

# The status of Important Zoonoses in Middle East

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WHO ESTIMATES OF  
THE GLOBAL BURDEN  
OF FOODBORNE DISEASES



FOODBORNE DISEASE  
BURDEN EPIDEMIOLOGY  
REFERENCE GROUP  
2007-2015

FERG

**Emro B**

**Bahrain**

**Iran (Islamic Republic of)**

**Jordan**

**Kuwait**

**Lebanon**

**Libyan Arab Jamahiriya**

**Oman**

**Qatar**

**Saudi Arabia**

**Syrian Arab Republic**

**Tunisia**

**United Arab Emirates**

**Emro D**

**Afghanistan**

**Djibouti**

**Egypt**

**Iraq**

**Morocco**

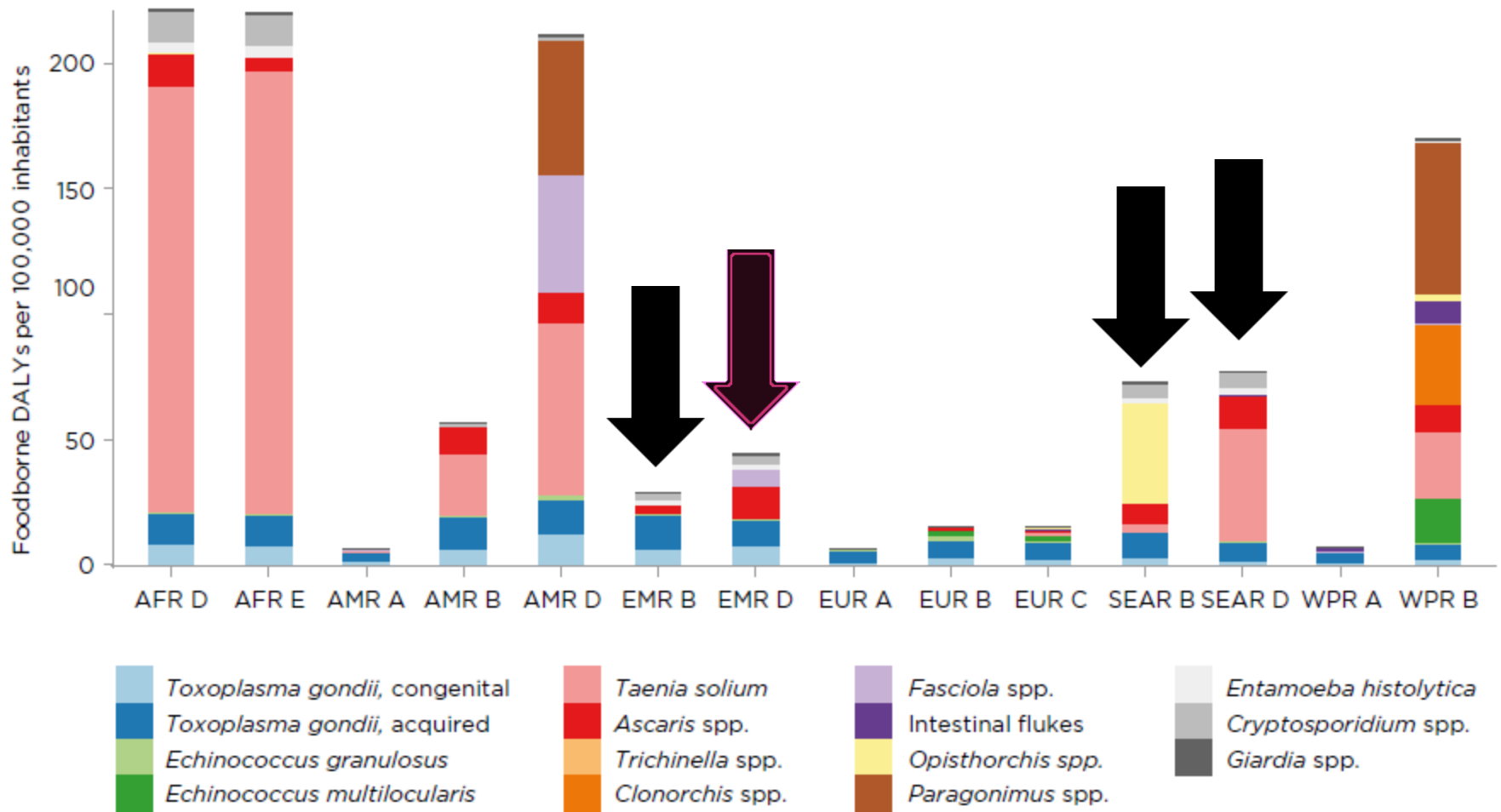
**Pakistan**

**Somalia**

**Sudan**

**Yemen**

**Figure 18A.** The relative contribution to the DALY incidence by each agent for each of the subregions. This includes enteric protozoa to complete the picture on foodborne parasitic diseases. However the detail is reported in the accompanying manuscript on foodborne enteric pathogens [168].



5 Cattle ingest cysts, which develop into liver flukes and migrate to the liver in 8 to 10 weeks.



Each adult liver fluke lays as many as 19,000 eggs per day. The average infection of 50 to 100 adult flukes results in as many as 1,900,000 eggs per host animal every day!



