7.10	67.81	2.32	32.62	40.21	187.65
2015	27,824	0.68	0.33	0.59	0.08	7.40	67.37	2.27	31.72	40.30	194.37
2016	27,955	0.27	0.33	0.59	0.09	7.10	68.44	2.23	29.56	36.34	180.93

2017	28,011	0.13	0.32	0.59	0.09	7.10	68.74	2.17	28.28	34.65	177.58
2018	28,080	0.35	0.32	0.59	0.09	7.10	69.04	2.12	27.04	32.90	174.37
2019	28,414	2.00	0.31	0.60	0.09	7.00	69.30	2.08	26.03	31.48	171.27
2020	28,967	1.85	0.30	0.61	0.09	7.30	69.11	2.05	25.18	30.30	172.80
2021	29,475	1.63	0.29	0.62	0.09	7.80	68.39	2.03	24.08	28.83	191.78
2022	29,715	-0.00	0.29	0.62	0.09	6.90	70.09	2.00	22.99	27.53	162.15
2023	29,695	-0.14	0.29	0.62	0.09	6.90	70.35	1.98	21.91	26.25	159.01

Source:

<https://population.un.org/wpp/downloads?folder=Standard%20Projections&group=Population>

Note: POP (Population in thousands), PGR=Population Growth Rate, CDR=Crude Death Rate, Life Expectancy at Birth, TFR= Total Fertility Rate, IMR=Infant Mortality Rate, U5MR=Under Five Mortality Rate, AMR =Adult Mortality Rate

The crude death rate (CDR) has steadily decreased from 26 per 1,000 population in 1950 to about 6.9 in 2023. This marked reduction is largely due to enhancements in healthcare access, public health initiatives, and improved living conditions throughout Nepal.

Life expectancy at birth (LEB) has significantly increased from 37.56 years in 1950 to 70.35 years in 2023. This improvement reflects advancements in healthcare, enhanced maternal and child health outcomes, and broader socioeconomic progress.

The total fertility rate (TFR) has sharply declined from 6.06 children per woman in 1950 to 1.98 children per woman in 2023. This decrease indicates a shift toward lower birth rates, influenced by factors such as greater educational attainment among women, increased access to family planning, and urbanization.

Furthermore, the infant mortality rate (IMR) has notably fallen from 227.52 deaths per 1,000 live births in 1950 to 21.91 in 2023. The under-five mortality rate (U5MR) has also

decreased significantly, reflecting improvements in healthcare and nutrition for children. Additionally, although the adult mortality rate (AMR) has fluctuated, recent trends generally indicate improvements in health.

National Population and Housing Census 2021 and Ageing Population

Table 4 shows various demographics like total population, the percentage of people in different age groups (0-14, 15-59, 60+), the stage of ageing, and the dependency ratio. The data is further broken down by sex (male and female), urban and rural areas, ecological regions (Mountain, Hill, Terai), and provinces (Koshi, Madhes, Bagmati, Gandaki, Lumbini, Karnali, Sudurpaschim).

The total population is self-explanatory, but the percentages in the 0-14, 15-59, and 60+ age groups will help me understand the age structure of the population. The stage of ageing indicates whether the population is in the "young" or "ageing" phase. The dependency ratio is the ratio of dependents (people younger than 15 or older than 64) to the working-age population (15 to 64), expressed as a percentage.

The total population is 29,164,578. The age distribution is 28% in the 0-14 age group, 62% in the 15-59 age group, and 10% in the 60+ age group. The stage is listed as "Ageing" with a dependency ratio of 0.61.

