

Trend of Cholera in Iraq in the Time of Unrest

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Abstract

Background: Countries that are facing war disasters are prone to develop outbreak emergencies especially when this is associated with massive displacement of populations or refugees to overcrowded settings, and when the provision of safe water supply and sanitation is a challenge. **Objective:** To portray the trend of cholera in Iraq for the last 18 years. **Methods:** Records of cholera cases registered for the last 18 years were reviewed from the Department of Health Statistics of the Iraqi Ministry of Health and categorized according to the 18 Iraqi governorates; the total of each governorate was computed for the whole studied years and then summed to get the total for Iraq. Data were categorized by gender and age. Rates of occurrence were plotted against time (for the period from 2000 to 2017) to define the trend of the disease. **Results:** The trend of cholera in Iraq showed four peaks, in 2003, 2007, 2012, and 2015, females showed slightly more cases than males, with a higher incidence among adult age group, and more in the southern provinces. **Conclusion:** The epidemics of cholera in Iraq are getting progressively more frequent, with higher number of cases forming a real burden on the health system and a serious threat to the community. Efficient preventive health plans are needed to overcome this growing problem that may compromise the life of people.

Keywords: Cholera, Iraq, trend, unrest

INTRODUCTION

Since many decades, cholera has been largely eliminated from the developed countries with the improvement of living standards, but it is still a significant cause of illness and death in many developing countries.^[1] It was considered one of the three diseases that necessitate WHO notification in the 1969 International Health Regulations (IHR), and today, after the 2005 revision of the IHR, it still considered as an emergency and requires notification.^[2]

The unique epidemiological characteristic of cholera is its tendency to hit as outbreaks which could flare up to epidemics if not been overcome early.^[3] The burden of the disease comes from its rapid transmission among populations causing high morbidity and mortality (if not treated). Severe vomiting and watery diarrhea may lead to severe dehydration and acidosis, renal failure, shock, and death.^[4]

The WHO estimated that cholera hits about 1.3–4.0 million human victims and kills about 21,000–143,000 person worldwide each year,^[5] but the true global number is much higher than that reported by the affected countries, which represents only 5%–10% of the real numbers^[6] due to underreporting caused by

fear of the countries from the negative impact on tourism and trade.^[7] Cholera remains a major public health risk in the Eastern Mediterranean Region where nine out of 22 countries reported outbreaks and sometimes epidemics in the last decade.^[8]

War and other armed conflicts usually result in severe morbidity and mortality in both military personnel and the civilian.^[9] Many social and health problems occur during and following conflicts manifested by destruction of the health system infrastructures, lack of food and safe water, poor sanitation, and lack of medical care and health services.^[10] Countries that are facing war disasters (like Iraq) are prone to develop outbreak emergencies especially when this is associated with massive displacement of populations or refugees to overcrowded settings^[11] and when the provision of safe water supply and sanitation being a challenge.^[12]

In Iraq, cholera is considered as an endemic disease in many of its locations since 1966 when the first outbreak of cholera

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Access this article online

Quick Response Code:



Website:
<http://www.mmjonweb.org>

DOI:
10.4103/MJ.MJ_40_18

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How to cite this article: Hussain AM, Lafta RK. Trend of cholera in Iraq in the time of unrest. *Mustansiriyah Med J* 2019;18:1-4.

appeared with a case fatality rate of 8.8%. In 1998, a large epidemic occurred with at least 2560 reported cases.^[13] The lack of sustained and equitable access to safe water supply, besides scarce sanitation facilities especially in the lost or recently returned territories as a consequence of wars and destruction of the infrastructures,^[14] kept Iraq endemic with cholera with documented outbreaks in 2007/2008, 2012, and 2015.^[15]

In this study, we tried to portray the trend of cholera in Iraq during the last 18 years and the accompanied epidemics that may help understand the situation and put a baseline for future plans to control this serious infection.

METHODS

In this biometry study, the records of cholera cases for the last 18 years were reviewed from the surveillance unit in the Department of Health Statistics of the Iraqi Ministry of Health on monthly basis, and confirmed by data from the registries of other health facilities like Communicable Diseases Control Center to fill the gaps if any, and to enhance reliability. Data were categorized according to the 18 Iraqi governorates; the total of each governorate was computed for the whole studied years and then summed to obtain the total for Iraq which was divided into three regions (north, middle, and south) to ease plotting the trend.

