

# Electromagnetic Fields and Its Biologic Effects on Al-Muthanna Citizens

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**Abstract.** Mobile telephones have become an elementary part of our life today, and are also one of the most relevant media to communicate. Several portable towers, especially in huddled urban areas and concrete areas, are therefore planted to hide additional areas. Now the bottom stations at those locations have transceivers using RF waves to determine contact between users in the mobile network. Due to the variety of base stations, it is needed, with greater portable usage and competition from the market and with new technical capacities. Thermal and non-thermal effects arise from the use of microwaves in mobile contact and have detrimental implications on the biological system. In this paper, a study on the quantification of electromagnetic field (EMF) radiation from mobile towers and their health impacts on human beings has been carried out in Samawa city of Iraq. The aim of this paper is to conduct a separate analysis of the recent document on potential biological and health effects and expected methods for microwave radiation to minimize their effects. This investigation is concentrated on the information and data that we are obtained from Samawa hospital are environment institutes of the same copy this information stapled and compared with global information of the distribution of electronic tower final in Samawa and its effects of city and the numbers inherent overseas and risk.

## INTRODUCTION

Human exposure to radiation was beginning through the second world war, in using radar. Also, since twenty years ago, devices use that deal with radio frequency and microwave frequencies have been growth rapidly .in addition to mobile communication using these . this grand dealing will mobile radar and other communication devices, we began afraid from the effect of miscellaneous radiations which obtained from such devices. These radiations are penetrated through the brain, eyes, and other smooth tissues these body organs undergo specific problems and health effects on a person's body. All radiation that are emitted by miscellaneous devices with specific bands of frequencies, was limited according to local and international standards, such as "world health organization (who)" and "federal communication commission(FCC)" and others. Man communication companies in the middle east especially in Iraq, such as Zain, korrek, and Asia cell, used frequency range ( 815 – 900)MHZ

## RELATED WORKS

This technology was widely used in the 1990s with the introduction of 900 and 1800 megahertz (MHz) mobile telephones using the digital GSM (Global Mobile Communication System) bandwidths and with the subsequent introduction of the Universal Mobile Telecommunication System (UMTS). The public concern and considerable debate about the potential health effects of the technology's electromagnetic field radiofrequency emissions have come from this development [1]. In [10] presented Staff's Knowledge and Practices in Environmental Foundation Regarding Prevention from Mobile and Tower Health Risks in Erbil City, Iraq. In [11] the authors presented Impact of human mobility on the emergence of dengue epidemics in Pakistan. In [12] the authors studied the Effects of Mobile Tower Radiations on human health: A case study from Bangalore.