## Liver Fluke Life Cycle

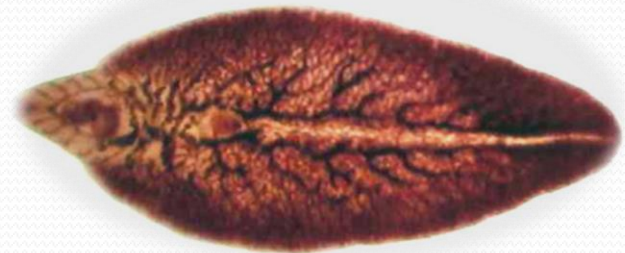
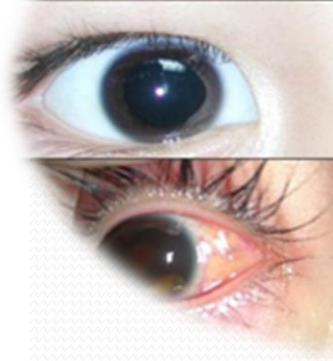
4 Offspring migrate out of the snail as cercariae and form cysts (metacercariae) on vegetation.



3 Larvae infect snails and produce several hundred offspring.



2 Contact with water or moisture helps the larvae (miracidia) hatch in 4 to 15 days.



# Fasciola spp.

# Fasciolosis

Country	No. of cases	Age (range years)
Iran	Two big outbreak in Iran: 10000 cases each of which in 1989 and 1999	
Iraq	18	25-82
Saudi Arabia	7	-
Kuwait	1	-
Egypt	678 5.2-19.0% (12.8%)	All ages

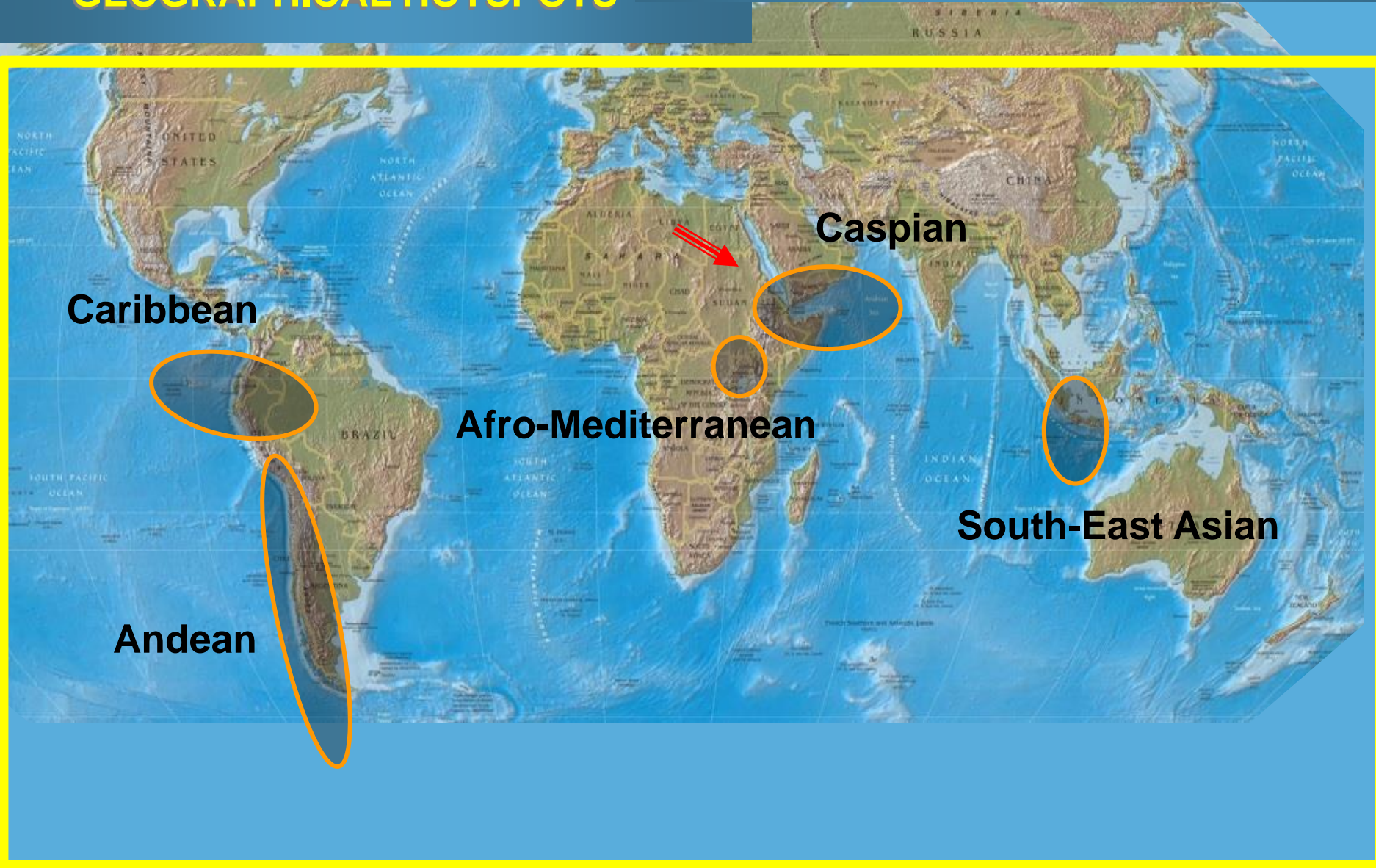
Country	No. of cases	Sex ratio F/M	Age (range years)	Diagnostic methods	References
Algeria	4	3/1	10–42	Parasitology/IEP	Zait and Hamrioui (2005)
Iraq	18	15/3	25–82	Hospital-based documents	Hawramy et al. (2012)
Iraq	10	–	–	Surgery-medical inspection	Hassan et al. (2013), Hawramy et al. (2012)
Israel	2	–	–	Case report (one imported case in 65-year-old female from Afghanistan)	Dan et al. (1981)
Pakistan	21	0.30/0.28	<20	Parasitology	Qureshi et al. (2005)
Pakistan	14	5.08/4.4	<30	IHA	Qureshi and Tanveer (2009)
Saudi Arabia	2 5	– –	– –	Parasitology Serology	Degheidy and Al-Malki (2012)
Tunisia	2	–	19; 41	Serology	Hammami et al. (2007)
Yemen	185	–	–	Parasitology/biliary drainage	Farag (1985)
Kuwait	1	F	–	Endoscopy	Al-Mekhaizeem et al. (2004)

