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SHORT REPORT
The persisting burden of visceral leishmaniasis in Iraq: data of the National Surveillance System, 1990–2009

B. MAJEED[1]*, J. SOBEL[1], A. NAWAR[2], S. BADRI[2] AND H. MUSLIM[2]

[1] *Centers for Disease Control and Prevention, Center for Global Health, Atlanta, GA, USA*
[2] *Ministry of Health, Communicable Disease Control Center, Baghdad, Iraq*

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SUMMARY

Visceral leishmaniasis (VL) is an endemic parasitic disease transmitted by the bite of sand flies. To describe trends and demographics of reported VL cases, we reviewed surveillance data from 1990–2009. Reported VL incidence per 100 000 population was 2·6 in 2007, 3·1 in 2008, and 4·8 in 2009, mostly in children aged <5 years. The number of cases varied greatly in step with prevailing economic and security conditions, raising concerns about the completeness and quality of surveillance data. Nevertheless, we conclude that VL remains an important endemic disease in Iraq and that surveillance system is recovering the capacity to detect cases as the country experiences greater stability. We recommend conducting formal entomological investigations, and evaluating existing control measures.

Key words: Epidemiology, Iraq, surveillance, visceral leishmaniasis.

Worldwide, half a million people are infected annually with visceral leishmaniasis (VL) which is also known as kala-azar [1]. VL is a parasitic disease caused by *Leishmania* spp., and transmitted by the bite of infected female phlebotomine sand flies. Symptomatic illness commonly occurs in malnourished and immunocompomised children and leads to death if neglected [2].

VL is endemic in Iraq (estimated population 32 millions), and it is caused by *Leishmania donovani* and *L. infantum*, both of which have also been identified in neighbouring Saudi Arabia, Turkey, and Iran [2]. Recent comprehensive entomological studies of the vector on an American military base in Iraq identified *Phlebotomus papatasi* and *P. alexandri* as the most abundant vector species [3, 4]. Feral dogs and jackals are the primary reservoir of *Leishmania* in Iraq and most of the Middle East [5].

The Communicable Disease Control Center (CDC Baghdad) at the central Ministry of Health (MOH) is responsible for communicable disease reporting and implementation of control and prevention programmes. The national VL control strategy includes weekly reporting via a passive population-based surveillance system, entomological investigations, reservoir control by rodent and feral dog extermination, vector control by insecticide spraying and night fogging, distribution of insecticide-impregnated bed nets to high-risk families, and ensuring appropriate treatment of diagnosed cases at the hospital level.

In Iraq, healthcare providers are required to report VL cases to the provincial Department of Health (DOH) via the national surveillance system. DOHs report aggregated VL data to CDC Baghdad and

* Author for correspondence: Dr B. Majeed, Centers for Disease Control and Prevention, Center for Global Health, 1600 Clifton Rd, Atlanta, GA 30333, USA.
(Email: bancomm2000@yahoo.com)

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implement the activities of the national VL control strategy [6]. In 2008, weekly reporting of VL to the Surveillance Section of CDC Baghdad became mandatory. We examined trends of VL occurrence in Iraq, using national surveillance data from 1990 to 2009.

A suspected case of VL was defined as fever, hepatosplenomegaly, progressive emaciation, and pancytopenia. A confirmed case was defined as a suspected case with a positive serological test for *Leishmania* infection. Tests used included the rK93 test (Kalazar Detect rapid test), which detects antibodies to the specific VL 93 amino-acid sequence (K93) and is widely available in most major hospitals in Iraq [7]; and the indirect fluorescent antibody test (IFAT), which was used as the confirmatory test at the central public health laboratory.

For the period of 1990 to 2006, only aggregated data were available for analysis; for 2007–2009, data on case age, sex, residence, and date of diagnosis were available. Population data accessed from the Surveillance Section were used to estimate the rate of disease in children aged <5 years.

Figure 1 shows national VL surveillance data for the period of 1990–2009. Between 1990 and 1999, a gradual increase in reported cases took place. The median number of cases per year during this period was 449. There was a three- to fourfold increase in the number of cases per year from 763 in 1999 to a high of 3218 in 2002. Reports of VL cases declined in 2004–2005 (from a high of 3171 in 2004 to a low of 775 in 2007), before rising again after 2007.

Total numbers of reported VL cases were 1009 in 2008 and 1549 in 2009. During the period 2007–2009, the highest number of cases were reported in Diyala province ($n=558$, median $=133$ per year), Wassit province ($n=540$, median $=156$ per year), and Missan province ($n=388$, median $=121$ per year).

Twenty deaths occurred in 2009 (case-fatality ratio 1·2%), of which 13 were reported in Diyala province. Incidence was 27·1/100 000 children aged <5 years, and 1·1/100 000 children aged 5–14 years in 2009. In 2009, the male to female ratio was 1·1:1, and the highest number of cases was reported during late winter and early spring (January–April). As shown in Figure 2, in 2009 the eastern province of Diyala reported 403 VL cases while the southeastern province of Missan reported 167 cases. During 2007–2009 a consistent seasonal variation was observed. Cases began to increase in November (ranging from 21–100), peaked in February (200–300 cases), and began to decline in spring.

