

Original article

## Cutaneous Leishmaniasis Prevalence in Northwest Libya from 2019 to 2026

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Corresponding email. [Omarfatima843@gmail.com](mailto:Omarfatima843@gmail.com)**Keywords:**

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**ABSTRACT**

In Libya, cutaneous leishmaniasis (CL), a serious vector-borne parasitic disease, is still a major public health concern, especially in the northwest region's endemic areas. The purpose of this study was to ascertain the demographic distribution and prevalence of CL cases in northwest Libya from 2019 to 2026. Registration records from primary healthcare facilities in Sabratha, Zawia, Surman, Al-Elajilat, Al-Jamil, Bader, Al-Tawela, and West Mountain were used in retrospective descriptive research. Descriptive statistics and the Chi-square test were used to gather and evaluate data on age, sex, and geographic distribution; statistical significance was defined at  $p < 0.05$ . Over the course of the study, 484 CL cases were documented. There were 305 (63.0%) instances involving adults and 179 (37.0%) involving children. In the majority of the research periods, males predominated, but during 2022–2024, female adults were more commonly impacted. Throughout the investigation, Sabratha had the most cases, followed by Al-Elajilat and Al-Jamil. The overall number of instances dropped from 238 in 2019–2021 to 106 in 2022–2024 before rising to 140 in 2025–2026. There were notable temporal differences in the distribution of cases in a number of areas, especially Sabratha. These results show that CL is still endemic in northwest Libya, with significant regional and temporal differences in the disease's incidence. Reducing disease transmission and supporting preventative efforts in endemic communities requires ongoing epidemiological surveillance, efficient vector control strategies, and raised public awareness.

**Introduction**

Leishmania is an obligatory intracellular protozoan that causes leishmaniasis, a vector-borne disease spread by female phlebotomine sandflies. Of the 30 species of Leishmania that infect mammals, 21 are known to infect humans [1]. In about 90 tropical, subtropical, and southern European nations, leishmaniasis is endemic. The ecological environments include deserts and rainforests. Although it can be found on the outskirts of some cities, leishmaniasis is often more prevalent in rural than urban regions. Additionally, about 200,000 new cases are recorded each year globally [2]. Therefore, the world health organization (WHO) has designated it as one of the seven major tropical diseases [3]. Geographically, Leishmaniasis is a prevalent chronic illness that affects people of all ages in North Africa and is associated with population mobility, poverty, malnutrition, substandard housing, and a lack of health services [4, 5]. Pathologically, *Cutaneous Leishmaniasis* (CL), *Mucocutaneous Leishmaniasis* (ML), and *Visceral Leishmaniasis* (VL) are the three classifications for the disease [6, 7, 8].

Rising incidence has been linked to urbanization, population displacement, and environmental change in a number of areas [9]. The Libyan National Center for Disease Control (NCDCL) reports that cutaneous and visceral leishmaniasis are endemic in Libya. Between 1971 and 2011, 19,396 cases of CL infection were reported in Nafusa Mountain cities, including Nalut, Gharyan, and Yafran, as well as Tawergha Al-Khoms and Tarhuna. For more than eight decades, reports of visceral leishmaniasis have been made in Libya [10]. The northern coastal districts near Tripoli and the Green Mountain region were the source of all these stories. The armed turmoil that has engulfed Libya since 2011 has made the country's healthcare sector worse and hindered national disease control initiatives [11]. There were 448 instances of CL in Libya in 2023; 148 of those cases occurred in Tawergha, which may have resulted from the recent return of displaced people to their city [12]. The large number of CL cases in Libya attests to the critical need for a Leishmania control program and the pressing need to identify the risk factors that led to the CL infection [13]. Therefore, based on the registration files of the primary health care facilities in Sabratha city, our goal was to ascertain the prevalence of CL cases among Libyan males and females in the northwest region between 2019 and 2026.