Table 4

Stages of Population Ageing in Nepal, 2025

Some Backgrounds	Population	0-14	15-59	60+	Stage	Dependency Ratio
Nepal	29164578	0.28	0.62	0.10	Ageing	0.61
Sex						
Male	14,253,551	0.30	0.60	0.10	Ageing	0.67
Female	14,911,027	0.26	0.64	0.10	Ageing	0.56

Urban/Rural							
Urban	19,296,788	0.27	0.63	0.10	Ageing	0.44	
Rural	9,867,790	0.30	0.59	0.11	Ageing	0.69	
Ecological							
Mountain	1,772,948	0.30	0.59	0.11	Ageing	0.69	
Hill	11,757,624	0.25	0.64	0.11	Ageing	0.56	
Terai	15,634,006	0.29	0.61	0.09	Young	0.62	
Province							
Koshi	4,961,412	0.26	0.63	0.11	Ageing	0.59	
Madhes	6,114,600	0.33	0.58	0.09	Young	0.72	
Bagmati	6,116,866	0.22	0.67	0.11	Ageing	0.49	
Gandaki	2,466,427	0.24	0.63	0.13	Ageing	0.59	
Lumbini	5,122,078	0.29	0.62	0.10	Ageing	0.63	
Karnali	1,688,412	0.33	0.59	0.08	Young	0.69	
Sudurpaschim	2,694,783	0.31	0.60	0.09	Young	0.67	

Source: Calculation done by researcher based on NSO (2023)

This tells us that Nepal is in the ageing stage of its population development, meaning that the proportion of older people (60+) is increasing, which can have implications for healthcare, social security, and the workforce. The dependency ratio is 0.61, which means there are 61 dependents for every 100 working-age individuals. Since the majority of the population is in the working-age group (15-59), this suggests that there's a moderate level of dependency.

Now, looking at the breakdown by sex: males and females each have a total population close to 14-15 million. The male population has 30% in the 0-14 group, 60% in the 15-59 group, and 10% in the 60+ group. The female population has 26% in 0-14, 64% in 15-59, and 10% in 60+. Both are categorized as "Ageing," with dependency ratios of 0.67 for males and 0.56 for females.

This indicates that while both sexes are experiencing ageing, the dependency ratio is higher for males than for females. This could be due to various factors, such as differences in life expectancy, labor force participation, or social roles.

Next, looking at the urban and rural distribution: the urban population is 19,296,788 with 27% in 0-14, 63% in 15-59, and 10% in 60+. The stage is "Ageing" with a dependency ratio of 0.44. The rural population is 9,867,790 with 30% in 0-14, 59% in 15-59, and 11% in 60+. The stage is also "Ageing" with a dependency ratio of 0.69.

The lower dependency ratio in urban areas suggests that urban populations have a higher proportion of working-age individuals, which could be due to migration of working-age individuals to urban areas for employment. In contrast, rural areas have a higher dependency ratio, indicating more dependents relative to working-age individuals, which might be due to a higher proportion of older individuals or younger families.

Looking at the ecological regions: Mountain, Hill, and Terai. The Mountain region has a population of 1,772,948, with 30% in 0-14, 59% in 15-59, and 11% in 60+. The stage is "Ageing" with a dependency ratio of 0.69. The Hill region has a larger population of 11,757,624, with similar statistics: 25% in 0-14, 64% in 15-59, and 11% in 60+, also categorized as "Ageing" with a dependency ratio of 0.56. The Terai region has the highest population of 15,634,006, with 29% in 0-14, 61% in 15-59, and 9% in 60+. Interestingly, the Terai region is categorized as "Young" with a dependency ratio of 0.62.

The Terai region being categorized as "Young" despite having a significant portion in the 60+ group is interesting. This could be due to a higher proportion of young people in the population, balancing out the older demographic, or differences in how the stage is determined beyond just the 60+ percentage.

Finally, looking at the provinces: Koshi, Madhesh, Bagmati, Gandaki, Lumbini, Karnali, and Sudurpaschim. Each province has its own statistics. For example, Bagmati has a population of 6,116,866 with 22% in 0-14, 67% in 15-59, and 11% in 60+, categorized as "Ageing" with a dependency ratio of 0.49. Madhesh province has the highest dependency ratio at 0.72, categorized as "Young," while Karnali and Sudurpaschim also have higher dependency ratios and are categorized as "Young."

