



The Reality of Health Frailty Among the Elderly in Algeria: A Socio-economic Statistical Study Based on the Multiple Indicator Cluster Survey (MICS6)"

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Abstract

This study examines the reality of health frailty among the elderly in Algeria based on data from the Multiple Indicator Cluster Survey (MICS6), for a sample of 16,858 elderly persons. The indicators revealed a growing burden of morbidity: the proportion of those afflicted with one disease reached 58.7%, while a quarter of the study sample faced the challenge of multimorbidity, at a rate of 25.4%. The chi-square test confirmed a significant association between morbidity among the elderly and socio-economic indicators.

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1. Introduction

The world today faces an unprecedented structural transformation in its population composition toward ageing, as the proportion and absolute number of older persons rise markedly relative to the total population. Despite the considerable attention that governments and specialized international bodies devote to issues concerning the elderly, the phenomenon of population ageing continues to present itself as one of the complex global dilemmas whose repercussions are difficult to contain in the near term. This is directly attributable to fundamental changes in the global demographic structure, where the combined effect of declining fertility and rising life expectancy at birth has led to a steady expansion in the size of this population segment.

The United Nations report *World Population Prospects 2022* indicated that “the world's population may reach approximately 8.5 billion in 2030, and 9.7 billion in 2050, and that this population growth is partly due to declining mortality rates, as reflected in the rising average life expectancy at birth. Global average life expectancy also reached 72.8 years in 2019, an increase of nearly 9 years since 1990, and further declines in mortality rates are expected to bring average life expectancy to about 77.2 years worldwide by 2050.” (Nations, 2022, p. i)

This United Nations projection leads us to conclude that the challenge now and in the future is to attempt to mitigate the effects of ageing, which extend to numerous societal sectors including housing and social protection, among others, as well as affecting family structures and intergenerational ties. Most important of all, however, is the health care provided to this group, on the premise that “ageing is characterized by a progressive loss of physiological integrity, leading to impaired organ function and increased vulnerability to death, and this decline is considered the principal risk factor for major human diseases.” (López-Otín, 2013)

The elderly are thus most exposed to the risk of contracting intractable diseases — not merely the risk of being afflicted with a single disease, but with two or more diseases, a phenomenon known as multimorbidity, which is considered the principal indicator of health frailty.

As for Algeria, which is not exempt from the gradual shift toward population ageing, life expectancy at birth reached 79.6 years in 2023 (ONS, 2020–2023), while the total fertility rate reached 2.7 children per woman (World Bank), which remains close to the replacement rate of 2.1 children per woman. “Since the 1998 census, the age structure of the Algerian population has been marked by an increase in the proportion of persons aged over 60, alongside a decline in the proportion of those under five years of age. These fundamental changes in the age structure were confirmed in the 2008 census, where the proportion of persons aged over 60 reached 7.4%, compared to only 10.2% for those under five years of age. The latter constituted nearly 20% of the

total population in 1966. Algeria has thus fully entered the stage of population ageing.” (Sahraoui, 2012, p. 135)

From this standpoint, the research problem crystallizes around an attempt to understand the reality of elderly health in Algeria, starting from the following question: What is the reality of health frailty among the elderly in Algeria, based on the data of the sixth round of the Multiple Indicator Cluster Survey 2019–2020 (MICS6)?

2. Defining the Concepts

2.1 Ageing

At the outset, ageing is termed “population ageing,” a gradual process resulting in an increasing proportion of older persons and a decreasing proportion of younger persons, whose principal cause is declining fertility. This leads to a rise in the median age and the mean age of the population. Most developed countries experience this demographic situation, in contrast to most developing countries, which are characterized by large proportions of their population in the younger age groups. Population ageing carries social, economic, and demographic consequences that receive considerable attention in developed countries, including changes in family size and structure, an increase in two-person households, a rise in the dependency burden placed on the working-age population, and rising costs of social and health care, among others. (Al-Khraif, 2010, p. 118)

It is a stage marked by further deterioration in physical and mental functions, a withdrawal from professional and social roles, and a further weakening of functional capacities. (Al-Issawi, 1989, p. 13)

2.2 Health Frailty

In this study, and drawing on MICS6 survey data, health frailty is understood through two complementary levels of morbid burden among the population aged 60 and above. The first level represents “simple health frailty,” measured through the prevalence of at least one diagnosed chronic disease, while the second level is represented by the phenomenon of “multimorbidity” — cases of the concurrence and accumulation of two or more chronic diseases simultaneously in the same elderly individual.