## Methods

### Study design

Based on the examination of registration records from primary healthcare facilities in Sabratha (the main registration center in the western regions responsible for CL cases registration, collected from all western regions), northwest Libya, this study was created as a retrospective cross-sectional epidemiological investigation. All recorded cases of CL reported between 2019 and 2026 were included in the study. To ascertain the frequency of CL among Libyan males and females in the northwest, information was gathered from accessible medical records and registration files. To evaluate the distribution and prevalence patterns of the illness during the study period, demographic factors such as gender and the year of diagnosis were examined.

### Study area and data collection

The study area extended from Tripoli to the western border regions of northwest Libya. Zawiya, Al-Elajilat, Surman, Sabratha, Al Jamil, and Regdalin were among the major cities and nearby settlements that were covered. The Mediterranean environment of this region makes it a significant endemic area for CL. Between 2019 and 2026, information was gathered from primary healthcare facilities spread throughout these cities in order to assess the frequency of CL cases among males and females in the western region of Libya.

### Statistical analysis

Data were entered and analyzed using Statistical Package for the Social Sciences (SPSS), version 23. Descriptive statistics were used to summarize the distribution of CL cases according to sex, age, region, and study period. Categorical variables were presented as frequencies and percentages. Differences in the distribution of CL cases among demographic and geographic categories were assessed using the Chi-square ( $\chi^2$ ) test. A p-value < 0.05 was considered statistically significant. The prevalence of CL was calculated as the proportion of reported cases relative to the total number of registered cases during the study period from 2019 to 2026.

## Results

The demographic features of patients with CL from 2019 to 2026 are compiled in (Tables 1–3). Males made up 59.1% of adult cases and 66.3% of pediatric cases during 2019–2021, with adults accounting for the majority of reported cases ( $n = 137$ ). The average age was 8.8 years for children and 42.6 years for adults. Compared to children (2.8), adults had a greater mean number of lesions (3.5). However, the overall number of cases dropped to 77 adults and 29 children between 2022 and 2024. Males continued to predominate among children (68.9%), while females made up the bulk of adult cases (59.7%). The average age rose somewhat to 10.6 years for children and 43.8 years for adults. The average number of lesions was highest during this time, with 4.5 in adults and 5.1 in children. There were 49 pediatric and 91 adult cases reported in 2025–2026. In both age categories, the distribution of males and females became almost equal. Adults' mean age climbed to 46.8 years, while children's mean age stayed at 8.9 years. In comparison to the prior period, the mean number of lesions significantly decreased to 2.5 in adults and 2.6 in children, suggesting a decrease in the burden of lesions. Consequently, males predominated in most groups except adult cases during 2022–2024, while adults consistently represented the majority of CL cases throughout the study period. Lesion load peaked in 2022–2024 and then significantly decreased in 2025–2026.

**Table 1. Distribution of patients depending on gender, mean age, and patients' mean during the period from 2019 to 2021.**

Patients	Gender (%)		Total	Mean of age (Y)	Mean number of lesions
	M	F			
Adults	81 (59.1%)	56 (40.8%)	137	42.6 Y	3.5
Children	67 (66.3%)	34 (33.6%)	101	8.8 Y	2.8

**Table 2. Distribution of patients depending on gender, mean age, and patients' means during the period from 2022 to 2024**

Patients	Gender (%)		Total	Mean of age (Y)	Mean number of lesions
	M	F			
Adults	31 (40.2%)	46 (59.7%)	77	43.8Y	4.5
Children	20 (68.9%)	9 (31.03%)	29	10.6Y	5.1

