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Demographic Statistics as a Tool for Future Foresight: An Analytical Study of Population Projections in Algeria - Horizons 2050 Using the Demographic Spectrum Program

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Abstract:

The use of statistical methods has become a fundamental pillar relied upon to solve numerous problems and issues across various fields, particularly in social and human sciences. These methods contribute to supporting decision-making regarding the studied phenomena and enable researchers to scientifically predict the outcomes of their studies. It is worth noting that there are numerous statistical methods and programs, such as the mathematical approach and the synthetic method, which are effective tools in population projection processes. We conducted a practical forecasting study to assess the future needs of the population up to the year 2050, analyzing demographic projection data due to its significant importance in social planning. This was achieved using the demographic spectrum program, "Spectrum," which supports analytical and future planning policies in areas such as health, employment, and education, contributing to meeting future needs and studying public policies in a systematic manner based on rigorous scientific foundations.

Keywords: data analysis, the age structure of the population, spectrum program, demographic projections.

1. Introduction:

The experimental study of phenomena in the social sciences and humanities requires resorting to numerical data that represent the statistical path to explain their causes and show the relationships that bind their variables, in order to reach the rooting of scientific research in the field of social sciences and humanities. Therefore, the scientific importance taken by data lies in the connotations they carry reflecting the reality of the phenomenon within its limits, and its analysis has an important impact on directing public opinion and decision-makers towards enacting laws and making decisions reflected in research based on them.

In light of rapid changes and global openness, the vast amount of data that is produced, stored, and made available from multiple locations has become a major asset for any society, which, if properly managed, can make an impactful contribution to social and economic development. Therefore, there is a growing recognition that the success of sustainable development depends on the ability of governments, companies, and civil society organizations to harness data in decision-making by building innovative data systems, especially in the social sciences and humanities.

a. The problem of research:

Population projections are one of the most important scientific tools for future planning, as they help decision-makers in drawing up future development policies. In light of the rapid demographic

changes taking place in Algeria, which are reflected in the changing population growth rates and the age composition of the population, it is important to study and analyze future population projections using modern tools and programs. Hence, the following main problem can be raised:

To what extent can the census, based on the demographic spectrum program, contribute to foreseeing Algeria's population future by 2050?

This main problem arises from the following sub-questions:

What are the most important current demographic indicators in Algeria on which we rely in population forecasts?

- How will Algeria's demographics evolve until 2050 according to future projections?

What are the future challenges and opportunities that these population projections indicate?

- How can the results of population projections be used in Algeria's strategic and development planning?

b. The importance of research:

The importance of the current research stems from the importance of the topic itself, as it illustrates the demographic features of the population and is a real indicator to know their future needs, which made this topic of great importance by thinkers, scholars, researchers and decision-makers alike in order to plan rationally and provide the opportunity to create infrastructure and launch studied economic projects.

c. Objective of the study:

1. Main objectives:

• Analyse the current demographic reality of Algeria and identify its main trends

• Preparation of accurate population projections for Algeria until 2050 using the Demographic Spectrum Program

• Provide a forward-looking vision of the expected population shifts and their potential impacts

2. **Sub-objectives:**

• Identify the factors affecting population growth in Algeria

• Study the expected changes in the age composition of the population

• Analysis of the impact of demographic shifts on various development sectors

• Provide practical recommendations to deal with future population challenges

• Evaluation of the effectiveness of the demographic spectrum programme in conducting population projections

d. Study Methodology:

In order to give the study the character of objectivity, and in accordance with its nature, and in order to reach it to answer its problem and questions, the descriptive, analytical and comparative analytical approach was relied on in describing and interpreting the phenomenon in question and its dimensions. Documentary and statistical sources as well as graphics have been used as a tool to gather information to analyze and address the topic.