3. Objectives of the Study

- To diagnose the reality of health frailty among the elderly in Algeria and identify its structural features.
- To monitor and analyze data on the phenomenon in Algeria.

- To provide scientific statistical indicators for decision-makers.

4. Significance of the Study

The significance of the topic lies in the context in which it is raised, concerning the elderly population in Algeria — particularly as Algerian society has begun to be characterized by the gradual phenomenon of population ageing, resulting from rising life expectancy at birth and declining fertility rates, which in turn has led to an expansion in the size of the elderly population. The significance also lies in the fact that this study attempts to uncover the socio-demographic and spatial gaps that influence the phenomenon of ageing in Algeria. Here, health frailty is not studied merely as a biological inevitability linked to age, but rather is addressed as a product of social interactions, such as what is known as the “feminization of frailty” (the gender gap), the influence of the residential environment (the rural–urban gap), and the effect of class disparity (standard of living). This approach contributes to understanding health frailty among the elderly in Algeria.

5. Study Methodology

This study relies on the descriptive-analytical method, supported by inferential statistical analysis, in order to diagnose the reality of health frailty and to disaggregate the associated socio-demographic disparities among the elderly in Algeria, drawing on official figures and statistics and statistical processing methods. We test and measure the degree of association or independence between the independent and dependent variables using the Pearson chi-square distribution. It should be noted that “don't know” responses and missing values, which did not exceed 0.5% of the total study sample, were excluded from the study.

5.1 Data Source

The study relies on the official database of Algeria's sixth round of the Multiple Indicator Cluster Survey 2019–2020 (MICS6), a comprehensive national survey conducted by the Ministry of Health and the National Statistics Office, in cooperation with the United Nations Children's Fund (UNICEF).

The survey was conducted over the period from 25 December 2018 to 22 April 2019, targeting a total sample of 31,325 households. The number of households actually interviewed reached 29,919, with a response rate estimated at 96.7%.

5.2 Study Sample

The study targets the elderly population (old age) in Algeria. The total sample size in the sixth round of the Multiple Indicator Cluster Survey 2019–2020 (MICS6) reached 16,858 elderly persons aged 60 and above. The total number of those afflicted with one disease reached 9,896 elderly

persons, representing 58.8% of the total sample. The total number of those afflicted with multimorbidity — i.e., two or more chronic diseases — reached 4,275 elderly persons, representing 25.4% of the total sample.

6. The Demographic Reality of Ageing in Algeria

Algeria's population aged 60 and above, estimated at more than 2.5 million in 2010, will double in less than two decades, triple in less than three decades, and more than quadruple by 2040. At the local level, the ageing of the Algerian population is expected to be more pronounced in the north of the country, with disparities between east and west. The north of Algeria is also the region that has experienced a greater decline in fertility compared to the south. The south continues to show resilience against declining fertility, which remains above the national average, despite some complex cases where high rates of both ageing and fertility are recorded. Nevertheless, according to projections, by 2020 all regions will be affected by ageing, particularly the southern regions. (Sahraoui, 2012, p. 135)

Table 1. Proportion of Elderly Persons in Algeria

Age group	1966	1970	1980	1990	2000	2010	2020	2030
0–19	56%	59%	57%	53%	46%	38%	32%	30%
20–59	37%	35%	37%	41%	47%	55%	58%	56%
60+	7%	6%	6%	6%	7%	8%	10%	14%
Total	100%	100%	100%	100%	100%	100%	100%	100%

Source: National Statistics Office (ONS), cited in: Bougarne & Allam (2019), p. 205.

The elderly population (aged 60 and above) recorded relative stability during the first decades following independence, ranging between 7% in 1966 and 6% during the period extending from 1970 to 1990. However, with the turn of the current millennium, the proportion began to rise gradually, reaching 7% in 2000, then rising to 8% in 2010, and continuing its ascent to reach 10% in 2020. By 2030, it is expected to rise by four percentage points to reach 14% of the total population.

