

The impact of demographic factors on the prevalence of chronic diseases in Algeria

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Abstract:

This study aims to examine the demographic factors that contribute to the prevalence of chronic diseases in Algeria. The research highlights the importance of this issue as it affects a vulnerable segment of society, particularly the elderly, who require protection from disease and the management of their chronic conditions. It is therefore essential to create living and environmental conditions that enable them to lead a healthy life and meet their basic needs.

Methodologically, the study adopts a descriptive-analytical approach. The study sample uses household data from the sixth Multi-Indicator Cluster Survey (MISC6) for the year 2019. The following results were obtained: The prevalence of chronic diseases increases with age, with higher rates observed in individuals aged 50 years and above compared to younger age groups. Hypertension, diabetes, cardiovascular disease and joint disease were found to be the most prevalent of all other chronic diseases. In addition, individuals living in rural areas were found to be less prone to chronic diseases than those living in urban areas.

Keywords: Gender, age, demographic factors, chronic diseases, multi-indicator cluster survey.

1- Introduction:

There are several factors that contribute to the onset and exacerbation of chronic diseases and increase the severity of a patient's health status. These factors include gender, age, genetics, as well as behavioural factors that are primarily modifiable. Unhealthy behaviours such as tobacco use, physical inactivity, poor diet and alcohol consumption lead to four major biological metabolic changes that increase the risk of non-communicable diseases. These

include high blood pressure, overweight/obesity, high blood sugar (diabetes) and high blood lipid levels (elevated cholesterol and triglyceride levels).

In addition, there are other social, economic, cultural, environmental and biological factors that contribute to the emergence of these diseases. These factors include family history of chronic diseases, components and determinants of health behaviour, ageing, family behaviour, the work and school environment, and urban expansion and the role of the physical environment in the spread of noncommunicable diseases. In addition to their negative impact on human physical and mental well-being, chronic diseases have economic and social consequences that hinder development in various areas.

Prevention is therefore considered to be the most important and effective approach to reducing the prevalence and impact of chronic diseases. In this context, we decided to study the demographic factors that influence the prevalence of chronic non-communicable diseases in Algeria. The study adopts a descriptive-analytical approach to describe the phenomenon and identify its characteristics through data collection, analysis and interpretation using the 6th Multi-Indicator Cluster Survey (MICS6). The study aims to identify the most common chronic diseases affecting Algerian citizens, which not only pose a threat to physical health, but also have psychological and social repercussions that can prevent individuals from fulfilling their daily tasks and expected social roles.

By avoiding these chronic diseases through prevention, education and health counselling, individuals can improve their physical and mental well-being. The following question is therefore asked: What are the prevalent chronic diseases in Algeria and what are the demographic factors influencing them?

2- Methods and tools:

A- Methodology: The study adopts a descriptive-analytical approach, which is a method used to describe and analyse the phenomenon under study by collecting, analysing and interpreting information. It aims to reach conclusions that contribute to the understanding of reality by analysing and interpreting the phenomenon or scientific problems (Abidat, 1997). Since we are conducting a study on the demographic factors influencing chronic diseases in Algeria, it was necessary to use this methodology.

B- Study area: We used the household files from the Multi-Indicator Cluster Survey (MICS6) database for Algeria. This survey focuses on monitoring the

situation of children and women and was conducted in Algeria in 2019 by the Ministry of Health, Population and Hospital Reform with the support of the United Nations Children's Fund (UNICEF) and the United Nations Population Fund (UNFPA). The survey covered seven geographical regions: North-East, North-Central, North-West, Eastern Plateau, Central Plateau, Western Plateau and South.

C- Study sample: The study sample included 21,132 patients, both male and female. The sample was randomly selected using the cluster sampling method based on MICS6 data. The sample was distributed across the seven geographical regions mentioned above. The study focused on patients with the following chronic diseases: hypertension, diabetes, cardiovascular diseases, respiratory diseases, joint diseases, cancer (all types), neurological and psychiatric diseases, renal failure and other diseases. We will analyse the differences in the prevalence of chronic diseases according to demographic factors.

D- Research tools: As this study aims to describe and analyse the demographic factors influencing the prevalence of chronic diseases in Algeria, we will rely on the MICS6 database from 2019. We will analyse the data and extract the results based on it.

First: Study concepts

1. Definition of chronic diseases:

1.1 Terminological: Chronic diseases are a type of disease characterised by persistence. They are distinguished from acute diseases, which appear suddenly and are quickly cured. Chronic diseases include a large number of conditions that vary in origin, cause, symptoms and treatment. They develop slowly and require long-term treatment (Ramadan, 2005).

2.1 According to the United Nations: Noncommunicable diseases, also known as chronic diseases, are long-term conditions resulting from a combination of genetic, physiological, environmental and behavioural factors (WHO, 2014).

