Evolution Of Health Indicators In Algeria: An Analytical Statistical Study From 1990 To 2023

Fawzia Seghairi[1]

Abstract:

This study explores the evolution of Algeria's healthcare system over the period from 1990 to 2023, by meticulously tracking the evolution of several critical health indicators. These indicators encompass life expectancy, an array of mortality rates, including general mortality, neonatal, under-five child mortality, and maternal mortality rates, as well as the prevalence of infectious and chronic diseases. It also examines the availability of basic healthcare facilities, the distribution of doctors across the public and private sectors, and the trends in healthcare spending. The analysis utilizes a rigorous statistical approach, drawing on extensive data from national surveys and comprehensive health and demographic reports specific to Algeria.

Keywords: *Health system, Health, Sustainable development, Diseases.*

Introduction:

Health indicators stand as critical benchmarks in developmental assessments, reflecting the overarching health status of a nation. The pursuit of enhanced health indicators necessitates the implementation of meticulously tailored programs and strategies, intricately aligned with the nuanced needs of the population. This includes demographic considerations and access to healthcare services.

A cornerstone of effective health management and service provision is the commitment to equitable and comprehensive distribution across various demographic strata, ensuring optimal health protection and care at minimal costs. This encompasses safeguarding against a myriad of diseases and potential epidemics.

Despite the substantial strides made since achieving independence, Algeria's healthcare system has engaged in a relentless pursuit of improvement through a series of reformative measures and strategic programs aimed at amplifying the quality and accessibility of health services. These concerted efforts have fostered notable enhancements in certain health indicators, such as the diminution of mortality rates and the mitigation of specific infectious diseases.

Nonetheless, the pace of improvement has been moderated by an amalgamation of economic, social, and security challenges prevalent throughout the examined period. This article aims to dissect and assess the current health paradigm in Algeria against the benchmarks established by the World Health Organization in 2000, taking into account various facets such as life expectancy, mortality rates, disease prevalence, essential health facilities, and the workforce comprising doctors and pharmacists.

This evaluative process is informed by a comprehensive review of developments in these indicators, underpinned by a diverse statistical database.

Problem Statement:

- What are the significant developments in health indicators, and what constitutes the current reality of the healthcare system in Algeria in recent years?

Objectives:

    – To meticulously analyze the health situation through the study of life expectancy and mortality indicators.

    – To conduct a thorough examination of the health landscape through the exploration of the evolution of infectious and chronic diseases.

    – To critically evaluate the healthcare system by scrutinizing the development of physical structures and human resources.

Methodology and Approach:
This investigation employs the descriptive-analytical method, leveraging detailed analysis to elucidate the trends and changes in the selected health indicators, while simultaneously interpreting the myriad factors that influence these trends.

The foundation of this approach rests on a rich statistical database, meticulously compiled from a variety of sources including extensive national surveys, comprehensive health reports, and robust demographic studies specific to Algeria. This methodology facilitates a nuanced understanding of the dynamics shaping the healthcare landscape over the designated period.

Study Axes:
 The study meticulously explores the healthcare environment through three primary axes, each focusing on different facets of health indicators:

1. **First Axis: General Health Indicators "Life Expectancy at Birth, Mortality Rates"**

This axis delves into several critical indicators, such as life expectancy, general mortality rates, as well as infant, neonatal, and maternal mortality rates.

1-1 **Life Expectancy:**

Life expectancy, also recognized under various designations such as average expected lifespan or prospective age, is defined by the World Bank as the average number of years a newborn is expected to live, assuming that the mortality rates at their birth persist unchanged throughout their life (World Bank Group, 2024). It is calculated using life tables, which stand as one of the most utilized demographic tools for analyzing mortality rates and projecting population trends.

Life expectancy serves as a barometer for the health and developmental status of a nation's health system. An ascending trend in life expectancy not only underscores the efficacy of a nation's health system but also highlights the level of human development, positioning it as a pivotal indicator within the Sustainable Development Index. As such, it emerges as a fundamental demographic tool for assessing the progression of a nation's health status as well as its economic and social echelons.
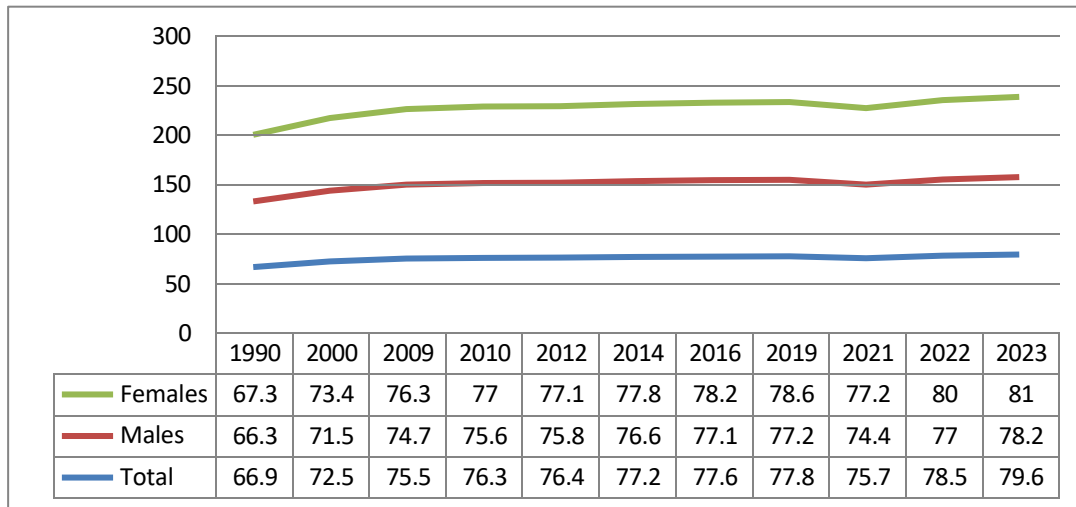
	1990	2000	2009	2010	2012	2014	2016	2019	2021	2022	2023
Females	67.3	73.4	76.3	77	77.1	77.8	78.2	78.6	77.2	80	81
Males	66.3	71.5	74.7	75.6	75.8	76.6	77.1	77.2	74.4	77	78.2
Total	66.9	72.5	75.5	76.3	76.4	77.2	77.6	77.8	75.7	78.5	79.6

