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The Impact of Population Growth on Health and Educational Services Distribution in AL-Salt City (1994-2015)

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Abstract

The study aimed to investigate the impact of population growth on the services sector (education and health) in AL-Salt city. The study used two approaches: (descriptive and analytical). Both approaches are used to analyze the effect of population growth on services by collecting the desired statistics and data. The study concluded that the population growth rate in the city during the period 1994-2015 preceded the rate of development in educational, health, and general services. The study found that there is a significant overcrowd and pressure on educational services of the schools, where the teacher students' ratio increased rapidly. Also, health services suffer from overcrowd where the ratio of population per one physician increased rapidly due to the lack of physicians in such. This pressure affects negatively the quality of provided health services. The study concluded that these results may be considered by planners, decision makers, and researchers.

Keywords: Population Growth, Health services, Educational services.

أثر النمو السكاني على توزيع الخدمات الصحية والتعليمية في مدينة السلط (1994-2015)

الملخص

هدفت هذه الدراسة إلى معرفة أثر النمو السكاني على قطاع الخدمات (التعليمية والصحية) في مدينة السلط. وقد استخدمت الدراسة المنهج الوصفي التحليلي من خلال جمع الإحصاءات والبيانات المطلوبة. وقد توصلت الدراسة إلى أن معدل النمو السكاني في المدينة خلال الفترة 1994-2015 يسبق معدل التنمية في الخدمات التعليمية والصحية. كما وكشفت الدراسة عن وجود اكتظاظ كبير وضغط كبير على الخدمات التعليمية للمدارس في مدينة السلط، ومن النتائج الهامة الأخرى التي توصلت لها الدراسة أن المراكز الصحية تعاني من الاكتظاظ حيث زادت نسبة السكان لكل طبيب بسرعة بسبب نقص الأطباء فيها وهذا الضغط يؤثر سلباً على جودة الخدمات الصحية المقدمة. وأخيراً توصلت الدراسة إلى أن هذه النتائج يمكن النظر فيها من قبل المخططين وصناع القرار والباحثين.

كلمات مفتاحية: النمو السكاني، الخدمات الصحية، الخدمات التعليمية.

1. INTRODUCTION

Many social and economic studies discussed the issue of rapid population growth, especially in the area of urban planning field. Urban planning agencies face many problems and they became unable to deal with rapid population growth and providing basic services to population, which leads to several problems in providing water to population, educational and health services, and increasing in random slum areas, as well as pressure on job opportunities which increased unemployment rate. These problems led to several administrative difficulties in the socio-economic development processes and reflected in the people's living standards in various fields.

There is a close relationship between the population growth and the provided services in various areas. Also, the overall population size plays a greater role in determining the framework of the demand of different services. Therefore, many factors determine the size of society (such as fertility, mortality and migration) and they determine services needed to the community at the same time, and therefore the lack of awareness of the issue of population which create a challenge for researchers to deal with the imbalance between population and available resources.

Despite of the efforts in this context, population growth still the major challenge that impede development, and hence the planners need to develop investments in different areas and create employment opportunities, which reflects good living conditions of the inhabitants.

2. STUDY PROBLEM

AL-Salt city witnessed a rapid population growth during the period 1994-2015, which is similar to other cities in Jordan. This is due to a number of factors, the most important are: the political, economic and social factors such as natural increase of the population; internal and external migrations. By the time, the population of the city grew; the number of job opportunities decreases at the same pace. Moreover, there are few studies discussed the relationship between the population growth and basic services needed in the Jordanian cities especially in AL-Salt city.

The study problem can be described through the following questions: Which is the most effective impact on population growth in Salt: Natural increase or migration? Is there a relationship between population growth and the provided services in AL-Salt city in the period 1994-2015? Is there a lack in the provided educational and medical services in AL-Salt city? Does health and educational services suffer from overcrowding?