3.1 Procedural: Chronic diseases are non-communicable diseases that are permanent or long-lasting and may accompany a person throughout his or her life. They become more common with age and progress slowly. They have varying financial costs depending on the disease and affect both the physical

and psychological health of individuals and their ability to carry out daily tasks normally.

2. Definition of demographic factors:

2.1 Terminology: Demographic factors refer to the analysis carried out by demographers to study the population in a given area. It involves the study of their specific characteristics such as age, ethnicity and gender. Demographic factors include social, economic and health-related information expressed in statistical terms (démographique, 2020).

2.2 According to the United Nations: Demographic factors are defined either categorically (gender, ethnicity, marital status, psychiatric diagnosis) or continuously (age, years of education, income, family size) (United Nations, 2018).

3.2 Procedural: Demographic factors include a number of factors such as gender, age, education level, living environment and wealth index. These factors directly influence, to varying degrees, the prevalence and nature of diseases.

Second, the evolution of chronic diseases in Algeria from 2000 to 2012:

Algeria, like many countries around the world, has conducted a significant number of health surveys aimed at providing important, accurate and diverse databases to help diagnose the country's health status. These surveys serve as a basis for developing future development policies and programmes in various fields to improve living conditions. Chronic diseases are among the most important areas of focus due to their rapid spread and increasing impact on individuals and society.

One of the surveys providing important data on chronic diseases in Algeria is the 2002 National Family Health Survey (PAPFAM). In addition, the Multiple Indicator Cluster Survey on Maternal and Child Health (MICS3) was conducted in 2006, the Time Use Survey in 2012 and the MICS4. All of these surveys contain valuable data that allow us to track the course and development of chronic diseases in Algeria.

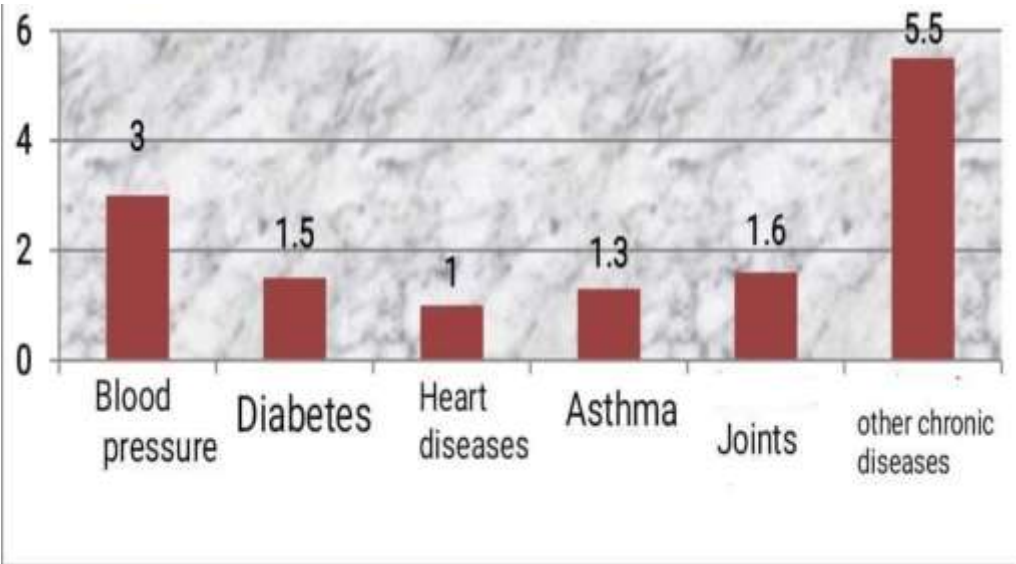
These health surveys have shown a marked increase in the prevalence of chronic diseases in Algeria, particularly hypertension and diabetes.

1. The National Family Health Survey (PAPFAM 2002):

The 2002 National Family Health Survey (PAPFAM) is the second of its kind after the 1995 survey. It is part of the International Family Survey Programme implemented by Algeria with the support of the United Nations Children's Fund (UNICEF) and financial contributions from the United Nations Population Fund. The survey covered 121,152 individuals from different households. It found that 11.4% of respondents reported having at least one chronic disease, with 3.8% having one chronic disease and 2.5% having two chronic diseases (Ministry of Health and Population, 2002).

The table shows that hypertension ranks first in terms of the number of people affected with 3.0%, followed by joint disease with 1.6%, diabetes with 1.5%, asthma with 1.3% and heart disease with 1.0%. The combined percentage of other chronic diseases is 5.5%.