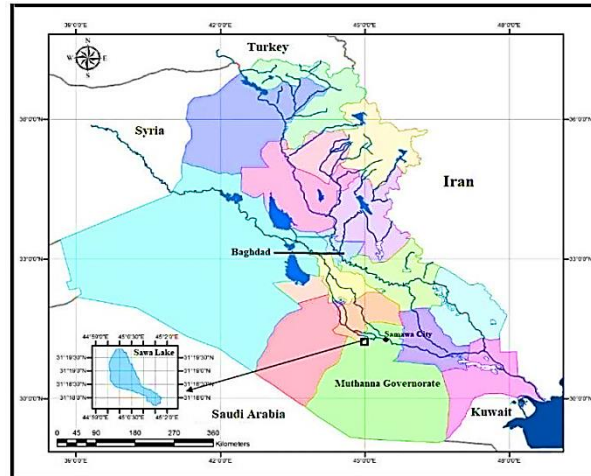


FIGURE 1. Map of Iraq showing the location of study

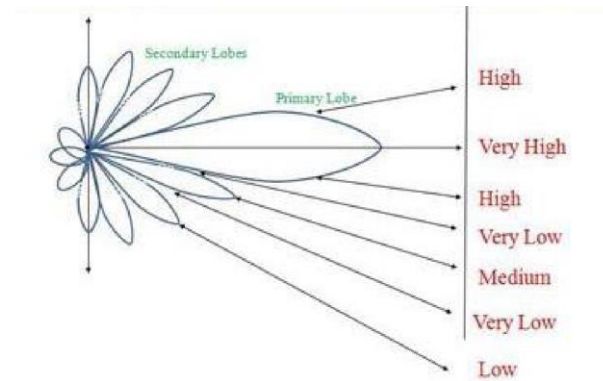
## EPIDEMIOLOGICAL STUDIES

In all over the world studies indicate, that the rates of cancer diseases , especially, leukemia for kids and adults humans, has caused by exposure for radio and radar radiations in miscellaneous fields. Such as (1) Poladian military study in 1996 (2) south of Sydney study in saturnalia 1996. (3) san Francisco study 1992 (4) Hawaii study of kids leukemia (Dr. coper 1994) . (5) Britain study of TV transmitter (Dr. Dolk and his partners 1997).the types of leukemia in above studies are:( acute Lymphocytic leukemia),( chronic Lymphocytic leukemia),( acute Moloid leukemia) and ( Chronic Moloid Leukemia) [2].

Due to the similarity between the waves emitted from mobile towers and radio broadcast .long-term studies on citizens whom are settlers in this regions must be concerned ,when towers are built ,specially their relation with miscellaneous cancers.by calculate the power density and measure human body absorption rate of radiations (human rate mean of exposure to power density [2] .

## RADIATION PATTERN OF A MOBILE TOWER ANTENNA

The radiation in the horizontal direction is the highest from the primary lobes. The most severe case of exposed radiation is the direct exposure to the primary lobes along the antenna line. Secondary lobe radiation ranges between medium and very low. An important factor is also the distance from the radiation source. The density of power varies by  $(1/R^2)$  where R is the distance. The radiation pattern is shown in the following figure [3].



**FIGURE 2.** Radiation pattern of mobile tower

The factors that determine the effect range of electromagnetic waves on human body [4]:

- 1- Electromagnetic power increases when radiations frequencies are increased
- 2- The amount of radiational absorption increases when exposure time is increased, as well as this amount is effected by the type of clothes .
- 3- The increasing of air motion surrounded the body leads to decreasing of radiations affects.
- 4- The weather humidity rate raises the radiation affects .
- 5- The weather temprture rate raises the radiation affects .
- 6- The absence of blood in some tissues such as eye leads to increasing of radiation affects.
- 7- The human body absorption of radiations dependent on his age ,the absorbed amount of radiations by child is greater than that absorbed by the adult.

## **THE MOBILE TECHNIQUE AND IT'S RELATION WITH THE HEALTH**

The mobile system in Iraq is global system of mobile (GSM) , so is used in(270) states. Mobile phone allow people to be connected at all times. The devices of low power radio waves ,which are called radio channels, sends and receives signals with frequencies of(900mega hertz-3.2 gega hertz) out or inside cities .Global system for mobile(GSM) association supports several scientific organizations ,that are deals with environmental and health effects, from1992 till 2008.these bodies develops standards and specifications for this technology ,and cooperates with the laws of different governments with regard to environmental and health effects, it goals to protect people health .There are many protocols and rules that control the construction of radio stations within residential blocks all over the world. In Iraq a protocol was established in 2007 by the Iraqi Ministry of health and environment, So that it guarantees the health and safety of all Iraqis citizens [5].

## **RADIATION RISK TO PREGNANT WOMEN**

The fact that these radiations react continuously to weak tissues and increasing cells is unimaginative for both a pregnant fetal and a wife. The membrane that prevents the transition of certain materials between maternal and fetal blood and protects fetal diseases may damage the placental barrier that prevents the embryo's mobile phone and turret radiation exposure [6].

## **RADIATION RISK TO CHILDREN**

Because children are thinner cranial bones and skin, thinner, more elastic ore, lower blood cell volume and greater conductivity of nerve cells, they are more impregnated to mobile telephone radiation than adults by using the

same phone. In childhood cells, the cancer is reproduced faster than in adults. Tracy Lightfoot et al. [6] [7] found memory errors, cognitive function and mental health problems due to exposure to EMF. Ching et al., [8] has confirmed decreases in skin resistance [9].

