



## Epidemiological Features of Dog Bites in Shomali Province In 2023

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### Abstract

**Background:** Reducing the amount of dog bites is one of the most important approaches to fight rabies. Iraq is one of many low- and middle-income nations where epidemiological studies on rabies and dog bites are scarce, making this a major public health concern.

**Objective:** Determination of epidemiological characteristics of dog bites in Shomali province.

**Methodology:** Using the Time Person Place epidemiological model, a cross-sectional descriptive study was conducted examining 2022-2023 data available at the Division of Communicable Diseases - Department of Public Health. Shomali General Hospital obtained the approval of the Department of Health as follows: Variables tested: time factors over months explaining frequency of dog bites, locations where dog bites occurred, by provinces of voivodeship; Victim variable was also examined, such as the sex, age, site of injury (exposure), and vaccination status.

**Results:** The males were clearly more dominant and younger than the female victims. The study found that only 16% of them adhered to the recommended five doses. The lower limbs were the main area of the body exposed to the bites at 69%, then the upper limbs (14%) were marked with the highest percentage of dog bites in January and February, which accounted for approximately 24.79% cases. Regarding the location factor, this study explained that the majority of dog bites (91.48%) were registered in the village of the department.

**Conclusion:** The dog bite problem is a significant health problem in Shomali, affecting boys more than girls. Four-fifths of the victims have not completed the recommended preventive rabies vaccination. A strategic health care plan to prevent and control this health issue is highly recommended.

**Keywords:** Dog Bites, Epidemiological Features, Iraq.

## Introduction:

Humans have lived with dogs for at least 14,000 years [1, 2]. They also knew of their diseases, which increased as people and their animals gathered in the cities that arose in Mesopotamia [3, 4, and 5]. Health problems after dog bites and the use of herbal medicines in treatment [6]. Separate duplicates depicted Sumerian guidelines and regulations which, in confirmed that the causal connection between the bite of a rabid animal and the death of a human from rabies was generally accepted in Iraq around four thousand years back. [7] Dog bites are a significant health issue causing both bodily and psychological harm to victims and significant costs to the community[8] and the most common animal bites are[9,10] Human death rate (from particular region dog-borne rabies) is estimated to be greatest in Asia in the world. Africa is closely monitored, but exposure estimates have never been certain since there isn't enough solid information. [11]

One of the most significant ways to combat rabies is to investigate the issue and take action to reduce the number of dog bites [12] Rabies, which is primarily transmitted through dog bites, is an almost invariably fatal disease once clinical symptoms manifest. Avoiding dogs and getting post-exposure prophylaxis are the best ways to avoid getting the disease, albeit [13]. Approximately 59,000 people die each year from rabies, which also causes more than 3.7 million disability-adjusted life years and almost \$8.6 billion in economic losses [14]. Most of these fatalities happen in Asian and African countries [15]. The World Health Organisation has proposed a deadline of 2020 to eradicate canine-borne rabies in Asia. The goal is to halve the present estimated rabies mortality toll in endemic nations [16]. Amputations, scars, psychological trauma (including PTSD and depression), and cynophobia (a fear of dogs) are among the serious illnesses and consequences that can result from dog bites. Isolation from loved ones who own dogs is a real possibility for those who suffer from canine anxiety [17, 18, and 19]. There was no recorded rabies fatality in Iraq between 2010 and 2014, and data on dog bites in the nation is scarce

[20]. The researchers in this study set out to learn more about the victims' dog bite epidemiology profiles. Over the course of five years, seeking medical attention in Babylon's province.