2- Conceptual Introduction:

2.1 Data analysis:

Although many groups, organizations, and experts have different ways of dealing with data analysis, most of them can be distilled into a one-size-fits-all definition. Data analysis is the process of scanning, altering, and processing raw data and extracting actionable and relevant information that helps businesses make informed decisions. (Tayseer, 2023)

We can use data analysis to derive all the indicators that carry important meanings. Which helps us make the right decisions. This gives us the opportunity to understand all the problems that we may face during the preparation of scientific research and doing all these procedures makes us able to draw a future plan that is well suited to the research topic. Or even to ensure a bright future for the company or institution that we want to grow and develop optimally. (Mallah, December 2022)

2.2 Statistical analysis:

Statistical analysis is the process by which the researcher collects, organizes, analyzes and extracts information useful to scientific research through it, so that this information is new and of valuable benefit (Mustafa, 2014). Statistical analysis is also defined as the process through which the researcher talks about a society, explains its characteristics and determines the features that distinguish it from the rest of the societies, and in order for the researcher to reach it, he must take a sample from it, in order to conduct a study on it according to scientific foundations, and extract from it the qualities that can be generalized to society, and thus determine its distinctive characteristics, and its importance appears as follows:

• Helps researchers to reach the results they seek, which are clear and with a certain degree of accuracy and clarity.

• If statistical analysis did not exist, researchers would be puzzled by the large amount of data collected and available to various bodies and institutions in how to exploit, process and benefit from them. (Mohammed, 2007)

One of the most important programs through which statistical analysis of data is carried out include:

SPSS ; SAS ; EVIEWS ; MINITAB ; R ; EXCEL; STATA; AMOS; ACASTAT; MAXSTAT ;P YTHON...

2.3 Demographic projections:

Population projections are projections of a population in terms of size and distribution by age and sex, which in turn is the starting point for other sectoral projections, and the importance of providing future data on population is increasing, with increasing demand for it by decision-makers and population policymakers.

Population projections are one of the main pillars on which development plans and programs are relied upon in the economic, social and demographic fields, in order to raise the standard of living of society and achieve prosperity for all its members. (Kafroni, 2011).

2.3.1 Objective of population projections:

Preparing future estimates of the population in terms of size and their individual and quinquennial age distributions, with the aim of helping to formulate appropriate population policies and develop social and economic plans and programs for them during long-term future periods of time. (Kafroni, 2011)

2.3.2 Importance of population projections:

Population projections gain importance from the increasing demand from users, as planners and follow-ups in all areas of development need future estimates of the size of the population and their age distributions, and these estimates are logical and based on good and reliable scientific programs and methodologies, as they help the planner to assess the current situation of the population, develop population programs and plans, and form population policies, to meet the basic current and future living needs of the population, whether educational, health or service (Kafroni, 2011).

2.3.3 **Methods and programmes used in the preparation of population projections:**

There are many ready-made methods and programs for preparing population projections, such as the mathematical method, and the synthetic method, as well as ready-made programs for preparing population projections, such as the Spectrum program, and the synthetic method is one of the good methods for estimating the population and is widely used in long-term projections, and it deals with changes in population growth compounds (births, deaths, migration). (Kafroni, 2011)

2.4 The concept of the Spectrum program:

It is a system of embedded models designed to determine the future results of current growth policies and programs, and it mainly concerns the following areas:

• DemProj Demography
• FamPlan family planning
• Costs and benefits of family planning programs
• Effects of AIDS Impact Model - AIM
• Economic and social effects of population growth RAPID

2-4-1- Defining a Model DemProj:

• It is a comprehensive program used for population projections and used as a basis for projections of other programs in Spectrum such as: Rapid, FamPlan and others.

 This program is based on the introduction of a set of data and hypotheses related to population, fertility, mortality and migration. (Initiative, 2007)

3- A forward-looking study of the future needs of the population with the horizon of 2050:

3.1 Statistical basics relied upon in the prospective study:

This is the applied part of the research, through which we aim to anticipate the future needs of the population, and this can only be done after knowing the future expectations of the population and from this point of view we will highlight the evolution of the population of Algeria until the beginning of the year 2050, using the synthetic method, which is considered one of the best methods for estimating the population, especially in the long term, and the latter is based on changes and developments in population growth vehicles (births, deaths and migration). These demographic compounds were embodied in fertility rates (ISF) and Amal. Life (E0) for both sexes, and taking into account the expected future population changes in Algeria, the population projections will be implemented according to three main scenarios: the high scenario, Fixed and low, related to fertility rates and life expectancy at birth, with the exclusion of the element of migration, since Algeria is not one of the countries exposed to migration currents, using the demographic spectrum program (Spectrum) for population projections, and as researchers used to do, the results of population projections are one of the main pillars on which to rely in developing development plans and programs in the economic, social and demographic fields, in order to raise the standard of living of society and achieve prosperity for all its members.