3. THE STUDY OBJECTIVES

This study intend to:

- Identify the population growth in AL-Salt for the period 1994 – 2015, and its impact on health and educational services.
- Analyze and evaluate the status of the health and educational services and public utilities sector in AL-Salt city and some suggestions to develop these services in the future in light of high population growth rates.
- The study is seeking to develop a data base based on educational and health statistics for such services.
- Identify the role of planning sector on health and educational services distribution in AL-Salt city.

4. STUDY IMPORTANCE

The study justifications may be summarized as follows:

- The importance of strategic geographical location of AL-Salt city in the Kingdom.
- Rapid population growth during the period 1994-2015.
- Rapid increase on educational and health services in AL-Salt city during (1994-2015).
- The emergence of some problems as a result of the population growth of the city; such as pressure on education and health services.
- The lack of studies that focused on population growth and its impact on the provided services to population in AL-Salt city.

5. STUDY AREA

The city is located on the old main road between Amman and Jerusalem. It was called “AL-Saltus”, in relation to the Greek leader who built a temple for the God Zeus in the area of “Zei”, located 28 kilometers west of the capital Amman, and about 900 meter above sea level. Its population in 2015 reached 99890 inhabitants (Dept. of Statistics, 2016), where it is considered as the eighth largest city in the Kingdom in terms of city ranking.

The city is located on one of the main crossing roads (figure 1) linking Jordan to Palestine via Wadi Shu'ayb and Jordan River, and hence, it connects the coast of the Mediterranean Sea with Iraq and the Arabian Peninsula (Royal Geographical Center, 2011).

It is difficult to deduct the history of the ancient AL-Salt, where the castle is the only archaeological site that has been built in 1220; located in the north-east and close to the remainder of the Roman era south of AL-Salt city, known as Tal El-Gador, a small temple of the Prophet Gador, next to Ain Gador (a settlement, believed to be Hellenic, and Byzantium).

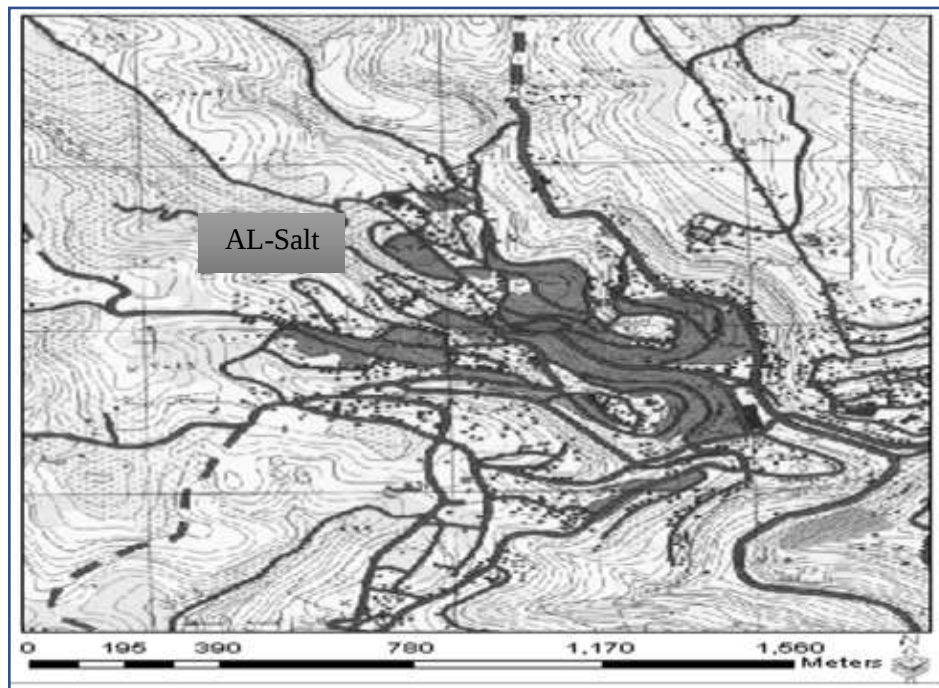


Figure 1: Location of AL-Salt City in Balqa Governorate and in Jordan

AL-Salt is the administrative center of Al-Balqa Governorate, where it consists of several districts: Al-Balqa district, Ain Al-Basha district, Southern Shunah district, Deirala district, Mahis, and Fheis. AL-Salt city has many governmental and official institutions in addition to commercial centers, cultural, public services, markets and other activities.