The results were conformed to the reports of the WHO, World Bank, and United Nations Children's Fund. The total population for each governorate was made available by the Iraqi Central Statistical Organization.

Data were categorized by gender and age that was divided into three main categories: under 5 years (the vulnerable age group), 5 to under 15 years (represents the rest of children category), and 15 and more that represents adult age group. The rates of occurrence were plotted against time (for the period from 2000 through 2017) to define the trend of the disease.

Approvals for conducting the study were taken from the College of Medicine, Mustansiriyah University, and the Iraqi Ministry of Health. No verbal consent was necessary as we did only treat patients' registries.

RESULTS

The trend picture of cholera in Iraq revealed four peaks, in 2003, 2007, 2012, and 2015 [Figure 1], females showed slightly more cases than males [Figure 2], with a higher incidence among adult age group [Figure 3], and in the provinces of the southern region of Iraq, as shown in Figure 4.

Table 1 demonstrates the distribution of cases for the studied 18 years by age, gender, and maximum numbers of cases per year.

DISCUSSION

Since 1980, Iraq passed through a long period of unrest with continuing conflicts and violence that resulted in a crippled health system with widely acknowledged rampant corruption,

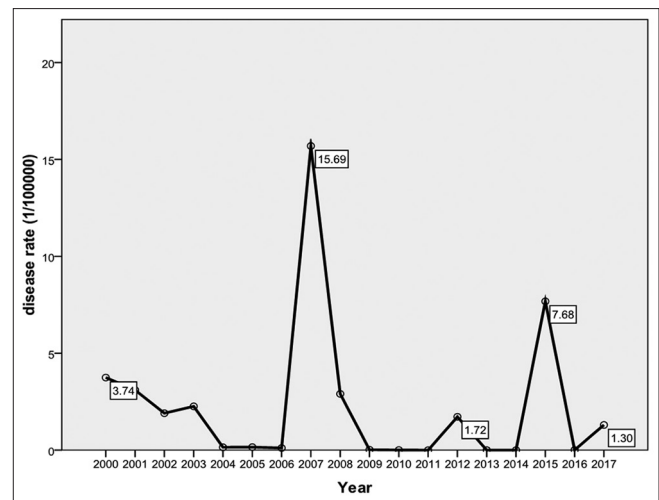


Figure 1: Trend of cholera in Iraq 2000–2017 ($P = 0.718$)

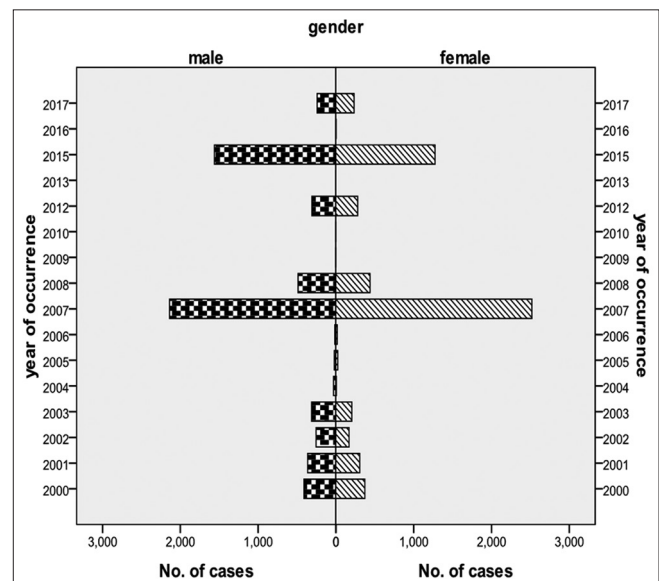


Figure 2: Cholera cases in Iraq by gender (2000–2017)

