

# CANCER IN MAYSAN COMPARED TO CANCER IN 3 OTHER PROVINCES

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## ABSTRACT

### Background:

Cancer is a worldwide and national public health problem; the incidence of cancer is increasing rapidly. In 2002 there were 11 million new cancer cases and nearly 7 million cancer deaths worldwide, by 2020, more than 16 million new cancer cases and 10 million deaths are expected and about 60% of all these new cases 70% of these deaths will likely occur in developing country.

This study investigates trends of cancer in Maysan Province and compares it to randomly selected provinces, finding are also compared with nearby countries.

### Methods:

A descriptive study based on Data that found in Iraqi cancer registry 2000 – 2006, comparison had been held between Maysan and 3 Iraqi Provinces selected randomly after classification of Iraq in to 3 regions.

### Results:

The total No. of cancer cases registered in Iraq during these 6 years was 79145, there is an increase in overall cancer trend in Iraq over the last 15 years and especially during 2000 – 2006, Maysan shows relatively similar trends during 6 years while others shows slight elevation in the disease trends, Maysan shows the lowest No of cases registered during 6 years (1251) while Kirkuk shows the highest (3018), Breast cancer was the top cancer registered in Maysan, Kirkuk and Kerballa during all the six years, while in Thi Qar, cancer of the urinary bladder was the top, The total No. of Breast Ca cases registered in Kirkuk since 2000 was about triple what registered in Maysan while what registered in ThiQar was double, The total No. of leukemia registered in Maysan was the lowest (81) while ThiQar was the highest (225).

### Conclusion:

There is an increase of cancer trend in Iraq (in general) and Maysan shows the lowest trend and cancer registration during the 6 years in comparison to the 3 selected provinces.

## INTRODUCTION

Cancer is an increasing problem in the Eastern Mediterranean Region. It ranks as the fourth leading cause of death in the Region and is one of the leading causes of death in the world, particularly in developing countries. (1) Although the incidence of cancer is still well below that in developed countries, the Region is

expected to experience the highest increase among all WHO regions in the coming two decades. (1) The increasing trend can be attributed to many factors including population ageing and exposure to risk factors, such as tobacco smoking, unhealthy diet and physical inactivity and environmental pollution. It is estimated that 40% of cancers can be prevented by risk factor modification.(1) Prevention

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therefore offers the greatest public health potential and the most cost-effective long-term approach for cancer control. Maysan is a province in southeastern Iraq, bordering Iran from the east, Basrah from the south, Wasit from the North and Thi Qar from the west. The provincial capital; Al-Amara city, is flanking the Tigris. The second important settlement is Majar Al-Kabir. Prior to 1976 the province was known as Amara Province. Cancer is one of important health problems in the province but scanty studies were carried out on its extent and mortality. This study is an attempt to examine the pattern of cancer in Maysan province as compared to three other selected provinces in Iraq.

Objective of the study:

1. To identify the time trend of cancer in Maysan Province during a specified period of time.
2. To compare the trend of cancer in Maysan with trends of the selected provinces
3. To specifically look into two cancers; Breast and leukemia in Maysan

## METHOD OF THE STUDY

This is a retrospective descriptive study based on reviewing Iraqi Cancer Registry for a period of six years: 2000-2005 inclusive. Registered data were used to describe the patterns in Maysan and three other provinces selected randomly after classification of Iraq into 3 regions (excluding Kurdistan Iraq for lack of data), North:(Nineveh, Saladin, Kirkuk, Dayala, Anbar), Middle Euphrates: (Najaf, Kerballa, Babil, and Dewaniya,) and South: (ThiQar, Basrah, Muthana and Wasit in addition to Maysan), Kirkuk had been selected randomly from north, Kerballa from Middle Euphrates and Thi Qar from South. Baghdad had been excluded from the study.

## RESULTS:

### Population

There is an increase in population of the four studied provinces during the 6 years as shown in Table 1

### Total registered cases

The total No. of cancer cases registered in Iraq during these 6 years was 79145, the highest registration was during 2005 and the lowest one was during 2003 as shown in Table 2.

### The time trend

The overall trend of cancer in Iraq is illustrated in Figure 1. A rising time trend is clearly seen over the last 15 years particularly during the six-year study period. A relative decline in 2003 is noticed. This decline coincides with the war of 2003.

### Comparative trends

The total No. of cancer cases registered in Maysan, Kirkuk, Kerballa, and ThiQar during the six years were 8833 cases, Maysan shows the lowest No of cases registered during 6 years while Kirkuk shows the highest (Table 3). Figure 2 illustrates the time trends in the four provinces (absolute numbers), Maysan shows relatively similar trends during 6 years while others shows slight elevation in the disease trends

### Comparative percentages

Table 4 shows cancer cases registered in the four studied provinces as percentage out of total cases registered in Iraq, in this table we notice that Maysan shows not significant variation during 6 years while Kirkuk and ThiQar show slight variations. Figure 3 shows the incidence rates per 100000 population, Maysan shows the lowest incidence rate in 2000 and 2003(27.62 and 15.6 respectively) and the highest incidence rate was found in Kirkuk in 2005 which was 78.05 case per 10<sup>5</sup>.