The sharp decline of the 0–19 age group, by 27 percentage points between 1970 and 2020, clearly reflects the direct effect of declining fertility rates, while the steady rise of the 60-and-above age group is explained by the success of the health system and the increase in life expectancy at birth. By contrast, by 2030 Algeria will enter the ageing stage according to international demographic standards, which consider a population to be ageing when the proportion of persons aged over 60 ranges between 7% and 14% of the total population.

7. Results

Table 2. Distribution of Elderly Persons With and Without at Least One Chronic Disease, by Socio-Demographic Variables

Variable	Category	Affected		Not Affected		Total	%
		<i>n</i>	%	<i>n</i>	%		
Age of elderly (**)	60–69	5014	52.7	4497	47.3	9511	100
	70–79	3102	65.7	1617	34.3	4719	100
	80+	1780	68.6	816	31.4	2596	100
Sex of elderly (**)	Male	4259	49.6	4324	50.4	8583	100
	Female	5637	68.4	2606	31.6	8243	100
Educational level of household head (**)	Below primary / Primary	7105	57.5	5200	42.5	12305	100
	Middle	1270	61.1	810	38.9	2080	100
	Secondary	983	62.9	580	37.1	1563	100
	University	517	61.2	328	38.8	845	100
Standard of living of household (**)	Very poor	1437	52	1324	48	2761	100
	Poor	1756	55.9	1387	44.1	3143	100
	Comfortable	1955	58.1	1412	41.9	3367	100
	Rich	2228	61.1	1416	38.9	3644	100
	Very rich	2520	64.4	1391	35.6	3911	100
Residential environment (**)	Urban	6934	61.1	4406	38.9	11340	100
	Rural	2962	54	2523	46	5485	100

Source: Table prepared by the researcher based on survey data. Statistical significance: (**) statistically significant at the significance level indicated by the chi-square test; (Ns) not statistically significant.

Regarding the age variable of the elderly, the older age group (80 years and above) recorded the highest rate of affliction with one chronic disease, at 68.6%, followed by the age group (70–79 years) with an affliction rate of 65.7%, while the age group (60–69 years) recorded the lowest affliction rate, at 52.7%.

As for the sex variable of the elderly, the results showed that females recorded the highest rates of affliction with one chronic disease, at 68.4%, while males recorded a lower affliction rate, estimated at 49.6%.

Regarding the educational level of the household head, it was found that elderly persons living under a household head with a secondary educational level were most affected by one chronic disease, at a rate of 62.9%, followed closely by the university-level category at 61.2%, then the

middle-level category at 61.1%, while the below-primary/primary category ranked last with the lowest affliction rate of 57.5%.

As for the standard-of-living variable of the elderly person's household, the very rich household category recorded the highest rate of affliction with one chronic disease, at 64.4%, followed by the rich household category at 61.1%, then the comfortable household category at 58.1%, followed by the poor household category at 55.9%, while the very poor household category recorded the lowest affliction rate, at 52%.

Finally, the figures for the residential-environment variable revealed that elderly persons residing in urban areas recorded the highest rate of affliction with one chronic disease, at 61.1%, while elderly persons residing in rural areas recorded a lower affliction rate, at 54%.

Table 3. Distribution of Elderly Persons With and Without Two or More Chronic Diseases, by Socio-Demographic Variables

Variable	Category	Affected		Not Affected		Total	%
		<i>n</i>	%	<i>n</i>	%		
Age of elderly (**)	60–69	2026	21.3	7485	78.7	9511	100
	70–79	1442	30.6	3276	69.4	4718	100
	80+	806	31.3	1790	68.7	2596	100
Sex of elderly (**)	Male	1693	19.7	6890	80.3	8583	100
	Female	2582	31.3	5660	68.7	8242	100
Educational level of household head (**)	Below primary / Primary	3061	24.9	9243	75.1	12304	100
	Middle	544	26.2	1536	73.8	2080	100
	Secondary	461	29.5	1103	70.5	1564	100
	University	201	23.8	644	76.2	845	100
Standard of living of household (**)	Very poor	517	18.7	2244	81.3	2761	100
	Poor	710	22.6	2434	77.4	3144	100
	Comfortable	832	24.7	2535	75.3	3367	100
	Rich	1029	28.2	2616	71.8	3645	100
	Very rich	1188	30.4	2723	69.6	3911	100
Residential environment (**)	Urban	3083	27.2	8257	72.8	11340	100
	Rural	1192	21.7	4294	78.3	5486	100

Source: Table prepared by the researcher based on survey data. Statistical significance: (**) statistically significant at the significance level indicated by the chi-square test; (Ns) not statistically significant.