6. PREVIOUS STUDIES

There are several studies that investigated the effect of the population growth on the provided services. However, there are a few studies interested in studying this problem in Jordanian cities especially in AL-Salt which suffer rapid population growth since mid 1990's.

Michael and Durant (1980) conducted a study on the citizens of Tennessee City in order to determine the relationship between demographic variables such as race and income, and satisfaction to the provided services and the desire of citizens to influence the decision making of public services. The study found that there is no effect of demographic variables on satisfaction to the provided services. Also, the study found that there is no relationship between the demographic variables and the desire of citizens to influence the decision making of public service, and this achieves a higher level of satisfaction by citizens for public services.

Attash and Beheshta (1994) studied the effect of the high population growth in the major cities of Iran on administrative and organizational aspects, with a focus on Isfahan. The researcher showed that population growth causes a pressure on the provided services and job opportunities in Isfahan. To overcome this problem, the study recommended establishing cities close to Isfahan in order to decrease pressure in it.

On the other hand, (Al-Henaiti, 1996) studied the relationship between population distribution and the distribution of health and educational services in Abu-Alanda and Qweismeh area in Amman governorate in order to analyze the relationship between population distribution and spatial distribution of services through applying an integrated approach. Also, the study aimed to evaluate the current status of the educational services in the study area and estimating the demand for future services that are suitable to the future population growth in the region. The study found that the distribution of health and education services is a random distribution that does not correspond to the actual distribution of the population.

The study of (AL-Ramamneh, 1998) examined the change in the size and composition of the population in the main localities in AL-Balqa Governorate from 1952 to 1994. The study dealt with the subject of changing population size of the AL-Balqa governorate, in order to trace population growth in these localities during the three periods (1952-1961, 1961-1979, 1979-1994) and then comparing these periods. The study found that the contrast in the population growth in the city resulted from migrations to the city especially in the last two decades.

The study of (AL-Zayed, 2000) examined the population growth and urbanization in Damascus during the period 1970-2000, in order to study the reality of population growth and urban expansion in the city and the spread of random housing in different locations of the region. The study concluded that Damascus suffers from high population growth, which led to the inability of the city to deal with this growth and thus worsened economic and social conditions and took various images such as the spread of unemployment and the lack of educational and health services to the population. Also, the study

found that the increasing number of transportations caused shrinking pedestrian sidewalks, lack in the number of car parking, which led to traffic in the streets.

Moreover, Al-Battosh (2000), discussed the relationship between population distribution and services in AL-Karak governorate. The study aimed to clarify the relationship between population distribution and spatial distribution of educational services through applying a descriptive approach linking them, and estimating future needs by raising the level of quality of service in some sites or setting up new sites commensurate with future population growth in the region. The study found that the current distribution of educational services sites is random distribution which is not compatible with the actual distribution of the population, and it did not achieve the principle of effectiveness and equality in the provision of services to the largest population and it could not reduce the cost of access.

Al-Fanatseh (2006) examined population growth and urban expansion in Ma'an from 1950 to 2004. The study examined the relationship between the population growth and urban expansion of the city, and then highlighting factors that influenced the growth of Ma'an city, and the growth of the population during the periods 1952-2004. The potential result of this study is that increasing the size of city and residential area parallel to population growth in the city.

Through the previous studies, it can be noted that some of these studies focused on the analysis of the relationship between population and the service distribution. Some of these studies focused on the relationship between population distribution and urban expansion, while others focused on tracking population growth over successive periods. On the other hand, this study will analyze the existing services in order to identify their size, efficiency, and suitability to the population growth in AL-Salt city and the level of citizens' satisfaction for provided services in the city.

7. METHODOLOGY

The study used descriptive and analytical methods to show the relationship between the population growth and provided services in AL-Salt city in the period 1994-2015. Both methods were used to analyze the collected data from various sources to achieve the objectives of the study.