## **BRAIN DISEASES AND CANCER**

Daived and his team discover in Nottingham university ,that simple structure worms, when they were exposure to ultrasound grown up in 5% rate comparing with those are not exposure to ultrasound. That means short waves affecting on the speed of cell division. Finally, the research team discover same result when they used mammalian animals. This results will raise fears about the ability of these short waves to increase the division of cancer cells. The fear has arisen again about the effect of mobile phone on the brain and other organs. As well as the Britain study indicated that rates of brain cancer appeared among some cell phone users. In addition to, head of the biophysics department in the Bristol Center, confirmed that an effect in the brain had become a reality.an other study by Finns scientists indicated that the brain membrane is effected by electromagnetic radiations of mobile phones . German chemist Friedelheim Follenhorst (13) has warned from the dangers of leaving devices of mobile phone is open in the bedrooms on human brain, and he said that keeping these devices or any satellite transmitters or receivers in the bedrooms causes a state of insomnia, anxiety, and damage to the brain, which leads to destruction of the immune system in the body [5].

## **EAR TUMORS**

The tumor of auditory nerve is one of Polyps, otherwise, the study of Swedish Karolinska Institute on 750 persons discovered that the rate of neuromas in ear area increased in 9.3 ones between those whom are using the mobile phone closer to their ears. Further ,this study indicated that the auditory nerve tumors depending on exposure time. So, the study urged people to use a headphone during a call. [5]

## **THE GEOGRAPHIC DISTRIBUTION OF MOBILE PHONE TOWERS IN SAMWA**

In the Republic of Iraq, there are many communications companies which offer mobile phone service like Zain, Asiacell, and Korek. These systems works on frequency range (900-815) MHz to about (950-960)MHz. In Wasit governorate, the number of towers which were installed about 47, 37, and 21, zain, Asia, and Korek communication companies respectively as shown in fig2, this paper focused on the level of radiation that emitted from Zain and Asia cell towers.

The geographical distribution of Asia Cell towers varied between the districts and sub-districts of the study area. As the data contained in Table (2) and (Figure 2) showed that the magnitude of this discrepancy, as the total number of the towers belonging to Asia Cell Company in Samawah city reached 43 towers, a high numbers belong to large area (39) kilometers square . While, kider district has 12 towers which are distributed on 8 kilometers and rumaiitha city 21 towers ,distributed on 18 kilometers square ,the increasing amount of towers belong to large area and high population. In Uruk district has 6 towers in 6 kilometers square In Salman district has 6 towers in 1 kilometers square. The 6 towers belong to Asia cell only .in Salman the distribution density of towers alone is greater than those of total distribution density of mobile phone towers companies.

TABLE 1. Distribution mobile company

City name	Area Km <sup>2</sup>	Distirbtion mobil phone company					
		Asiacell	zain-iq	Al-farahidi	AI-nakeel	our call	
Samawah	39	43	13	–	2	4	4 105
Kider	8	12	2	–	–	–	2 24
Rumtha	18	21	5	1	1	–	3 49
Uruk	6	6	2	–	–	–	1 15
Salmen	1	6		–	–	–	1 8