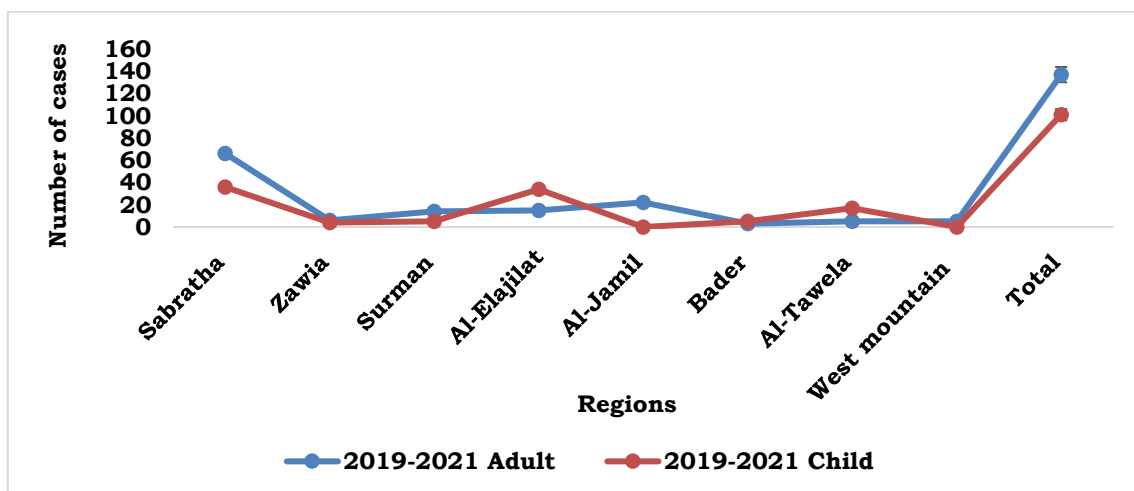
**Table 3. Distribution of patients depending on gender, mean age, and patients' mean during the period from 2025 to 2026.**

Patients	Gender (%)		Total	Mean of age (Y)	Mean number of lesions
	M	F			
Adults	47 (51.6%)	44 (48.3%)	91	46.8Y	2.5
Children	25 (51%)	24 (48.9%)	49	8.9Y	2.6