Figure 1: Evolution of Life Expectancy in Algeria 1990-2023

An examination of Figure 1 reveals a consistent upward trajectory in life expectancy for both genders, ascending from 66.9 years in 1990 to 77.6 years in 2016. This trend continues, with life expectancy reaching 79.6 years in 2023, noting a gender disparity of three years (81 years for females and 78.2 years for males in 2023). It is generally observed that males have a shorter lifespan compared to females. Moreover, the survival probability at age 75 has seen an increase from 10.8 years in 2007 to 13 years in 2023.

The notable rise in life expectancy and the increasing demographic of elderly individuals are crucial indicators of the health situation's evolution, reflecting directly on the populace's overall health. The health status of an individual profoundly impacts their mental and physical capacities, accentuating the importance of enhancing health services tailored to the elderly.

Furthermore, life expectancy is influenced by an intricate interplay of factors including urbanization levels, educational attainment, individual income and poverty levels, sanitation standards, air quality, the caliber of health services provided, as well as the adequacy of physical and human health resources. Personal behaviors such as smoking, alcohol consumption, and dietary habits also play a significant role in shaping this demographic indicator.

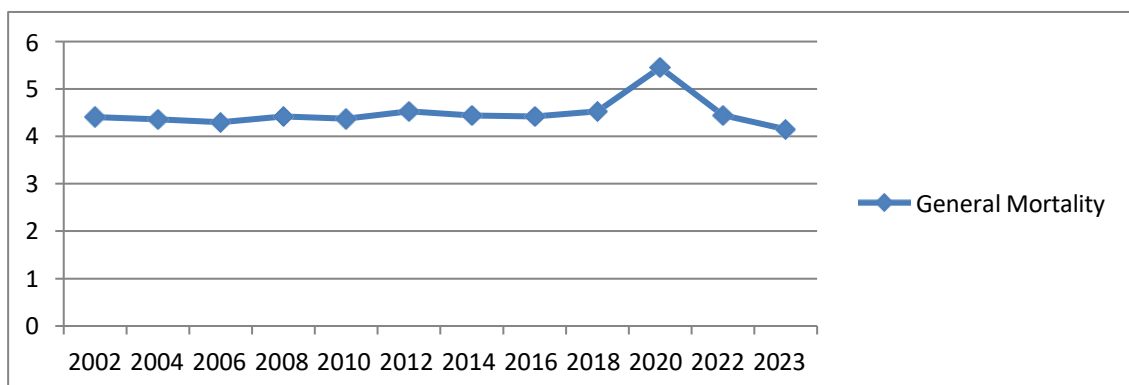**1-2 General Mortality in Algeria:**

Figure 2: Evolution of General Mortality 1990-2023

An analysis of Figure 2 illustrates that mortality rates in Algeria remained relatively stable from 2002 to 2018. However, there was a notable increase to 5.45‰ in 2020, representing the peak mortality rate over the last five years, primarily attributed to the COVID-19 pandemic.

This global health crisis led to heightened mortality rates worldwide, with the elderly and individuals with pre-existing chronic conditions being particularly vulnerable. Subsequent measures to control the pandemic saw a gradual reduction in these rates, culminating in a decrease to 4.15‰ by 2023.

1-3 **Infant Mortality**

According to the World Bank, infant mortality encompasses the deaths of infants before reaching one year of age within a specific period. The infant mortality rate, quantified as the number of infants dying before their first birthday per 1,000 live births within the same timeframe, serves as a critical indicator of a country's health system evolution and its level of healthcare, social, and economic development (World Bank Group, 2024).

Additionally, this rate reflects the capabilities and infrastructure available to the population. Infant mortality is categorized into two segments:

- The **neonatal mortality rate**, accounting for infant deaths under four weeks of age or less than one month per year per 1,000 live births. This category is further segmented into early and late neonatal deaths.