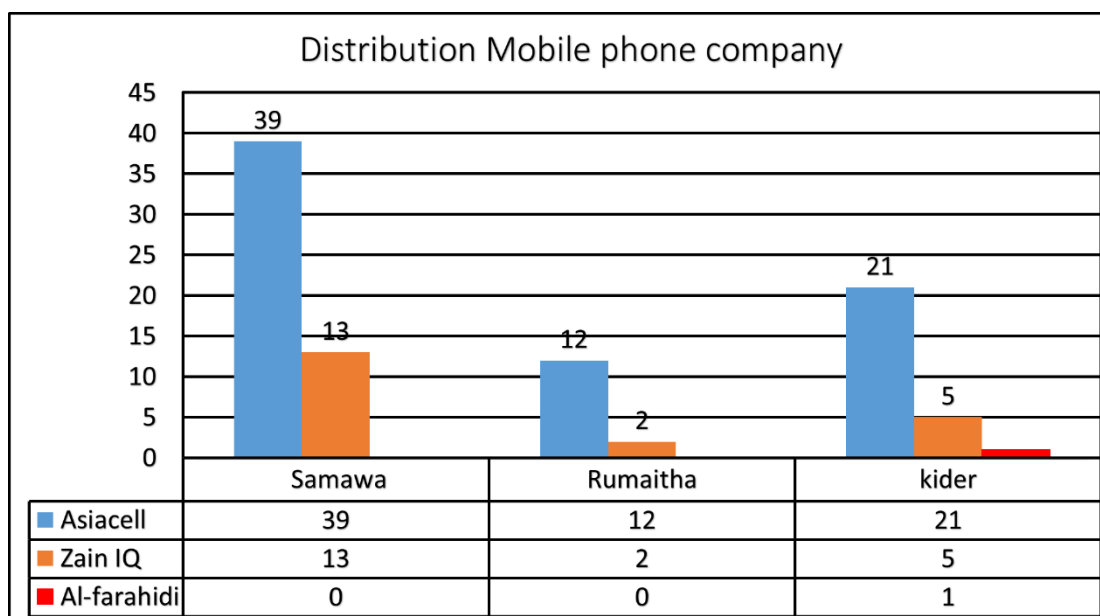
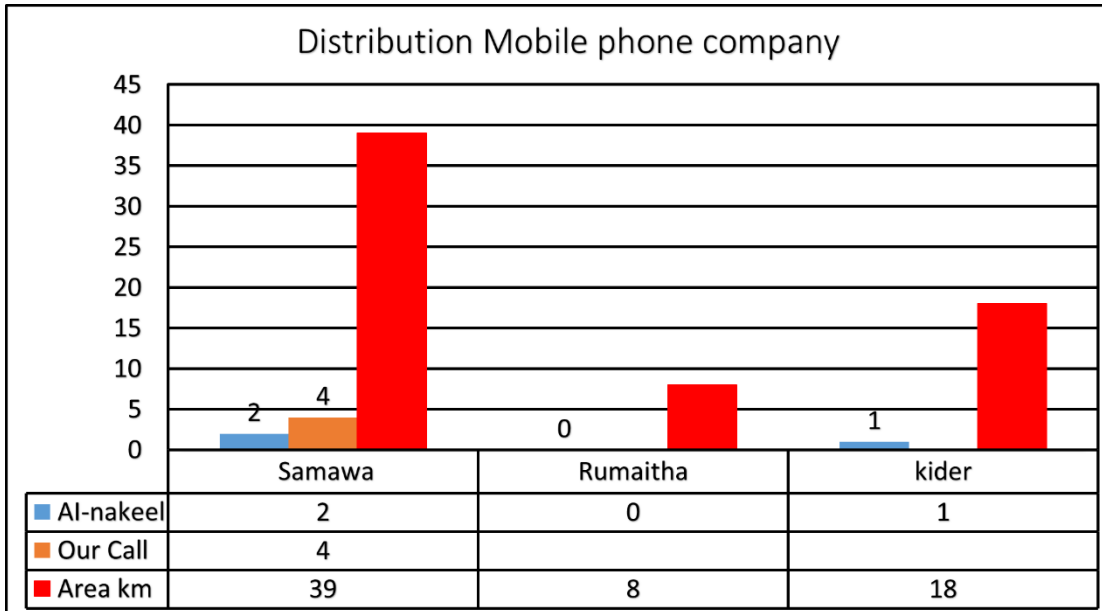
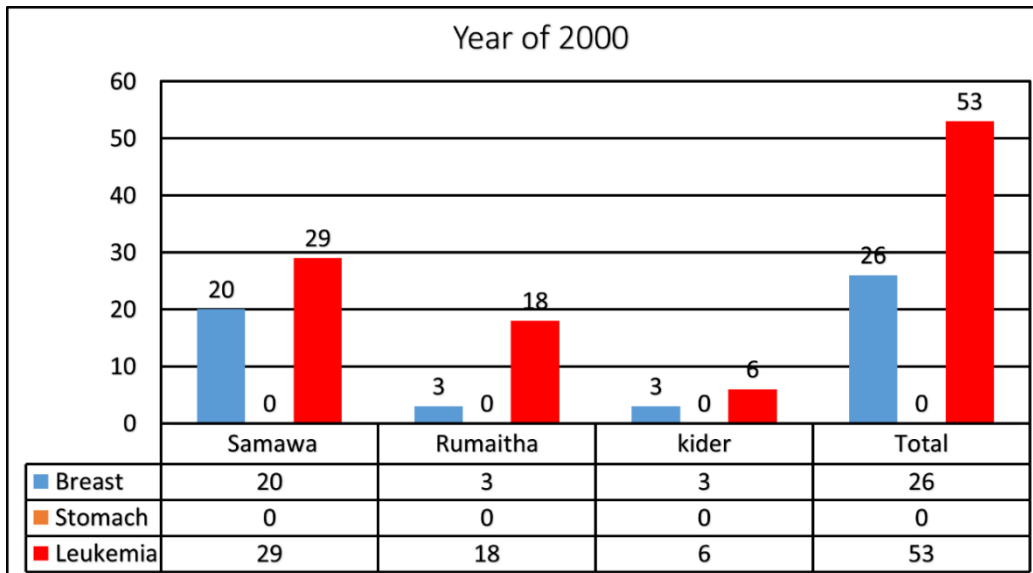