### Time trend of selected individual cancers

Breast cancer was the top cancer registered in Maysan, Kirkuk and Kerballa during all the six years, while in Thi Qar, cancer of the urinary bladder was the top cancer during (2001 –2004) and Ca Breast was the top in (2000 and 2005) as shown in Tables 3-6.

#### Breast cancer

Figure 4 illustrates time trends of breast cancer cases (absolute numbers), Maysan shows the lowest increase in Breast Ca cases and Kirkuk also shows the highest increase in Ca cases registered. Figure 5 shows the incidence rates per 10<sup>5</sup> population, Maysan was the lowest province in the incidence rates per 10<sup>5</sup> populations. The total No. of Breast Ca cases registered in Kirkuk since 2000 was about triple what registered in Maysan while what registered in ThiQar was double. Table (7). Fig(6) shows that there is an increase in the trend of leukemia in Iraq since 1991 and it shows that there is a sharp increase in registered cases during 2004 and it returns to its accepted limits in 2005. The total No. of leukemia registered in Maysan was the lowest while ThiQar was the highest. Table (8). Fig (7) shows that the trend of leukemia in Maysan provinces was the lowest and it sloping downward till 2004, while it was increasing in Kirkuk and Kerballa and fluctuated in ThiQar . Karbella shows the highest leukemia incidence per 100000 in 2000, 2003, 2004 and 2005 while Kirkuk shows it in 2001 and 2002 as what found in fig (8).

## DISCUSSION

Cancer is an increasing problem in the Eastern Mediterranean Region. It ranks as the fourth leading cause of death in the

Region and is one of the leading causes of death in the world, particularly in developing countries. In the Eastern Mediterranean Region (EMR) of WHO, cancer is the fourth most common killer and is increasingly recognized as a major health problem (2). The overall time trend of registered cancer cases in Iraq exhibit an increasing pattern of cancer in Iraq, which goes with global increase, also we notice that there is obvious decline in cancer registration in 2003; it was because of war conditions which led to decrease in cancer registration in Iraq. Maysan registered the lowest No. of cancer cases during 6 years ( 2000- 2005) which was ( 190, 213, 253, 116, 235, 243 respectively) which may be due to their low population and/or under-registration. Figure 3 Also shows that Maysan form the lowest incidence rate per 10<sup>5</sup> , we need further studies to confirm this result, the highest registration of Kirkuk during almost all 6 years may be due registration of referred cases from Kurdistan region, this reason may explain the highest incidence rate per 10<sup>5</sup> in Kirkuk if compared to other provinces as found in fig 3. This variation in No. of cases registration also found in the surrounding countries such as Jordan in which and during 2007, Amman, the capital reported (57.6 %) of all cases followed by Irbid (14.5 %), Zarqa (10.7%) and Balqa (4%).Meanwhile only 0.6 %, 1.1 % from Tafila and Aqaba respectively and also Amman, shows the highest rate (112.6) Per 100,000 population and Tafila shows the lowest rate (33.7) per 100,000 population. (3). There are marked variations in the incidence of various cancers in the Region. For example, stomach and esophageal cancer have a higher incidence in the Islamic Republic of Iran and oral cancer has a higher incidence in Pakistan. Breast cancer is among the

five most common cancers in all countries. It is worth noting that cancer incidence does not correlate precisely with socioeconomic status. Thus, Afghanistan, Pakistan and Somalia, all low-income countries, have high rates, while Oman, an upper middle income country has one of the lowest rates. (1). Female breast cancer is the second most common cancer in the world and the most common cancer in women accounting to about 23% of all cancers. It is estimated that approximately one million cases of female breast cancer are diagnosed every year worldwide. Breast cancer is the most frequent cause of death among cancer deaths in women. An estimated 410,712 breast cancer deaths occurred in 2002. (4). In our study, 3 provinces (Maysan, Kirkuk and Kerbella) show predominance of breast cancer on other kinds such as bladder ca in Maysan, bronchus and lung in Kirkuk and leukemia in Kerballa, this predominance going with what was found in surrounding countries such as (Egypt, Jordan, Kuwait, Lebanon, Pakistan, Qatar, Saudi Arabia, Sudan, Syrian Arab Republic, United Arab Emirates and Yemen) (1). Breast cancer is the most common cancer in the GCC States. Between January 1998 and December 2005, 8,347 breast cancer cases were reported from all GCC States accounted to 11.6% from all cancers and 23.2% from cancers among females. Cancer of urinary bladder is the third most common cancer in Bahraini males accounted to 7.7%. The average annual ASR was 13.4/100,000 population. The lowest ASR (8.0/100,000) was reported in 2005, while the highest rate (24.6/100,000) was reported in 1999 (5). Thi Qar shows predominance of Bladder Ca on Breast Ca and Leukemia. This kind of predominance may arise from highly incidence and prevalence of schistosomiasis and its