Figure 01: Percentage Distribution of Chronic Diseases – PAPFAM -



Source: Author's compilation based on data from the National Family Health Survey PAPFAM

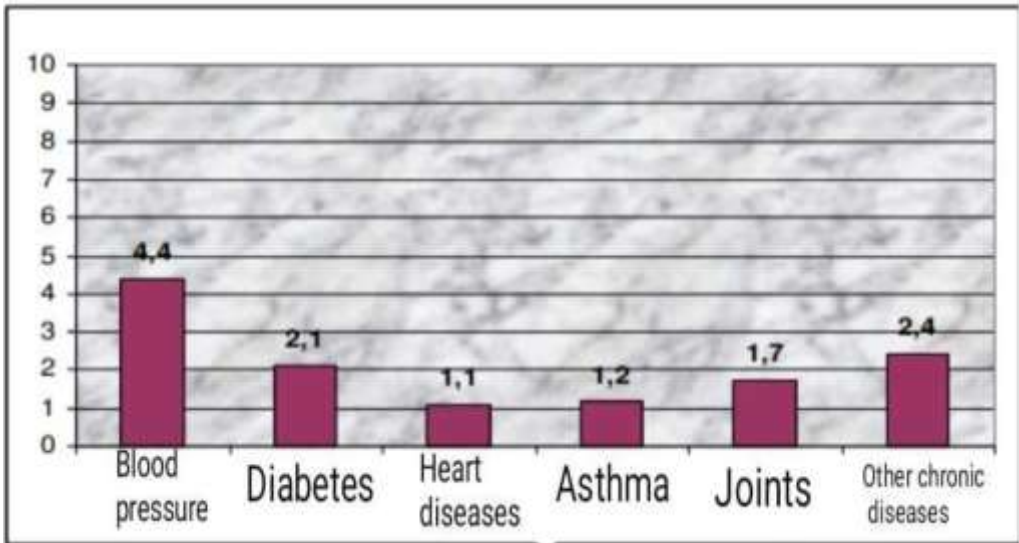
2. Chronic diseases in the 2006 Multiple Indicator Cluster Survey (MICS3)

The Multiple Indicator Cluster Survey MICS3, conducted by the Algerian Ministry of Health and Population and Hospital Reform in 2006, is part of the

international household survey programme developed by UNICEF. It followed the previous surveys in 1995 and 2002 and provides updated information on the status of children, women and the living conditions of both groups. It also provides demographic and health data. According to the survey, 10.5 per cent of residents in the households surveyed reported having known chronic diseases, with 95.2 per cent of these cases diagnosed by doctors (Ministry of Health and Population, 2006).

According to the graph, hypertension ranks first in terms of the number of people affected with 4.4%, followed by diabetes with 2.1%, joint diseases with 1.7%, asthma with 1.2%, heart diseases with 1.1% and other chronic diseases with 2.4%.

Figure 02: Percentage distribution of chronic diseases by type - MICS3 - Algeria 2006



Source: (National Institute of Statistics, 2006, p. 51)

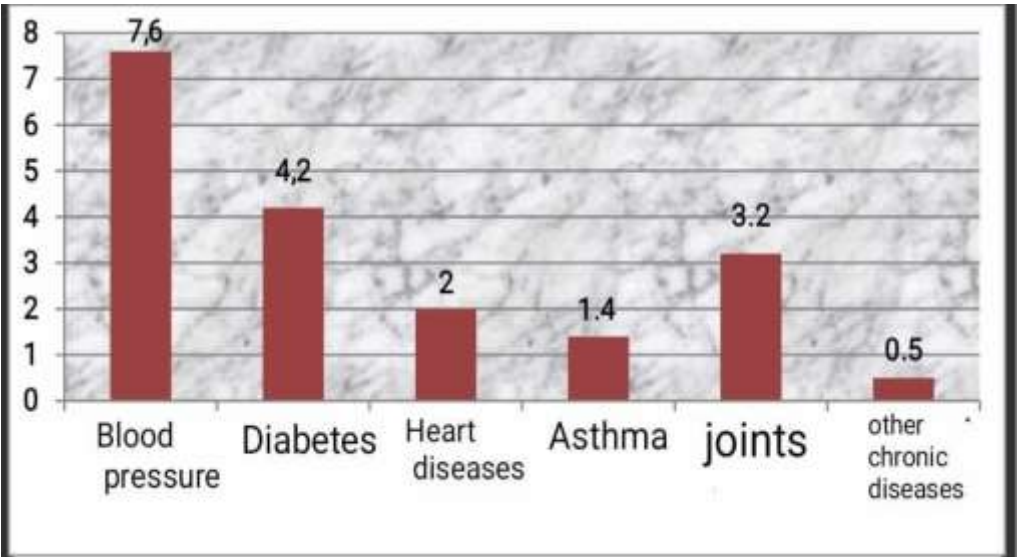
3. Chronic diseases in the National Survey on Time Use in Algeria 2012

The National Survey on Time Use (ENET) in Algeria 2012 is a household survey conducted by the National Statistical Office. It included a sample of 9,015 households distributed throughout the national territory. The study targeted adults aged 12 and over and data collection took place from 6 May to 10 July 2012. One of its objectives was to understand how Algerians allocate

and use their time, including the chronic disease aspect of the population's health status.