FIGURE 3. Comparison between distribution mobile phone Asiaccell, zain IQ and Al-Farahidi Company in Samawa, Rumaitha, and Kider

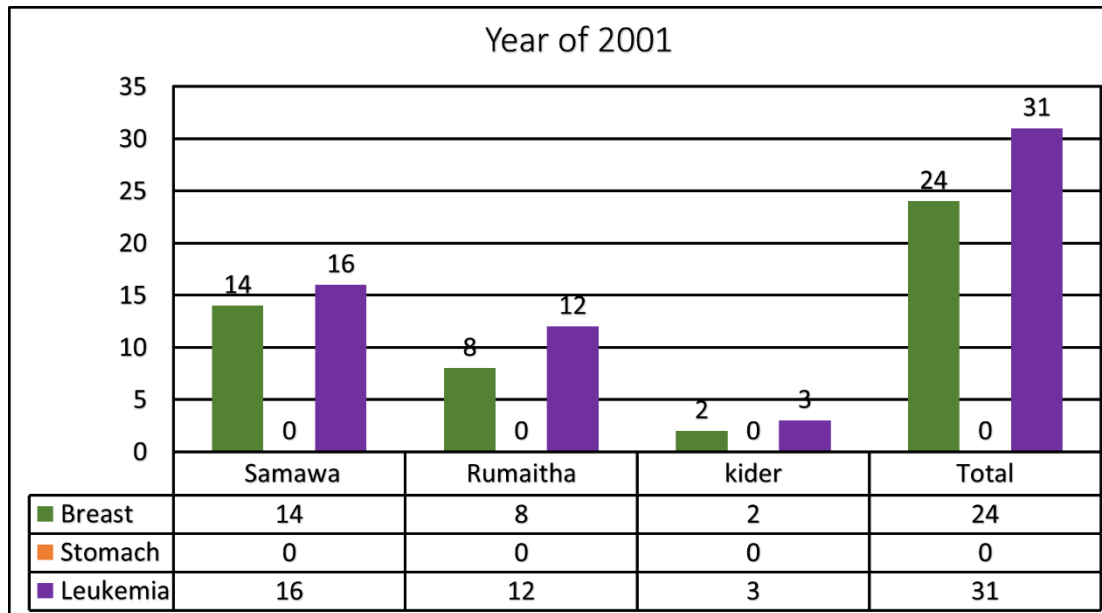


**FIGURE 4:** Comparison between distribution mobile phone Al-nakeel, Our Call Company in Samawa, Rumaitha, and Kider

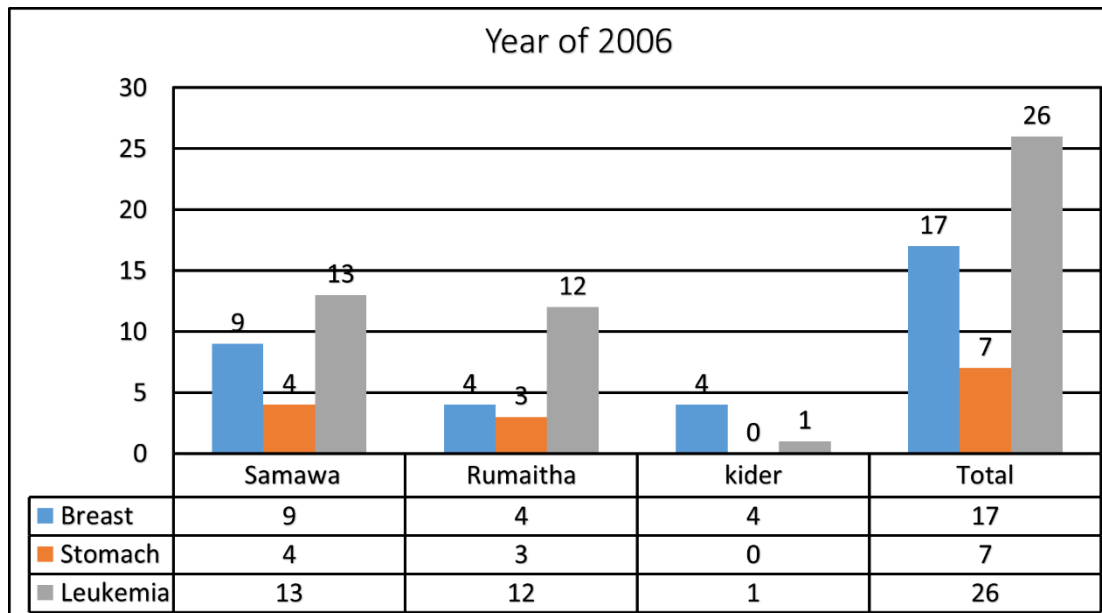
All studies and research indicated that the exposure to electromagnetic radiations cause chronic headache, tension, terror, depression, increased skin sensitivity, eyes sensitivity, heart