Human fasciolosis in MENA region (Middle East and north Africa)



# GEOGRAPHICAL HOTSPOTS

# HUMAN FASCIOLIASIS

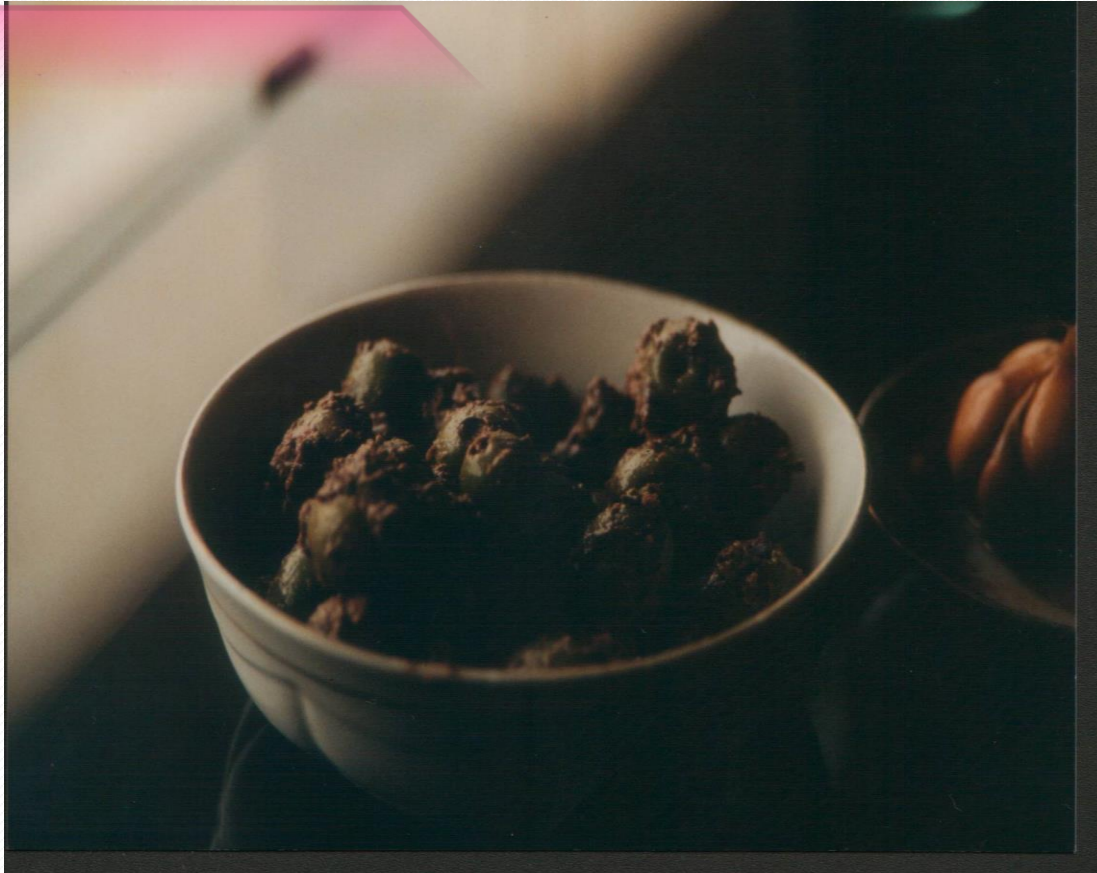




# Fascioliasis in Iran



## Proceeded olive



**67% of *Fasciola metacercaria* were alive  
after 14 days**

# Delar



- *Mentha pulegium* Khlivash
- and *Mentha piperita* Bineh
- Salt (w/w)
- pH= 5

47% of *Fasciola metacercaria*  
were alive after 48 days

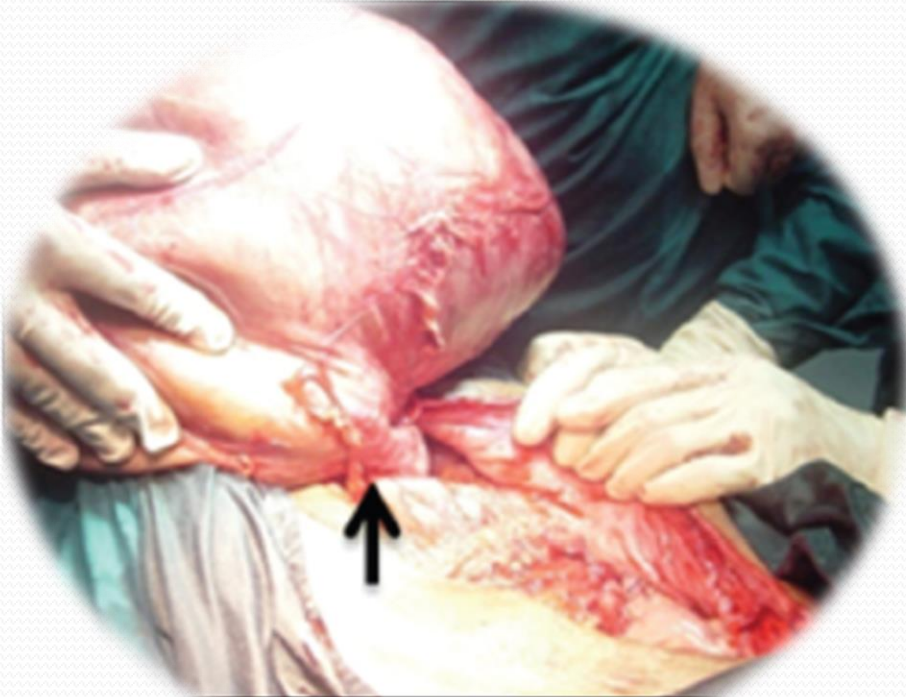
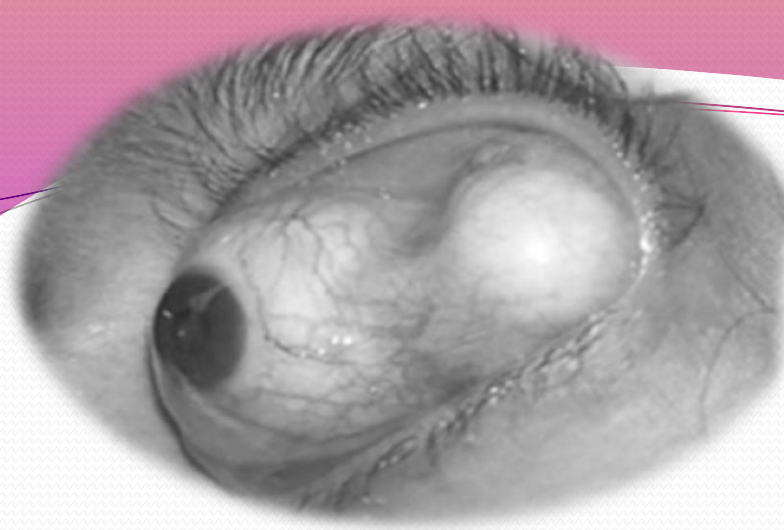
47% of *Fasciola metacercaria*  
were alive after 48 days