7.1 Data sources

Data sources are as the following:

7.1.1. Previous Studies

The researcher reviewed many studies concerning in population growth and its effect on the provided services, including: theses, published reports, and research papers.

7.1.2 Official Institutions:

- ❖ Department of Statistics:
 - a. 1994, 2004, 2015 population censuses.
 - b. Statistical year book.
- ❖ The municipality of AL-Salt: where the researcher obtained geographical and demographic data of AL-Salt City.
- ❖ Directorate of Education for Balqa Governorate. Reports on educational services in the AL - Salt city were obtained from preparing kindergartens, preparing primary and secondary schools for males and females, preparing students at each educational stage, and preparing teachers and administrators in each educational institution within the boundaries of the study area.

- ❖ Directorate of Health in AL-Salt: where the researcher obtained statistics on the health services provided to citizens in AL-Salt city, in addition to the number of health centers in the city, the number of doctors, and nurses in each center.

7.2 Data processing

The researcher used a descriptive approach to identify the characteristics of the population and characteristics of educational and health services. Also, the researcher depended on an analytical approach which depends on statistical methods to measure the growth, composition, and housing of population AL-Salt City.

8. Population Growth Rate:

Equation 1 shows the growth rate of population (Bogue, 1968, P.168).

$$r = \left(\sqrt[t]{\left(\frac{pt}{po} \right)} - 1 \right) * 100 \quad \text{Equation (1)}$$

R: Annual Growth Rate.

t: Time (Period between Two Censuses).

Po: Population in Previous Census.

Pt: Population in Latest Census.

8.1 Population growth in the period (1994-2015)

Formula 1 was used to compute the growth rate in a period 1994-2015. As shown in table 1, AL-Salt City suffers from rapid population growth in the recent years, where the population counted (56,458) in 1994 and (99,890) in 2015. The growth rate reached 2.6% in 2004, and 2.79 in 2015.

Table 1: Population Growth (1994-2015) in AL-Salt City

Year	Population	Male	Female	Growth Rate %
1994	56,458	29,484	26,974	-
2004	73,528	37,702	35,826	2.64%
2015	99,890	52,095	47,795	2.71%

Source: Department of Statistics, 1994, 2004, and 2015.

The growth rate in a period 1994-2004:

$$R = \left(\sqrt[10]{\left(\frac{73528}{56458} \right)} - 1 \right) * 100$$

R= 2.64% (for the period 1994-2004)

The growth rate in a period 2004-2015:

$$R = \left(\sqrt[11]{\left(\frac{99890}{73528} \right)} - 1 \right) * 100$$

R= 2.79% (for the period 2004-2015)

The growth rate can calculate on the study period 1994-2015 by equation 1 as shown in the followings:

$$R = \left(\sqrt[21]{\left(\frac{99890}{56458} \right)} - 1 \right) * 100$$

R= 2.71 % (for the period 1994-2015)

The average growth rate over the study period is 2.71%, which considered as a rapid population growth. However, population growth reached 2.40% in AL-Mafraq city (Taran, 2016, P. 1836), which is lower than AL-Salt city. This value indicates that population in the AL - Salt city increased rapidly and it means that the planners must give more efficient plans in order to face this rapid growth.

8.2 The Relationship between Population Growth and Number of Schools

Figure 2 shows the number of schools in AL-Salt city in the period 1994-2015 according to gender. The educational services developed rapidly in the recent years, as well as the schools' number the same time. This development is due to the government interest in enhancing the educational services in Jordan.

As shown in the figure 2, the number of mixed-schools is greater than those of the female and male schools along the study period. However, the schools in AL-Salt city suffer overcrowding; because of the rapid increase of population and students over the study period.

