



## EPIDEMIOLOGY OF CHICKENPOX DISEASE IN IRAQ, A RETROSPECTIVE STUDY

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### ABSTRACT

Chickenpox is a common viral disease among children and adult. This study aimed to find the occurrence and trend of chickenpox disease in Iraq during 2014 to 2018. A retrospective cross - sectional study was done. Review of the existing anonymous surveillance records of chickenpox for the years from 2014-2018 were done. Out of 285560 cases, 148741/285560 (52.1%) were male and 136819/285560 (47.9%) were female cases. The male cases were much higher percentage 27.3%, 17.0%, 20.6%, 17.2% during 2014, 2015, 2016, and in 2018 than female cases. There are highly significant association between the gender, age groups by years at the p. value less than 0.05. The rate of chickenpox cases were higher in 2014, followed by 2017. We need to find the higher risk groups by using the laboratory confirmation of cases to assess the burden of the chickenpox disease in the country. Therefore, we need to put a clear plan of introducing the chickenpox vaccine into the immunization program in Iraq after complete understanding of the real epidemiological situation of the disease in Iraq.

**KEYWORD:** Rate, Chickenpox, Epidemiology, Iraq, Gender.

### INTRODUCTION

Varicella (or: varicella - Chickenpox) is a common disease that leads to the appearance of a rash, itching, and the appearance of red spots and vesicles throughout the body.<sup>[1]</sup> Essentially, chickenpox is a common and mild in children, but most people develop it at some point in their lives, if they do not receive the vaccine against chickenpox.<sup>[2]</sup> As regards the WHO report, it estimated the burden of chickenpox to be more than one hundred and forty million cases, 4.2 million severe complications, and four thousand deaths. Moreover, the incidence of chickenpox is 15 cases per 1000 people annually.<sup>[3]</sup> Of these cases, 2% have complications and 4% need to be admitted to hospital, with a case fatality rate of 2 / 100 000 cases annually.<sup>[4]</sup> Therefore, in Iraq 2014, the rate of chickenpox disease was higher 21.13 /100000 person -years and declined in 2018 to 11.92/100000 person-years.<sup>[5,6]</sup> In temperate climates, varicella tends to be a childhood disease, with peak incidence among preschool and school-aged children; <5% of adults are susceptible to varicella.<sup>[7]</sup> The disease typically occurs during late winter and early spring.<sup>[8]</sup> In tropical climates, by contrast, infection tends to be more common later in childhood, with higher susceptibility among adults than in temperate climates, especially in less densely populated areas.<sup>[9]</sup> The highest incidence of disease in tropical climates occurs during the driest, the coolest months.<sup>[10]</sup> Because varicella is endemic worldwide, all susceptible travelers are at risk of infection during travel.<sup>[11]</sup> There are few studies in Iraq

about the chickenpox disease; pattern; ways of transmission among people; complications of the disease. There is also a little awareness of mothers about how to prevent this disease and, how to avoid it, treat it and this led us to focus and fervor to research about it. From this point, this study aimed to determine the occurrence and trend of chickenpox disease in Iraq during 2014 to 2018.

### METHODS

A retrospective cross sectional study was done. Review of the existing anonymous surveillance records of chickenpox for the years from 2014-2018 was done. Those monthly records were sent from corresponding surveillance units in Baghdad and other provinces which collect the data from primary health care centers. Excel 2010 was used for statistical analysis. Frequency and relative frequency were displayed; Bar graphs and line chart were used to present frequency distribution and seasonal variation. Chi square test (X<sup>2</sup>) was used to calculate the significance of the different frequency among gender and age groups from 2014-2018, each separately. P value was considered significant when it is less than 0.5. Age classification used in this study was based on age classification used in the surveillance system in Iraq.

### RESULTS

Out of 285560 cases, 148741/285560(52.1%) were male and 136819/285560 (47.9%) were female cases. The male cases were higher percentage 27.3%, 17.0%,

20.6%, 17.2% during 2014, 2015, 2016, 2018 more than female cases. In 2017, the female cases 27.7% were higher percentage more than male cases 17.9%. There is highly significant association between the gender by years at the p. value less than 0.05 [Table1]. The rate of chickenpox cases were higher 21.3 in 2014, followed by 17 in 2017, 14.05 in 2016, 12.53 in 2015 and 11.92 in 2018, respectively [Figure 1]. The higher percentage of

cases were higher in 2014, followed by 2017, 2016 and lower percentage in 2015 and 2018. Also in the same table show that the higher percentage of cases occur in the age groups 1 to 9 years , followed by 20 to 44 age groups and lower percentage in the age more than 45 years old. There is highly significant association between the age groups by years at the p. value less than 0.05 [Table2].