relation to Ca Bladder (6). In Qatari males urinary bladder cancer was the fourth most common cancer that accounted to 7.9%. The average annual ASR of bladder cancer was 14.3/100,000 population. The lowest ASR (7.2/100,000) was reported in 2005, while the highest rate (25.3/100,000) was reported in 2000 (5). Fig (5) and table (7) shown that the highest registration of Breast Cancer was noticed in Kirkuk, the explanation of this issue may be the same of above (registration of referred cases from Kurdistan region) and it need more studies after 2005 in which a special cancer registration were found for Kurdistan region. The significant and important result that needs further investigation is the high incidence rate of Breast cancer in Kerbella that exceed what was found in Maysan and ThiQar. Leukemia is the 12th most common cancer in the world. The estimated number of newly diagnosed cases of leukemia was 300,522 cases in 2002 accounting to about 2.8% of all new cancer cases with male to female ratio of 1.32: 1. In 2002, there were 222,506 reported deaths attributed to leukemia accounting to 3.3% of all cancer deaths (4). In the GCC States, Leukemia is the fourth most common cancer. Between January 1998 and December 2005 there were 4,913 cases of leukemia accounted to 7.8% from all cancers in the GCC States (5). In our study we notice that leukemia was the third most common cancer in Maysan in 2000 and 2005 and ThiQar in 2000 – 2005 as shown in table (5) and (8) while it was the second most common cancer in Karbella in 2000 and 2004 as shown in table (6), and it is not with top 3 cancers in Kirkuk. during 2004 which shows the highest leukemia registration in Iraq, we notice and as shown in table (8) that Maysan form the lowest leukemia incidence per 105 (1.8), while Kerbella form the highest one (4.82)

and then Kirkuk and ThiQar, the numbers of last 3 provinces were close to what found in Kingdom of Saudi Arabia in 2004 in which The five regions with the highest ASR were Najran region at 5.7/100,000, Qassim region at 4.8/100,000, Tabuk region at 4.2/100,000, Riyadh region at 4.1/100,000 and Jouf region at 3.5/100,000.(7). If we compare the results that extracted from 2005 Iraqi cancer registry concerning Maysan Province to the year 1384 (2005 – 2006) Iranian cancer registry concerning provinces that have borders with it (Khouzestan and Ilam) we will see that the crude incidence rates of all cancers per 105 in Khouzestan and Ilam were 67.41 and 41.84 respectively (8), while in Maysan it was closer to Ilam more than Khouzestan which was 31.04. Regarding breast cancer, during 2005 Maysan had registered 27 cases, it represents 11.1% of all types of cancers registered in the province and formed 3.4 case per 105. In Khouzestan, there was 299 cases had been registered, which represented 26.55% of all types of cancers, and formed 13.51 case per 105, while in Ilam they detect 15 cases which represented 18.75% of all cancer and 5.59 cases per 105 (8). Maysan showed higher

incidence rate of leukemia than Ilam and lower than Khouzestan, during 2005, 19 cases had been registered in Maysan; this no. represents 7.8% of all cancers registered in the province and 2.42 cases per 105, in the closer Iranian provinces and during 2005-2006, 11 and 209 cases of leukemia had registered in Ilam and Khouzestan respectively, these No. represent 5.15% and 8.94% of all cases registered in 2 provinces, which formed incidence rate of 1.95 and 4.76 per 105 in both provinces respectively.( 8). Finally, the most frequent cancers identified in this study in the four studied provinces (Breast, bladder, leukemia and lung ) generally reflect the predominant cancers in Iraq and the pattern is very close to the findings reported by other researchers (9-10)

## CONCLUSION:

1. There is an increase of cancer trend in Iraq (in general) and in Maysan.
2. Maysan shows the lowest trend and cancer registration during the 6 years in comparison to the 3 selected provinces.
3. Maysan shows the lowest breast Cancer and Leukemia registration during the 6 years

## TABLES AND FIGURES

Table 1: Estimated population in 4 provinces 2000 – 2005

| Provinces | Estimated population |         |         |         |         |         |
|-----------|----------------------|---------|---------|---------|---------|---------|
|           | 2000                 | 2001    | 2002    | 2003    | 2004    | 2005    |
| Maysan    | 687957               | 705939  | 724425  | 743409  | 762872  | 782826  |
| Kirkuk    | 794674               | 809191  | 824011  | 839121  | 854470  | 870098  |
| Karbella  | 670013               | 697503  | 726155  | 755994  | 787072  | 819376  |
| Thi Qar   | 1299888              | 1340968 | 1383411 | 1427220 | 1472405 | 1518962 |

## Cancer in Maysan compared to cancer In 3 other Provinces

Table No.2: Registered cancer cases in Iraq for the years 2000-2005

| Year  | No. Of cancer cases registered |
|-------|--------------------------------|
| 2000  | 10888                          |
| 2001  | 13332                          |
| 2002  | 13985                          |
| 2003  | 11248                          |
| 2004  | 14520                          |
| 2005  | 15172                          |
| Total | 79145                          |

