

# Epidemiological and Exposure Related Attributes of Crimean-Congo Hemorrhagic Fever during the 2024 Outbreak in Thi-Qar province, Iraq

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## ABSTRACT

**Objective:** To explain the epidemiology and sociodemographic details of Crimean-Congo hemorrhagic fever in Thi-Qar, Southern Iraq.

**Study Design:** Cross-sectional study

**Place and Duration of Study:** This study was conducted at the using data from the Department of Public Health, Province of Thi Qar from 15<sup>th</sup> September 2024 to 31<sup>st</sup> December 2024.

**Methods:** A total of 44 cases of Crimean-Congo hemorrhagic fever were identified during the period by reverse transcription polymerase chain reaction or enzyme-linked immunosorbent assay.

**Results:** The mean age of the patient was 42.05±12.72 years. The majority of patients get the infection during May (N=7, 16%) and June (N=10, 23%). 57% of patients reported having interaction with animals, and slaughter by 14% and contact with raw meat 43%. The majority of patients (N=21, 48%) were housewives. Livestock breeders represent (N=8, 18%), and Butcher represent (N=6, 14%). They lived in both rural (46.01%) and urban (33.88%) areas. Death represents (N=6, 13.7%) and patients get complete cure represent (N= 38, 86.3%). The outcome of hemorrhagic fever patients was significantly correlated with the year of infection (P<0.001).

**Conclusion:** Crimean-Congo hemorrhagic fever is a hazardous illness that can lead to major health issues. Iraq is currently considered to be a country with a high prevalence of Crimean-Congo hemorrhagic fever

**Keywords:** Hemorrhagic fever, Crimean-Congo haemorrhagic fever virus (CCHFV), Viral infection

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## INTRODUCTION

Crimean-Congo hemorrhagic fever (CCHF) is a severe zoonotic viral disease caused by the Crimean-Congo hemorrhagic fever virus (CCHFV), a member of the genus *Orthonairovirus* within the family *Nairoviridae*. The virus is primarily transmitted through bites of infected *Hyalomma* ticks or through direct contact with blood or tissues of infected animals and humans.<sup>1,2</sup>

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Since there is no known cure or vaccine for CCHF, it is regarded as an emergent arboviral zoonotic disease in many nations, perhaps as a result of increased vector bionomics and changing climates.<sup>3</sup> Due to its high case fatality rate, which may range from 10% to 40%, and the absence of a specific antiviral treatment or licensed vaccine, Crimean-Congo hemorrhagic fever remains a major public health concern worldwide.<sup>4</sup> Iraq is considered one of the endemic countries, where repeated outbreaks have been documented over the past decades. Since the first confirmed cases reported in 1979, CCHF has continued to pose a significant threat, particularly in rural and semi-urban areas where livestock breeding, animal slaughtering, and tick exposure are common practices, CCHF is widespread in Iraq's neighbors, Saudi Arabia, Iran, and Turkey.<sup>5</sup> In recent years, Iraq has experienced a noticeable increase in reported CCHF cases. This rise has been attributed to multiple factors, including climatic changes, increased tick activity, uncontrolled animal movement, and traditional slaughtering practices, particularly during religious occasions.<sup>6,7</sup> Therefore, the purpose of this study was to describe the epidemiological, sociodemographic, and exposure-related characteristics of confirmed CCHF cases reported in Thi-Qar Province, southern Iraq, during the 2024 outbreak.

**METHODS**

A cross-sectional study was conducted on 44 human CCH-FV cases that were reported in the Thi-Qar Governorates, Iraq from 15<sup>th</sup> September 2024 to 31st December 2024 letter No. 234/QM/Approval/ieuhhe 97262 dated September 10, 2024. The obtained data were reviewed all of the patient medical documents related to this outbreak. All suspected patients showing symptoms of CCHF were admitted to isolated wards and Intensive Care units in Thi-Qar Hospitals. Blood samples were obtained from every patient during the outbreak. Immediately after collection, the specimens were delivered to Baghdad's Central Public Health Laboratory. Each verified situations identified by the Central Public Health Laboratory (CPHL), Baghdad, utilizing RT-PCR (Real Star® CCHFV RT-PCR Kit) or ELISA IgM (human Crimean Congo haemorrhagic fever virus IgM [CCHF-IgM] ELISA Kit/abbexa) methods.<sup>5</sup> The serological identification of specific IgM and IgG is necessary for a laboratory detection of CCHF. A recent infection is indicated by the presence of IgM. But some IgM and IgG antibodies don't show up until five to seven days after the first sign of symptoms, and in many cases, they might not be found. Early diagnosis of CCHFV in a patient's blood can be achieved by RT-PCR detection of viral RNA.<sup>3</sup> The data was entered and analyzed through SPSS-2024. The Chi-Square Test was used to assess the relationship among categories of variables. By definition, a p-value of less than 0.05 was considered significant.

