

## **A field and statistical study on the spread of Tuberculosis in various districts of Baghdad city for the years 2009 - 2012**

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**Summary:** Tuberculosis (TB) is a potentially fatal contagious disease that can affect almost any part of the body but is mainly an infection of the lungs. It is caused by a bacterial microorganism, the tubercle bacillus or *Mycobacterium tuberculosis*. Although TB can be treated, cured, and can be prevented if persons at risk take certain drugs, scientists have never come close to wiping it out. Few diseases have caused so much distressing illness for centuries and claimed so many lives.

*In this statistical study on tuberculosis disease, samples were obtained from Baghdad city, ensuring different sex, ages, and for the last four years.*

*The study indicates that this disease is more in female than male, the mature age is more susceptible than other ages, and the education courses plays an important rule in preventing the spread of the disease.*

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### **I. Introduction**

Where and when humans first became afflicted with tuberculosis is unknown, but it appears to have existed for several thousands of years. Ancient Hindu texts (3000 BP) refer to TB as Rogaraj, the king of disease and Rajayakshma, the disease of kings. The first of these names emphasize that this disease was, and in many countries still is, the leading cause of death in human societies. The second name stresses that TB, being an infectious disease [1]

On March 24, 1882, Dr. Robert Koch announced the isolation of *Mycobacterium tuberculosis*, the bacteria that cause tuberculosis (TB) during this time, Dr. Koch's discovery was the most important step taken toward the control and elimination of this deadly disease [2].

Tuberculosis is an infectious disease caused by the bacillus *Mycobacterium tuberculosis*. It commonly affects the lungs (pulmonary TB) but can affect other sites as well (extra pulmonary TB) and affects mostly adults in the economically productive age groups around two third of cases are estimated to occur among people aged 11-59 years [3].

TB is a multi-systemic disease with myriad presentation and manifestations, and it is the most common cause of infectious disease-related mortality worldwide. The World Health Organization (WHO) has estimated that 2 billion people (1/3 of the world population) have latent TB [4].

Most infected people have latent TB meaning they have the tuberculosis bacilli in their bodies, but their immune systems protect them from becoming sick [1-1]. TB is a contagious disease. Like the common cold, it spreads through the air. Only people who are sick with TB in their lungs are infectious [5]. New TB treatments are being developed [6], and new TB vaccines are under investigation [7].

The prevalence of tuberculosis is continuing to increase because of the increased number of patients infected with human immune deficiency virus, bacterial resistance to medications, increased international travel and immigration from countries with high prevalence, and the growing numbers of the homeless and drug abusers [8].

All members of the closely related phylogenetic grouping of *Mycobacteria* known collectively as the *Mycobacterium tuberculosis* complex may cause tuberculosis in a range of species including man. Some members of this group are predominantly human (*M. tuberculosis*, *M. africanum*, *M. canettii*) or rodent pathogens (*M. microti*), whereas others have a wide host spectrum (*M. bovis*; *M. caprae*) [9,10].

Tuberculosis or *M. bovis*; however, it is now apparent that phylogenetically it preceded *M. bovis* and it is only since the development of genotyping techniques allowing greater discrimination that its existence became apparent [11]. The *Mycobacterium tuberculosis* complex (MTC) is uniquely comprised of seven closely related, host-associated organisms responsible for tuberculosis in mammals and humans with direct host-to-host transmission [12,13].

With more than 36 million people have cured of tuberculosis between 1995 and 2008 [14] and 9 million new cases are diagnosed worldwide each year [15]. The health of those affected over the long term in Saharan Africa, considered by WHO to be "high burden countries." Sub-Saharan Africa has the highest incidence of the disease [16,17,18]. In 2009, the disease killed 1.7 million people [5] TB is one of the top ten

causes of illness, death, and disability worldwide and is the leading cause of death from a curable infectious disease [19,20].

Mycobacterium tuberculosis is spread by small airborne droplets, called droplet nuclei, generated by the coughing, sneezing, talking, or singing of a person with pulmonary or laryngeal tuberculosis. These minuscule droplets can remain airborne for minutes to hours after expectoration [21]. Tuberculosis is a communicable disease with pulmonary TB are the most important source of infection. Infection is initiated by inhalation of droplet nuclei, which are particles of 1-5  $\mu\text{m}$  in diameter [22].

The risk of infection is dependant on several factors such as the infectiousness of the source case, the closeness of contact, the bacillary load inhaled, and the immune status of the potential host [22,23]. After primary infection, TB may reactivate at anytime and anywhere in the body [24,25]. Clinical manifestations of TB are variable and depend on a number of factors that are related to the microbe, the host and the environment [26].