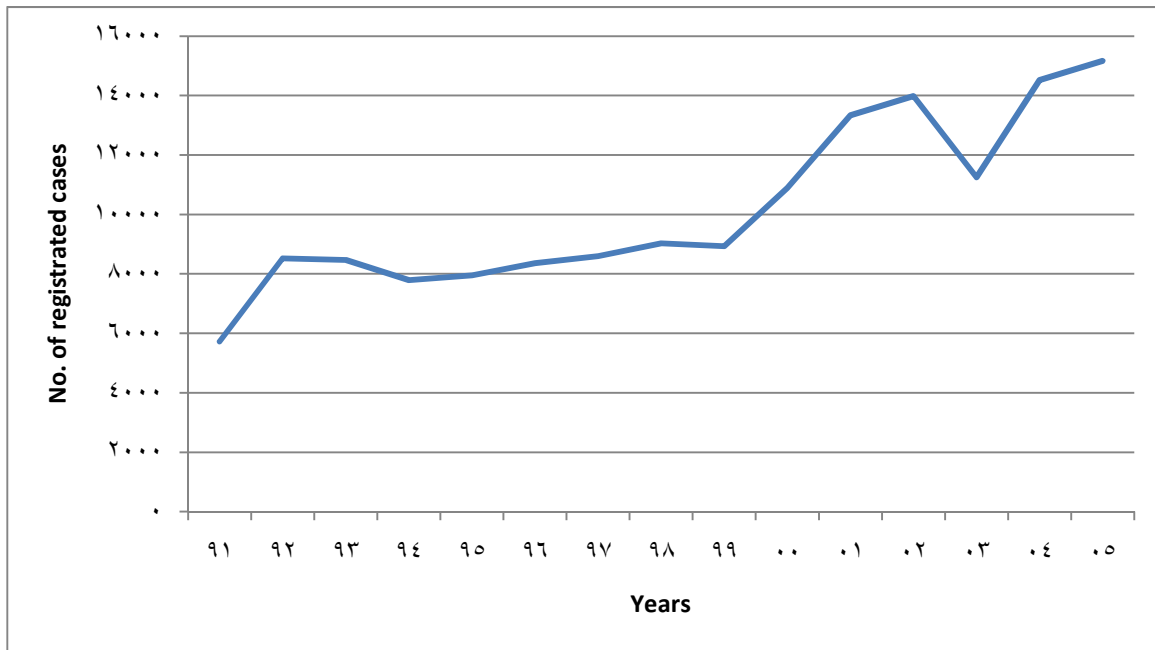


Fig (1) Time Trend of registered cancer cases in Iraq over the years 1991 - 2005

Table No.3: Registered cancer cases in the four provinces during 2000-2005.

| provinces | Total No Of cancer cases registered during 6 years |
|-----------|--|
| Maysan    | 1251   |
| Kirkuk    | 3018   |
| Kerballa  | 2003   |
| ThiQar    | 2561   |
| Total     | 8833   |

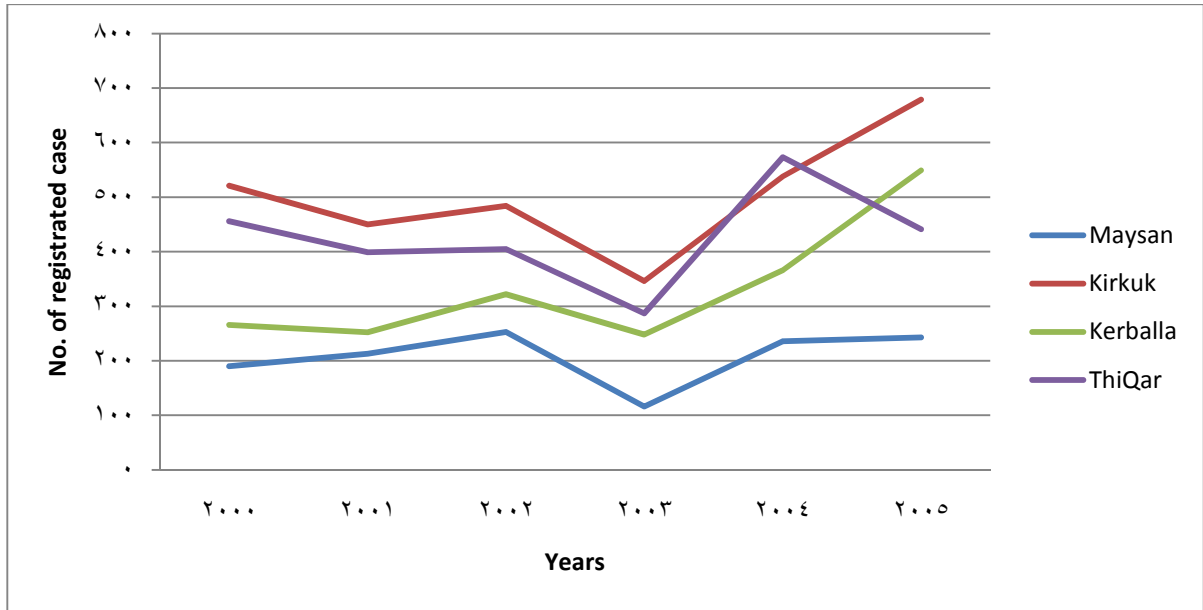


Fig (2) Time Trend of Cancer in four provinces 2000 - 2005

Table No. 4: cancer percentage of total in 4 provinces 2000 – 2005

| Provinces | % of Total cancer |      |      |      |      |      |
|-----------|-------------------|------|------|------|------|------|
|           | 2000              | 2001 | 2002 | 2003 | 2004 | 2005 |
| Maysan    | 1.75              | 1.60 | 1.81 | 1.03 | 1.63 | 1.60 |
| Kirkuk    | 4.79              | 3.38 | 3.46 | 3.08 | 3.71 | 4.48 |
| Karbella  | 2.44              | 1.89 | 2.30 | 2.20 | 2.52 | 3.62 |
| Thi Qar   | 4.19              | 2.99 | 2.90 | 2.55 | 3.95 | 2.91 |

