

Temporal Trends and Spatial Patterns of Cutaneous Leishmaniasis in the most densely populated region of Morocco.

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Background

Cutaneous leishmaniasis (CL) is caused by protozoa of the *Leishmania* genus and transmitted through infected sand fly bites, and poses a significant public health burden in Morocco. Our study focuses on the Casablanca-Settat region, the most densely populated region of the country, and aims to analyze the spatio-temporal trends of CL in this area retrospectively for over 14 years (2009-2022). Our study explores epidemiological patterns, seasonal variations, and the impact of climate variables on CL incidence.

Methods

CL data was collected from the Ministry of Health, demographic information data from the High Commission of Planning and climatic factors were collected from NASA POWER (<https://power.larc.nasa.gov/>). All data were analyzed using QGIS (version 3.8) and R statistical packages.



Results

Results revealed a steady increase in CL cases until 2019, followed by a significant rise. All the reported CL cases were caused by *Leishmania tropica*. Incidence rates vary among groups, with higher rates in females and children aged 5-14. Seasonal analysis indicates a notable increase in cases during spring and winter. Spatial distribution analysis identifies the highest hotspot in El Brouj (Settat province), the only recognized endemic CL focus in the region, emphasizing the need for targeted interventions. Pearson correlation analysis shows a significant positive association between CL cases and minimum temperature and precipitation.

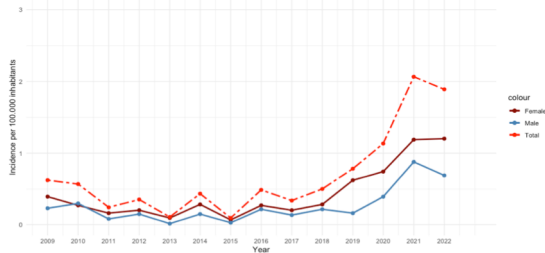


Fig 1: Temporal distribution of CL in Casablanca-Settat region: annual incidence per 100,000 inhabitants by complete sample and sexes from 2009-2022.

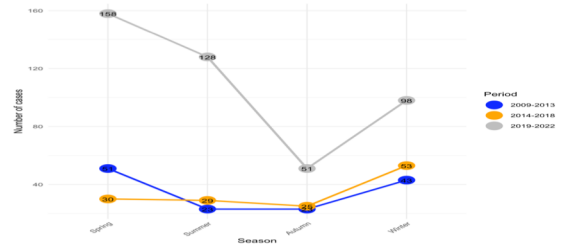


Fig 2: Seasonality of CL incidence from 2009-2022 in the Casablanca-Settat region.

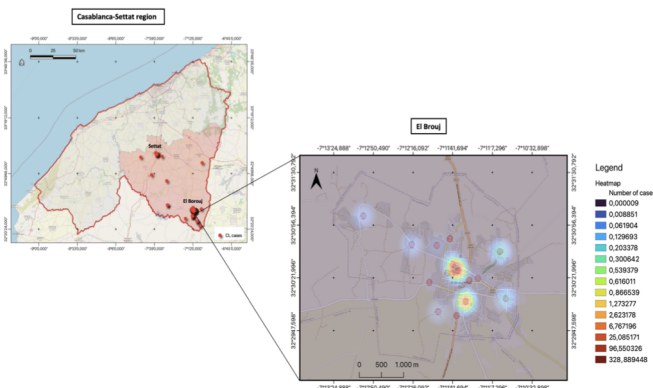


Fig 3: Heatmap of the spatial distribution of CL in the Casablanca-Settat region and El Brouj by complete study time 2009-2022. Made with QGIS3.8.

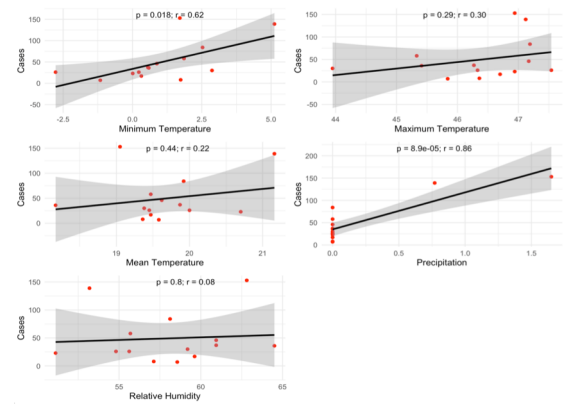


Fig 4: Pearson Correlation and Linear Regression of CL case numbers in El Brouj focus with climate data from 2009 to 2022.

Conclusion

This retrospective study provides crucial insights into CL epidemiology in the Casablanca-Settat region, emphasizing the role of climate variables in disease incidence in the El Brouj focus. The findings underscore the importance of tailored prevention strategies, increased disease awareness, and local control programs to improve case reporting and curb CL transmission.