Table 5*Some Population Dynamics, 2025*

Some Backgrounds	LEB	TFR	IMR	U5MR	AMR
Nepal	71.21	1.97	17.13	22.88	6.81
Sex					
Male	68.49	-	18.85	24.82	9.27
Female	74.11	-	15.15	20.67	4.62
Urban/Rural					
Urban	71.05	1.88	16.34	21.70	6.20
Rural	71.81	2.17	18.43	24.89	7.26
Ecological					
Mountain	72.45	2.26	16.57	24.18	6.65
Hill	72.14	1.78	12.97	17.76	6.29
Terai	70.53	2.06	19.97	26.11	6.72
Province					

Koshi	70.36	1.81	18.59	24.34	7.76
Madhesh	71.76	2.51	20.64	26.84	5.95
Bagmati	72.38	1.64	11.77	16.20	5.51
Gandaki	72.04	1.63	11.71	15.88	7.27
Lumbini	69.50	1.92	20.04	26.56	7.98
Karnali	72.45	2.32	13.68	19.60	6.35
Sudurpaschim	71.24	1.99	16.29	22.63	7.58

Source: Calculation done by the Researcher based on NSO (2023)

Note: LEB=Life Expectancy at Birth, TFR=Total Fertility Rate, IMR=Infant Mortality Rate, U5MR=Under 5 Mortality, AMR=Adult Mortality Rate

Overall, this suggests that different regions within Nepal are experiencing different stages of population ageing, which could be influenced by factors like fertility rates, mortality rates, migration patterns, and economic development. Provinces with higher dependency ratios and categorized as "Young" may be experiencing faster population growth or higher birth rates compared to those categorized as "Ageing."

Nepal has a life expectancy at birth of 71.21 years, which is relatively high. The total fertility rate is just under 2 children per woman, which is close to replacement level. The infant mortality rate is 17.13 per 1,000 live births, and under-5 mortality is 22.88 per 1,000. Adult mortality rate is 6.81 per 1,000.

Looking at the sex differences, females have a higher life expectancy than males (74.11 vs. 68.49), which is a common pattern due to various factors like higher risks for males in certain occupations, behavioral factors, and possibly biological factors. The female advantage is also seen in lower infant, under-5, and adult mortality rates.

In urban areas, life expectancy is slightly higher (71.05) compared to rural areas (71.81), which seems contradictory. Usually, urban areas have better healthcare facilities and lower

mortality rates. So why is life expectancy higher in rural areas? Let me think. Maybe it's due to differences in lifestyle, environmental factors, or even migration patterns. Perhaps urban areas have more stress, pollution, or other health risks.

Total fertility rate is lower in urban areas (1.88) compared to rural areas (2.17). This makes sense as urban areas tend to have better access to contraception, higher education levels, and different socio-economic factors that influence family size.

Infant mortality rate is lower in urban (16.34) than rural areas (18.43), which is expected due to better healthcare access in cities. Similarly, under-5 mortality is lower in urban (21.70) compared to rural (24.89), and adult mortality is lower in urban (6.20) compared to rural (7.26).

Looking at ecological regions:

Mountain Region: Has a relatively high life expectancy (72.45), but a high TFR (2.26), which is one of the highest. The infant mortality rate is 16.57, the under-5 is 24.18, and the adult mortality rate is 6.65.

Hill Region: Similar to the mountain region but with slightly lower TFR (1.78) and lower mortality rates (IMR: 12.97, U5MR: 17.76, AMR: 6.29).

Terai Region: This region has the lowest life expectancy (70.53), the highest TFR (2.06), and the highest mortality rates (IMR: 19.97, U5MR: 26.11, AMR: 6.72). This could be due to various factors like geographical challenges, healthcare access, or socio-economic conditions.

Now, looking at the provinces:

Bagmati: This province has the highest life expectancy (72.38) and one of the lowest TFR (1.64). The infant mortality rate is the lowest at 11.77, under-5 mortality is 16.20, and the adult mortality rate is 5.51. This suggests that Bagmati is one of the more developed provinces with better healthcare facilities and lower fertility rates.