- The **post-neonatal mortality rate**, which includes the number of infant deaths from 29 days up to the end of the first year of life per 1,000 live births in the same year.
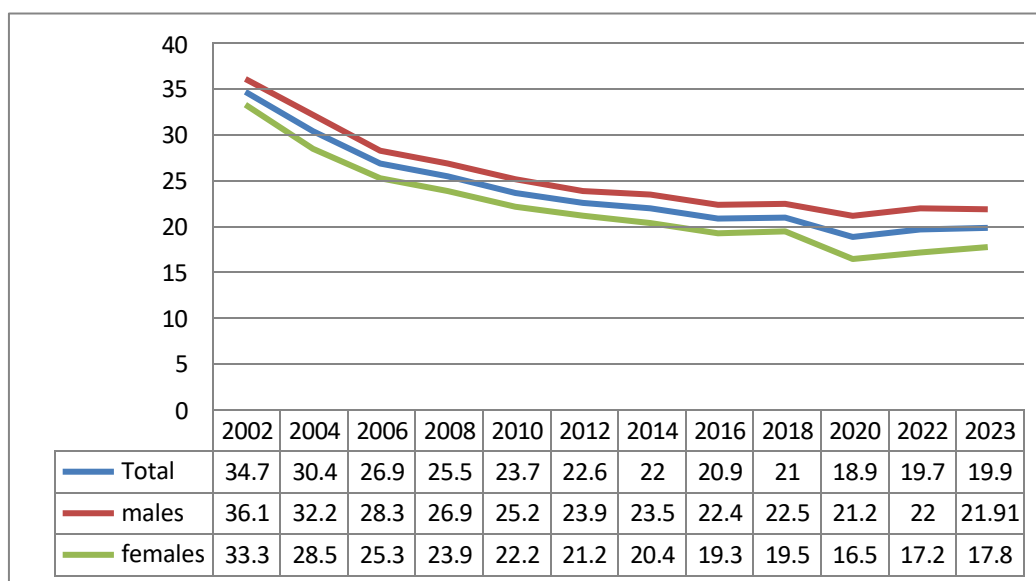
	2002	2004	2006	2008	2010	2012	2014	2016	2018	2020	2022	2023
Total	34.7	30.4	26.9	25.5	23.7	22.6	22	20.9	21	18.9	19.7	19.9
males	36.1	32.2	28.3	26.9	25.2	23.9	23.5	22.4	22.5	21.2	22	21.91
females	33.3	28.5	25.3	23.9	22.2	21.2	20.4	19.3	19.5	16.5	17.2	17.8

Figure 3: Evolution of Infant Mortality Rates 2002-2023

The trajectory of infant mortality rates has undergone significant fluctuations. Between 1966 and 1980, these rates were exceedingly high, peaking at 162‰ in 1971. This spike can be attributed to a confluence of factors, notably the substandard health and living conditions in the immediate post-colonial period, the prevalence of diseases and epidemics, and a lack of adequate health and hospital facilities.

The implementation of health development initiatives, including extensive vaccination campaigns in both rural and urban settings, facilitated a substantial decline in these rates. By 1998, the rate had reduced to 37.4‰, further decreasing to 19.9‰ by 2023. Despite this notable reduction, when compared to developed nations like Italy, which reported an infant mortality rate of 2.2‰, and Japan at 1.7‰ in the same year, the rate in Algeria remains relatively high, underscoring the ongoing challenges and disparities in global health outcomes (World Bank Group, 2024).

1-4 **Child Mortality Under Five Years:**

This critical health indicator quantifies the number of children who perish before reaching five years of age, specifically focusing on the age bracket of 0-4 years, within a specified time frame. To compute this rate, the number of deaths of children under five during a given

period is divided by the number of live births in the same year, with the result then multiplied by 1000.

Esteemed organizations such as the World Health Organization and the International Children's Organization recognize the under-five mortality rate as a quintessential metric for assessing social progress and the general well-being of a society. This rate reflects a myriad of socio-economic factors including income levels, nutritional standards, healthcare access, and the availability of basic education services (Al-Shakhteriya & Abdel-Malik, 2003).
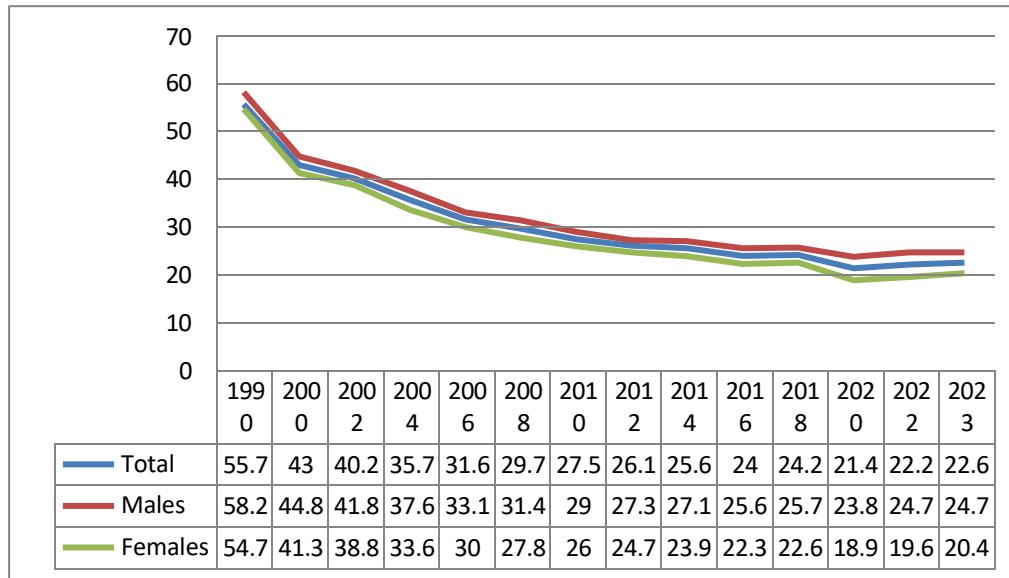
	1990	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018	2020	2022	2023
Total	55.7	43	40.2	35.7	31.6	29.7	27.5	26.1	25.6	24	24.2	21.4	22.2	22.6
Males	58.2	44.8	41.8	37.6	33.1	31.4	29	27.3	27.1	25.6	25.7	23.8	24.7	24.7
Females	54.7	41.3	38.8	33.6	30	27.8	26	24.7	23.9	22.3	22.6	18.9	19.6	20.4

Figure 4: Evolution of Under-Five Mortality Rate 1990-2023

Algeria has initiated numerous health programs aimed at curtailing the under-five mortality rate. These include comprehensive vaccination campaigns, initiatives to counteract diarrhea in children, and measures to combat communicable diseases among this demographic. Such programs have been systematically implemented across the nation, leading to a notable reduction in the mortality rates of children under five.