## Fasciolosis and chewing khat (*Catha edulis*)



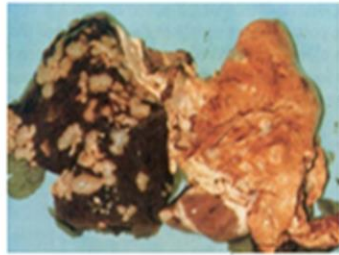
# Hydatid cyst



(arrow) of giant hepatic hydatid



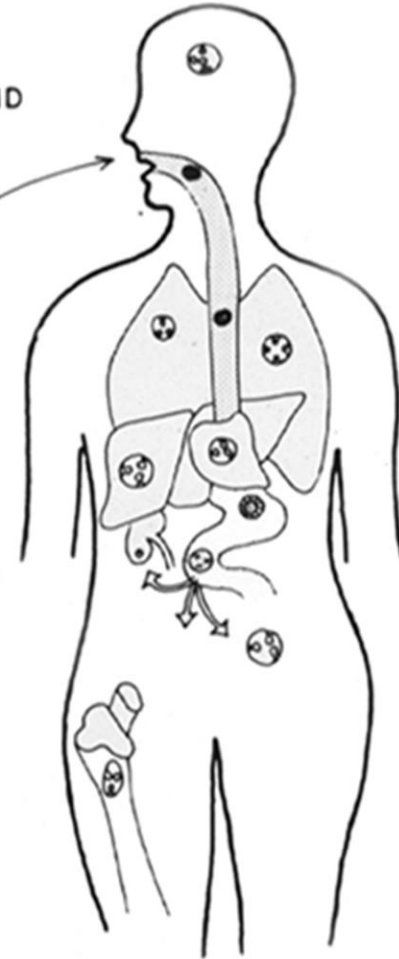




**GRAVID PROGLOTTID**

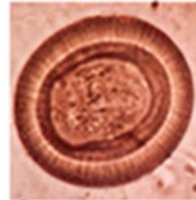


**EGG**



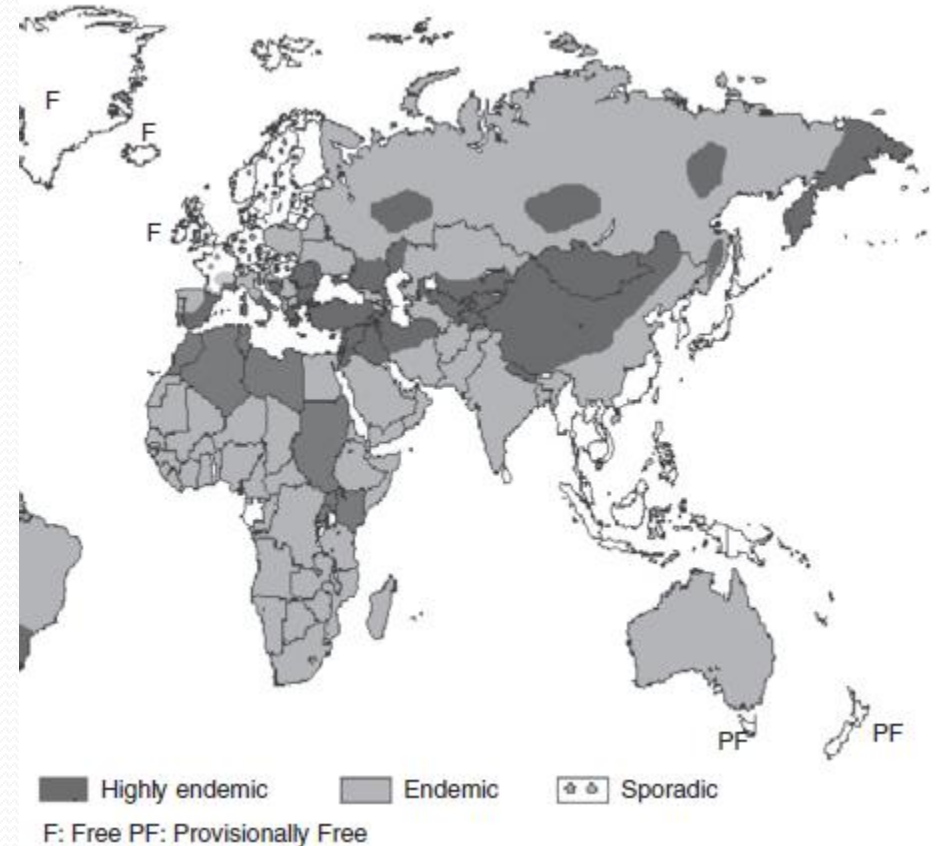
**HYDATID CYST  
IN LIVER AND LUNGS**

**INTERMEDIATE HOST  
SHEEP, PIGS, ETC.**



# Echinococcosis

In Iran, 1% of all surgeries is related to CE  
Case reported in nearly all countries of the region



Country	Reference (Language)	Region	Design	Diagnostic methods	Source population	Target population	Outcome
Egypt	Kandeel A (2004) (English)	National	Cohort	Chart review: Diagnostic imaging, serology, therapy, and histopathology or analysis of cyst fluid	Patients seeking treatment at 14 generalized and specialized hospitals	CE cases treated from 1997-1999	133 new cases of CE reported (out of 492,953 cases admitted)  IR (author reported)= Matrough: 1.34-2.60 / 100,000 person-years Giza: 0.80-1.16/ 100,000 persons-years
Palestinian Authority	Abu-Hasan N (2002) (English)	West Bank, Palestinian territory	Cohort	Surgical records review: Surgically confirmed cases of CE	Catchment population of all 7 public and 5 private hospitals on the West Bank	Surgical cases of CE (Palestinian) seen at these hospitals	390 cases of surgical CE diagnosed from 1990-1997  MASI (author reported) = Mean: 3.1/100,000 1995: 3.7/100,000 1996: 3.4/100,000 1997: 2.9/100,000
Iraq	Saeed I (2000) (English)	Arbil Province	Cohort	Surgical record review: Surgically and histopathologically confirmed CE	Catchment population of the 2 main hospitals in Arbil Province	CE patients diagnosed from 1990-1998 in the 2 main hospitals in Arbil Province	99/4,971 surgical cases = CE
Jordan	Al-Qaoud KM (2003)	National	Cohort	Surgical records review: Surgically	Population of Jordan	Surgical CE cases seen at major	1994-2000: 472 cases

Country	Article	Total Patients	Liver	Lung	Spleen	Kidney	Other
Iran	Pezeshki A (2007)	78	54 (69.2%)	9 (11.5%)	6 (7.69%)	1 (1.28%)	8 (10.2%)
Iraq	Saeed I (2000)	99	65 (65.6%)	27 (27.3%)	4 (4.0%)	3 (3.03%)	5 (5.0%)
Turkey	Koc Z (2008)	212	169 (79.7%)	36 (17.0%)	2 (0.943%)	3 (1.41%)	6 (2.83%)
Palestinian Authority	Abu-Hasan N (2002)	390	273 (70.0%)	101 (25.9%)	4 (1.02%)	3 (0.80%)	10 (2.6%) Unspecified=19 (4.9%)

**Cystic echinococcosis cyst location  
(symptomatic patients)**

(symptomatic patients)

## Burden of cystic echinococcosis in Iran

- The overall annual cost of CE in Iran was estimated at US\$232.3 million including both direct and indirect costs.
- **The cost associated with human CE was estimated at US\$ 93.39 million**
- The annual cost associated with CE in livestock was estimated at US\$132 million.
- **The cost per surgical human case was estimated at US\$ 1,539.**
- CE has a considerable economic impact on Iran, with the cost of the disease approximated at 0.03% of the country's gross domestic product.