3.2 Basic demographic variables in future outlook:

Since ancient times and throughout the ages, the main concern of man is to know the secrets of the future, so he relied on several methods and methodologies to explore the future such as predictions, astrology, projections, predictions, simulation models, scenario development as well as future analysis.

The size, growth and distribution of population in any region is affected by three main elements: births, deaths and net migration, and these elements are affected by many demographic, social and economic factors that may affect each of these elements directly and indirectly, and the

elements referred to are a key pillar in the preparation of future population projections that constitute key data in the preparation of future development plans and programs, and the age and gender composition of the population reflects demographic changes in population conditions as a result of changes in elements The main for population growth. (Saleh, 2017, page 9).

Basic demographic variables : are the main demographic factors that influence population growth and composition over time. These variables are used in future foresight processes to understand population trends and potential changes, which aids in strategic planning and policy development. These variables include:

In many third world countries, young people constitute a large proportion of the demographic structure, in contrast to many countries in the developed world where the rate of aging is accelerating, while the challenge associated with the population with a high percentage of youth differs from the challenge associated with their age, both ultimately require a similar response by policies. governmental. (United Nations Fund, 2010, p. 27) From this standpoint, and in confirmation of the historical development of the total fertility rate and life expectancy at birth, and considering the current salient feature of the young population in Algeria and what it will inevitably lead to in the future, from all of the above, we will answer the following questions: How far will the population of Algeria be by the beginning of 2050? What are the trends in demographics? And which age group will reach the peak of development? What will the population pyramid look like with the horizon of 2050? And other related questions, in order to highlight the future developments that will inevitably occur to the age structure by adopting population projections according to the three scenarios mentioned above, in order to scientifically analyze their outputs, i.e. the results obtained to guide the state's policies to know the needs of each age group according to its future development, and on this basis, determining the long-term goal, or rather the future vision, is based on rational planning according to scientific foundations.

3.3 Population projections and scenario development:

3.3.1 Future estimates of Algeria's population by 2050:

- In order to make future projections of the population of Algeria, we relied on the synthetic method, considering that the base year is 2018, and the five-year age groups according to three scenarios related mainly to fertility rates represented by total fertility rates (ISF) (child / woman) and mortality rates represented by life expectancy at birth (E0) for both sexes, and it should be noted that fertility in general has known a declining pattern in Algeria, moving according to data from the National Bureau of Statistics from 4.5 (child / woman) in 1990 to 2.8 (Child / per woman) in 2008 and did not exceed 3 (child / per woman) during the period (2018-2024) and the highest value recorded during this period (2008-2024), which is considered the period of stability is 3.1 (child / woman), so we assumed it as a maximum value for fertility, and it turns out that most of the indicators Socio-economic (urbanization, education, women's access to the world of work, average age of marriage for women, standard of living, ...) which have a direct or indirect relationship with the development of the level of fertility suggests that its decline will continue in the coming years, and quite the contrary, the expected life expectancy at birth in Algeria has witnessed an upward trend from year to year, and is expected to continue in the foreseeable future to improve, but at a lower pace than during the transition from the nineties of the last century and the entrance of the current century. The expected hypotheses of the latter were taken in a statistical manner to take into account its development during the period (2008-2024).

3.3.2Scenario development:

The hypothesis data on fertility and life expectancy were developed according to the three scenarios for the time period (2018-2050) as follows:

*** First scenario (Scénario 1):**

The fertility level is supposed to rise to 3.1 (child/woman) in 2050.

Table (01): High fertility and life expectancy (Researcher, 2024, p. 6)

Years		First scenario
2050	2018	
3.1	3	**ISF** : Total fertilité rate (child/woman)
85	78.4	**E0**$_W$: Life expectancy at birth for the inat
79.6	77.1	**E0**$_M$: Life expectancy at birth for males

*** Second scenario (Scénario 2):**

The hypothesis of this scenario is that fertility and life expectancy at birth remain at their current level recorded in 2018 throughout the projection period.

Table (02): Fertility Stability and Life Hope (Researcher, 2024, p. 6)

Years		Second scenario
2050	2018	
3	3	**ISF** : Total fertilité rate (child/woman)
78.4	78.4	**E0**$_W$: Life expectancy at birth for the inat
77.1	77.1	**E0**$_M$: Life expectancy at birth for males

***Third scenario (Scénario 3):**

The fertility level is supposed to drop to 1.4 (child/woman) in 2050.