disorders arthritis, and impotence. Also cause to premature aging. These diseases occur when electromagnetic radiations more than 0.5 milliwatt/cm square. In general the electromagnetic radiations (microwaves) is represented by their wavelengths of ranging from one meter to one millimeter, also their frequencies between 300 MHz (0.3 GHz) and 300 GHz.



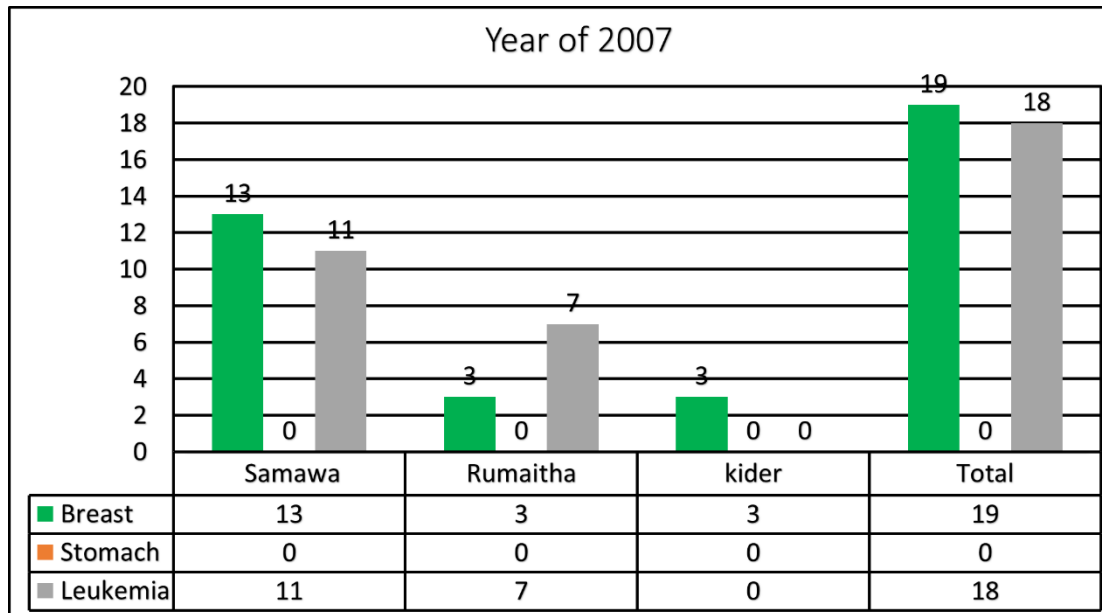
**FIGURE 5.** Comparison between Breast, Stomach and Leukemia in Samawa, Rumaitha, and Kider in 2000 year