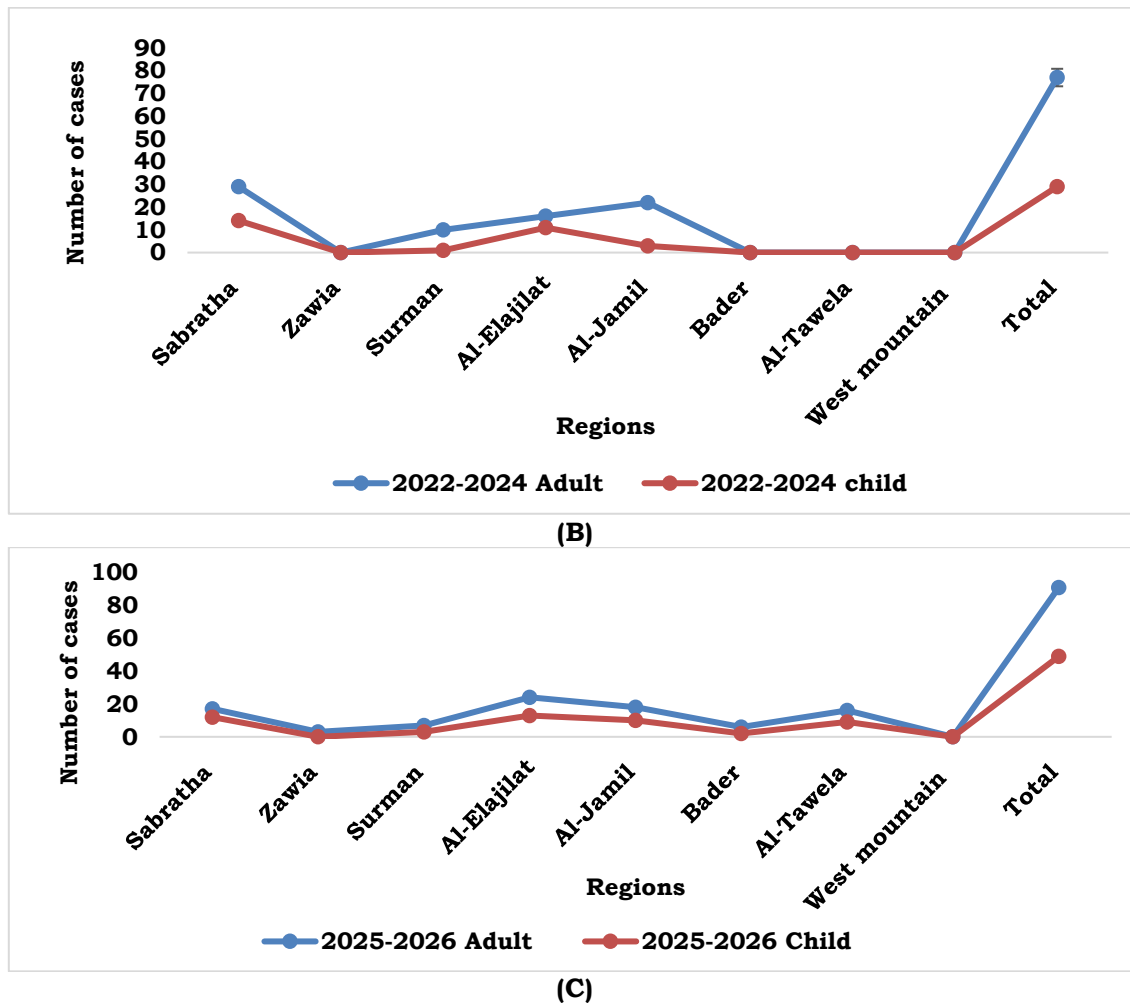
Table 4 shows that Sabratha had the most cases over the course of the study, with 102 cases in 2019–2021, 43 cases in 2022–2024, and 29 cases in 2025–2026. Although minors made up a sizable fraction, adults accounted for the majority of cases in Sabratha. Additionally, there were 238 instances recorded between 2019 and 2021, comprising 101 children and 137 adults. In addition to Sabratha, Al-Elajilat (49 cases), Al-Jamil (22 cases), and Al-Tawela (22 cases) had comparatively high case counts. During this time, a significant percentage of cases in Al-Elajilat and Al-Tawela involved children. The overall number of instances decreased significantly to 106 cases (77 adults and 29 children) between 2022 and 2024. Al-Elajilat and Al-Jamil were the next most impacted areas, after Sabratha. During this time, Zawia, Bader, Al-Tawela, and West Mountain did not report any cases. In 2025–2026, the number of reported cases increased to 140 cases, including 91 adults and 49 children. Sabratha continued to report the highest number of cases, followed by Al-Elajilat (37 cases) and Al-Jamil (28 cases). Adults represented the majority of cases in most regions, while children remained substantially affected in Al-Elajilat, Al-Jamil, and Al-Tawela (Figure 1).

**Table 4. Demographic distribution of patients during the period from 2019 to 2026.**

Region	2019-2021		2022-2024		2025-2026	
	Adult	child	Adult	child	Adult	child
Sabratha	66	36	29	14	17	12
Zawia	6	4	-	-	3	-
Surman	14	5	10	1	7	3
Al-Elajilat	15	34	16	11	24	13
Al-Jamil	22	-	22	3	18	10
Bader	3	5	-	-	6	2
Al-Tawela	5	17	-	-	16	9
West mountain	5	-	-	-	-	-
Total	137	101	77	29	91	49



(A)



**Figure 1. Demographic distribution of patients during the period from 2019 to 2026**

The distribution of CL cases by region during the study periods is displayed in (Table 5). Throughout the period, Sabratha had the most cases; there was a notable drop from 102 cases (58.6%) in 2019–2021 to 43 cases (24.7%) in 2022–2024 and 29 cases (16.7%) in 2025–2026 ( $p < 0.001$ ). Additionally, Zawia, Bader, Al-Tawela, and West Mountain showed significant temporal changes ( $p < 0.05$ ). On the other hand, there was no significant difference in the distribution of cases between the study periods in Surman, Al-Elajilat, and Al-Jamil ( $p > 0.05$ ). Therefore, the results show that the regional distribution of CL cases has changed over time, with Sabratha continuing to be the most impacted area throughout the study period.