•**Table (03):** Fertility decline (Researcher, 2024, p. 7)

Years		Third scenario
2050	2018	
1.4	3	**ISF** : Total fertilité rate (child/woman)
86.6	78.4	**E0**w: Life expectancy at birth for the inat
82.2	77.1	**E0**M : Life expectancy at birth for males

3.3.2Data entry into the demographic spectrum programme for population projections: After completing the scenario process, we proceed to enter the data accurately and carefully in order to proceed to examining the results of the process**.**

Results of demographic projections in Algeria (2018-2050):

The results of the population projections include, in addition to the total population, many demographic indicators, including, but not limited to: the age distribution of the population by single, quinquennial and broad (main) groups, annual growth rate, crude mortality rate, crude birth rate, infant mortality rate, under-five mortality rate, total fertility rate... , and other indicators that are of critical importance.

. Prospective analysis of the results of the study:

Based on the results of the population projections process for the period (2018-2050) through the Spectrum program according to the proposed scenarios, the following was concluded:

✓ Decrease in the proportion of dependent population of young people (minimum age dependency ratio) due to their shrinking size in all scenarios, especially the scenario of low total fertility, where the decrease reached almost half. Decision makers and authorized bodies for this, based on the future path of this category as a result of the outputs of the population projections for the period (2018-2050), should direct a share of the resources or financial appropriations that were directed to meet the needs of this age group to serve other age groups most in need in a rational manner. The low rate of natural growth of the population for all imposed scenarios, which leads to a high average median age of the population and thus a high number of years of population doubling, and the youth group (15-30) years has increased in size, which requires work to provide the needs of this age group according to the average increase according to the outputs of population projections from various aspects, the most important of which are: vocational training, higher education and the provision of jobs, i.e. creating job opportunities for young people, unemployment insurance, covering all workers with social security as the best investment To improve the lives of future generations of older persons, improve the health situation by expanding access to health services for this group, especially reproductive health and family planning programs....

✓ The increase in the population in the economically active group (15-64) years, which maintained its dominance over the age structure of the population, where the average increase rate was expected at about 49% and according to the expected statistics, imposes terrible economic challenges, represented in the extent to which the economy can confront them and achieve high levels of growth that will enable to absorb the huge amount of new arrivals to the world of work and keep pace with the excess supply of work, decision-makers in the country must adopt optimal

strategies that contribute to A balance between the growth of the active category on the one hand and new jobs on the other, i.e. the compatibility between supply and demand to eliminate the problem of unemployment, and also ensures that there is no tendency to go to the parallel economy, or as it is called informal, hidden or illegitimate, which leads to the erosion of the general economic system because it destroys the basic structure of the economy and limits the effectiveness of the state's financial and monetary policies, as well as works to shrink citizens' respect for the law and legitimacy so that society tends to chaos and collapse. The shrinking percentage of the young people (0-14) years, was added to the elderly category (+65 years), which in turn witnessed a significant and terrible increase, as the expected population moved from 2.68 million people in 2018 to more than 9.5 million people in 2050, thus exceeding twice as much, the high percentage of the elderly considered resulted in an increase in the percentage of dependents of the elderly (the largest age dependency rate) in all scenarios, and the decrease in the percentage of population bullies and the increase in The Urbanization Index indicates the future trajectory of Algeria's population, which is the transition to old age. From this standpoint, these expected statistics indicate that Algeria has entered the stage of opening the demographic window (gift) that allows the state the opportunity to accelerate economic growth and improve the quality of life for the population, and that the transformation of the demographic burden resulting from population increase into a demographic gift is mainly related to increasing the absorptive capacity of labor markets by increasing the participation rate of the active group in economic activity, and on the contrary, if it is not exploited, it will lead to serious results such as a rise in the percentage of unemployed and an exacerbation of demand. on international migration in various ways.

✓ The increasing number of elderly people in society requires more attention to them and their integration into social life based on their accumulated experience over the years by advancing the development process through the formulation of coherent strategies and the planning of comprehensive public policies to address the current gaps in the health and social needs of the elderly, and to meet the growing future requirements

3.Recommendations:

- In light of the review of the reality of the future path of the population in Algeria, a number of recommendations can be developed as a roadmap to meet the future needs of each age group according to its expected future growth:
- Giving the utmost importance to demographic statistics, especially data on age and gender structure, since they are the cornerstone of any planning for the provision of all services and needs, whether educational, health or social;
- The establishment of a national committee composed of experts and specialists to audit the validity of demographic data so that future studies based on such data are more accurate and objective, as they are considered the whole point of the planning process;
- Adapting the future needs of the population according to the change in age structure through future studies and reports of specialists and researchers.