The results, presented in the table below, show that hypertension and arteriosclerosis rank first in terms of the number of people affected with a rate of 7.6%, followed by diabetes with 4.2%, joint diseases with 3.2%, heart diseases with 2.0%, asthma with 1.4% and other chronic diseases with 0.5%.

Figure 03: Percentage of adults aged 12 and over who reported having a chronic disease



Source: Personal compilation based on data from the National Time Use Survey in Algeria 2012.

3/ Demographic factors influencing the prevalence of chronic diseases, based on analysis of data from the sixth Multiple Indicator Cluster Survey (MICS6) conducted in Algeria in 2019.

The prevalence of chronic diseases is influenced by several factors, including gender, age, level of education, place of residence and wealth index. Here is a summary of these factors:

1. Gender:

The study of gender composition is important in population studies because an individual's gender determines his or her social and economic role in life. The

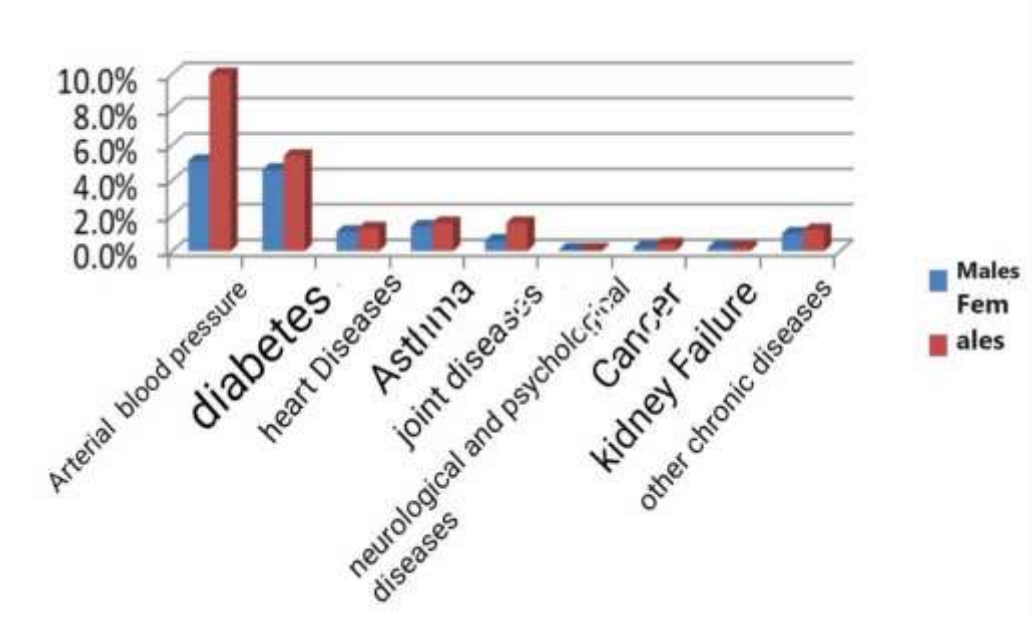
ratio of men to women can vary from one society to another, with some societies having an equal ratio, others having more men than women and vice versa. Gender composition is one of the most commonly used measures to understand population balance.

Table 01: Prevalence of chronic diseases by sex and type of disease.

	Blood Pressure	Diabetes	Heart Diseases	Asthma	Joint Diseases	Neurological And psychological	Cancer	Kidney Failure	Other diseases
Male	5.1	4.6	1.1	1.4	0.6	0.1	0.2	0.2	1.0
Female	10	5.4	1.3	1.6	1.6	0.1	0.4	0.2	2.2

Source: Author's compilation based on data from the Multiple Indicator Cluster Survey MICS6.

Figure 04: Prevalence of chronic diseases by sex and type.



Source: Personal compilation based on data from the Multiple Indicator Cluster Survey (MICS6).

The table and graph above show that women have higher prevalence rates of most chronic diseases than men, especially for conditions such as hypertension (10.0% for women and 5.1% for men) and joint diseases (1.6% for women and 0.6% for men). However, the rates are similar between the sexes for conditions such as kidney disease, neurological disorders and mental illness (0.2% and 0.1% respectively for both sexes). Gender as a demographic factor plays an important role in the prevalence of chronic diseases.

Several factors contribute to this difference. Physiological and hormonal differences between the sexes, as well as the roles and responsibilities associated with each sex, can influence the incidence of chronic diseases. Women, for example, may experience the consequences of pregnancy, childbirth and the psychological pressures associated with their household and sometimes outside it. Hormonal imbalances, especially during the menopause and with the use of contraceptives, can also affect their health. A tendency towards physical inactivity, weight gain and obesity can also contribute.