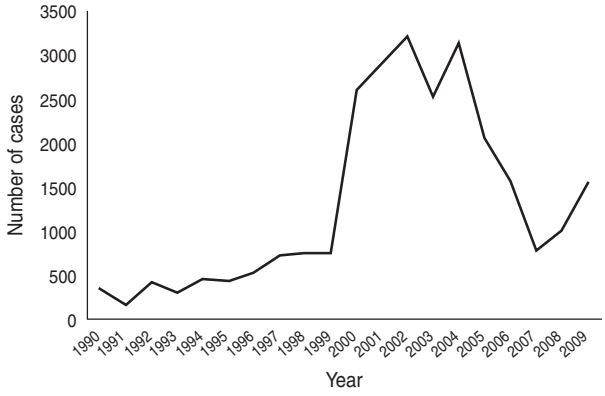

Fig. 1. Reported visceral leishmaniasis cases in Iraq, National Surveillance System, 1990–2009.

Reporting of VL in Iraq has been complicated by volatile political, economic, and security conditions for decades; surveillance data must be interpreted accordingly. The relatively low but increasing number of cases reported between 1990 and 1999 probably reflect severe underreporting due to the low priority given to VL or lack of laboratory tests required for case confirmation. In 1999, the national health authorities responded to political and media pressures to strengthen VL surveillance and encouraged reporting by healthcare providers, with a resultant tripling of VL cases reported from 1999 to 2000. The relatively stable occurrence of approximately 2500–3000 cases per year during 2002–2004 is probably a reasonable reflection of disease occurrence in Iraq; factors contributing to the burden of disease during this period probably include the impact of international sanctions since the 1990s on healthcare and public health and the disruptions associated with the 2003 war. The precipitous decline in reported cases between 2004 and 2007 is most likely a reporting artifact due to the insurgency and its severe impact on all facets of life in Iraq. The increase during the period of 2007–2009 probably reflects the gradual restoration of the surveillance system's capacity to detect cases. Although we recognize that surveillance data from the period 2007–2009 are distorted by these artifacts of reporting, consistencies in the data suggest some preserved capacity of the surveillance system to detect and report cases, thereby allowing us to draw some conclusions. The sex ratio of cases, seasonal variation, and geographical distribution remained constant throughout the period. The risk of VL infection increases during summer because heat accelerates sand fly development and parasite maturation [8].

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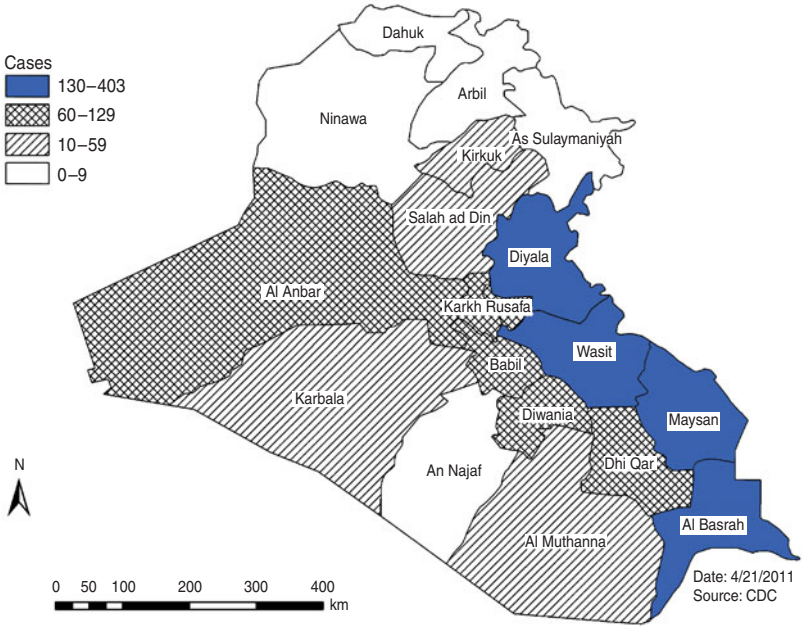

Fig. 2 [*colour online*]. Reported visceral leishmaniasis cases by province, Iraq, National Surveillance System, 2009.

However, the majority of cases are identified during winter, because of the long incubation period. The seasonal pattern of reported VL cases during 2007–2009 in Iraq is consistent with the known seasonality of the disease. We therefore believe that while the true incidence and burden of disease have been under-reported in recent years, the increasing number of reports reflects the soundness of surveillance system, which, with increasing stability and improved security in the country, is progressively recovering its ability to detect cases with reasonable sensitivity.

Thus, despite severe disruptions in reporting of cases in Iraq in the past decade, the available surveillance data indicate that this potentially lethal disease constitutes a continuing and substantial health burden for the population, particularly in young children. We therefore recommend a formal evaluation of VL control programmes, including the entomological and epidemiological surveillance systems and vector control capacity, with a view to more accurately monitoring the full burden of disease and appropriately directing control efforts.

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DECLARATION OF INTEREST

None.

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