Conclusion:

Our prospective applied study, through which we achieved remarkable results using advanced statistical methods and programs, clearly highlights the extent to which statistical analysis has developed in the field of social sciences and humanities. These methods not only provided accurate analysis of data, but also helped in anticipating future trends and predicting the needs of the

population, as the change in the age structure of the population is one of the prominent demographic phenomena that have aroused wide interest among researchers in the fields of economics and demography, due to its importance and profound impact on sustainable human development paths. This study is an attempt to explore changes in the age structure of the population, which is considered one of the most prominent demographic indicators that reflect the nature of social and economic transformations in societies.

These changes are not just a numerical phenomenon, but have direct repercussions on the needs of the population and the distribution of resources, especially in light of the transformations that occur during different age stages. The "demographic gift" phase is important, which represents a unique opportunity for sustainable development gains if demographics are strategically managed. However, achieving these gains requires comprehensive reform policies, based on rational planning and anticipation of future needs to ensure that the aspirations of all age groups are met, thus enhancing the society's ability to face challenges and achieve comprehensive and sustainable development.

List of Appendices:

Appendix No. (01): Statistical table showing the evolution of population structure according to censuses - Census 2008

Unit: Person/Individual

Age Groups	*Female*	*Male*	*Total*
0-4	1654821	1750097	3404918
5-9	1412702	1475674	2888376
10-14	1596513	1662260	3258773
15-19	1787859	1847311	3635170
20-24	1867802	1895704	3763506
25-29	1691968	1730409	3422377
30-34	1361910	1379085	2740995
35-39	1175529	1167249	2342778
40-44	1010644	1007683	2018327
45-49	812432	817004	1629436
50-54	664337	682357	1346694
55-59	515398	547181	1062579
60-64	356788	354694	711482
65-69	316345	314958	631303
70-74	256254	248672	504926
75+	346325	337091	683416
Total	16847283	17232747	34080030

Source: (prepared by the researcher according to the outputs of the demographic spectrum program)

Appendix No. (02): Statistical table of population structure development according to 2018 estimates

Unit: Person/Individual

Age Groups	*Female*	*Male*	*Total*
0-4	2449136	2590127	5 039 263
5-9	2111866	2232694	4 344 560
10-14	1671473	1772879	3 444 352
15-19	1434551	1499629	2 934 180
20-24	1617421	1682762	3 300 183
25-29	1807128	1862782	3 669 910
30-34	1882687	1905203	3 787 890
35-39	1700541	1734451	3 434 992
40-44	1363452	1376957	2 740 409
45-49	1172185	1159980	2 332 165
50-54	1000488	991470	1 991 958
55-59	796596	792743	1 589 339
60-64	639318	644678	1 283 996
65-69	482422	496978	979 400
70-74	316741	301371	618 112
75-79	256457	240582	497 039
80+	304705	285270	589 975
Total	21 007 167	21 570 556	42 577 723

Source: (prepared by the researcher according to the outputs of the demographic spectrum program

Appendix No. (03): Statistical table of the evolution of the expected age structure of the population for the year 2050 according to the three scenarios

Unit: Person/Individual

Years	*Scenario 01*			*Scenario 02*			*Scenario 03*		
	Age Groups			*Age Groups*			*Age Groups*		
	(0-14) years	(15-64) years	65+ years	(0-14) years	(15-64) years	65+ years	(0-14) years	(15-64) years	65+ years
2018	12 828 175	27 065 022	2 684 526	12 828 175	27 065 022	2 684 526	12 828 175	27 065 022	2 684 526
2019	13 217 269	27 420 686	2 793 332	13 215 649	27 420 178	2 792 400	13 199 293	27 420 937	2 793 768
2020	13 578 365	27 792 680	2 907 487	13 573 507	27 791 158	2 904 650	13 524 632	27 793 431	2 908 816
2021	13 904 182	28 185 525	3 027 286	13 894 485	28 182 485	3 021 528	13 797 202	28 187 023	3 029 987
2022	14 188 698	28 603 092	3 152 849	14 172 586	28 598 031	3 143 103	14 011 356	28 605 586	3 157 426
2023	14 427 835	29 047 875	3 284 334	14 403 763	29 040 287	3 269 477	14 163 431	29 051 614	3 291 321
2024	14 619 391	29 521 349	3 421 422	14 585 852	29 510 722	3 400 267	14 251 656	29 526 583	3 431 388
2025	14 762 796	30 022 977	3 564 347	14 718 316	30 008 792	3 535 632	14 275 767	30 029 845	3 577 796