The patients with active tuberculosis are patients who have the bacilli inside their bodies and the immune system are failed to eradicate this bacilli therefore causing infection in the lungs or other parts of the body. Symptoms may include a chronic bad cough, pain in the chest, or coughing up blood. Treatment can be as long as 12 months and typically involves taking several different antibiotics. Most cases of active TB (5-6 million annually) occur during the economically productive years of peoples lives (13-59 years) [27]. Patients identified as TB suspects are referred for smear microscopy to one of the specially equipped laboratories at the diagnostic and treatment centers. Identified TB patients are treated at the same sites using a standardized 8-month regimen with an initial phase of 2 months consisting of four drugs (rifampicin [RMP], isoniazid [INH], ethambutol [EMB] and pyrazinamide [PZA]) followed by 6 months of INH and EMS (2RHEZ/6HE). New pulmonary TB patients undergo four follow-up examinations, at 2, 3, 5 and 7/8 months. The 3-month follow-up is performed in the case of a positive result at the 2-month follow-up, while the other three are compulsory. These examinations are free of charge [28,29]. The cure rate was higher among patients who were smear-negative at the 2-month follow-up (77.3%) [30].

The patients suffering from multi drugs resisting (MDR-TB) are defined as patients who are resistant to at least the 2 most effective first line drugs, isoniazid and rifampin [31]. (MDR-TB) can develop when patients do not finish their full course of medication. Sometimes people stop taking their medication because they feel better, or they move away from the "area where they first received treatment to a new location. If people stop taking their treatment too soon they will most likely get sick with TB again. Since the TB bacteria in this person's body have already been exposed to TB drugs, the bacteria may well have developed resistance. People who develop multi drug resistant TB can spread it easily to other, as easily as regular TB [1,32].

The importance of this study is to show a general scale about the incidence of Tuberculosis disease in different areas in Baghdad, and different sex and age in the last four years (2009-2012), also to demonstrate the education part for the patient health. Also the role of education in the prevision of contamination with bacteria and other causative organisms.

## **II. Method**

The data collected in this study were obtained by the students from the Iraq National TB Center in Baghdad city. The data obtained were classified according to the ages into five age groups ranged from 1 day old to more than 60 years, for both male and female for the last four years (2009-2012).

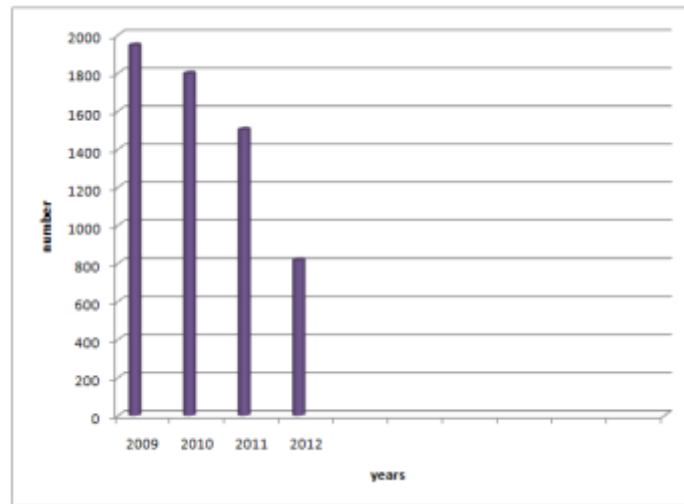
All the results obtained were expressed as Mean  $\pm$  SEM statistically significances in parameters was calculated using Student-t-test.

## **III. Results**

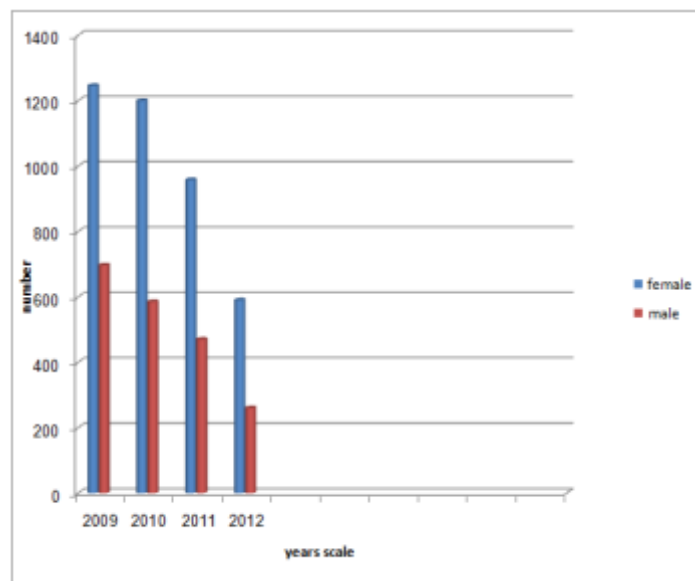
The data obtained in this search shows clearly that female were more susceptible to TB disease than male, and that was clear for the last four years but more evident in 2011-2012 as in Figure 1 ( $P < 0.001$ ).