As depicted in Figure 4, this mortality rate has significantly decreased from 53.7‰ in 2004 to 22.6‰ in 2023. Notably, the rate for males stood at 24.7‰ while for females it was lower at 20.4‰ in 2023 (ONS, 2024). This demonstrates the effectiveness of ongoing state efforts to diminish child mortality rates, which, despite these advancements, still remain relatively high when compared to developed nations such as Japan (2.3‰) and Spain (3‰) in 2023 (World Bank Group, 2024).

1-5 Maternal Mortality:
Maternal mortality encompasses the deaths of women during pregnancy or within 42 days of termination of pregnancy, irrespective of the location or duration of the pregnancy, from any causes related to or exacerbated by the pregnancy or its management, excluding accidental or incidental causes (Ben Ammar, 2018). This metric is calculated by dividing the total number of maternal deaths (recorded or estimated) in a period by the total number of live births (recorded or estimated) during the same period, then multiplying by 100,000 (Maach, 2020).

Maternal deaths primarily result from direct obstetric complications which may occur during pregnancy, labor, or the postpartum period. These include conditions such as high blood pressure, pre- and postpartum hemorrhage, obstructed labor, miscarriage, and puerperal sepsis. Additionally, there are indirect causes that are exacerbated by the physiological effects of pregnancy, such as viral hepatitis, anemia, heart diseases, and diabetes.
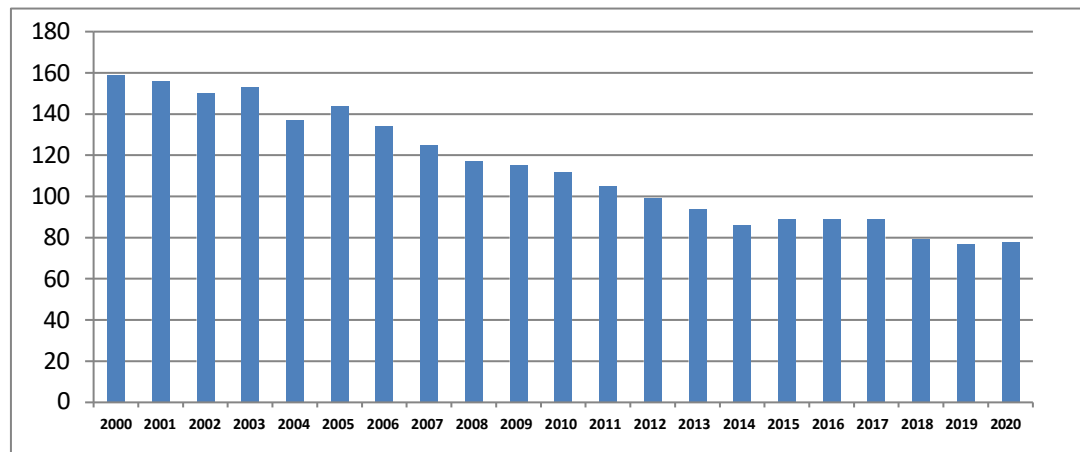
Figure 5: Evolution of Maternal Mortality Rate in Algeria 2000-2020

Improving maternal health is a pivotal target within the Sustainable Development Goals set for 2030, specifically under Goal 3: Ensure healthy lives and promote well-being for all at all ages. This goal encompasses 13 targets and 27 indicators, including the objective to diminish maternal mortality rates. As illustrated in Figure 5, there has been a consistent and gradual decline in maternal mortality rates, which decreased from 159‰ in 2000 to 78‰ in 2020, reflecting a reduction of over half in just two decades.

Several critical factors influence maternal mortality, particularly the age at which women give birth. A pronounced correlation exists between reproductive age and associated pregnancy risks, especially for women under 18 and over 34 years of age. These age-related risks often stem from early marriage practices prevalent in rural Algerian communities and late pregnancies, which can lead to severe health complications and, in some cases, mortality. Additionally, the interval between pregnancies is a notable determinant of maternal health.

Significant strides in reducing maternal mortality rates have been made through the implementation of robust health policies that established comprehensive healthcare programs for mothers. These include:

- The national program to combat maternal morbidity and mortality and perinatal deaths, initiated in 1997 and 2002.

- The national program on childbirth from 2005 to 2008.

- In 2013, the Ministry of Health and Population mandated the declaration and audit of maternal deaths.

- From 2015 to 2019, the national program to accelerate the reduction of maternal mortality was launched.