**RESULTS**

**Table No. 1: Demographic information of the patients (N=44).**

Variable	No.	%
<b>Gender</b>		
Male	23	52.0
Female	21	48.0
<b>Age (years)</b>		
< 20	2	4.0
20-30	6	14.0
30-40	10	23.0
40-50	15	34.0
50-60	7	16.0
≥60	4	9.0
<b>Residence</b>		
Rural	20	45.0
Urban	17	39.0
Suburban	7	16.0
<b>Occupation</b>		
Housewife	21	48.0
Livestock breeders	8	18.0
Butcher	6	14.0
Earners	5	11.0
Student	1	2.0
Employee	3	7.0

There were 23 (52%) males and 21 (48%) females. More than half of patients (N=15, 34%) presented with age group (40-50) years, while the 30-40 years group accounts for 23%. The mean age of the patient was 42.05±12.72 years. Majority of patients 20 (45%) were from rural areas. According to occupation, 21 (48%) were housewives. Livestock breeders represent in 8 (18%) and Butcher represent in 6 (14%) [Table 1]. The majority of patients get the infection during May 7 (16%) and June 10 (23%) [Table 2].

Table 3 showed the distribution of patients with hemorrhagic fever according to the outcome, including (death, cure and discharge on their family responsibility). Death represents (N=6, 13.7%) and patients get complete cure represent (N= 38, 86.3%). Animal contact was reported by 57% of the patients, slaughtering by 14% and contact with raw meat 43% (Table 4).

**Table No. 2: Allocation of individuals according to month-wise (N=44)**

Month	No.	%
January	1	2.0
February	-	-
March	1	2.0
April	6	14.0
May	7	16.0
June	10	23.0
July	6	14.0
August	4	9.0
September	5	11.0
October	3	7.0
November	1	2.0
December	-	-

**Table No. 3: The relationship between hemorrhagic fever patient's outcomes and year of infection (n=44)**

Year of infection	Outcome			P value
	Death	Cure	Discharge on their family responsibility	
2024	6 (13.7%)	38 (86.3%)	-	0.0001**

\*\*P<0.01

**Table No. 4: Epidemiologic association of patients with Crimean-Congo hemorrhagic fever**

Link	No.	%
<b>Animal contact</b>		
Yes	25	57.0
No	19	43.0
<b>Slaughtering</b>		
Yes	6	14.0
No	38	86.0
<b>Contact with raw meat</b>		
Yes	19	43.0
No	25	57.0

## DISCUSSION

The continued occurrence of Crimean-Congo hemorrhagic fever (CCHF) cases highlights the persistent circulation of CCHFV in southern Iraq and reflects the endemic nature of the disease in the region.<sup>5</sup> It has shown that these livestock are often infected by tick species, particularly *Hylomma* species, the primary carriers of CCHFV.<sup>8</sup> The biggest problem with this endemic is the lack of collaboration between the human and animal sectors in terms of illness prevention. The outbreak is made worse by a lack of tick control initiatives. Additionally, there is an absence of laboratory kits for CCHF diagnosis, particularly at the district level. This may result in delayed therapy or inaccurate diagnosis, which would raise the number of case mortality.<sup>9</sup> Among the patients, 57% reported coming into contact with an animal, 43% reported touching raw meat, and 14% reported animal slaughter. In this study, death represents (N=6, 13.7%) and patients who get complete cure represent (N= 38, 86.3%) of total patients recorded in periods of data collection. In this outbreak, males accounted for a slightly higher proportion of cases than females. This finding is consistent with previous studies from Iraq and neighboring countries, where male predominance has been linked to occupational and behavioral exposure, including livestock handling and outdoor activities.<sup>10,11</sup> Nevertheless, the substantial proportion of female cases particularly housewives indicates that domestic exposure remains an important route of infection. Most cases occurred among individuals aged 30–64 years, a pattern commonly reported in CCHF outbreaks and attributed to higher levels of occupational and household exposure to animals and raw animal products.<sup>12</sup> In our study, The majority of patients get the infection during May (N=7,16%) and June (N=10, 23%). The spread of the virus's vector could be the cause of the rise in CCHFV infections in Iraq. The distribution showed a clear peak during May and June, corresponding to periods of increased tick activity. High temperatures and low humidity enhance tick aggressiveness and human-tick contact, thereby increasing the risk of virus transmission.<sup>13</sup> In addition, increased animal slaughtering during spring and early summer, especially around religious festivals, may further amplify transmission.<sup>6</sup> The study also found that rural, urban, and suburban distributions were (45%, 39%, and 16%) respectively. The incidence of CCHFV is increasing in rural areas due to the large number of livestock breeders. Additionally, sheep wool is sheared during spring without the utilizing of personal protective equipment or safety precautions to avoid direct infection from ticks or tick-infected livestock. In recent decades, there has been an overlap between rural and urban areas, which has led to an increase in cases in

urban areas. In additionally, the increasing number of livestock breeders in urban areas.<sup>5,14</sup> The majority of patients 21 (48%) were housewives, whereas 18% and 14% of the patients were livestock breeders and butchers, respectively. This high percentage of housewives may be due to the fact that, historically, Iraqi housewives frequently handle raw meat, particularly after it has been slaughtered, and they breed animals in rural regions. Exposure analysis revealed that direct animal contact and handling of raw meat were common among patients. These findings support the role of animal-related exposures in maintaining CCHFV transmission and emphasize the importance of household-level risk factors, particularly among individuals not traditionally classified as high-risk occupational groups.<sup>1,15</sup> Overall, these findings underline the need for strengthened surveillance, improved public awareness regarding safe animal handling, and effective tick control programs. Targeted interventions during high-risk seasons and focused health education for vulnerable populations are essential to reduce the impact of future outbreaks.