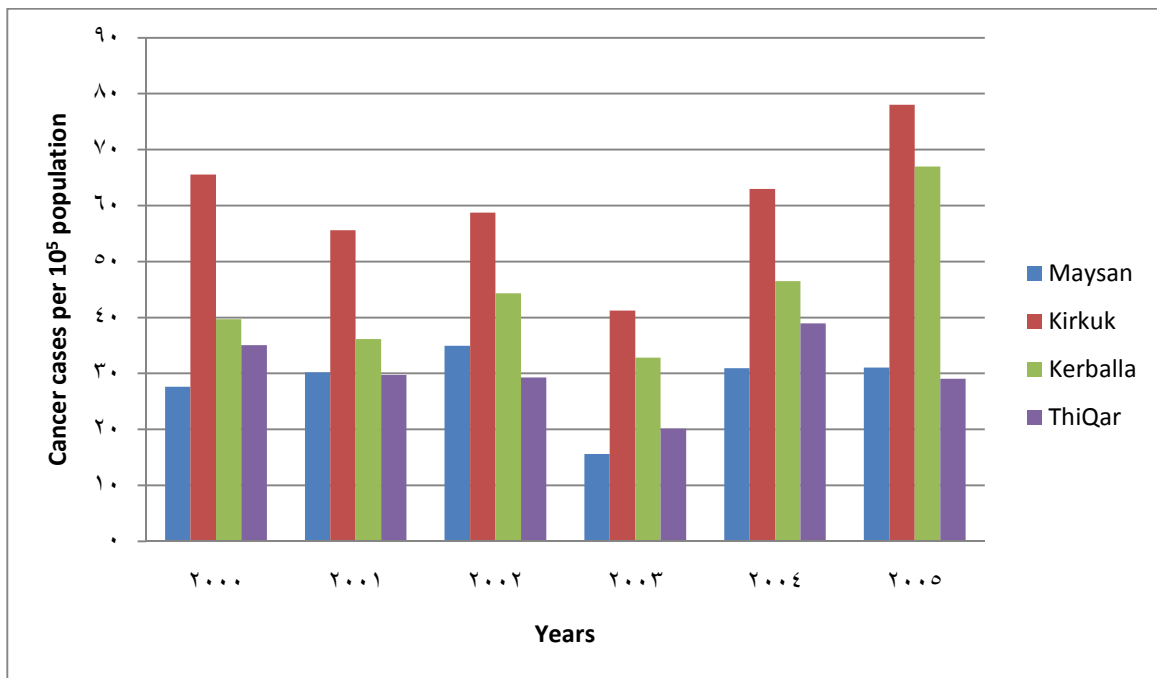


Fig (3) Cancer registered cases per 10<sup>5</sup> population in four provinces

## Cancer in Maysan compared to cancer In 3 other Provinces

Table 5: Top three cancers in Maysan by years

| 2000                 | 2001                  | 2002                    | 2004                     | 2005                |
|----------------------|-----------------------|-------------------------|--------------------------|---------------------|
| Bre (12.1)*(3.3)**   | Bre (17.8)(5.3)       | Bre (12.2) (4.2)        | Bre (14.4)(4.4)          | Bre (11.1)<br>(3.4) |
| Br. & lu.(11.0)(3.0) | Bla (12.2)(3.6)       | Bla (11.4) (4.0)        | Bra & CNS (8.0)<br>(2.4) | Bla (9.0) (2.8)     |
| Leu (10.0)(2.7)      | Br.&<br>lu.(9.4)(2.8) | N.H. lym<br>(11.4)(4.0) | Bla (8.0) (2.4)          | Leu (7.8)<br>(2.4)  |

Table 6: Top three cancers in Kirkuk by years

| 2000                | 2001                  | 2002                  | 2004                     | 2005                     |
|---------------------|-----------------------|-----------------------|--------------------------|--------------------------|
| Bre (13.0)*(8.5)**  | Bre<br>(20)(11.1)     | Bre<br>(17.7)(10.4)   | Bre<br>(16.9)(10.6)      | Bre (15.2)(11.8)         |
| N.H. lym (9.0)(5.9) | Br.&<br>lu.(7.7)(4.3) | Br.&<br>lu.(7.4)(4.4) | Br.&<br>lu.(13.7)(8.7)   | Br.&lu.(14.9)(11.6)      |
| Lar. (8.1)(5.2)     | Lar.<br>(6.4)(3.5)    | Lar. (6.4)(3.8)       | Bra & CNS<br>(7.4) (4.7) | Bra & CNS (6.5)<br>(5.1) |

Table 7: Top three cancers in Kerballa by years

| 2000               | 2001                     | 2002                     | 2004                  | 2005                   |
|--------------------|--------------------------|--------------------------|-----------------------|------------------------|
| Bre (13.9)*(5.5)** | Bre (17.5)(6.3)          | Bre (17.7) (7.8)         | Bre (15.0)(6.7)       | Bre (11.8)<br>(7.9)    |
| Leu (9.8)(3.9)     | Br.&<br>lu.(9.5)(3.4)    | Bra & CNS<br>(8.4) (3.7) | Leu (10.4)(4.8)       | Br.&<br>lu.(11.7)(7.8) |
| Lar. (7.9)(3.1)    | Bra & CNS (9.1)<br>(3.3) | Br.&<br>lu.(7.4)(3.3)    | Br.&<br>lu.(9.0)(4.2) | Bla(8.9) (6.0)         |