Regarding the age variable of the elderly, the older age group (80 years and above) recorded the highest rate of affliction with two or more chronic diseases, at 31.3%, followed by the age group (70–79 years) with an affliction rate of 30.6%, while the younger age group (60–69 years) recorded the lowest affliction rate, at 21.3%.

As for the sex variable of the elderly, the results showed that females recorded the highest rates of affliction with multimorbidity, at 31.3%, while males recorded a lower affliction rate, estimated at 19.7%.

Regarding the educational level of the household head, it was found that elderly persons living under a household head with a secondary educational level were most affected by two or more chronic diseases, at a rate of 29.5%, followed by the middle-level category at 26.2%, the university-level category at 21.2%, then the below-primary/primary category at 24.9%, while the university-level category recorded the lowest affliction rate, at 21.2%.

As for the standard-of-living variable of the elderly person's household, the very rich household category recorded the highest rate of affliction with two or more chronic diseases, at 30.4%, followed by the rich household category at 28.2%, then the comfortable household category at 24.7%, followed by the poor household category at 22.6%, while the very poor household category recorded the lowest affliction rate, at 18.7%.

Finally, the figures for the residential-environment variable revealed that elderly persons residing in urban areas recorded the highest rate of affliction with two or more chronic diseases, at 27.2%, while elderly persons residing in rural areas recorded a lower affliction rate, at 21.7%.

8. Discussion

A cross-reading of the results of the two tables shows a direct upward trend in chronic-disease affliction rates as the elderly person advances in age. The rate of affliction with at least one disease rises from 52.7% among what is known as the “third age” group of the elderly (60–69 years) to reach its peak at 68.6% among the advanced-old-age group, referred to as the “fourth age” group (80 years and above). This same trend is evident in the increasing complexity of health status through affliction with two or more diseases, known as multimorbidity, where the rate of affliction with two or more diseases rose from 21.3% for the third-age group to 31.3% for the fourth-age group. This clearly illustrates the assumption linking advancing age with chronic-disease affliction and the transition to multimorbidity, particularly among the advanced-elderly group, whose characteristics include physiological decline, structural weakness, and diminished resistance capacity, which renders the elderly person at this stage vulnerable to the concurrence and overlap of diseases.

Regarding the sex variable, it is clearly evident that females suffer significantly greater health frailty compared to males. The rate of affliction with at least one disease rose to 68.4% among females, compared to 49.6% among males. This gap was also clearly evident in the multimorbidity indicator, where females recorded an affliction rate of 31.3%, far exceeding the 19.7% recorded among males.

This finding intersects with international statistics, which agree that females live longer than males, exposing them to a greater risk of chronic-disease affliction in return for the cumulative weakening of their physical constitution with advancing age. From another perspective, and through retrospective observation, we find that with the passing years, Algerian women accumulate life burdens stemming from repeated childbirth and demanding family roles of raising and caring for children, even at advanced ages. Finally, it may be assumed that females tend, more than males, to disclose illness and to seek regular medical check-ups.

Regarding the educational level of the household head, the results reveal clear paradoxes between educational levels and affliction rates. While the rates of affliction with one disease rise in a relatively ascending direction from the lower to the higher categories, the multimorbidity indicator drops sharply and clearly for the university-level category, recording the lowest affliction rate among all categories, at 21.2%.

At first glance, it may appear that households headed by a person with a middle or secondary educational level, which show higher rates of affliction with one or more diseases, are the most exposed to illness. However, this increase reflects the level of health awareness within these households: more educated households are better able to notice symptoms of illness in their elderly members and are more inclined toward visiting medical clinics and undergoing periodic check-ups. In addition, elderly persons — or other household members who assume the role of household head within this category — tend to disclose chronic-disease affliction during surveys more readily than the illiterate or less-educated category. As for the decline in multimorbidity among the university-educated category, the cultural capital of the university-educated household head is clearly evident in curbing the progression of the disease state from a single disease to multimorbidity: an individual in this situation possesses greater health literacy and is more cautious regarding the consequences of multiple afflictions, which drives them toward early diagnosis; they also have a better understanding of treatment protocols, and ultimately are able to avoid renewed affliction by adopting a strict and regular healthy diet.