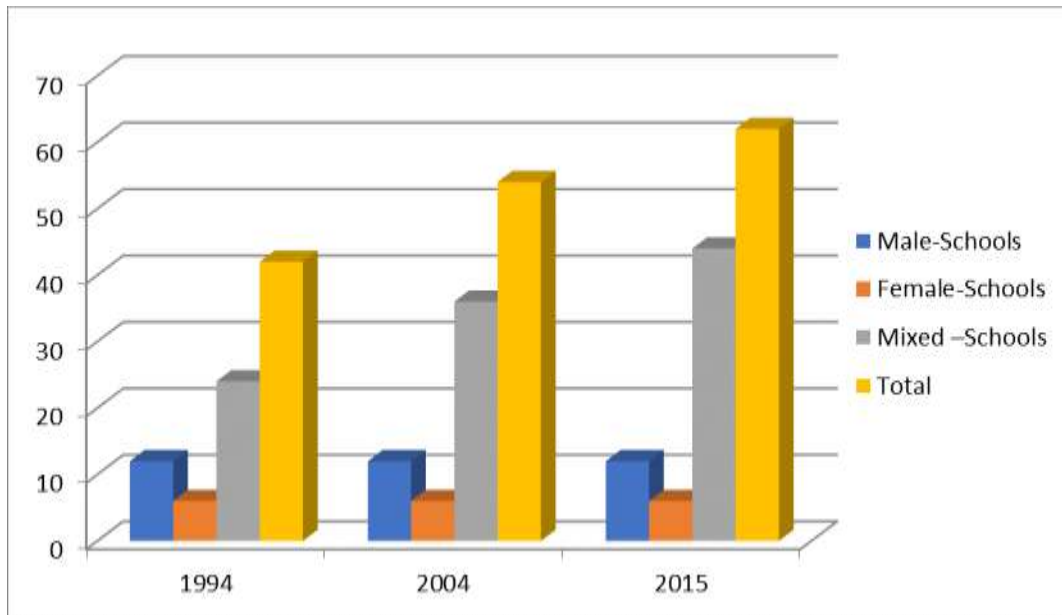


Figure 2: Schools' Number in AL-Salt city (1994-2015)

(Source: Directorate of Education in Balqa Governorate)

8.3 The Distribution of Students over the Study Period

Figure 3 shows the number of students over the study period (1994-2015), where the numbers have increased rapidly since 1994. The students' number increased (7,225) in 1994, then, it increased to (16,389) in 2004, and it increased to (27,242) in 2015.

From the figure, it can be noted that the number of students increased rapidly during the period 1994-2015, where the maximum growth rate is during the period (2004-2015).

