
The global, regional, and national burden of leishmaniasis: An ecologic analysis from the Global Burden of Disease Study 1990-2017



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Key words: age-standardized prevalence rates; cutaneous leishmaniasis; DALYs; disability-adjusted life-years; GBD; Global Burden of Disease Study database; global medicine; leishmaniasis; refugees; socio-economic status; women.

Cutaneous leishmaniasis is the most common manifestation of infection by the protozoan *Leishmania*, transmitted by infected female phlebotomine sandflies. It is a tropical disease associated with poverty and poor living conditions. Leishmaniasis ranks third in disease burden among the World Health Organization neglected tropical diseases, and in the last few decades alone, its global prevalence has more than doubled (1,934,553.46 in 1990 vs 4,166,621.79 in 2017).^{1,2}

One measurement of the morbidity of skin diseases such as leishmaniasis is through disability-adjusted life-years (DALYs), the sum of years lost because of premature death and years lost because of living with disability. We used the Global Burden of Disease Study 2017 data sets to perform an ecologic analysis of DALYs of cutaneous and mucocutaneous leishmaniasis from 1990-2017 to better understand the global burden of this disease.³

In 2017, the regions with the highest number of DALYs were North Africa and the Middle East (122,776 for female individuals and 92,066 for male individuals), followed by South Asia (15,888 and 12,448, respectively) (Table D). The top 5 countries with the highest age-standardized DALY rate (DALYs per 100,000) were Afghanistan (627.46), Yemen

Abbreviation used:

DALY: disability-adjusted life-year

(164.98), Syria (92.39), Bolivia (55.75), and Burkina Faso (29.01). From 1990 to 2017, the top 5 countries with the highest age-standardized annual percentage of growth were Guatemala (11.05%), Syria (8.97%), Cameroon (6.84%), Iraq (6.59%), and Tajikistan (6.31%).

The influence of cutaneous leishmaniasis appears to be greatest in countries with large populations of displaced peoples owing to recent civil and political unrest. In 2017, there were 16.2 million refugees across the globe, with an estimated 11.8 million individuals displaced within their country.⁴ Sixty-eight percent of global refugees can be accounted for by 5 countries: Syria, Afghanistan, South Sudan, Myanmar, and Somalia.⁴ The combination of favorable climate for abundant sandfly populations and living conditions in refugee camps, including absence of clean water, malnutrition, poor housing, and inadequate sanitation, may contribute to increased infection in these areas.

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Funding sources: None.

Conflicts of interest: None disclosed.

This research was conducted as part of the Global Burden of Diseases Study (GBD), coordinated by the Institute for Health Metrics and Evaluation. The GBD was partially funded by the Bill & Melinda Gates Foundation. The funders had no role in the study design, data analysis, data interpretation, or writing of the report. All authors are collaborators with the GBD. This

article was not developed with consultation or support with the GBD research team.

Reprints not available from the authors.

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J Am Acad Dermatol 2021;84:1203-5.
0190-9622/\$36.00

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<https://doi.org/10.1016/j.jaad.2020.08.043>

Table I. Total disability-adjusted life-years (DALYs) of leishmaniasis by sex and geographic Global Burden of Disease Study regions in 2017

Region	Male DALYs	Female DALYs
North Africa and Middle East	92,066.35	122,775.85
South Asia	12,448.07	15,888.16
Andean Latin America	4132.78	2291.97
Western sub-Saharan Africa	2545.98	3631.65
Tropical Latin America	2288.75	1179.29
Central Latin America	1615.40	882.12
Central sub-Saharan Africa	381.02	421.18
Eastern sub-Saharan Africa	314.20	389.54
Central Asia	79.88	147.54
Southeast Asia	42.17	46.98
Caribbean	22.14	10.94
Southern Latin America	15.91	8.97
Western Europe	6.88	6.61
East Asia	2.09	1.75
Central Europe	0.61	0.68
Southern sub-Saharan Africa	0.11	0.13
High-income North America	0.083	0.085

Of the 21 Global Burden of Disease Study regions, 4 (Oceania, Eastern Europe, high-income Asian Pacific, and Australasia) did not have any leishmaniasis DALYs for male or female individuals and were thus excluded.