**Table 1: Distribution of studied sample by years and gender during 2014 to 2018.**

Years	Gender				Total	
	Male		Female		Frequency	Percent
	Frequency	Percent	Frequency	Percent		
2014	40542	27.3	35542	25.9	76084	26.6
2015	25282	17.0	21005	15.4	46287	16.2
2016	30757	20.6	22486	16.4	53243	18.6
2017	26652	17.9	37837	27.7	64489	22.6
2018	25508	17.2	19949	14.6	45457	16.0
Total	148741	100	136819	100	285560	100

P= 0.001



**Figure 1: Rate of chickenpox cases in Iraq during 2014 to 2018.**

**Table 2: Distribution of chicken pox cases by age groups during 2014 to 2018.**

Years	Age groups (Years)					Total
	Less than 1	1-9	10-19	20-44	More than 45	
	Frequency %	Frequency %	Frequency %	Frequency %	Frequency %	
2014	2029 33.5	48503 33.9	22845 18.9	2470 21.7	237 6.2	76084 26.6
2015	1058 17.5	27056 18.9	16379 13.5	1454 12.8	340 8.8	46287 16.2
2016	1034 17.1	29263 20.5	20647 17.0	1974 17.3	325 8.4	53243 18.6
2017	1108 18.3	31799 22.2	28912 23.9	2359 20.7	311 8.1	64489 22.6
2018	823 13.6	6456 4.5	32393 26.7	3143 27.5	2642 68.5	45457 16.0
Total	6052 100	143077 100	121176 100	11400 100	3855 100	285560 100

P= 0.001

## DISCUSSION

There was an obvious decline in the registration of chickenpox cases from (76083 case) in 2014 to (45457) in 2018. These frequencies are much lower than what was reported in Saudi Arabia.<sup>[12]</sup> The rate in 2014 and 2017 is suggestive of a possible outbreak. However, this rise can be attributed to increasing the number of primary health care centers that eased the access of the population to medical care whenever they need it. From this point, this study aimed to determine the occurrence and trend of chickenpox disease for five years. Gender distribution of the cases throughout the years has a shown sustained preponderance for the males over females.<sup>[13]</sup> This might be attributed to the social preference and care for the males in the Iraqi community that leads to seeking health care for the sick male more than for sick female.<sup>[14]</sup> In our study, we found the (52.1%) were male and (47.9%) were female cases. In a study done it by Fleming et al<sup>[15]</sup>, they reported there was no gender difference in the incidence of chickenpox except in the 15-24 years age group (female excess). This may be refers to lack awareness about how to avoid this disease or ways of management especially among females.

Also, in this study we found that the male cases were much higher percentage 27.3%, 17.0%, 20.6%, 17.2% during 2014, 2015, 2016, and in 2018 than female cases. Compared with other studied in France<sup>[16]</sup>, the authors mentioned the female cases were much higher frequencies more than male cases during their studied; this refers to differ of lifestyle and attitudes between the countries. Therefore, in 2017, the female cases 27.7% were much higher percentage more than male cases 17.9%. Compared with other study in England<sup>[17]</sup>, they found the male were much higher than female cases during their studied. The rate of chickenpox cases per 100.000 of population were higher 21.3 in 2014, followed by 17 in 2017, 14.05 in 2016, 12.53 in 2015 and 11.92 in 2018, respectively. Population-wide occurrence of varicella cases in Turkey, which is still in the pre- vaccine era, is estimated to be 466-768 per 100.000 children.<sup>[18]</sup> In Italy, Varicella incidence in 0-14 year- old was 6136.8/100.000 person-years in 2000 and 4004.8 in 2008 after introduction of vaccine.<sup>[19]</sup> In Taiwan, a study has estimated the highest incidence of chickenpox was to be 540 cases per 100.000 populations.<sup>[20]</sup> In addition, in our study we found that the highest percentage of cases occur in the age groups 1 to 9 years, followed by 20 to 44 age groups and the lower percentage were in the age more than 45 years old. This study shows that most of the cases occurred in those of age 5-14 years (65%), only 1% occur in those >45 years with statistical significance  $p=0.001$ . In temperate climates, at least 90% of the population has had varicella disease by the age of 15 years and at least 95% of the population by young adulthood.<sup>[21]</sup> In tropical countries the epidemiology of the disease is quite different. In these areas a higher proportion of cases occur among adults.<sup>[21]</sup>

## CONCLUSION

Mostly cases were male; the majority of cases were in the age less than 20 years. The rate of disease was higher during 2014. There are highly significant associations between the age groups, gender by years at the  $p$ . value 0.000.

**Recommendation:** We need to determine the high risk groups by using the laboratory confirmation of cases in order to identify the burden of the chickenpox disease in the country. Therefore, we need to put a clear plan of introducing the chickenpox vaccine into the immunization program in Iraq after complete understanding of the real epidemiological situation of the disease in Iraq.

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