# Sheep sellers and hydatid cyst





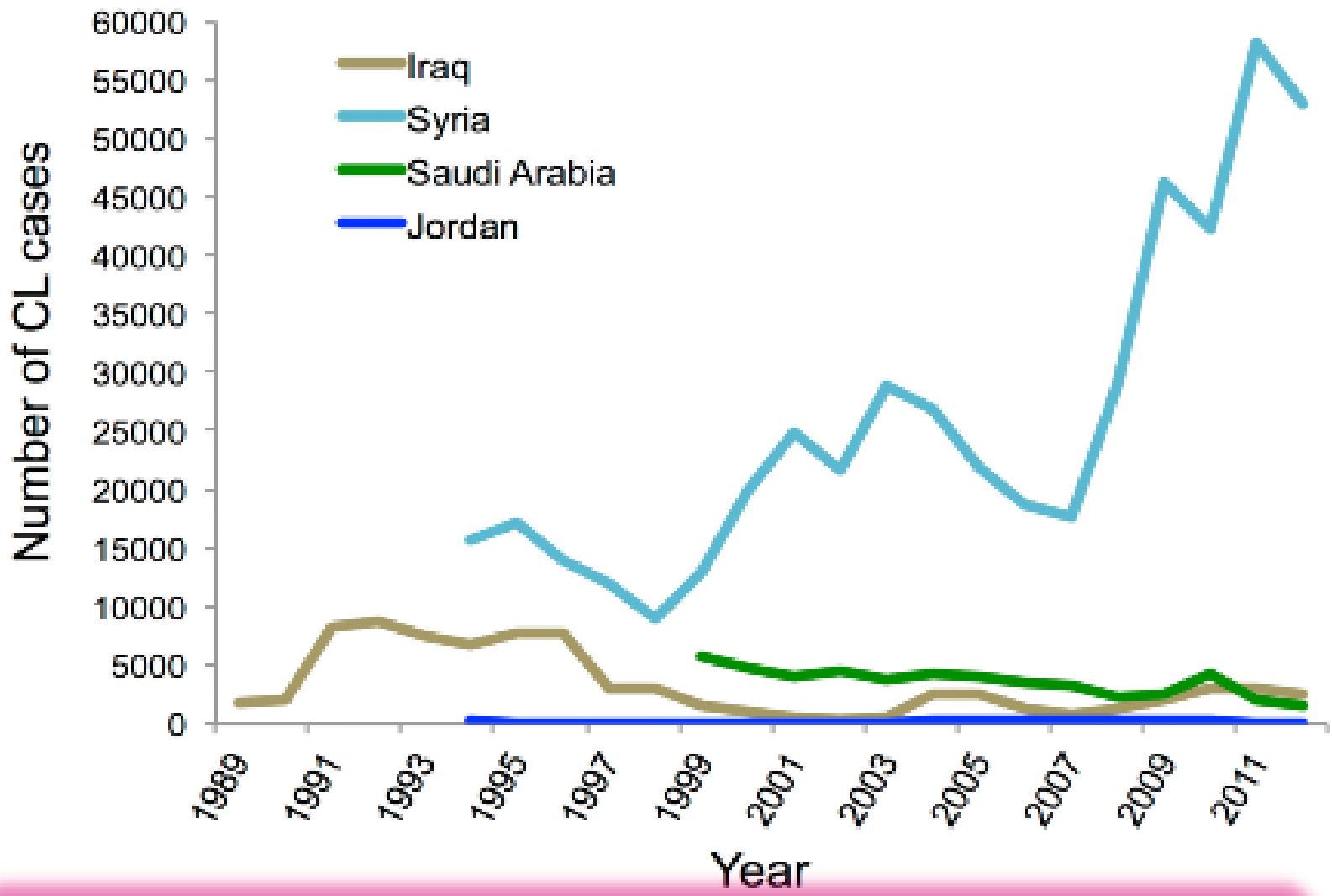
Carrot juice and  
Ice cream and  
echinococcosis