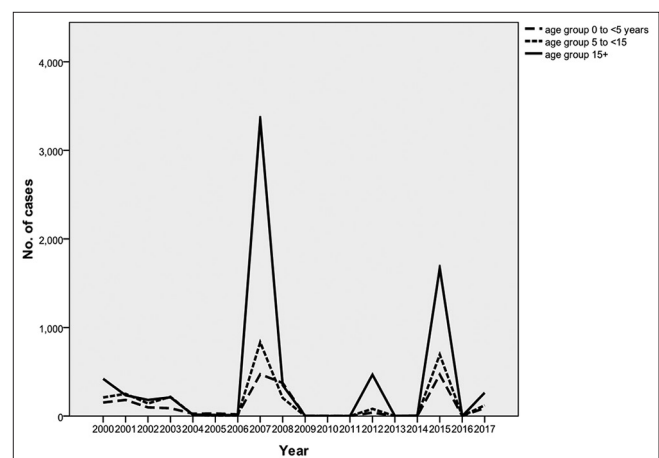


Figure 3: Distribution of cases of cholera in Iraq by age group

malnutrition-associated diseases became prevalent and deaths due to diarrhea rose fivefold.^[16–18]

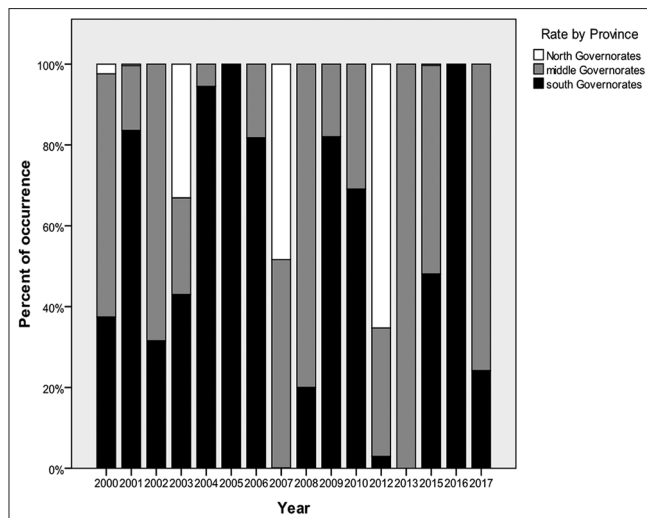


Figure 4: Cholera in Iraq by governorates

Table 1: Distribution of cholera cases by age and gender

2000-2017	Number of cases (11,998), n (%)	Maximum/year (4658)
Male cases	6153 (51.3)	2139
Female cases	5845 (48.7)	2519
Age<5 years	2049 (17)	472
Age group 5-15	2781 (23)	833
Age>15	7198 (60)	3353

Cholera outbreaks in Iraq seem to have a cyclic trend every 4–5 years. After the peak of 1998/1999, there were four peaks; in 2003, 2007, 2012, and 2015; in the last epidemic, about 3000 cases were registered, the cases were clustered in the middle and south provinces and affected all age groups. This secular trend could be due to the time required for the micro-organism to breed and rearrange itself in a sizable population, or to the accumulation of a susceptible cohort for the development of an epidemic. The low education of people about modes of transmission, shortage of health workforce,^[19] and destruction of the health infrastructure (including safe water supply) may have contributed to these epidemics.

The number of cases in those epidemics was considered high when compared to the neighboring countries that share similar environmental and cultural characteristics with Iraq, like Iran, where the outbreak of 2011 affected 1188 cases,^[20] and Syria where the last reported epidemic of cholera that occurred in 2009 in the provinces “Deir Ezzor” and “Raqqa” infected about 1000 person.^[21]

In the current study, children were more affected than adults during the nonepidemic cholera years probably attributed to the first exposure, less immunity, and ignorance regarding the fundamental hygienic precautions; however, the age group of above 15 years showed more vulnerability during the major epidemics,^[22] which might be attributed to more exposure.

In general, provinces of the southern region were more affected by all the successive epidemics through reporting more cases. This might be explained by the low general sanitation and poor preventive measures, in addition to the very warm weather and unsafe water swamps (that form a good media for *Vibrio Cholerae*) in that region, compared to the provinces in the middle and north regions.

CONCLUSION

The epidemics of cholera in Iraq are getting progressively more frequent with higher number of cases forming a real burden on the health system and a serious threat to the community at the time that infectious diseases are disappearing from the world. Efficient preventive health plans are urgently needed to overcome this problem that may compromise the life of people, particularly (based on our findings) that we are expecting an epidemic in the next year (2019).

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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