Men, on the other hand, may be more affected by factors such as tobacco and alcohol consumption and a lack of health awareness and compliance with preventive measures. Social isolation and occupational hazards, particularly related to family and community responsibilities, may also affect their health.

2- The age structure (age groups):

it varies from one society to another and affects population growth. A young population, where the youth ratio is higher, indicates the strength of the population's productivity and economic efficiency. The age structure helps to understand future population growth, with a youthful structure indicating a higher fertility potential, as the number of women entering reproductive age is greater than the number of women reaching menopause.

Table 02: Prevalence rate of chronic diseases by age group and type.

Age Group (in years)	Hypertension	Diabetes	Heart Diseases	Asthma	Joint Disorders	Cancer	Neurological and Psychological	Disorders Kidney Failure	Total
[15 -	0.0	0.6	0.1	1.1	0.3	0.0	0.6	0.1	2.8

[19]									
[20 - 29]	0.2	0.4	0.2	0.7	0.2	0.0	0.9	0.1	2.7
[30 - 39]	0.8	1.3	0.2	1.0	0.4	0.1	1.5	0.1	5.4
[40 - 49]	5.0	4.6	0.8	2.0 22.0	1.2	0.4	0.2	0.3	16.3
[50 - 59]	13.5	10.3	1.8	2.0	2.1	0.6	1.9	0.4	32.6
[60 - 69]	48.5	30.5	6.7	4.5	5.3	1.5	3.4	1.0	101.4
70+	120.3	46.7	18.1	11.1	8.2	5.2	5.5	1.6	216.7

Source: Personal compilation based on data from the Multiple Indicator Cluster Survey (MICS6).

The table above shows that the [15-19] age group has a very low prevalence rate, around 2.8% overall. The [20-29] age group also has a low prevalence rate of 2.7%. In the [30-39] age group, however, the prevalence rate rises to 5.4%. It rises further to 16.3% in the [40-49] age group. The pattern continues in the [50-59] and [60-69] age groups, where the totals reach 32.6% and 101.4% respectively. It peaks in the [70+] age group, where it reaches its highest value of 216.7%.

From the above, it can be seen that the prevalence of chronic diseases increases significantly with age. This increase in disease incidence is natural, as tissues, vital organs and other biological structures in the body weaken with age. In addition, social and economic responsibilities, occupational hazards and exposure to chronic disease risk factors tend to increase. In addition, physical

inactivity and an unhealthy diet leading to weight gain and obesity increase the likelihood of developing chronic diseases, especially after the age of forty.

3- Educational level: The educational level of individuals in households is considered one of the most important characteristics of a family's living conditions, as it is associated with many phenomena. We will try to determine the extent of the impact of the level of education on the prevalence of chronic diseases in Algeria. The level of education is classified as follows

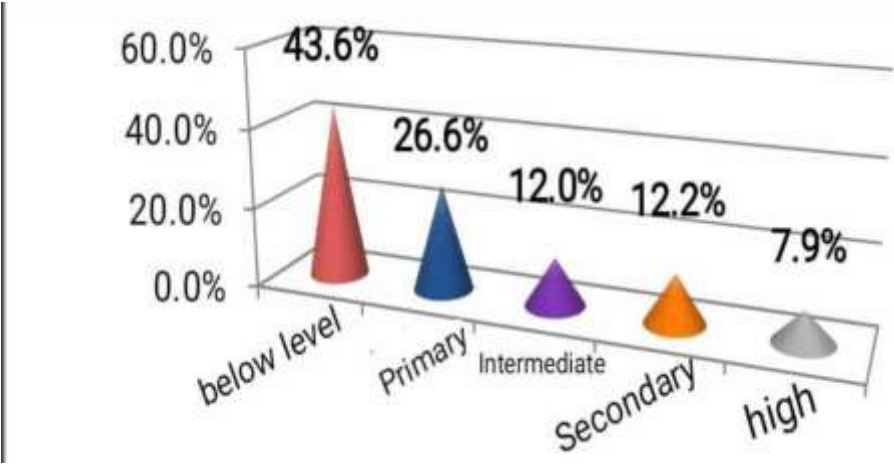
- No education: This means that the person has never attended school or any preparatory school.
- Primary education: from the first to the fifth year of primary education or up to the sixth year of primary education according to the previous education system.
- Intermediate: Includes from the first year to the fourth year of intermediate school or up to the third year of intermediate school in the previous education system.
- Secondary: Comprises from the first year to the third year of secondary education.
- Higher education: Includes university education.

Table 03: Prevalence rate of chronic diseases by educational level.

	Below level	Primary	Intermediate	Secondary	High
Percentage	43.6	26.6	12.0	12.2	7.9

Source: Personal compilation based on data from the Multiple Indicator Cluster Survey MICS6.

Figure 05: Prevalence Rate of Chronic Diseases by Educational Level.