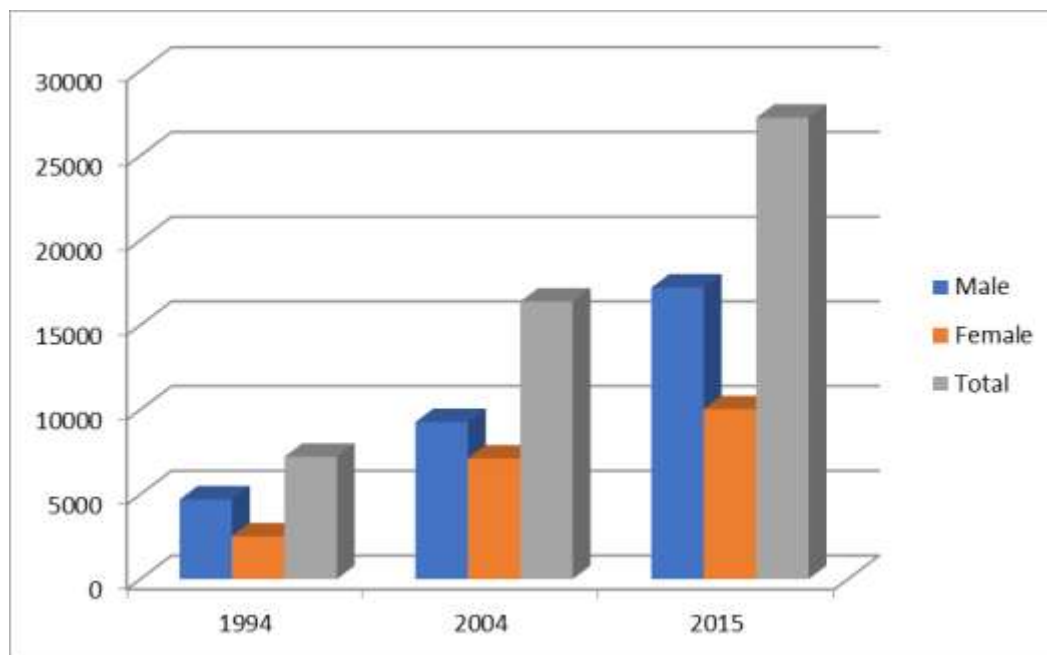


Figure 3: Distribution of Students According to Gender in AL-Salt city during the Study Period (1994-2015)

8.4 The Distribution of Students and Schools in AL-Salt City 1994-2015

Figure 4 shows the distribution of students, teachers, and schools in the AL - Salt city over the study period. Also, the table shows the ratio of students for each teacher. As shown in the table, each teacher has 14 students in a year 1994, but in the year 2004 this ratio decreased to 13 students for each teacher. Then, the ratio increased to 16 students for each teacher in 2015. The ratio of students to teachers indicates that the education services does not suffer pressure.

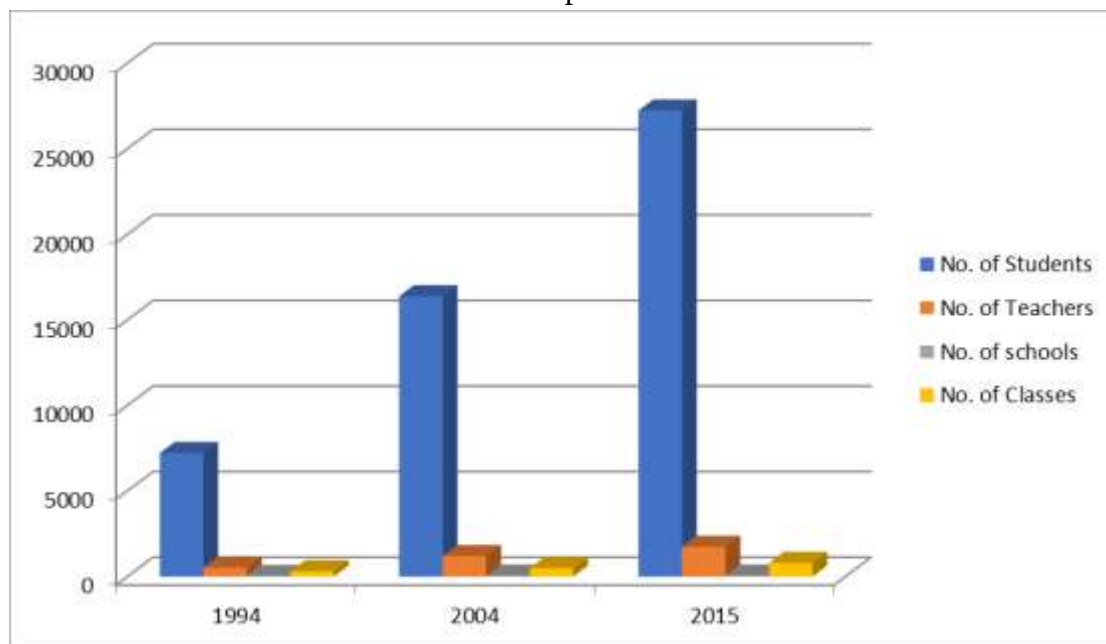


Figure 4: Distribution of Students, Teachers, Schools, and Classes in AL-Salt City (1994-2015)

- **The relationship between students', and schools' growth and population growth (1994-2015):**

The schools' growth:

$$R = \left(\sqrt[21]{\left(\frac{61}{42}\right)} - 1 \right) * 100$$

$$= 1.70\%$$

We note that there is a significant difference between schools' growth and population growth, which means that the schools' number increases slowly over the study period.