Leishmaniasis

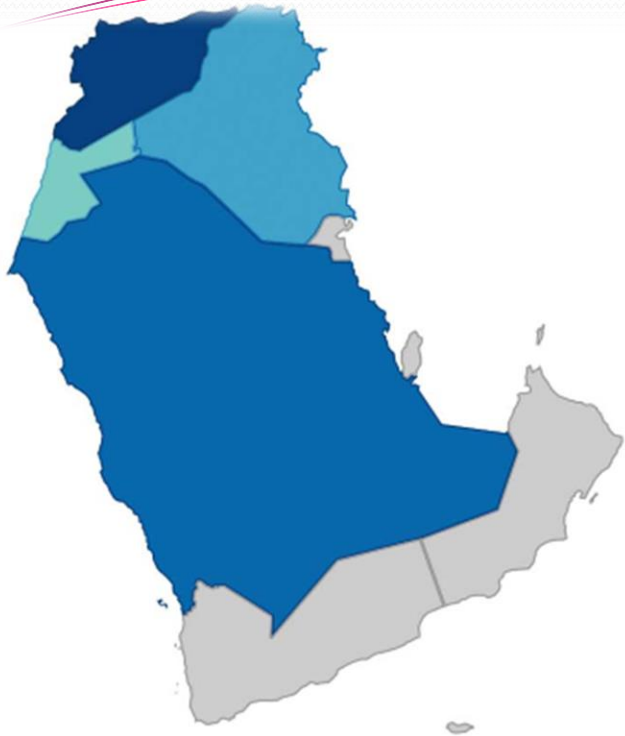




Trend on Cutaneous leishmaniasis in Middle East (WHO report)



## CL Cases Reported in the year 2008

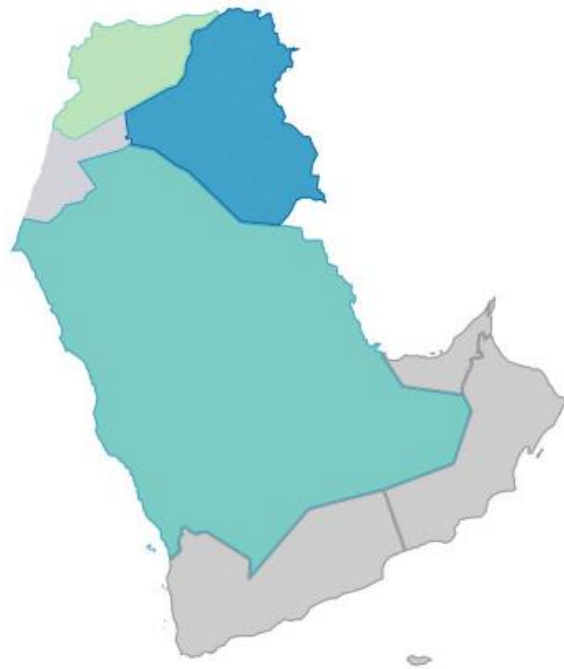




	Jordan	(244 Cases)
	Iraq	(1250 Cases)
	Saudi Arabia	(2321 Cases)
	Syria	(29140 cases)