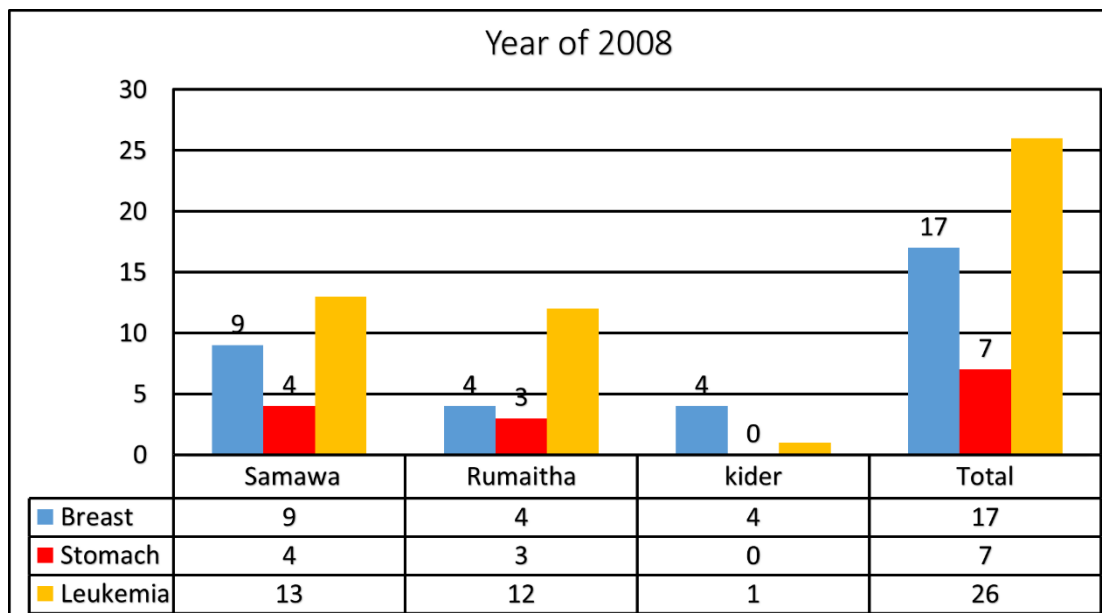
**FIGURE 6.** Comparison between Breast, Stomach and Leukemia in Samawa, Rumaitha, and Kider in 2001 year