2026	14 859 306	30 549 872	3 714 516	14 802 481	30 531 638	3 676 923	14 237 372	30 558 506	3 731 977
2027	14 912 209	31 097 630	3 873 653	14 841 757	31 074 957	3 825 856	14 140 023	31 108 261	3 895 779
2028	14 926 911	31 661 849	4 042 767	14 841 549	31 634 351	3 983 352	13 989 004	31 674 705	4 070 259
2029	14 872 364	32 276 120	4 222 130	14 770 793	32 243 408	4 149 593	13 752 845	32 291 432	4 255 740
2030	14 819 103	32 873 982	4 410 739	14 699 979	32 835 671	4 323 494	13 501 448	32 891 979	4 451 267
2031	14 771 289	33 456 462	4 606 798	14 633 217	33 412 142	4 503 189	13 238 093	33 477 382	4 655 084
2032	14 734 044	34 024 718	4 807 977	14 575 570	33 973 931	4 686 289	12 966 713	34 048 822	4 864 895
2033	14 713 260	34 578 759	5 012 756	14 532 924	34 520 910	4 871 220	12 691 682	34 606 362	5 079 217
2034	14 692 880	35 139 702	5 221 421	14 490 440	35 072 814	5 058 196	12 412 838	35 153 260	5 298 380
2035	14 698 129	35 686 202	5 434 822	14 473 144	35 608 319	5 247 985	12 153 241	35 668 249	5 523 284
2036	14 735 195	36 215 271	5 652 841	14 487 042	36 124 453	5 440 400	11 917 020	36 148 585	5 753 858
2037	14 809 211	36 724 560	5 875 415	14 537 068	36 618 889	5 635 307	11 707 052	36 592 131	5 989 959
2038	14 923 886	37 212 068	6 102 939	14 626 723	37 089 667	5 833 023	11 524 864	36 997 248	6 231 990
2039	15 083 257	37 677 718	6 334 433	14 759 767	37 536 731	6 032 508	11 371 671	37 364 253	6 478 999
2040	15 290 097	38 119 664	6 571 042	14 938 661	37 958 303	6 234 814	11 247 410	37 691 686	6 732 179
2041	15 543 750	38 532 902	6 817 772	15 162 493	38 349 559	6 444 765	11 149 602	37 974 883	6 996 625
2042	15 841 514	38 912 006	7 081 156	15 428 367	38 705 291	6 668 648	11 074 352	38 208 536	7 278 994
2043	16 178 466	39 255 100	7 365 372	15 731 263	39 023 787	6 910 404	11 016 392	38 390 577	7 583 582
2044	16 548 881	39 564 675	7 671 050	16 065 360	39 307 630	7 170 479	10 969 829	38 522 984	7 910 998
2045	16 946 734	39 846 968	7 995 314	16 424 535	39 563 070	7 445 888	10 928 625	38 611 204	8 258 046
2046	17 365 028	40 109 488	8 334 304	16 801 757	39 797 579	7 732 694	10 886 645	38 661 889	8 620 861
2047	17 796 023	40 361 857	8 682 569	17 189 318	40 020 663	8 025 427	10 837 718	38 683 532	8 993 958
2048	18 231 548	40 613 381	9 035 356	17 579 124	40 241 482	8 319 323	10 775 865	38 684 019	9 372 552
2049	18 661 816	40 871 327	9 390 901	17 961 565	40 467 170	8 612 543	10 694 643	38 668 665	9 754 877
2050	**19 078 354**	**41 142 264**	**9 747 509**	**18 328 347**	**40 704 151**	**8 903 331**	**10 588 946**	**38 641 968**	**10 139 245**

Source: (prepared by the researcher according to the outputs of the demographic spectrum program

Appendix (04): Statistical Table of Population Structure Development by Outputs of the Demographic Spectrum Program for the Year 2050 by First Scenario