**Figure 4. Relative distribution of CL cases reported in the year 2008.**

doi:10.1371/journal.pntd.0003208.g004

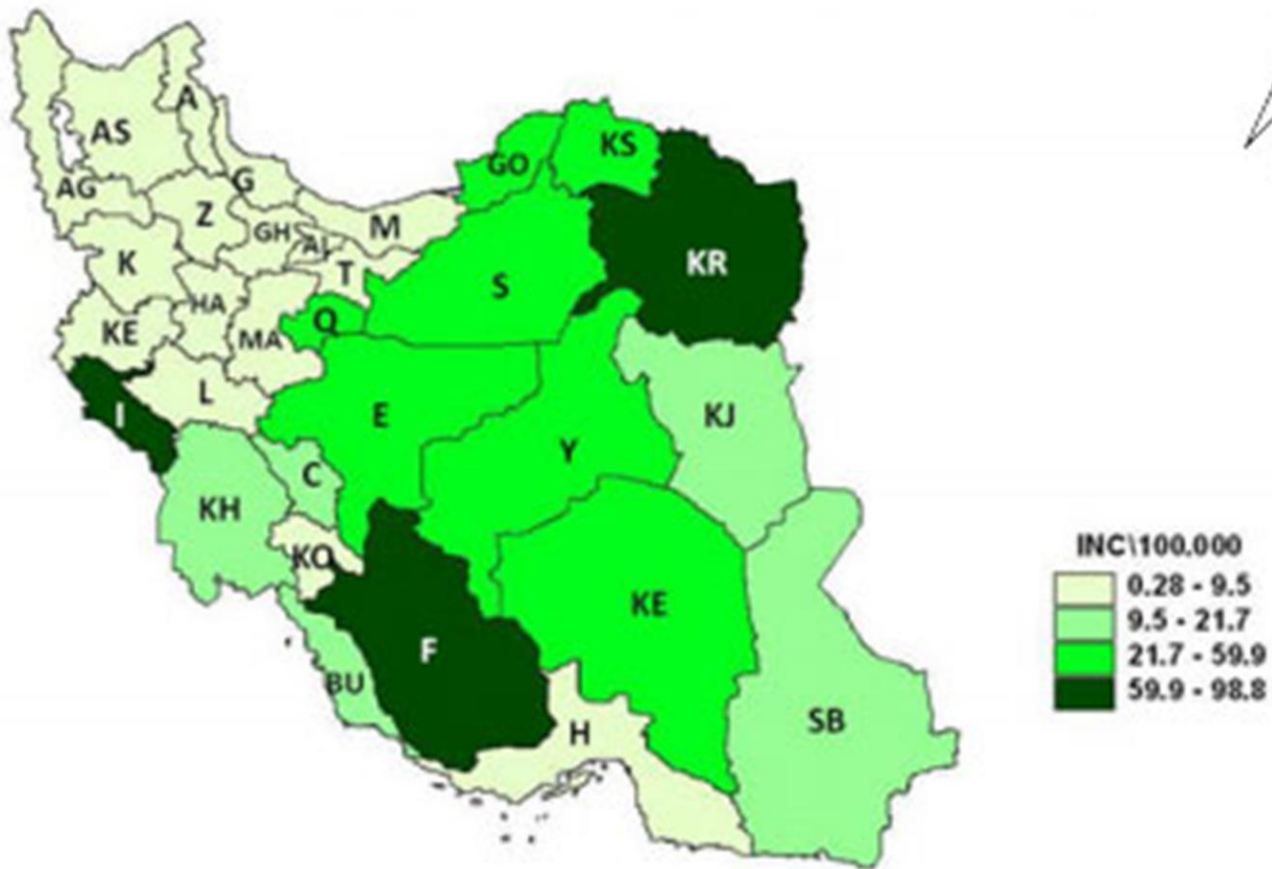
## VL Cases Reported in the year 2008



	Syria	(17 Cases)
	Saudi Arabia	(32 Cases)
	Iraq	(1041 Cases)