The students' growth:

$$R = \left(\sqrt[21]{\left(\frac{27242}{7225}\right)} - 1 \right) * 100$$

$$= 6.40\%$$

We note that students' growth is more than population growth (2.71%) which means that students' number increased significantly over the study period.

8.5 The Distribution of Health Centers over the Study Period

Figure 5 shows the number of medical and health centers distributed in the AL - Salt City. As shown in the table, there is a lack in the number of the medical centers during the period (1994-2015), which means that they suffer from crowding and pressure; because of the rapid population growth, which affect negatively on the quality of medical services.

Also, the figure shows the distribution of medical centers according to their types over the period (1994-2015) in AL-Salt City, where they are classified into three classes: primary, secondary, and completed centers. It can be noted that the number of medical centers increased slowly during the study period. As shown in figure 5, the medical centers suffer overcrowd which causes pressure and negative impact on the quality of services.

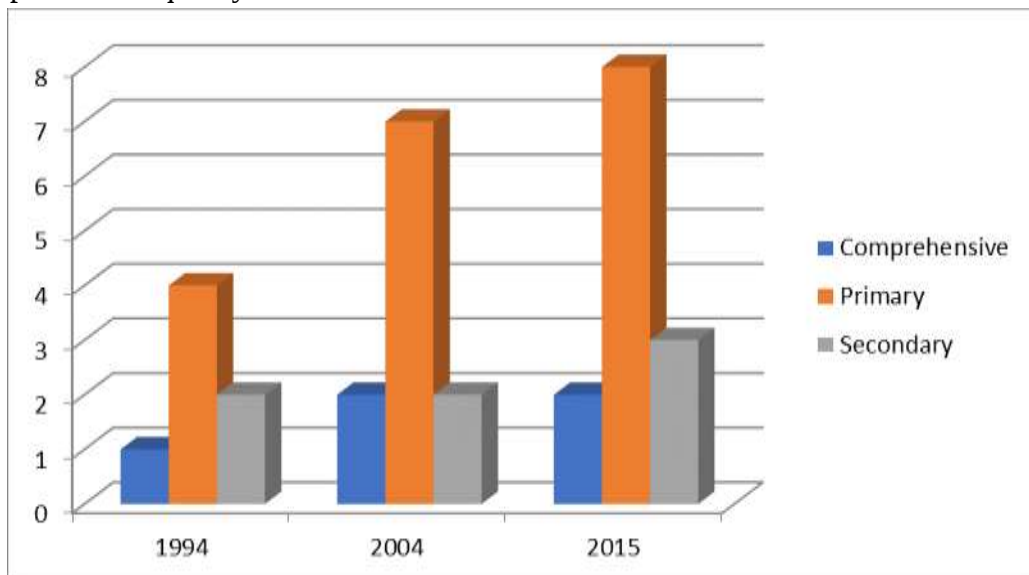


Figure 5: Health Centers in AL-Salt (1994-2015)

- **The relationship between health centers' growth and population growth (1994-2015):**

Health centers' growth:

$$R = \left(\sqrt[21]{\frac{3}{2}} - 1 \right) * 100$$

=1.90%

We note that the health centers' growth (1.90%) increases at a lower pace than the population growth (2.71%). This means that AL-Salt city suffers from a lack of health centers, and it indicates that the city will suffer more in the future if it remains at the same pace.

8.6 Relationship between Population Growth and Development of Health Centers, Nurses, and Physicians

Figure 6 explains population growth and distribution of health centers, nurses, and physicians over the study period, as well as the ratio of population that can be calculated for each physician. Also, the figure shows the relationship between population growth and development of schools, students, teachers, health centers, physicians, and nurses in AL-Salt city over the study period (1994-2015). As shown in the figure, we can note that education services do not suffer from pressure, which means that the status of education services is better than the status of health services. Finally, it is concluded that the health sector suffers from overcrowding, and the number of physicians did not increase and this means that there is a negative impact on the quality of provided services.