## Methodology:

The data were in the form of the dog bites that were reported at the department of infectious disease and public health at Shomali General hospital for the period of January 1, 2017, to December 31, 2017. What I like about filmmaking is that it squeezes all the energy from the crew members. From February to December, we focused on shooting and analysing the data. The researchers then went on to carry out the data analysis both through the visualization of the recorded data as well as through the cross-sectional descriptive analysis which was based on the Time Person Place epidemiological model. Modeling of demographic parameters which are the foundation of illnesses or health-related events is a rather straightforward process by applying the currently available data [21]. Among the various contributing factors that the study observed after the health authorities' approval was provided. We addressed how and when dog bites occurred based on the months under spatial variables using temporal variables like months. This was also showed as there was a decrease in the number of dogs which was according to the counties in the province. Individual characteristics of the victims, such as their gender, age with the location of the injuries, dogs' bites, and whether or not they got vaccinated, were analyzed.

The data collected were analyzed using version 21 of the Statistical Package of Social Science (SPSS), statistical inferential statistics (chi-square and t-tests were used to determine the significance of the difference between variables. P-value of less than 0.05 is considered statistically significant.

## Results:

Table 1 shows the distribution of people bitten by dogs by month of exposure. In the study group, the majority (16.39%) had been exposed to a dog bite in September.

**Table 1: The distribution of persons bitten by dogs by months of exposure.**

months of exposure	No.	%
January	30	8.1967%
February	25	6.83%
March	34	9.2896%
April	28	7.68%
May	31	8.47%
June	28	7.65%
July	29	7.92%
August	24	6.557%
September	60	16.39%
October	25	6.83%
November	23	6.28%
December	29	7.92%
Total	366	100%

**Table 2: The distribution of persons with dog bites according to gender of exposure.**

Gender	No.	%
Male	269	73.5%
Female	97	26%
Total	366	100%

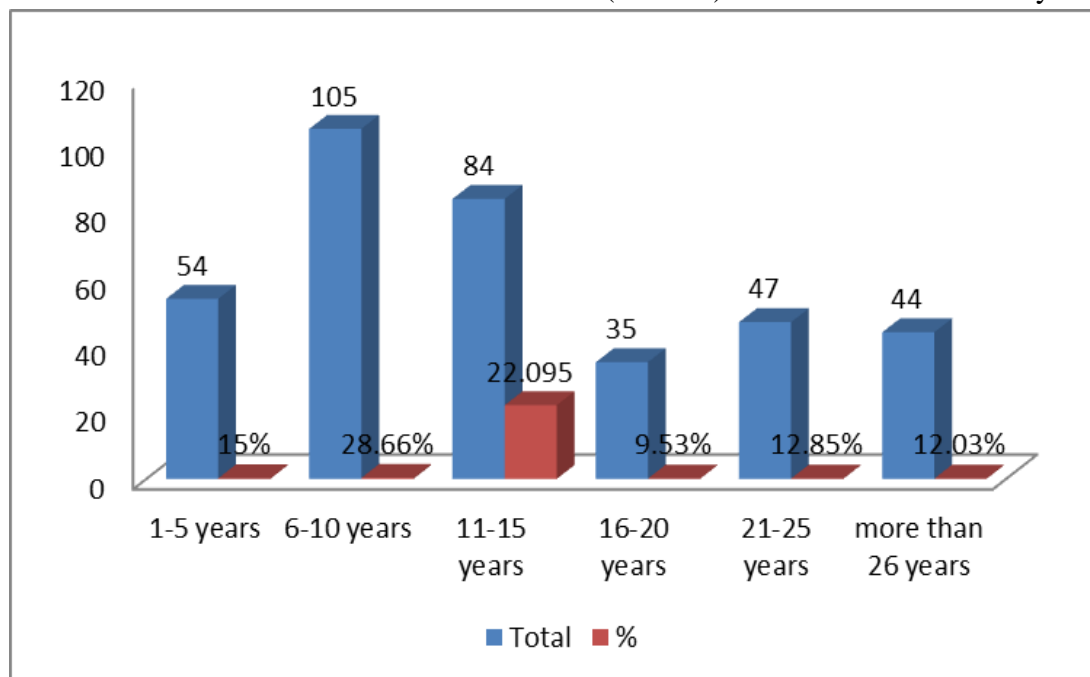
Table 2 shows the distribution of persons with dog bites according to gender (73.5%) are male.