Table 8: Top three cancers in Thi Qar by years

| 2000               | 2001             | 2002             | 2004             | 2005                |
|--------------------|------------------|------------------|------------------|---------------------|
| Bre (13.8)*(4.8)** | Bla(14.3) (4.2)  | Bla(11.6) (3.4)  | Bla(16.9) (6.6)  | Bre (13.8)<br>(4.0) |
| Bla(12.5) (4.4)    | Bre (12.0) (3.6) | Bre (11.1) (3.2) | Bre (13.3) (5.2) | Bla(12.2) (3.6)     |
| Leu (10.5)(3.8)    | Leu (10.3)(3.1)  | Leu (10.1)(3.0)  | Leu (9.2)(3.6)   | Leu (9.5)(2.8)      |

\*% of each kind to the total No. of cancers, \*\* Incidence rate / 100,000 population, Bla= Bladder, Bre= Breast, Br. & Lu= Bronchus and Lung, Bra & CNS= Brain & CNS  
Lar. = Larynx, Leu=leukemia, N.H. Lym=Non – Hodgkin's lymphoma



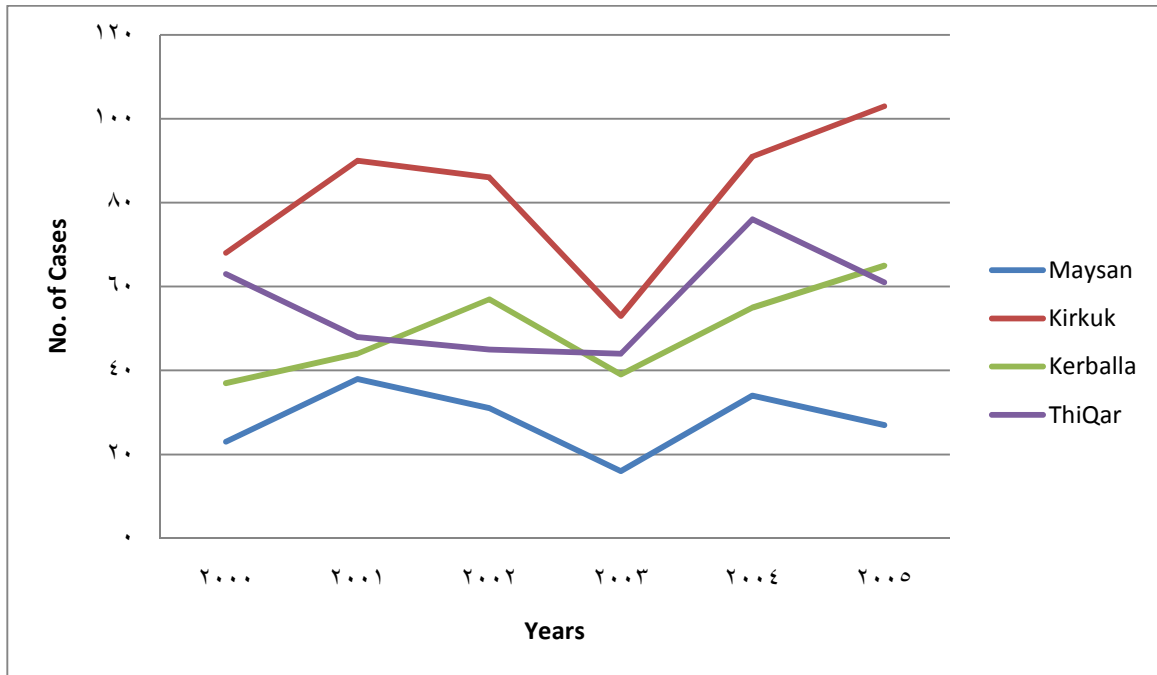


Figure 4: The time trends of the breast cancer cases (numbers) in the four provinces