These initiatives have markedly improved prenatal healthcare coverage, which escalated from 58% in 1992 (ESAME, 1992) to 81% in 2002 (EASF, 2002), and further to 90.30% in 2006 (MICS3, 2006). Additionally, the death rate due to infectious diseases, maternal conditions, pre-birth periods, and nutrition decreased from 19.38% in 2000 to 12.98% in 2019 (World Bank Group, 2024).
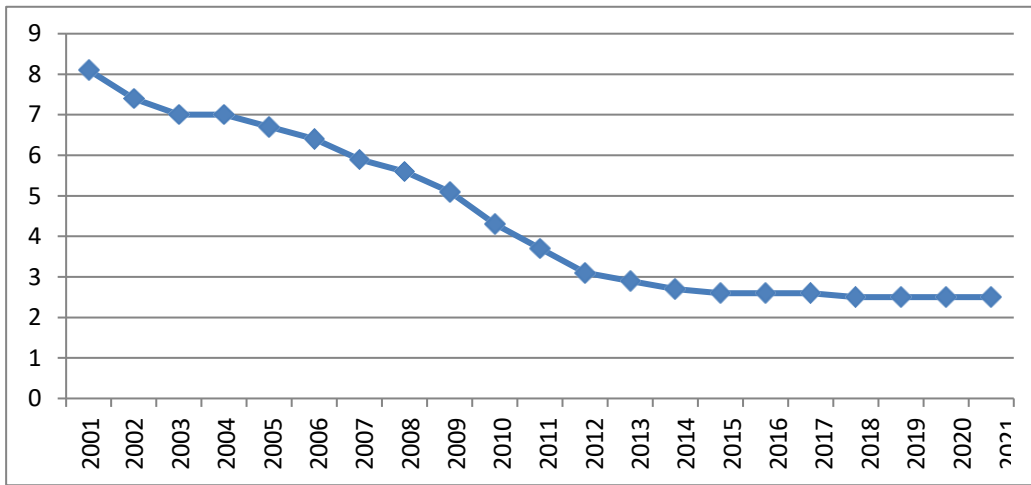
Figure 6: Trends in the Development of Malnutrition Prevalence 2001-2021

This figure reveals a gradual decline in the rates of malnutrition prevalence in Algeria. Post-colonial economic and social challenges initially sustained high rates of malnutrition, which stood at 8.1% in the early 2000s. However, subsequent improvements in living conditions, economic stability, and the educational and cultural levels of the population facilitated a reduction in prevalence to 2.5% by 2021—a significant 5% decrease over two decades.

The percentage of pregnant women receiving care at least once during pregnancy from qualified health workers rose remarkably from 58% in 1992 to 95.3% in 2019 (World Bank Group, 2024). Concurrently, the percentage of childbirths supervised by specialized doctors—indicative of births attended by professionals trained to provide necessary supervision and care during pregnancy, labor, and the postpartum period—increased from 15% in the 1980s to 76% in the early 1990s, reaching an impressive 98.8% in 2019.
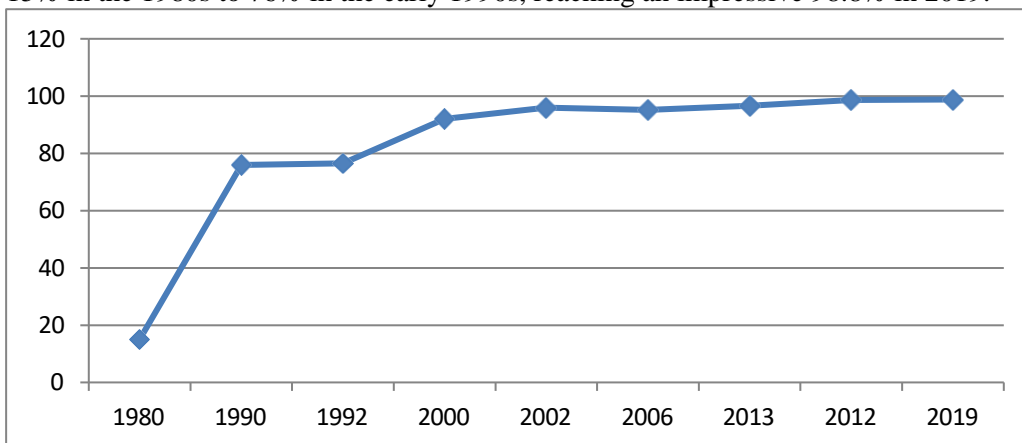

Figure 7: Childbirths Supervised by Skilled Health Physicians in Algeria

2. Second Axis: General Health Indicators "Infectious and Chronic Diseases"

2-1 **Chronic Diseases:**

Chronic diseases, or non-communicable diseases (NCDs), are generally long-lasting and non-transmissible ailments that frequently result from internal bodily dysfunctions or are the cumulative impact of years of psychological and social stresses (Yekhlef, 2023). These diseases are a major health burden, particularly in low and middle-income countries, where they account for more than three-quarters of global NCD-related deaths (Global Health, 2023).
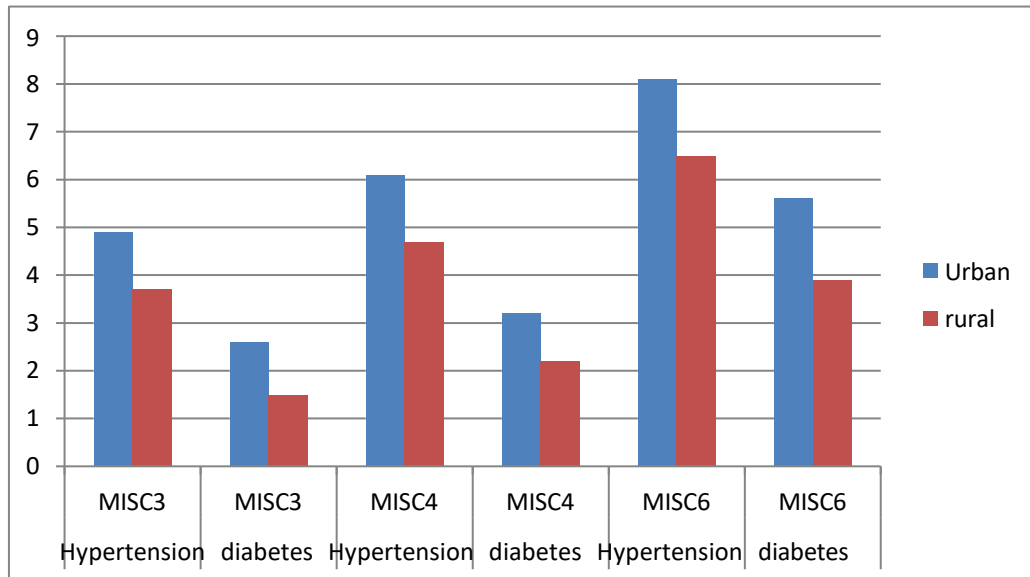
Figure 8: Development of Chronic Diseases in Algeria Through National Surveys

Hypertension stands as a predominant chronic disease in Algeria, often labeled as the "silent and hidden killer" due to its insidious nature and the significant health risks it poses, including its association with other serious conditions such as diabetes (Global Brief on Hypertension, 2013).