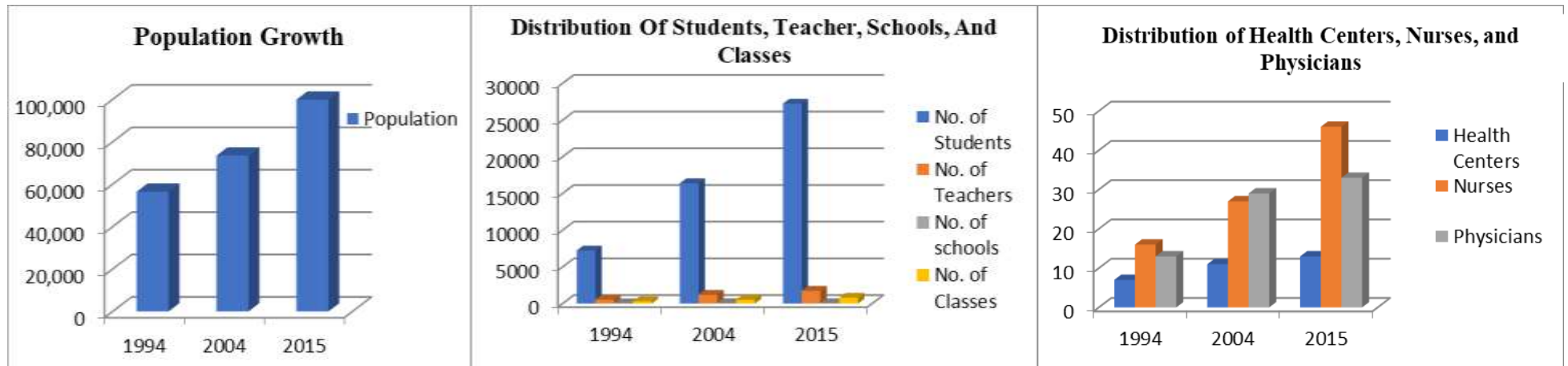


Figure 6: Population Growth, Distribution of Teachers and Students, and Health Centers in AL-Salt City (1994-2015)

- Comparison Between the Services' Level Between AL-Salt City and International Levels

Table 2 shows comparison between the level of services provided in AL-Salt city and international levels. The study found that AL-Salt city suffer a significant traffic and pressure on the provided services compared to the international standards. According to the international levels, number of students to each teachers should be 12, number of students in each class should be 15 (Ministry of Education, 2018), and number of patients to each physician should not increase more than 32 (Ministry of Health, 2018).

Table 2: Comparison between Services' Levels in AL-Salt City and International Levels

Service Type	AL-Salt City	International Levels
Students\ Teachers Ratio	15 students to each teacher	12 students to each teacher
Students\ Classes Ratio	29 students in each class	15 students in each class
Population\ Physician Ratio	92 patients to each physician	32 persons to each physician

9. STUDY RESULTS

1. The population growth rate in AL-Salt city increased rapidly over the study period, where it reached 2.79 % in 2015, which means that the population increased rapidly.
2. The analysis of the above statistics indicated that there is a clear and increasing pressure on the services provided to community of AL-Salt city, and this pressure will continue in the future.
3. By calculating the ratio of students to teachers, the results showed that education services do not suffer pressure.
4. AL-Salt City suffers the lack of health centers' number compared to the rapid population growth, which affects negatively the provided health services.
5. The overcrowding affects negatively the quality of health services in AL-Salt City.
6. The status of education services is better than the status of health services.

10. RECOMMENDATIONS

The study suggests the following:

1. More facilities and services to meet the increasing numbers to suit the requirements of the city's social groups in all educational and health services.
2. Decision makers may take into consideration the factors affecting population growth and population density by the planners while designing up the population policies of the city and linking them to the local community, and economic and social development projects, in order to control and guide the movement of the population and their stability.
3. Enhancing the quality of health services and trying to make balanced distribution among the different districts of the city. It also witnessed student/teachers ratio during that period.
4. Enhancing the service quality in far dwellings from the city center in order to ensure the stability of the population in these districts and to establish projects that meet the requirements of development.
5. The decision makers should seek fund raising for health and educational services in order to overcome the problem of overcrowding in health centers and schools.

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