Source: Author's compilation based on data from the Multiple Indicator Cluster Survey (MICS6).

The table and figure show that the prevalence of chronic diseases is higher among those with lower levels of education. Those with no education have a prevalence rate of 43.6%, while those with primary education have a prevalence rate of 26.6%. The prevalence rate decreases with higher levels of education, with rates of 12.0% for intermediate education, 12.2% for secondary education and 7.9% for tertiary education. This is probably due to increased knowledge and awareness of healthy behaviours and practices among those with a higher level of education, which helps them to avoid such chronic diseases.

It should be noted that people with no education and even those with primary education tend to be older, and age also contributes to the higher prevalence of chronic diseases in these groups compared to others.

4. Residence: This refers to the place of residence of people with chronic diseases, either urban or rural.

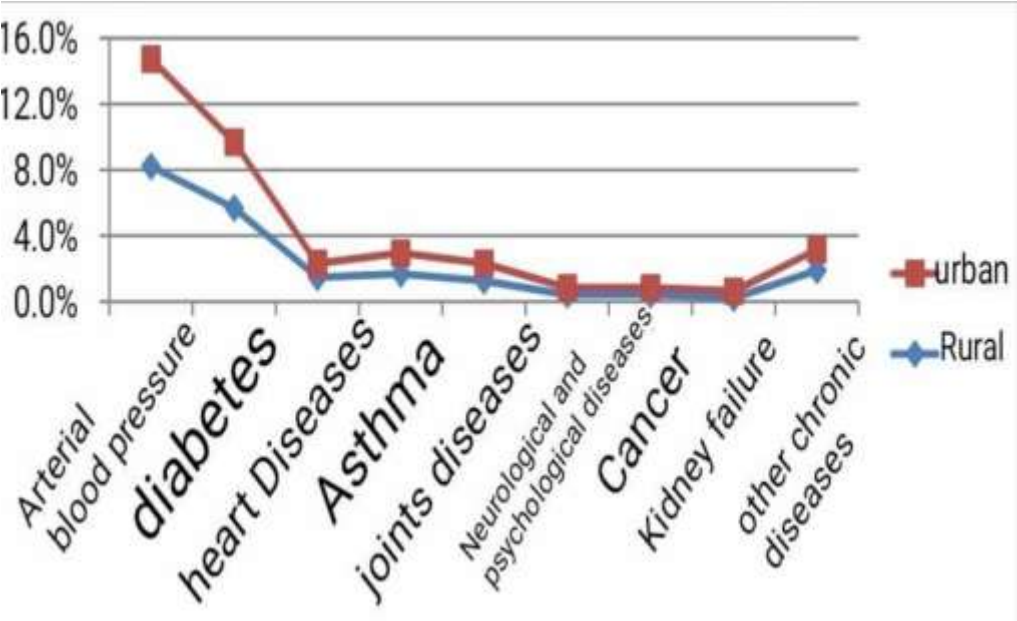
Table 04: Prevalence rate of chronic diseases by place of residence and type of disease

	Arterial blood pressure	Diabetes	Heart diseases	Asthma	Joint diseases	Neurological and psychological diseases	Cancer	Kidney failure	Other diseases
Urban	8.1	5.6	1.3	1.6	1.1	1.4	0.4	0.2	1.8

Rural	6.5	3.9	1.0	1.3	1.1	1.5	0.3	0.3	1.3
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Source: Personal compilation based on data from the Multiple Indicator Cluster Survey MICS6.

Figure 06: Prevalence Rate of Chronic Diseases by Residential Area and Type.



Source: Author's compilation based on data from the Multiple Indicator Cluster Survey (MICS6).

The table and figure show that the prevalence of chronic diseases is higher in urban areas than in rural areas. For example, the prevalence rate of hypertension is 8.1% in urban areas, which is higher than the prevalence rate of 6.5% in rural areas. Similarly, the prevalence rate of diabetes is 5.6% in urban areas compared with 3.9% in rural areas.

This disparity can be attributed to socio-economic differences, social and cultural differences, lifestyle patterns, population density and the resulting psychological and social pressures. Urban areas often face challenges such as housing, poverty and poorer general health, which contribute to a higher prevalence of chronic disease in urban populations.