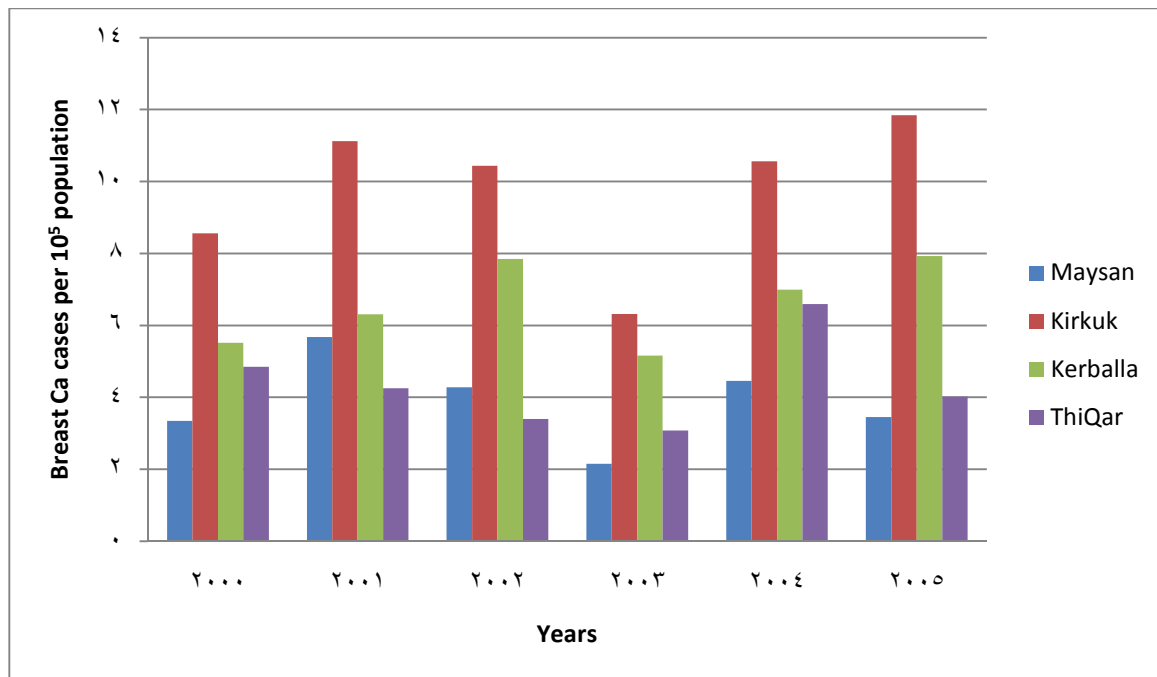


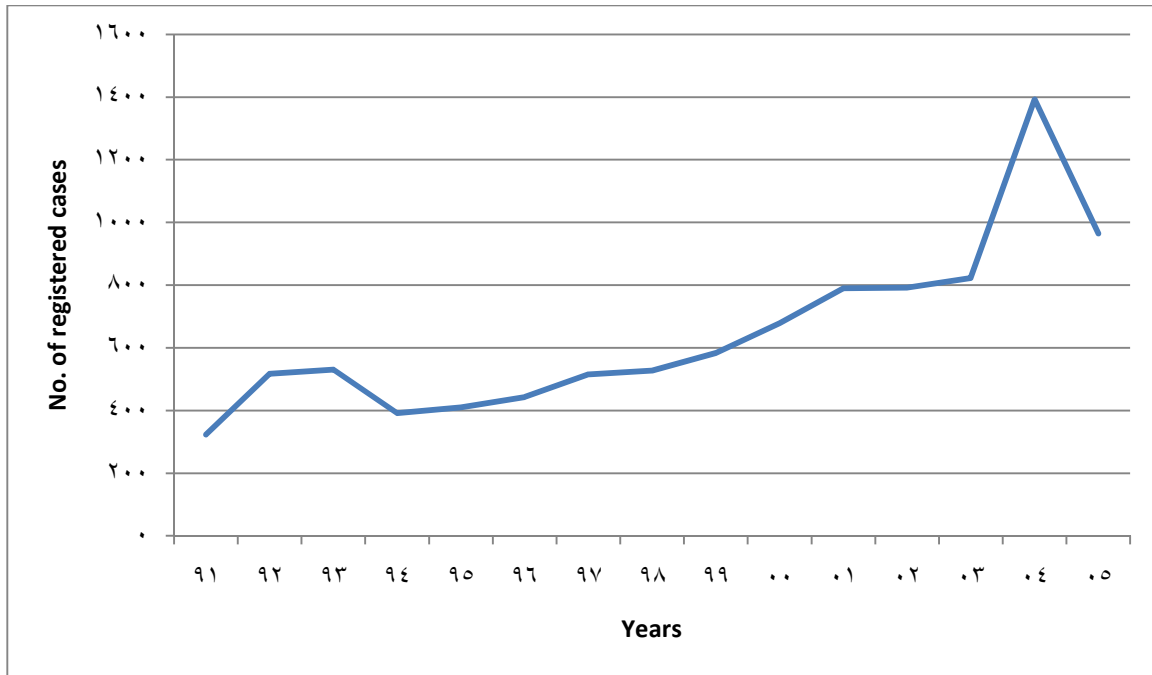
Fig (5) Breast Ca Registered cases / 10<sup>5</sup> population in 4 provinces

Table (7) Total No. of Breast Ca registered in 4 provinces 2000 - 2005

| provinces | Total No Of Breast cancer cases registered during 6 years |
|-----------|---|
| Maysan    | 169   |
| Kirkuk    | 491   |
| Kerballa  | 297   |
| ThiQar    | 337   |