The National Institute of Public Health's Medical Causes of Death Department reports that chronic diseases are responsible for 57% of all registered deaths in the country. Notably, 66% of these deaths occur prematurely among individuals aged 30-69 years. The breakdown of these chronic disease-related deaths is as follows: 22% are due to heart diseases, 13% to cancerous tumors, nearly 6% to respiratory diseases, and 4.5% to endocrine diseases (Algerian Health, 2021).

The analysis from Figure 8 also highlights the significant impact of residency on the prevalence of chronic diseases. Urban areas, with their inherently higher levels of noise and stress, exhibit increased rates of hypertension and diabetes compared to rural settings. pecifically, the prevalence rate of hypertension in urban areas is 8.1%, compared to 6.5% in rural areas. Similarly, the rate of diabetes is 5.6% in urban areas versus 3.9% in rural settings. Additionally, there is a gender disparity in the incidence of chronic diseases, with females exhibiting a higher rate of at least one chronic disease at 24.2% compared to 16% in males.
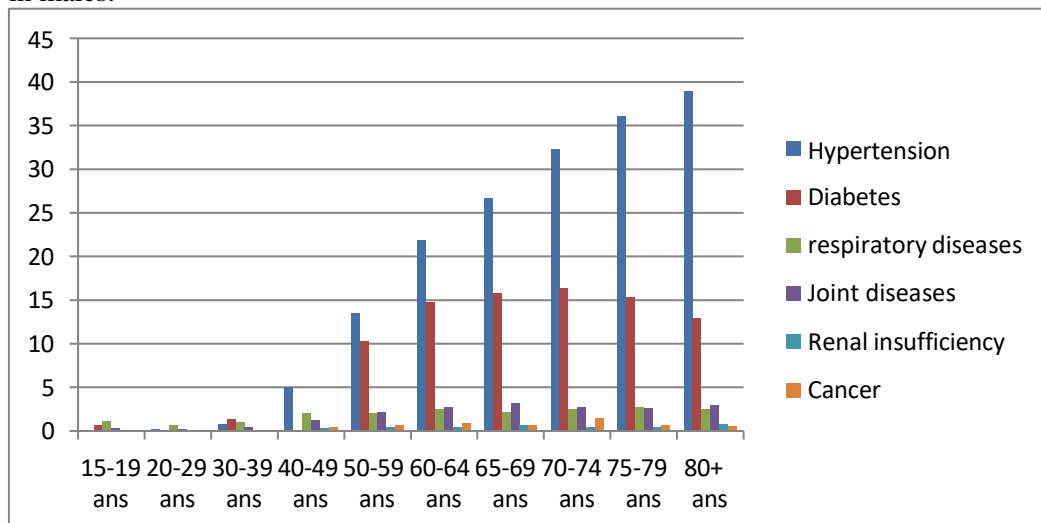

Figure 9: Development of Chronic Diseases by Age Group

Figure 9 demonstrates a clear age-related increase in the likelihood of developing chronic

conditions such as hypertension and diabetes. The prevalence of hypertension escalates significantly with age, peaking at 36% in the age group of 75-79, in stark contrast to just 5% in those aged 40-49. Similarly, the prevalence of diabetes is markedly higher in older age groups, recorded at 16.4% among those aged 70-74, compared to a mere 1.3% in the 30-39 age bracket. Joint diseases also follow this trend, with incidence rates increasing with age, reaching 2.6% in individuals aged 75-79.

2-2 **Infectious Diseases:**
Infectious diseases, capable of transmission from one individual to another, propagate through various agents including microbes and parasites. These transmissions can occur directly, such as with diseases like tuberculosis and cholera, or indirectly through intermediaries. These intermediaries may be living entities such as insects, or non-living mediums like air, water, or food (Al-Sayeh, 2009, p. 86).

The prevalence of infectious diseases in Algeria has been aggravated by a lack of health awareness and challenging living conditions, necessitating urgent and comprehensive interventions. Health development programs aimed at curtailing the spread of these diseases have been pivotal, including mandatory vaccination campaigns against critical ailments such as tuberculosis in 1993, whooping cough, tetanus, smallpox, and a compulsory measles vaccination program initiated in 1985.

Child immunization quantifies the percentage of children aged 12-23 months who have received vaccinations prior to the age of 12 months or anytime before the survey's execution. A child is considered adequately immunized against measles after receiving at least one dose of the measles vaccine. According to data depicted in Figure 10, the vaccination rate in 1985 peaked at 68%, contributing to a decline in measles cases between 1998 and 2008.