Gandaki: Similar to Bagmati with high life expectancy (72.04), low TFR (1.63), low mortality rates (IMR: 11.71, U5MR: 15.88, AMR: 7.27).

Madhesh: High TFR (2.51), which is the highest among all provinces. It also has high mortality rates (IMR: 20.64, U5MR: 26.84, AMR: 5.95). The life expectancy is 71.76.

Koshi: Life expectancy is slightly lower at 70.36, and TFR is 1.81, which is close to the national average. Mortality rates are higher than in Bagmati but lower than in Madhesh.

Lumbini: Life expectancy is 69.50, which is lower than the national average. TFR is 1.92. It has high mortality rates (IMR: 20.04, U5MR: 26.56, AMR: 7.98).

Karnali: Life expectancy is 72.45, the same as Mountain and Sudurpaschim. TFR is 2.32, which is relatively high. Mortality rates are moderate (IMR: 13.68, U5MR: 19.60, AMR: 6.35).

Sudurpaschim: Life expectancy is 71.24, TFR is 1.99, which is close to the national average. Mortality rates are moderate (IMR: 16.29, U5MR: 22.63, AMR: 7.58).

From these observations, it seems that provinces like Bagmati and Gandaki are performing better in terms of health outcomes and lower fertility rates, possibly due to better infrastructure, education, and access to healthcare. Provinces like Madhesh and Lumbini have higher fertility rates and higher mortality rates, indicating that they may need more targeted interventions to improve health care and family planning services.

The Terai region, in particular, stands out with the lowest life expectancy and highest mortality rates, which could be due to a combination of factors like poverty, lack of access to healthcare, and possibly higher exposure to infectious diseases.

Overall, the data suggest that there are significant disparities in health outcomes and demographic indicators across different regions and provinces in Nepal. Addressing these disparities would likely require tailored policies and interventions that consider the unique challenges and circumstances of each region.

Implications of the Data

The continuous decline in fertility rates combined with rising life expectancy suggests that Nepal is undergoing a demographic transition, shifting from a society with high mortality and fertility rates to one with lower rates for both. This transition has critical implications for policymakers regarding economic planning, healthcare services, and pension systems.

The growing percentage of the older adult population (60+) calls for a reassessment of healthcare services and social support systems to meet the needs of an aging demographic. With

the proportion of older adults reaching 62% by 2023, there is an urgent requirement for elder care services and health provisions tailored to chronic conditions and geriatric care.

The reduction in mortality rates across all age groups, particularly among infants and children under five, indicates significant progress in healthcare interventions, vaccination initiatives, and maternal health services. These trends demonstrate the effectiveness of health policies implemented over the years.

Changes in the working-age population (ages 15-59) amid declining birth rates present both challenges and opportunities for economic growth. A smaller youth population may create economic opportunities if the labor market can absorb the working-age cohort effectively, but it also poses a risk of labor shortages if not managed properly.

The dataset encompassing Nepal's demographic and health indicators from 1950 to 2023 reflects profound transformations in population dynamics, health outcomes, and social structures. The trends highlight improvements in life expectancy and health, driven by public health efforts and socioeconomic development, alongside reduced fertility and mortality rates. However, the increasing aging population presents significant challenges for healthcare and social support systems that must be proactively addressed. Future efforts should focus on supporting this demographic shift while continuing to enhance healthcare access and quality for all age groups across Nepal.

Conclusion

Nepal's population is transitioning through different stages of ageing, with significant regional and demographic variations. Comprehensive and targeted policies are essential to manage the challenges and opportunities presented by these demographic shifts. Nepal exhibits significant regional and sex-based disparities in demographic and health indicators. Provinces like Bagmati and Gandaki demonstrate better health outcomes, while Madhesh and Lumbini face higher fertility rates and mortality. Addressing these disparities requires targeted policies, improved healthcare access, and socio-economic interventions tailored to each region's unique challenges.

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