Unit: Person/Individual

Age Groups	***Male***	***Female***	***Total***
0-4	3613897	3458086	7071983
5-9	3291337	3147626	6438964
10-14	2847517	2719890	5567407
15-19	2515488	2399719	4915207
20-24	2444259	2328988	4773247

25-29	2544288	2420406	4964694
30-34	2577081	2442400	5019480
35-39	2409611	2285153	4694765
40-44	1930086	1827095	3757181
45-49	1534614	1467156	3001771
50-54	1540722	1495743	3036465
55-59	1721892	1697095	3418987
60-64	1761144	1799323	3560467
65-69	1586908	1671062	3257970
70-74	1188669	1303960	2492629
75-79	816594	969397	1785992
80+	948120	1262798	2210918
Total	**35272229**	**34695897**	**69968127**

Source: (prepared by the researcher according to the outputs of the demographic spectrum program

Appendix (05): Statistical Table of Population Structure Development by Outputs of the Demographic Spectrum Program for the Year 2050 by Second Scenario

Unit: Person/Individual

Age Groups	***Male***	***Female***	***Total***
0-4	3461614	3280787	6742401
5-9	3179499	3010637	6190137
10-14	2771425	2624385	5395809
15-19	2464603	2334111	4798713
20-24	2410441	2283177	4693617
25-29	2525221	2392454	4917675
30-34	2571863	2433092	5004956
35-39	2406145	2278616	4684761
40-44	1926167	1819923	3746090
45-49	1529728	1458522	2988250

50-54	1532250	1481436	3013685
55-59	1705480	1669756	3375236
60-64	1731946	1749221	3481168
65-69	1543370	1591916	3135285
70-74	1137841	1202175	2340016
75-79	764127	848909	1613036
80+	846674	968320	1814994
Total	**34508392**	**33427437**	**67935829**

Source: (prepared by the researcher according to the outputs of the demographic spectrum program

Appendix No. (06): Statistical table of population structure development according to the outputs of the demographic spectrum program for the year 2050 according to the third scenario