Nonetheless, there was a subsequent resurgence of measles cases, with the incidence rate escalating to 3,544 cases in 2013 in some regions. This resurgence can be attributed to delays by parents in administering the vaccine, despite its availability free of charge in both rural and urban settings. The implementation of robust vaccination programs has played a pivotal role in eradicating and controlling several severe epidemic diseases in Algeria, effectively reducing the incidence of various infectious diseases across different regions.
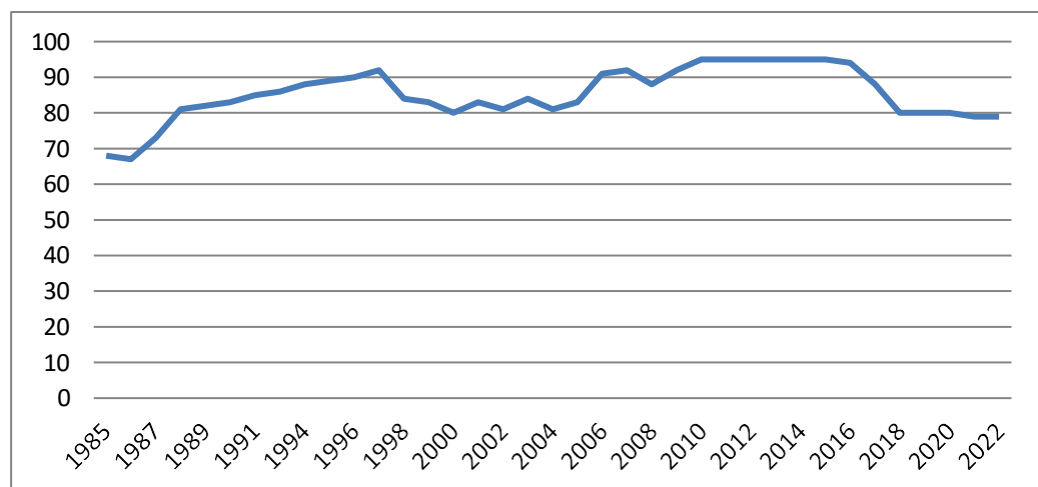

Figure 10: Measles Vaccination 1985-2022

Third Axis: Healthcare Indicators "Physical and Human Resources"
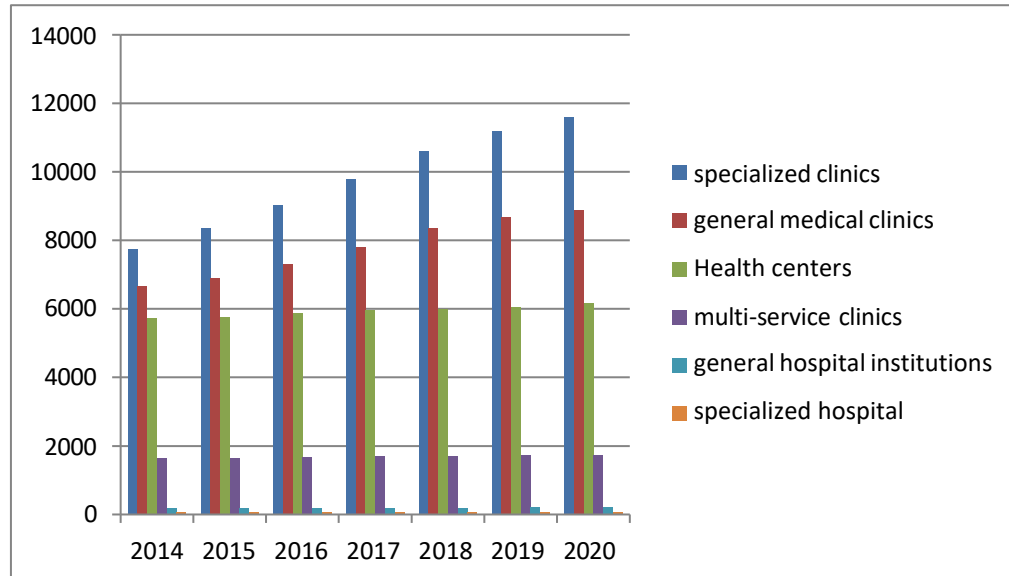
3-1 **Basic Health Facilities:**

Figure 11: Basic Health Facilities

The development of basic health facilities in Algeria, encompassing clinics and both general and specialized hospitals, has been gradual. As illustrated in Figure 11, the number of general hospital institutions by 2020 was estimated at 210, marking an increase of 10 institutions nationally between 2015 and 2020. The count of specialized hospital institutions remained stable, totaling 79 institutions between 2018 and 2020.
 In contrast, the number of general medical clinics saw a notable rise; by 2020, the total stood at 8864, reflecting an increase of 537 clinics from 2018 to 2020. The specialized clinics also showed growth, with the count reaching 11591 in 2020, an augmentation of 381 clinics within just one year, between 2019 and 2020. Furthermore, the number of multi-service clinics increased to 1748 in 2020, up by 89 clinics from 2015-2020.

3-2 **Health Expenditure:**

Health expenditure as a proportion of the gross domestic product (GDP) in Algeria was comparatively low during the 1990s, mirroring the severe living and security challenges of the time. By 2021, this rate had escalated to 5.5% of GDP. The domestic general government expenditure on health as a share of current health expenditure accounted for 59.1%, indicating a significant investment in health relative to other areas of public expenditure. This increase underscores the government's commitment to improving health outcomes and reflects broader economic improvements over the period.