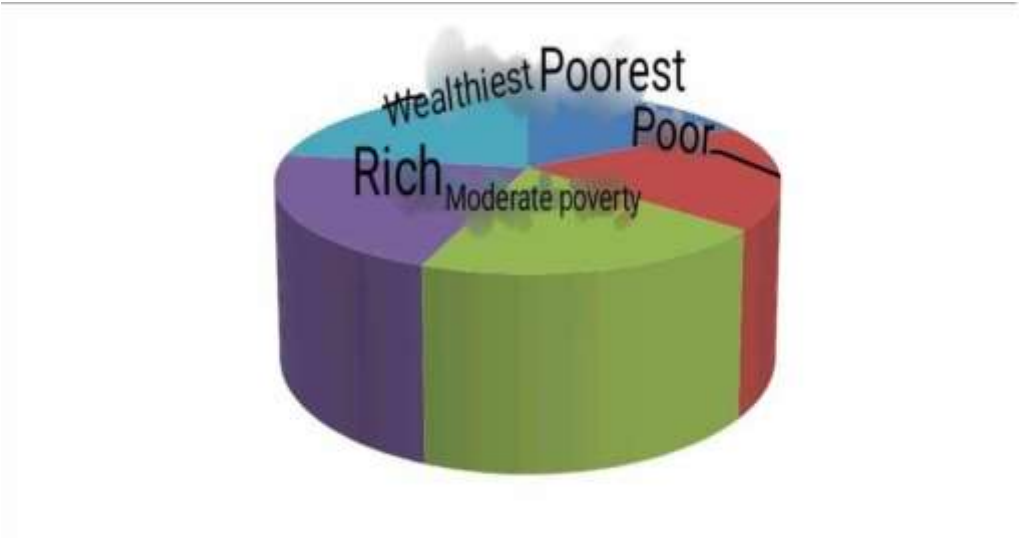
5. Wealth Index: This is an important indicator used to measure the level of well-being of households. It is divided into categories such as poorest, poor, rich and richest.

Table 05: Prevalence rate of chronic diseases by wealth index.

	Poorest	Poor	Moderate poverty	Rich	Wealthiest
Percentage	17.1	18.7	19.8	21.4	22.6

Source: Personal compilation based on data from the Multiple Indicator Cluster Survey MICS6.

Figure 07: Prevalence Rate of Chronic Diseases by Wealth Index.



Source: Author's compilation based on data from the Multiple Indicator Cluster Survey (MICS6).

The table and figure show that the prevalence rate of chronic diseases gradually increases from 17.1% for those in the poorest category to 18.7% for those in the richest category. We can therefore see that the prevalence of chronic diseases increases as the standard of living improves.

This can be attributed to the daily behaviours that distinguish individuals in wealthier categories from those in poorer categories. Wealthier individuals often have access to modern amenities, particularly transport, an abundance of unhealthy food, a sedentary lifestyle and a lack of physical activity. These factors contribute to the development of diseases such as high blood pressure, type 2 diabetes, cancer and cardiovascular disease.

Conclusion:

Based on the above and the data from the Multiple Indicator Cluster Survey (MICS6) in Algeria for the year 2019, we have reached a number of findings, including:

- The prevalence of chronic diseases is influenced by several indicators and demographic factors.
- There is a relationship between the variation in the prevalence rates of chronic diseases according to the gender of the respondents and the type of chronic disease. Women have a higher prevalence of chronic diseases such as hypertension (10% compared to 5.1%) and diabetes (5.4% compared to 4.6%).
- The prevalence of chronic diseases increases with age, especially in the age groups 50-59, 60-69 and 70 and over, compared to younger age groups.
- Hypertension, diabetes, cardiovascular diseases and joint diseases are the most common chronic diseases.
- The prevalence of chronic diseases decreases as the level of education increases. The rates are about 12.0% for those with primary education, 12.2% for those with secondary education and 7.9% for those with tertiary education. The prevalence is significantly higher among those with low educational attainment, at 43.6%.
- People living in rural areas are less prone to chronic diseases than those living in urban areas. The prevalence rates of hypertension (8.1% urban vs. 6.5% rural) and diabetes (5.6% urban vs. 3.9% rural) are higher in urban areas.
- The prevalence of chronic diseases also increases with economic status. It increases progressively from 17.1% in the poorest category to 18.7% in the richest category.

Based on the findings, we recommend a number of suggestions and interventions, including:

- Intensify awareness campaigns to promote a healthy lifestyle, including a balanced diet low in salt, sugar and saturated fat and rich in fruit, vegetables and legumes. Emphasising the importance of adequate sleep, regular physical activity and the avoidance of tobacco and alcohol, taking into account gender, age, location and cultural norms. Use modern technology, such as social media platforms, to promote health.
- Strengthen research and studies on prevention and treatment, with a particular focus on innovative approaches.
- Improve early detection, diagnosis and treatment of diseases that can be prevented through primary care, such as hypertension and diabetes.
- Strengthen health information systems to provide reliable, accurate, comprehensive and timely data on noncommunicable diseases. This will contribute to evidence-based planning and decision-making for prevention and control efforts.
- Ensure equitable health care for all members of society, with a focus on promoting mental health.
- Include in future health surveys the assessment of major risk factors for chronic diseases in order to predict and plan prevention and control measures.

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Appendix:

Table No. (01): Data and statistics from the sixth Multiple Indicator Cluster Survey (MICS6) on chronic diseases in Algeria.