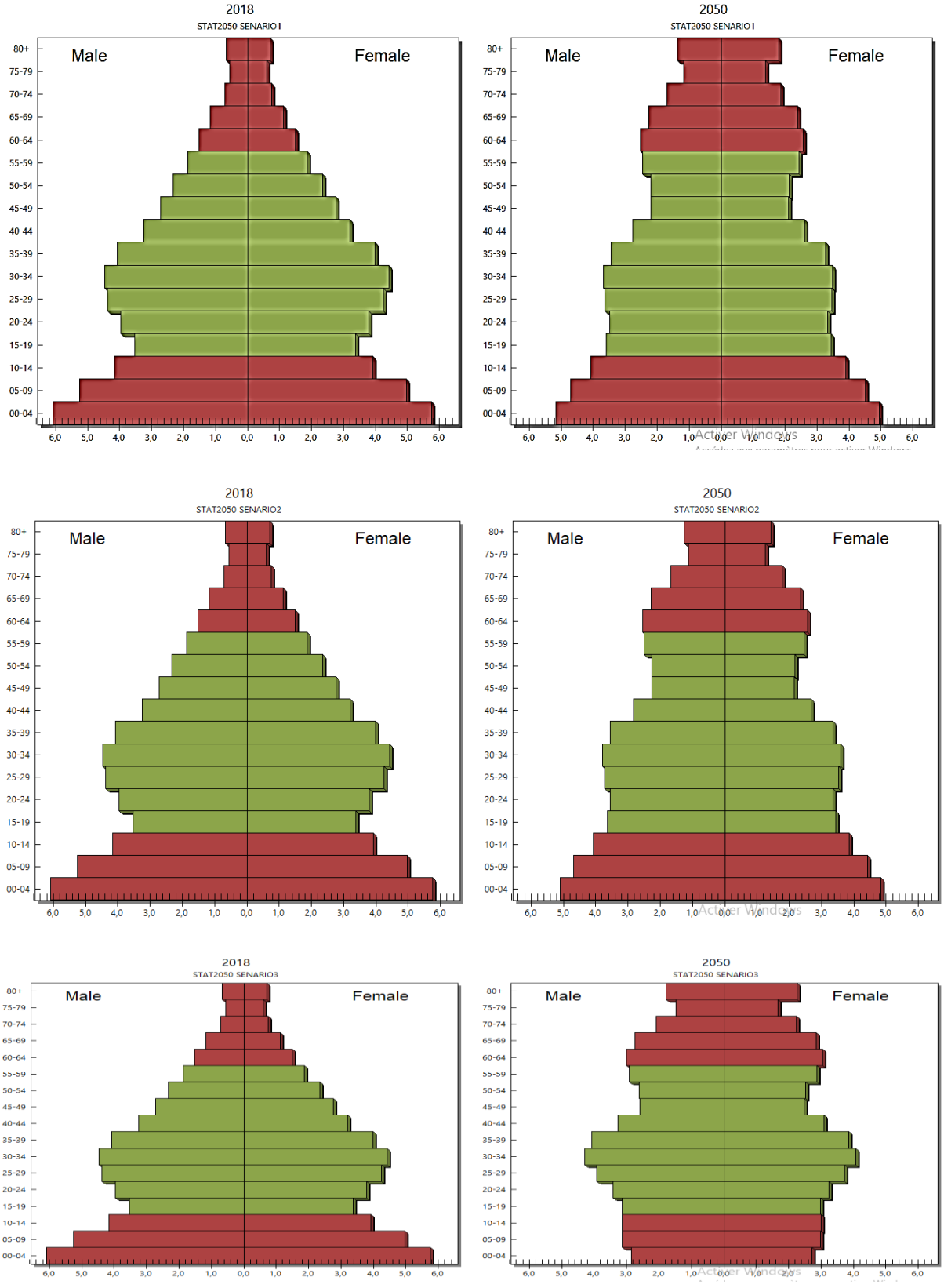
Unit: Person/Individual

Age Groups	***Male***	***Female***	***Total***
0-4	1693731	1617420	3311151
5-9	1860296	1775859	3636155
10-14	1864420	1777220	3641640
15-19	1864271	1774896	3639167
20-24	2022921	1924486	3947406
25-29	2326093	2210844	4536937
30-34	2552655	2417712	4970367
35-39	2412539	2286318	4698857
40-44	1933367	1828370	3761736
45-49	1538703	1468714	3007417
50-54	1547882	1498356	3046238
55-59	1736033	1702164	3438196
60-64	1786887	1808758	3595645
65-69	1626552	1686504	3313056
70-74	1236897	1324854	2561751
75-79	868858	995711	1864569

80+	1060747	1339122	2399869
Total	**29932852**	**29437307**	**59370159**

Source: (prepared by the researcher according to the outputs of the demographic spectrum program

Appendix No. (07): Population pyramid for the years (2018-2050) according to the three scenario



Source: (prepared by the researcher according to the outputs of the demographic spectrum program

List of sources and references

1. *Amani Musa Muhammad. (2007). Statistical analysis of data. Cairo: Institute of Statistical Research and Studies.*
2. *Kharabsha Kamal Saleh. (2017). Report on the impact of population growth on some development sectors at the level of the Kingdom of Saudi Arabia 2015-2050 using RAPID program.*
3. *United Nations Population Fund. (2010). Population Situation Analysis: A Conceptual and Methodological Guide.*
4. *Mohammed Tayseer. (2023). Step-by-step data analysis steps guide. Founder of the Arab Journal of Science and Research Publishing.*
5. *Maazazi Younes and Zikyo Mustafa. (2014). The importance of statistical analysis method in scientific research and studies.*
6. *Youssef Kafroni. (2011). Statistics in the Social Sciences (2nd Edition Edition). Peruth: Arab Center for Research and Documentation.*
7. *National Bureau of Statistics. (2011). Statistical vesicle No. 156. Algeria.*
8. *National Bureau of Statistics. Annual Statistics in Algeria, Results (1993-1994), 1992 edition, 1993, 1994, 1996.*
9. *World Bank 2024. World Population Outlook United Nations 2024.*
10. *African Union, Statistical Yearbook for Africa 2010, p88, website, www.africa-union.org*
11. *Initiative, T. U. (2007, 12). AIM A Computer Program for Making HIV/AIDS Projections and Examining the Demographic and Social Impacts of AIDS. Retrieved on 06 12, 2020, on Spectrum System of Policy Models: https://www.jhsph.edu*
12. *National Bureau of Statistics. (2024-2023-2022-2021-2020-2019-2018) Demographic of Algeria.*
13. *Amina Mallah. (December 2022). The purpose of data analysis. Master Educational Services.*