The cross-tabulated statistical indicators for the standard-of-living variable of the elderly person's household reveal a linear, positive, upward curve linking a good standard of living with rising morbidity rates. As we move from the extremely poor categories toward the wealthier categories, the rates of affliction with at least one disease rise progressively, from 52% among very poor

households to reach the highest level of affliction among very rich households, at 64.4%. This observation corresponds exactly with multimorbidity, where the rate rose from its lowest level among very poor households, at 18.7%, to its highest level among very rich households, at 30.4%.

Theoretically, material affluence would be expected to contribute to improved health indicators. However, households with high economic welfare in Algerian society are associated with a shift toward modern consumption patterns characterized by dietary behavior oriented toward fatty, calorie-dense foods, alongside a growing tendency toward physical inactivity. Here, the economic factor emerges as a decisive variable in elderly care: the independent financial capacity of well-off households allows them early access to accurate diagnosis through the public or private sector, and to undergo costly examinations and complex tests — not to mention providing an excellent care environment for the elderly person suffering from a chronic disease, such as regularly purchasing medication, medical follow-up, a comprehensive healthy diet, and so on. In contrast, the financial incapacity of poor households, which leads them to avoid treatment costs, results in the concealment of latent diseases among their elderly members. Statistically, in survey data, this factor affects the true reporting of chronic-disease afflictions among the elderly.

The residential-environment variable reveals significant spatial disparities in the levels of health frailty among the elderly in Algeria, with the urban environment recording higher morbidity rates compared to the rural environment. The rate of affliction with one disease among elderly persons residing in cities reached 61.1%, compared to 54% among their rural counterparts. The same observation held true for the multimorbidity indicator, where the rate in urban areas reached 27.2%, compared to 21.7% in rural areas.

The geographical disparity in chronic-disease affliction rates reflects the effect of the urban environment as a driving variable for morbidity, as contemporary urban life is associated with a range of behaviors and environmental risks — most notably sedentary lifestyles, persistent psychological stress, and a growing reliance on fast food and high-calorie foods, which directly lead to obesity and a deterioration in general health status. By contrast, the rural individual still relatively maintains a lifestyle that requires greater physical effort and mobility. Despite the foregoing, this higher rate cannot be separated from the abundance of hospital and health facilities generally found in cities, which accordingly facilitates earlier diagnosis of disease affliction or its absence, whereas distance, the lack of specialized medical coverage, and the difficulties of travel from rural areas to cities often lead elderly persons to forgo check-ups except in critical emergency cases. As a result, morbid conditions in urban areas appear more prominently in statistical surveys due to the greater availability of care and health awareness compared to rural areas.

9. Conclusion

In conclusion, Algeria today, amid demographic and epidemiological transitions, faces major societal and institutional challenges in particular. The phenomenon of population ageing is not merely a population problem but represents a challenge to maintaining population balance; the gradual shift of society toward old age constitutes a demographic gap that requires vigilance. On the other hand, health care for the elderly, their medical insurance coverage, and their social protection represent a challenge and a developmental stake first and foremost, and a social and health one secondarily.

In the same context, social and health care systems are no longer limited to providing retirement pensions, institutional housing, or preferential health services for the socially insured; today they also require addressing rising morbidity rates, protecting the cohesion of families that care for their elderly members, providing support for treatment costs, and preparing to confront the phenomenon of multimorbidity.

Finally, Algeria has made, and continues to make, considerable efforts to provide health and social care for the elderly by enabling sick elderly persons to access medication through the “Chifa” health-insurance card for those who are insured. According to the survey data, 75.9% of elderly persons suffering from chronic diseases hold a Chifa card, indicating substantial health coverage for this segment of society. However, despite the efforts made by state institutions, new approaches must be considered to establish automatic protection as soon as an individual reaches old age and as soon as a chronic disease is confirmed, in order to provide for elderly persons who are not socially insured, and thereby offer indirect support to the family support system in Algeria.

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