## CONCLUSION

Crimean-Congo hemorrhagic fever is a hazardous illness that can lead to major health issues. Iraq is currently considered to be a country with a high prevalence of CCHF. To lower the death rates, stop infection, and protect public health in Iraq and globally, targeted public health initiatives are required. Firstly, a sufficient number of public health labs with comprehensive PCR testing capabilities are developed across the country. Tick control and stringent slaughtering regulations come in second. Thirdly, it is crucial to regulate the movement of animals both within and outside of Iraq, particularly in the Thi-Qar area. Lastly but not least, improving health education and promotion initiatives, particularly among high-risk individuals.

### Author's Contribution:

Concept & Design or acquisition of analysis or interpretation of data:	Azhar Hamid Rasool, Dalal Kadhim Almousawi
Drafting or Revising Critically:	Abdullah Hijaz Hashim, Nasser Saleh Lhwak
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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**REFERENCES**

1. Frank MG, Weaver G, Raabe V. State of the Clinical Science Working Group of the National Emerging Pathogens Training; Education Center's Special Pathogens Research Network2; State of the Clinical Science Working Group of the National Emerging Pathogens Training Education Center's Special Pathogens Research Network. Crimean-Congo Hemorrhagic Fever Virus for Clinicians-Epidemiology, Clinical Manifestations, and Prevention. *Emerg Infect Dis* 2024;30(5):854-63.
2. Jakimovski D, Banović P, Spasovska K, Rangelov G, Cvetanovska M, Cana F, et al. One health investigation following a cluster of Crimean-Congo haemorrhagic fever, North Macedonia, July to November 2023. *Euro Surveill* 2025; 30(4): 2400286.
3. Al-Abri SS, Abaidani I, Fazlalipour M, Mostafavi E, Leblebicioglu H, Pshenichnaya N, et al, Current status of Crimean-Congo haemorrhagic fever in the World Health Organization Eastern Mediterranean Region: issues, challenges, and future directions. *Int J Infect Dis* 2017;58: 82-9.
4. World Health Organization. Crimean-Congo haemorrhagic fever. Geneva: WHO 2025; 15-9.
5. Baghdadi GA, Aakef IR, Mahdi SG, Khaleel RI. Crimean-Congo haemorrhagic fever in Iraq. *East Mediterr Health J* 2024;30(8):570-76.
6. Atwan Z, Alhilfi R, Mousa AK, Rawaf S, Torre JDL, Hashim AR, et al. Alarming update on incidence of Crimean-Congo hemorrhagic fever in Iraq in 2023. *IJID* 2024; 10: 75-9.
7. Abdulrahman MA. Crimean-Congo hemorrhagic fever, a real health problem in Iraq, *IJID* 2025; 14: 100588.
8. Shahhosseini N, Wong G, Babuadze G, Camp JV, Ergonul O, Kobinger GP, et al. Crimean-congo hemorrhagic fever virus in Asia, Africa and Europe. *Microorganisms* 2021;9(9):1-24.
9. Jafar U, Usman M, Ehsan M, Naveed A, Ayyan M, Cheema HA. The outbreak of Crimean-Congo hemorrhagic fever in Iraq - Challenges and way forward. *Ann Med Surg* 2022;81:104382.
10. Izadi S, Naieni KH, Madjdzadeh SR, Nadim A. Crimean-Congo hemorrhagic fever in Sistan and Baluchestan Province of Iran, a case-control study on epidemiological characteristics. *Int J Infect Dis* 2004;8:299-306.
11. Sabir DK, Mohammad SM, Khwarahm NR, Arif SK, Tawfeeq BA. Epidemiological study of the 2023 Crimean-Congo hemorrhagic fever outbreak in Iraq. *IJID* 2024; 2: 100017.
12. Balinandi S, Patel K, Ojwang J, Kyondo J, Mulei S, Tumusiime A, et al. Investigation of an isolated case of human Crimean–Congo hemorrhagic fever in Central Uganda, 2015. *Int J Infect Dis* 2018;68: 88-93.
13. Uspensky I. Low air humidity increases aggressiveness of ixodid ticks under high ambient temperatures. *Ticks Tick-borne Dis* 2019;10: 101274.
14. Fazlalipour M, Jalali T, Hewson R, Pouriayevali MH, Salehi-Vaziri M. Crimean-Congo haemorrhagic fever among healthcare workers in Iran 2000-2023, a report of National Reference Laboratory. *BMC Infect Dis* 2024;24(1):1312.
15. Bente DA, Forrester NL, Watts DM, McAuley AJ, Whitehouse CA, Bray M. Crimean-Congo hemorrhagic fever: history, epidemiology, pathogenesis, clinical syndrome and genetic diversity. *Antiviral Res* 2013;100(1):159-89.