**Table 5. Distribution of cutaneous leishmaniasis cases by region across the study periods (2019–2026).**

Region	2019–2021 n (%)	2022–2024, n (%)	2025–2026, n (%)	P-value
Sabratha	102 (58.6)	43 (24.7)	29 (16.7)	<0.001
Zawia	10 (76.9)	0 (0.0)	3 (23.1)	0.014
Surman	19 (47.5)	11 (27.5)	10 (25.0)	0.471
Al-Elajilat	49 (43.4)	27 (23.9)	37 (32.7)	0.113
Al-Jamil	22 (29.3)	25 (33.3)	28 (37.4)	0.571
Bader	8 (50.0)	0 (0.0)	8 (50.0)	0.018
Al-Tawela	22 (46.8)	0 (0.0)	25 (53.2)	<0.001
West Mountain	5 (100.0)	0 (0.0)	0 (0.0)	0.007

*P-values were calculated using the Chi-square test. Statistical significance was set at  $p < 0.05$ .*

## Discussion

The current study showed that the geographic distribution of CL changed over the course of the investigation, with Sabratha continuously reporting the greatest number of cases. While Al-Jamil and Al-Elajilat maintained very consistent case counts throughout the study period, Sabratha saw a significant reduction in CL cases between 2019–2021 and 2025–2026 ( $p < 0.001$ ). These results demonstrate the disease's varied distribution throughout nearby areas and suggest that northwest Libya continues to be a significant endemic focus for CL. Previous Libyan research that identified northwestern Libya as one of the major endemic foci of CL is consistent with the prevalence of patients in Sabratha and the surrounding coastal areas. Both *Leishmania major* and *Leishmania tropica* circulate in the western part of Libya, where CL is widely dispersed due to favorable ecological conditions for sandfly vectors and reservoir hosts, according to molecular and epidemiological findings [14, 15]. The endemic nature of the disease in the northwestern coastal district has also been shown by previous surveys that have shown ongoing CL transmission [16].

Variations in vector density, environmental factors, shifts in human exposure, or advancements in disease management and surveillance efforts could all be responsible for the significant decline in case numbers between 2022 and 2024. Nonetheless, the rise in cases noted in 2025–2026 indicates that CL transmission is still ongoing and that the illness is still a serious public health issue in western Libya [17]. In other endemic nations, where population mobility, urbanization, and climate variations affect disease incidence, similar temporal oscillations have been documented. Al-Elajilat and Al-Jamil continue to have comparatively high case counts, which may be due to local biological and environmental variables that support the continuation of CL transmission.

Previous research has shown a substantial correlation between the regional distribution of CL in Libya and plant cover, rodent reservoirs, and sandfly vectors [18]. These results align with data from other endemic areas in the Middle East and North Africa, where environmental appropriateness is critical to maintaining transmission cycles. Additionally, the idea that CL is a focused disease with restricted transmission patterns is supported by the notable geographical variations found in this study. The need for ongoing surveillance and focused intervention strategies is highlighted by recent epidemiological studies from Libya that continue to show active transmission in a number of western communities [17, 19]. Therefore, improving early case detection, bolstering vector control efforts, and raising community awareness are crucial tactics for lowering the CL burden in northwest Libya.

## Conclusion

In northwest Libya, CL is still a major public health concern. The distribution of cases varies significantly between localities and research periods. Sabratha is a prominent endemic focus, as evidenced by the fact that it continuously registered the largest number of cases. Over the course of the investigation, adults were more commonly impacted than children. While there was a decrease in incidence in 2022–2024, the subsequent rise in 2025–2026 indicates continued transmission. To lessen the prevalence of cutaneous leishmaniasis in the area, our results emphasize the necessity of ongoing surveillance, efficient vector control initiatives, and focused public health initiatives.

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