**Table 3: Distribution the number of bites and gender with months.**

Months	No of Male	%	No of Female	%
January	25	6.83%	5	1.36%
February	18	4.9%	8	2.18%
March	21	5.73%	13	3.55%
April	20	5.46%	8	2.18%
May	24	6.557%	7	1.9%
June	22	6.01%	6	1.63%
July	21	5.73%	8	2.18%
August	20	4.46%	4	1.09%
September	43	11.7%	17	4.64%
October	15	4.09%	10	2.73%
November	18	4.9%	5	1.63%
December	22	6.01%	7	1.9%
Total	269	73.5%	97	26.5%

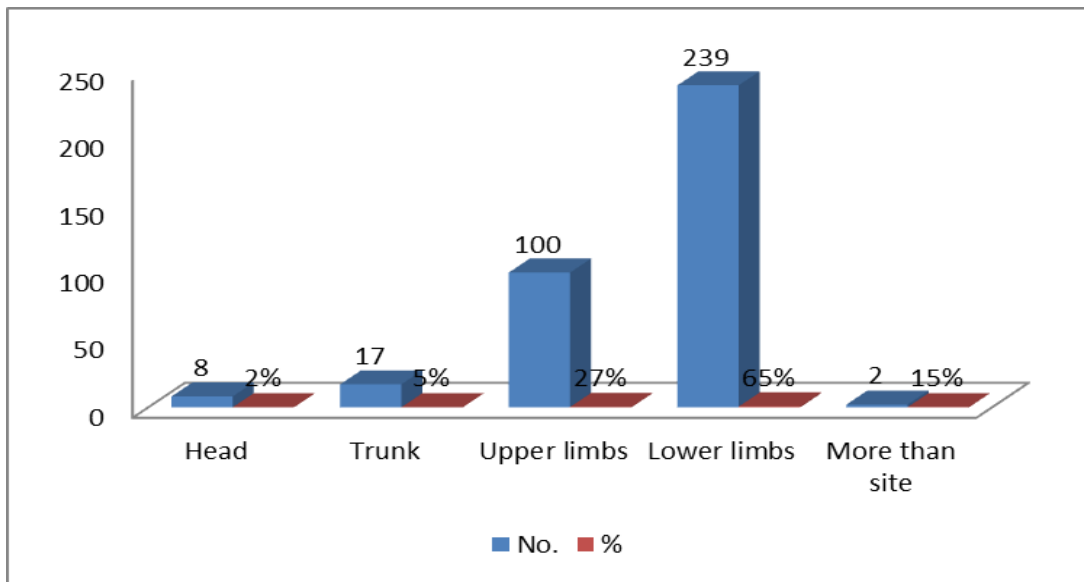
Table 3 shows the distribution of people bitten by a dog based on exposure time. In September, the study group (11.7%) was at risk of being bitten by a dog.

Figure 1 shows the distribution of people bitten by a dog by age. In the study group, the majority (28.66%) were children under 10 years of age.



**Figure 1: Distribution of patients bitten by a dog by age.**

Figure 2 shows the distribution of people bitten by a dog by bite site. In the study group, the majority (65%) are at risk of being bitten on the lower extremities by a dog.



**Figure 2: Distribution of patients bitten by a dog by bite site.**

**Table 4: The distribution of persons with dog bites according to residency.**

Districts	No.	%
City center	36	9.86
Rural	330	90.14
Total	366	100%

Table 4 shows the distribution of people bitten by dogs by place of residence of exposure in the study group (90.14%) exposed to dog bites and living in rural areas.