The data obtained in this study shows that the incidence of TB disease significantly more in female than male in all the data collected in the last four years as in Figure 2 ( $P < 0.001$ ).

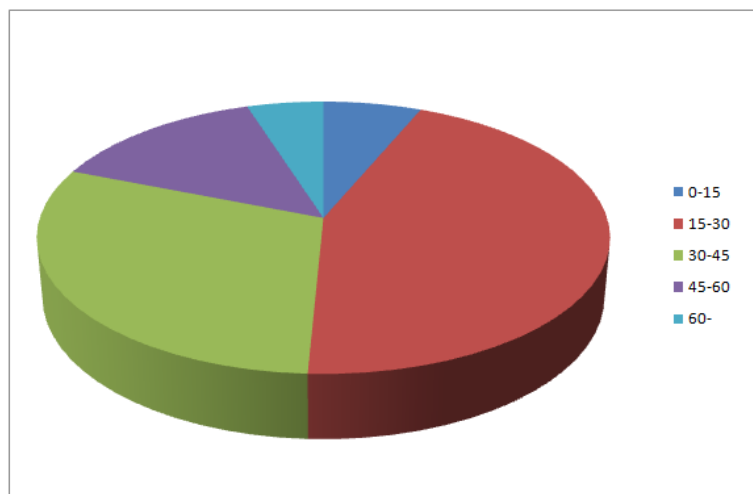
Also, the results demonstrates that TB disease was widely and significantly occurred in a range of age 15-45 years old in both sex in Baghdad City and also for the last four years see Figures 3,4,5,&6 ( $P < 0.05$ ,  $P < 0.05$ ,  $P < 0.001$ , &  $P < 0.001$  respectively).



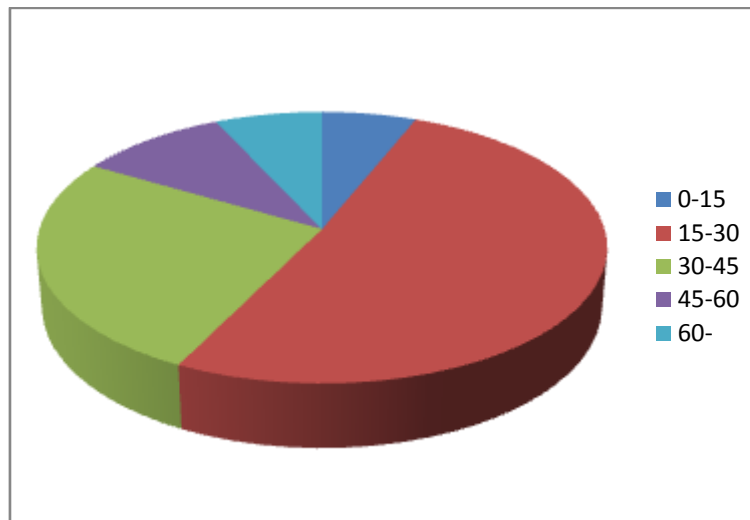
**Figure -1:-** The incidence of TB disease in both sexes for the last four years in Baghdad city .



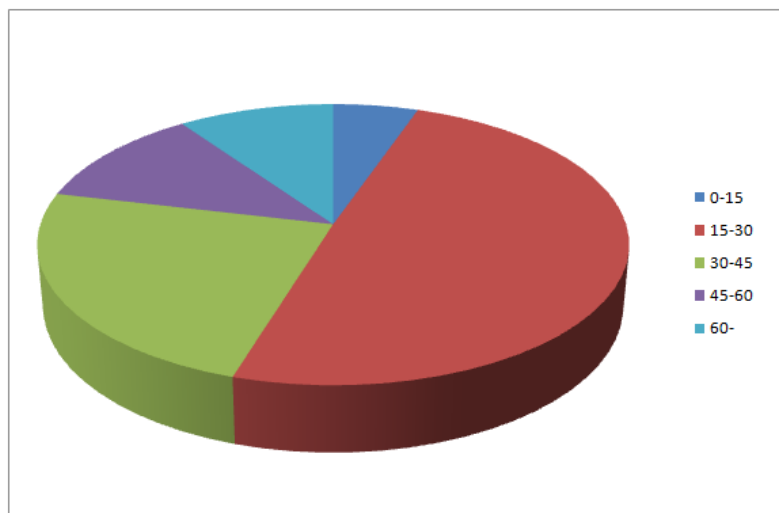
**Figure 2 :-** The incidence of TB disease in male and female for the last four years in Baghdad city .