In addition, we found a greater burden of cutaneous leishmaniasis in female individuals in terms of prevalence (2,346,787.27 female vs 1,819,834.52 male individuals), incidence (327,199.79 vs 299,416.83, respectively), and DALYs (147,683.44 vs 115,962.43, respectively) (Fig 1). A principal disease manifestation contributing to the disability associated with leishmaniasis is the potential for cosmetic disfigurement, leading to social stigmatization, delayed presentation, and more advanced disease. This may be more significant in women, especially among certain cultures. For example, most Yemeni women wear a face veil; when an uncovered women develops a facial lesion, she may fear judgment that if she had been modestly covered, she would not have been infected.⁵ Other possible explanations for the sex disparity include altered susceptibility to infection during pregnancy, rates of immunity after infection, and different treatment responses between the sexes.⁵

Limitations of the Global Burden of Disease Study include inconsistent reporting of mortality by skin disease in assessing DALYs.³ Disability reflects only symptoms such as itch and appearance including

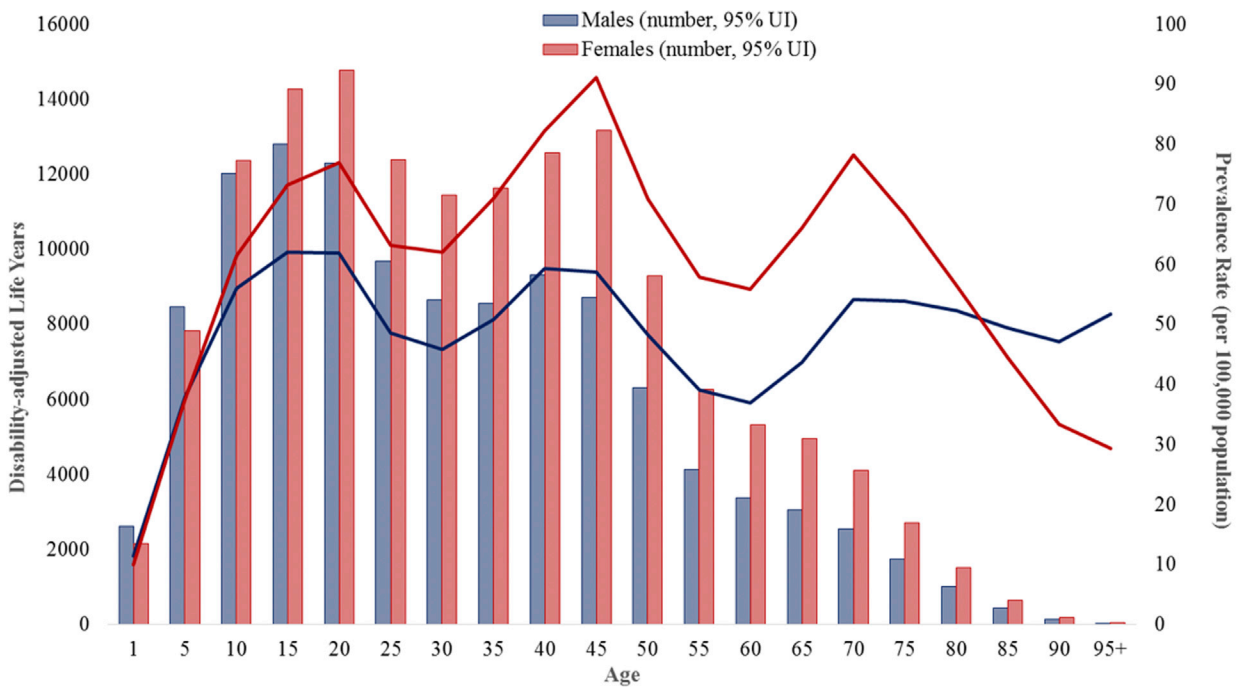


Fig 1. Global 2017 leishmaniasis age-specific disability-adjusted life-years and age-specific prevalence rate (per 100,000 population) in male and female individuals. *UI*, Uncertainty interval.

disfigurement, not capturing other complications such as secondary infection and mental illness. DALYs can serve as a purposeful measure for developing interventions to reduce the global burden of leishmaniasis, with special attention on early diagnosis in refugees and female individuals.

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