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## Spatial distribution and epidemiological features of cutaneous leishmaniasis in southwest of Iran

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### KEYWORDS

Cutaneous leishmaniasis;  
 Epidemiology;  
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**Abstract** *Introduction:* Leishmaniasis, as a major health concern exists in 14 out of 22 countries of the Eastern Mediterranean Region (EMR). Therefore, the aim of present investigation was to evaluate the epidemiological features and spatial distribution of cutaneous leishmaniasis (CL) during six consecutive years (2009–2014).

*Material and methods:* In current retrospective cross-sectional study among 2009–2014, simple direct smear was taken from all suspicious CL subjects who referred to health centers affiliated to Ahvaz Jundishapur University of Medical Sciences. For each patient a questionnaire including some demographic details was filled. Eventually data analysis was done by SPSS.16.

*Results:* Trend of CL in the region was unstable. Spatial distribution of CL in central and west cities was higher than in others. During the years, a total of 4137 smear positive individuals were diagnosed. Of these 55.7% lived in urban and 44.3% lived in rural districts. Frequency of CL was higher in men (60.1%) than in women (39.9%). Also based on age range, 11–30 was the most afflicted group (45.7%). Anatomic location of ulcers was as follows: hands 45.7%, feet 27.4%, face 19.1% and other places 7.8%.

*Conclusions:* Regarding high incidence of CL in southwest of Iran, special programs related to vector and reservoir control should be adopted and implemented. Traffic control of immigrants and travelers from neighboring endemic countries, also can be helpful.

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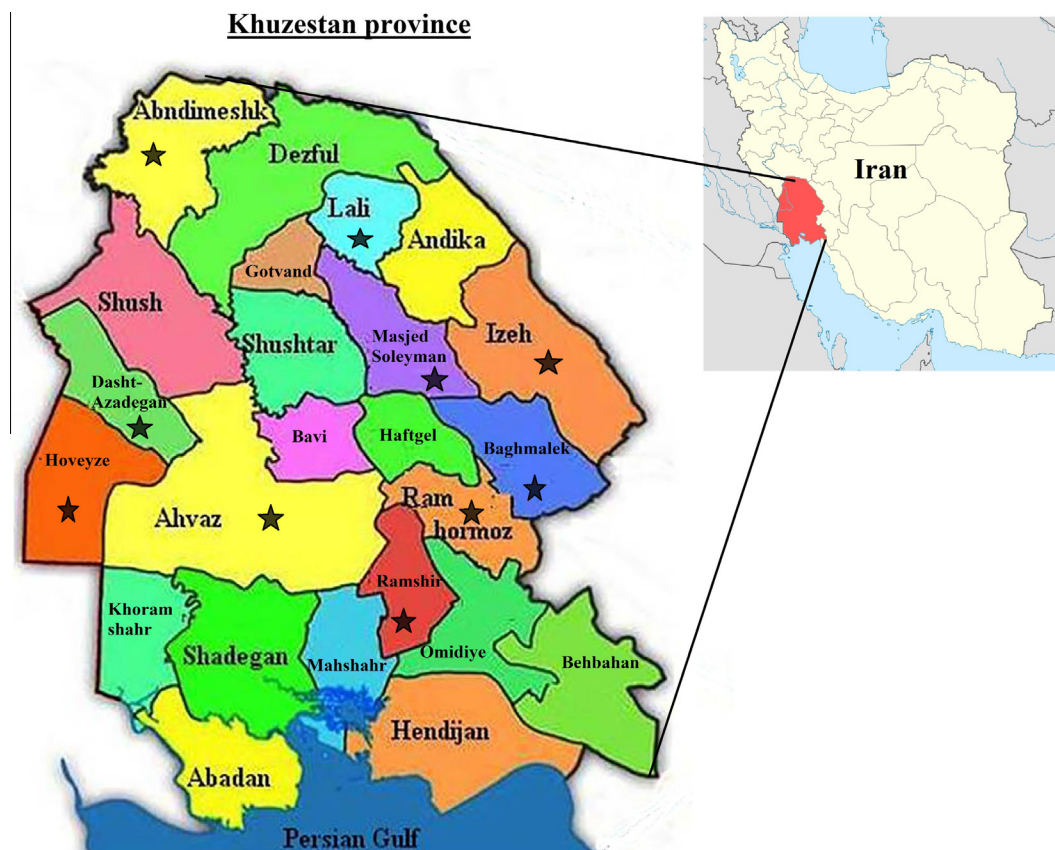
## 1. Introduction

Leishmaniasis is a vector-borne tropical and subtropical disease caused by obligate intracellular protozoa known as *Leishmania* genus. The disease can present clinically in three main ways as follows: cutaneous leishmaniasis (CL), visceral leishmaniasis (VL) and mucocutaneous leishmaniasis (MCL). It is a major global health problem in five continents that estimated 350 million people in about 100 countries are at risk and currently 12 million persons are infected worldwide. Two million new clinical cases occur throughout the world annually that incidence of CL and VL is 0.7–1.2 million and 0.2–0.4 million, respectively. Majority (about 70–75%) of total CL cases occur in 10 countries: Brazil, Peru, Colombia, Costa Rica, North Sudan, Algeria, Ethiopia, Syria, Afghanistan and Iran.<sup>1</sup> Leishmaniasis in the Eastern Mediterranean Region (EMR) is considered as a major health problem. Also CL and VL were seen and are endemic in 14 out of 22 countries of the region such as Palestine, Egypt, Libya, Sudan, Tunisia, Morocco, Jordan, Yemen, Syria, Saudi Arabia, Iraq, Iran, Afghanistan and Pakistan.<sup>2</sup> Pentavalent antimonial compounds such as Glucantime and Pentostam are being prescribed routinely for leishmaniasis treatment as first-line drugs, while unfortunately there is no effective and efficient vaccine against leishmaniasis yet.<sup>3,4</sup>

Leishmaniasis control program was initiated in 1345 in Iran. The disease exists in more than 17 provinces of Iran country particularly in southwest regions, Khuzestan province.

CL occurs in two forms of ACL (Anthroponotic cutaneous leishmaniasis) and ZCL (Zoonotic cutaneous leishmaniasis), and their etiological agents are *L. tropica* and *L. major*, respectively and both of them were identified in Khuzestan province.<sup>5</sup> Despite the performed measures and national and international investments for CL control, the disease still exists in many provinces and new endemic foci have been created and reported constantly.<sup>6,7</sup> Various factors for the establishment and incidence of CL are as follows: environmental changes, development of agricultural projects, unplanned expansion of cities, migration of non-immune individuals to endemic areas, construction of residential buildings in the vicinity of rodent nest, and dams construction and reduced or discontinued programs spraying against malaria vectors.<sup>5</sup>

Khuzestan province due to the special geographical location is considered as a free trade zone and agricultural center in Iran and a considerable number of persons are referred to this province. Moreover, in some seasons of the year embraces several million pilgrims and tourists. Besides, due to its adjacency to Iraq (an endemic country), traffic from foreign nationals is observed over the year.<sup>8</sup> On the other hand, presence of vectors (*Phlebotomus papatasi* and *Phlebotomus sergenti*) and reservoir (a rodent of the genus *Tatera indica*) for CL in the region,<sup>5</sup> makes this province faced at risk. Due to lack of a comprehensive study in this region, the aim of present investigation was to evaluate the epidemiological features and spatial distribution of CL during six consecutive years (2009–2014).



**Figure 1** Location of Khuzestan province in Iran. Ten study regions are shown with asterisks.

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