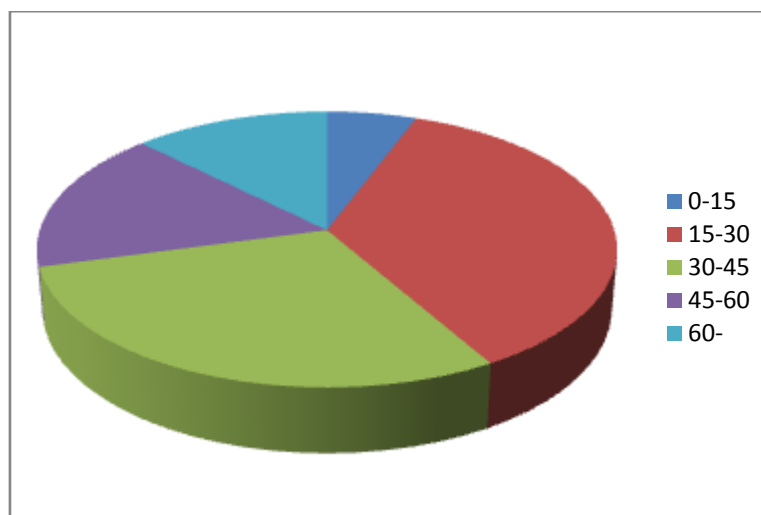
**Figure-3:-** The incidence of TB disease in Baghdad city at different ages intervals in 2009.



**Figure-4 :- The incidence of TB disease in Baghdad city at different ages intervals in 2010.**



**Figure-5:- The incidence of TB disease in Baghdad city at different ages intervals in 2011.**



**Figure-6:-The incidence of TB disease in Baghdad city at different ages intervals in 2012.**

#### IV. Discussion

Tuberculosis is caused by bacteria that spread from person to person through microscopic droplets released into the air. This can happen when someone with the untreated, active form of tuberculosis coughs, speaks, sneezes, spits, laughs or sings. Although tuberculosis is contagious, it's not easy to catch. You're much more likely to get tuberculosis from someone you live with or work with than from a stranger. Most people with active TB who've had appropriate drug treatment for at least two weeks are no longer contagious. Since the 1980s, the number of cases of tuberculosis has increased dramatically because of the spread of HIV, the virus that causes AIDS. Tuberculosis and HIV have a deadly relationship each drives the progress of the other.

Infection with HIV suppresses the immune system, making it difficult for the body to control TB bacteria. As a result, people with HIV are many times more likely to get TB and to progress from latent to active disease than are people who aren't HIV positive. Another reason tuberculosis remains a major killer is the increase in drug-resistant strains of the bacterium. Since the first antibiotics were used to fight tuberculosis 60 years ago, some TB germs have developed the ability to survive, and that ability gets passed on to their descendants. Drug-resistant strains of tuberculosis emerge when an antibiotic fails to kill all of the bacteria it targets. The surviving bacteria become resistant to that particular drug and frequently other antibiotics as well.

Note that the reason for increasing the proportion of females to males for four years is the fact that a large proportion of women in such reconstruction few mixing society because of the social situation which causes the low immunity and the second reason is the situation physiological for women, pregnancy and lactation this from the side of the other side, the vast majority of women in the Iraqi countryside suffers from a lack of awareness and ignorance, functioning in the field, and accompanied by the farm animals long periods causes to the likelihood of infection by more than men.

Note through planned that the percentage of infection and over the four years are almost ages 15-30 and ages 30-45 are more infected with TB that this reconstruction is useful lives in society and in the daily and direct contact with the external environment As for the other ages either be trapped in the house like old ages and child.

The progress of the years in this study note a marked reduction in infection rates for the year 2012 and this shows how success in the detection and treatment of infected cases and the effectiveness of treatment and method of use.

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