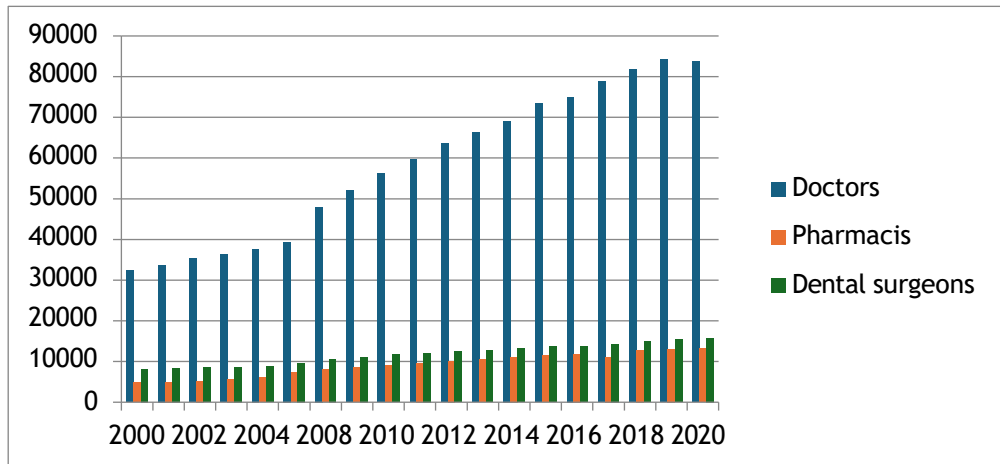**3-3 Development of the Number of Doctors and Pharmacists:**

Figure 12: The Number of Doctors and Pharmacists

As depicted in Figure 12, there has been a substantial and consistent increase in the number of healthcare professionals, including doctors, pharmacists, and dental surgeons. The total number of doctors escalated to 84161 by 2019, up from 47995 in 2008, representing an approximate 50% increase over an 11-year period. Despite this growth, there was a slight decline in the number of doctors by 448 between 2019 and 2020, largely attributed to the global health crisis triggered by the COVID-19 pandemic, which unfortunately resulted in the deaths of many healthcare workers.

On the other hand, the number of pharmacists rose by 8459 from 2000 to 2020. Dental surgeons also saw a significant increase in their numbers, rising from 8197 in 2000 to 15745 in 2020, marking an increase of 7548 over two decades. While these figures represent tangible progress in the development of human resources within the healthcare sector, the scale of increase remains modest when considering the duration, population density, and the budget allocated to the health sector.

Conclusion:

Despite concerted efforts by the Algerian government to develop and successfully implement reforms within the health sector, and notable achievements such as increased life expectancy, reduced infant and under-five mortality rates, decreased maternal mortality, and controlled spread of certain infectious diseases, the pace of development in the health sector is still slow compared to other nations. The challenges facing Algeria's health sector are not merely financial.

The reality indicates that the health expenditures allocated do not correspond effectively with the services rendered. The recent COVID-19 crisis has underscored vulnerabilities within the sector, highlighting the urgent need for a greater focus on human resource development to combat mismanagement and nepotism within public health structures. Emphasizing health services as a fundamental right accessible to all individuals across the nation, it is evident that reforming the health sector in Algeria necessitates a wise and long-term policy strategy aimed at achieving a high standard of healthcare.

References:

1. Al-Shakhteriya, A. A., & Abdel-Malik, L. J. (2003). Under-Five Child Mortality in Benghazi City for the Year 2001. In Proceedings of the Arab Conference on Primary Health Care in the Arab World (p. 2).
2. Ben Ammar, N. (2018). Causes of Maternal Deaths - A Field Study at the Specialized Hospital Institution Mother and Child Maryam Bouatoura, Batna. Journal of Social Sciences, University of Laghouat, 181.
3. El-Sayeh, M. (2009). Environmental and Health Awareness for Students of Higher Education and Universities. (1st ed.). Cairo: World of Books.
4. Maach, F. (2020). Maternal Mortality in Light of the Millennium Development Goals and the

Sustainable Development Agenda for 2030. Horizons in Sociology, 17.

5. Ministry of Health, Population and Hospital Reform, & National Office of Statistics. (2015). Multiple Indicator Cluster Survey "MICS4, 2012-2013", Algeria 2015.

6. Ministry of Health, Population and Hospital Reform, & National Office of Statistics. (2008). Multiple Indicator Cluster Survey "MICS3, 2006", Algeria 2008.

7. Ministry of Health, Population and Hospital Reform. (2002). Algerian Family Health Survey 2002.

8. Ministry of Health, Population and Hospital Reform. (2020). Multiple Indicator Cluster Survey [MICS] 2019, Final Results Report December, 2020.

9. National Office of Statistics. (2020). Algerian Demography 2020, No. 949, p. 6.

10. National Office of Statistics. (2020). Statistical Summary 1962-2020, Health, Algeria.

11. National Office of Statistics. (2023). Algerian Demography 2020-2023, No. 1030, p. 7.

12. Numbeo. (2024). Healthcare in Algiers. Retrieved from https://fr.numbeo.com/soins-de-sant%C3%A9/ville/Alger

13. Sari, F. M., & Ben Amer, O. (2021). Performance of the Health System in Algeria "An Analytical Study of Indicators". Journal of Algerian and Comparative Public Law, 399.

14. World Bank Group. (2024). Retrieved from https://data.albankaldawli.org/indicator

15. World Health Organization. (2013). Global Brief on Hypertension "The Silent Killer and One of the Global Public Health Crises." World Health Day.

16. World Health Organization. (2023, September 16). Non-communicable Diseases. Retrieved from https://www.who.int/ar/news-room/fact-sheets/detail/noncommunicable-diseases

17. Yekhlef, R. (2023, June 1). The Elderly Between Chronic Diseases and Social Ailments. Nasiriya Journal for Social and Historical Studies, 652.