Cancer in Maysan compared to cancer In 3 other Provinces

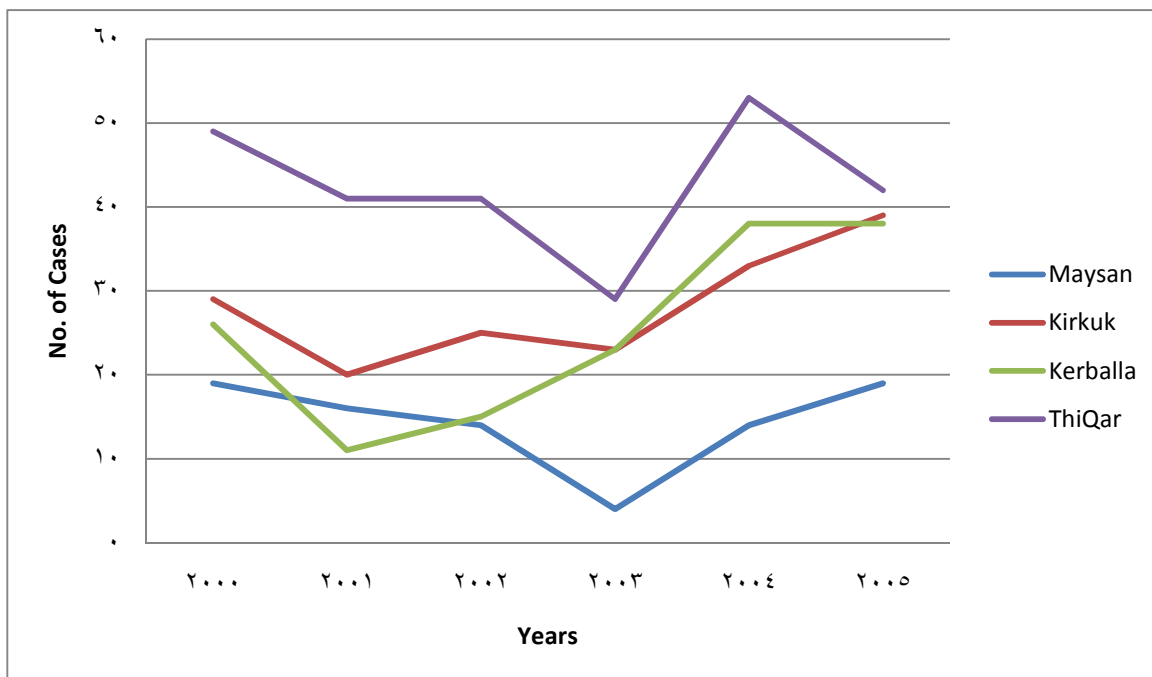
Leukemia



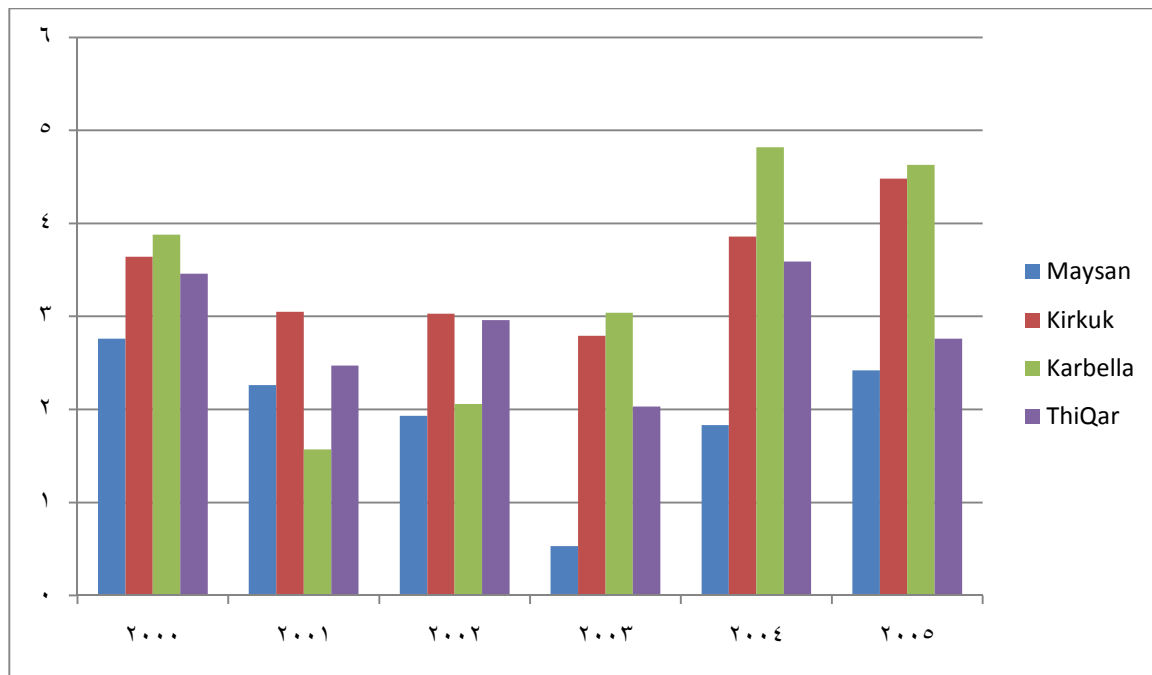
**Fig (6) Time Trend of leukemia in Iraq 1991 - 2005**

**Table (8) Total No Of leukemia cases registered during 6 years in four provinces**

| provinces | Total No Of leukemia cases registered during 6 years |
|-----------|--|
| Maysan    | 86   |
| Kirkuk    | 169  |
| Kerballa  | 151  |
| Thi Qar   | 255  |



**Fig (7) Time trends of Leukemia in 4 provinces 2000 - 2005**



**Fig (8) Leukemia Registered cases / 10<sup>5</sup> population in 4 provinces**

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