**Table 5: Relationship between the number of vaccine doses and gender.**

Study variable	Gender		Total
	Male	Female	
<b>Number of vaccine doses</b>			
<b>0</b>	0(0%)	0(0%)	0(0)
<b>1</b>	269(73%)	97(27%)	366(100%)
<b>2</b>	251(68%)	91(25%)	342(93%)
<b>3</b>	195(53%)	76(21%)	271(74%)
<b>4</b>	104(28%)	38(10%)	142(38%)
<b>5</b>	9(2%)	4(1%)	13(3%)

Table 5 shows the distribution of patients bitten by a dog by number of vaccine doses. In the study group (3%), all five doses were completed.

**Discussion:**

Animal bites present a significant general health risk in both developed and developing nations [22]. During the study period in 2017, there were an estimated 366 cases of dog bites in Shomali Province, resulting in a rate of 278 cases per 100,000 people. However, the actual number of incidents may be higher as many individuals do not seek medical assistance. This rate is comparatively lower than the reported estimate of 144 cases per 100,000 population in the Islamic

Republic of Iran, suggesting a potential variation in dog bite prevalence between regions [10].

Regarding the epidemiological characteristics examined, there were notable differences observed between older males and females who were victims of dog bites. These findings align with a similar study conducted in Baghdad [23]. The age group most vulnerable to dog bites was children under 10 years old, accounting for 34.7% of the cases. This observation is consistent with the findings of

several other studies, indicating that children are frequently the victims of dog bites. Additionally, interactions between children and dogs were identified as a common cause of such incidents, with bites decreasing as children reach the age of 15.

Furthermore, our study revealed an increase in the number of dog bites during the months of March and September. In contrast, no significant monthly distribution peak was observed in Ethiopia [27]. However, in Ghana [28] and Chandigarh, India [29], where living dogs were involved, a higher number of cases occurred during the summer months. The relatively temperature-independent activity of dogs, as warm-blooded animals with temperature homeostasis mechanisms, could account for these seasonal variations [30].

Most of the patients in the study resided in rural areas, which aligns with the findings of other international studies [31, 32]. In terms of injury location, dog bites primarily affected the lower extremities, consistent with previous investigations [33, 34, and 35]. This can be attributed to the fact that paws are considered the closest point of contact during such incidents. Interestingly, our results contradict the findings of a study by Sheikholeslami ZN in Iran, which indicated that canine-related skin lesions predominantly affected the upper limbs [10]. Another study by Chaim SC et al. in South Australia, focusing on children during 2009-2011, reported that the head was the most affected location for such lesions [36].

People with any dog bite in our country are vaccinated with a recommended schedule of five doses as according to the vaccines of World Health Organisation. For day 0, 3, 7, 14, 28; these dosages are recommended for which immunization. Through the intramuscular injection is done. Injection site is such as anterolateral thigh or shoulder (deltoid area) which are suitable for a kid [37, 38]. Be careful to ignore that pre-exposure prophylaxis won't get rid of the requirement for immediate post-exposure prophylaxis quickly [39, 40].

The first outreach rabies patient was assigned to the entire subject in the research. A research study has been performed by Quiambao Btw et al. that reported a percentage rate of 0. While the participant's recall was 5% regarding the initiating prophylactic vaccine, which resulted into a greater proportion of unvaccinated patients in that study. Fifty-three percent tenure of patients evidently got a second rabies dose. The share of cases would be 8% and a third dose to have 43% of them. 5% of cases. We may find a vast difference between the knowledge about rabies vaccination and the grasp of the disease between the locals of Shomali and our study whose vaccination rate does not match our results (41).

### Conclusion:

In summary, there is a persistent dog bite problem in Al-Somali province. Children are at high risk and there is variation within the province with a peak in dog bite attacks in March and September, affecting the lower limbs. As it is the most common site for dogs to be bitten, only one in 13 had it Victim completed prophylactic rabies vaccination.

### Recommendations:

It is crucial to reinstate active surveillance of animal bites and implement effective measures to enhance health education, aiming to increase public awareness regarding the severity of the issue. It is strongly advised to conduct campaigns for vaccinating domestic dogs and addressing the problem of stray dogs.

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