Tableau SR.8.1N : Types de maladies chroniques

Pourcentage de la population âgée de 15 ans et plus atteinte de maladies chroniques selon le type et les caractéristiques sociodémographiques du malade, MCS Algérie, 2013

	Pourcentage de la population âgée de 15 ans et plus atteinte de										Pourcentage de la population âgée de 15 ans et plus atteinte d'au moins une maladie chronique ³	Population âgée de 15 ans et plus
	Hypertension artérielle ¹	Diabète ²	Maladies cardiovasculaires ¹	Maladies respiratoires ¹	Maladies articulaires ¹	Cancer (tout type) ¹	Troubles neurologiques ¹	Insuffisance rénale ¹	Maladies hépatiques (hépatite, Thalasémie, cirrhose) ¹	Autres		
Total	7,5	5,8	1,2	1,5	1,1	0,3	1,5	0,1	0,1	1,6	20,8	105 628
Sexe												
Masculin	5,1	4,6	1,1	1,4	0,6	0,2	1,6	0,2	0,1	1,0	16,0	53 605
Féminin	10,0	5,4	1,3	1,6	1,6	0,4	1,3	0,1	0,1	2,2	24,2	52 023
Âge												
15-19 ans	0,0	0,6	0,1	1,1	0,3	0,0	0,6	0,1	0,1	0,9	3,9	10 873
20-29 ans	0,2	0,4	0,2	0,7	0,2	0,0	0,9	0,1	0,1	0,9	3,9	23 467
30-39 ans	0,8	1,3	0,2	1,0	0,4	0,1	1,5	0,1	0,1	1,5	7,2	22 438
40-49 ans	5,0	4,6	0,8	2,0	1,2	0,4	2,0	0,3	0,2	2,2	18,6	17 522
50-59 ans	13,5	10,3	1,8	2,0	2,1	0,6	1,9	0,4	0,2	2,2	25,8	34 470
60-64 ans	21,9	14,7	2,9	2,4	2,7	0,9	1,9	0,4	0,1	2,2	30,0	5 419
65-69 ans	26,6	15,8	3,8	2,1	3,1	0,6	1,5	0,6	0,0	2,1	36,1	4 107
70-74 ans	32,3	16,4	4,3	2,5	2,7	1,4	1,1	0,4	0,1	1,8	42,9	2 733
75-79 ans	36,0	15,1	6,4	2,7	2,6	0,7	2,4	0,4	0,0	2,8	49,4	1 993
80 ans & +	38,9	12,9	7,4	2,4	2,9	0,5	2,0	0,8	0,0	1,7	49,5	2 539
NSP/Non réponse	12,1	2,1	0,0	3,5	0,0	0,0	0,0	0,0	0,0	2,5	21,3	67
Milieu de résidence												
Urbain	8,1	5,6	1,3	1,6	1,1	0,4	1,4	0,2	0,1	1,8	21,6	67 894
Rural	6,5	3,9	1,0	1,3	1,1	0,3	1,5	0,3	0,1	1,3	17,2	37 733
Espace de Programmation Territoriale												
Nord Centre	8,1	5,5	1,3	1,2	1,3	0,3	1,6	0,3	0,1	2,1	21,9	35 088
Nord Est	7,4	5,4	1,4	1,4	1,0	0,3	1,4	0,2	0,1	1,8	20,2	15 650
Nord Ouest	8,3	5,9	1,3	1,8	1,2	0,5	1,6	0,2	0,1	1,3	21,4	17 893
Haut Plateau Centre	7,0	3,7	0,9	1,3	0,8	0,2	1,0	0,2	0,1	1,6	16,8	7 492
Haut Plateau Est	6,2	4,6	1,4	2,1	1,2	0,3	1,4	0,2	0,1	1,6	19,3	14 571
Haut Plateau Ouest	7,0	3,7	0,9	1,3	1,0	0,3	1,1	0,2	0,1	1,0	16,5	5 264
Sud	6,5	4,7	0,5	1,1	0,6	0,1	1,0	0,2	0,1	1,0	15,8	9 670
Education												
Précollaire/Maternel	28,1	9,8	2,9	2,2	2,5	0,6	2,8	0,5	0,1	2,2	43,6	21 110
Primaire	9,8	7,2	1,7	1,7	1,5	0,4	2,3	0,4	0,2	1,8	26,9	16 882
Moyen	3,3	3,3	0,6	1,2	0,7	0,2	1,1	0,1	0,1	1,3	12,0	29 550
Secondaire	3,5	3,3	0,6	1,3	0,7	0,2	0,8	0,1	0,1	1,5	12,2	22 871
Supérieur	2,0	2,8	0,4	1,0	0,3	0,1	0,5	0,1	0,1	1,3	7,9	15 532
NSP/Non réponse	10,0	10,6	5,3	0,7	1,8	0,0	3,2	0,9	0,0	0,9	31,3	83