**FIGURE 7.** Comparison between Breast, Stomach and Leukemia in Samawa, Rumaitha, and Kider in 2001 year

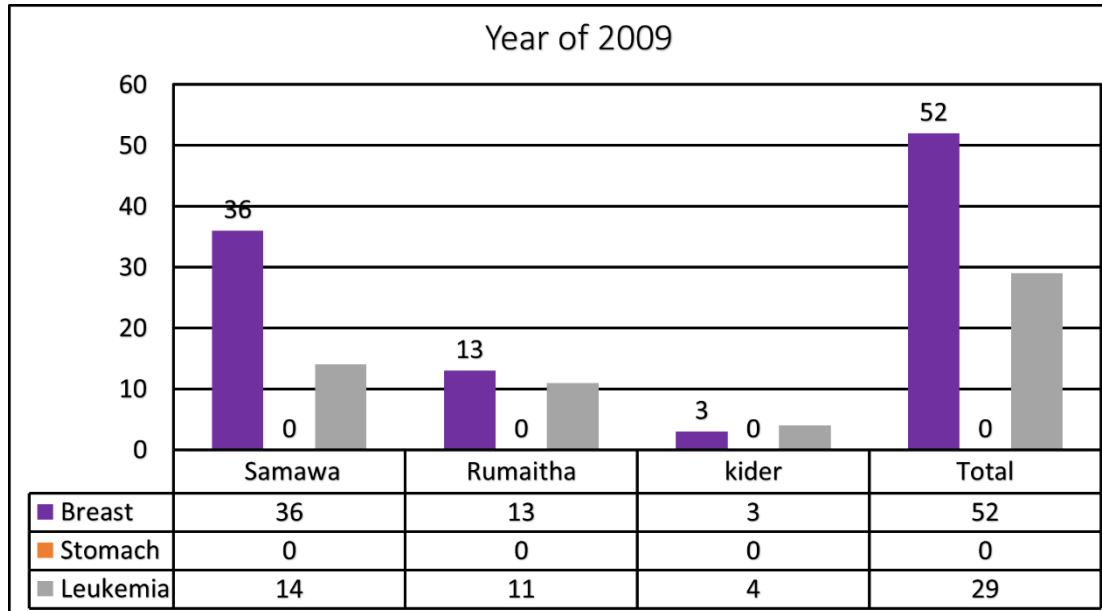


**FIGURE 8.** Comparison between Breast, Stomach and Leukemia in Samawa, Rumaitha, and Kider in 2007 year

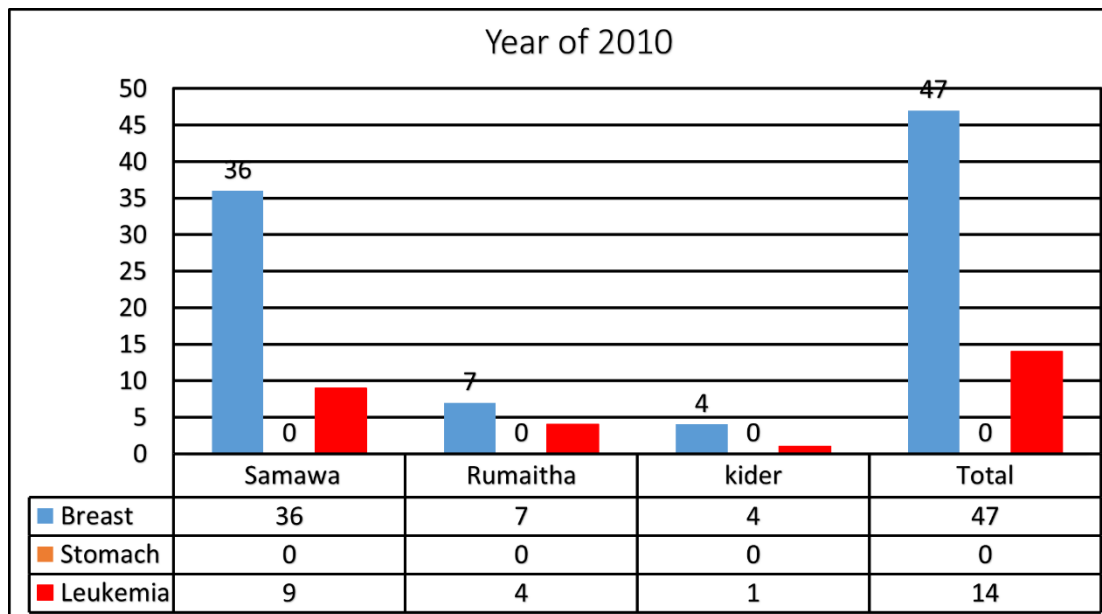


**FIGURE 9.** Comparison between Breast, Stomach and Leukemia in Samawa, Rumaitha, and Kider in 2008 year





**FIGURE 10:** Comparison between Breast, Stomach and Leukemia in Samawa, Rumaitha, and Kider in 2009 year



**FIGURE 11.** Comparison between Breast, Stomach and Leukemia in Samawa, Rumaitha, and Kider in 2010 year

## CONCLUSION

Most of the symptoms in the exposed group were statistically significant (headache, irritability, nausea, appetite loss, discomfort, sleep disturbance, depression, memory loss difficulty in concentration and dizziness). The results show clearly the strong risk factor for all adverse health effects identified for electromagnetic radiation (EMR) by cellular telephones and cellphone tower radiation, as they share the same biological mechanisms. The greatest risk is to radiation from the phone tower because the human head has a high exposure and because the brain tissues and brain processes are very sensitive. As well as increasing the cancers in between the citizens of all over Almathanna government according to information obtained Almathanna health directorate.

## RECOMMENDATIONS

1. Spreading the environmental culture in the region by educating citizens about the dangers of using the roofs of their homes to install mobile phone towers
2. To oblige the owners of companies to apply environmental determinants in the construction of those stations and not to minimize the effects of those errors that cause radiation pollution to the area at different levels.
3. Reducing the construction of multi-storey buildings to reduce the residents' exposure to radiation and the placement of materials
4. Move the towers
5. Which are located within the vital areas of the city in locations where environmental safety applies

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