**Figure 5. Relative distribution of VL cases reported in the year 2008.**  
doi:10.1371/journal.pntd.0003208.g005

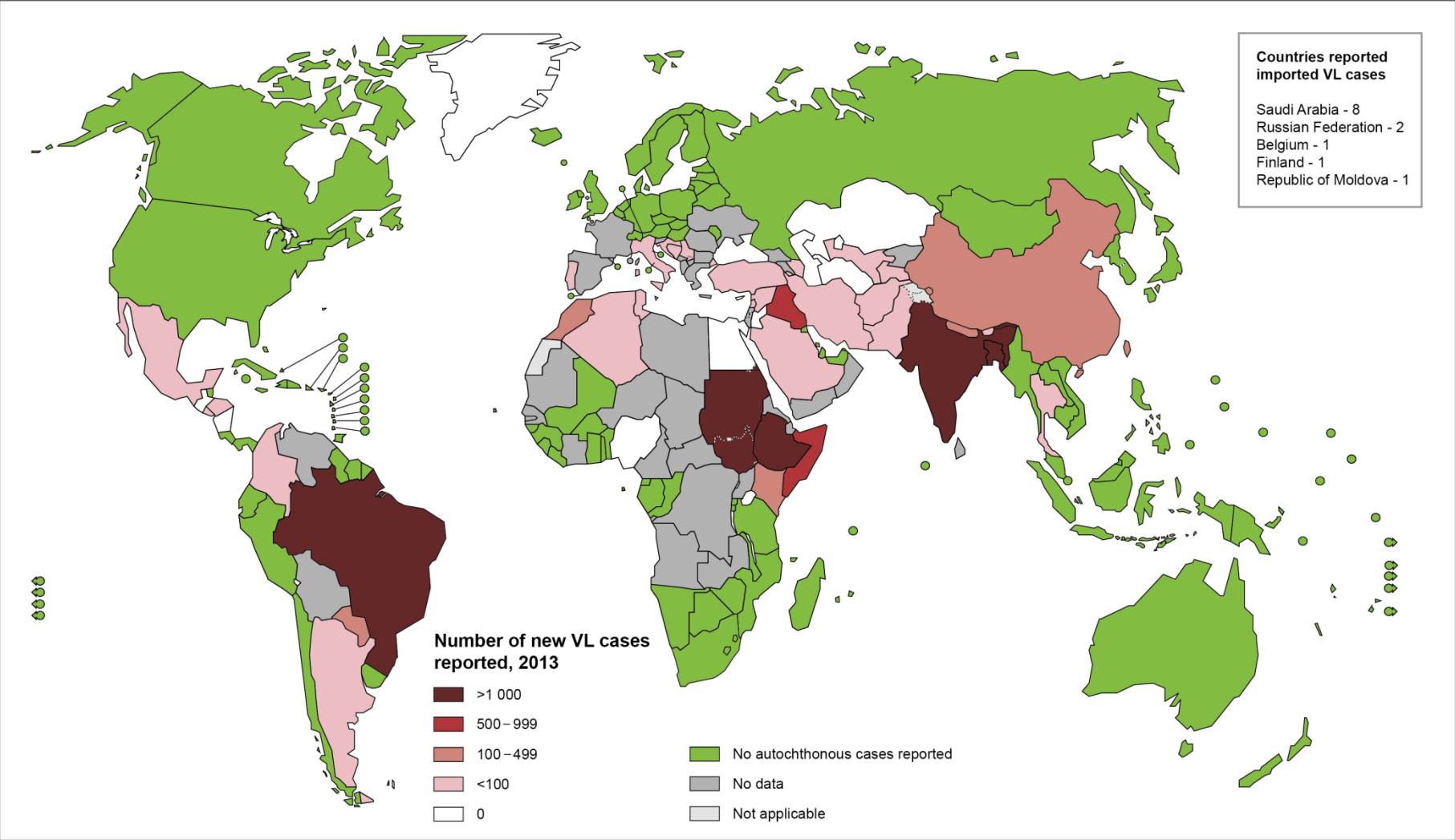
<b>Country</b>	<b>Case number</b>
Afghanistan	113,100–226,200
Iran	69,000–113,300
Syria	64,100–105,300
Tunisia	21,400–35,100



## Cutaneous leishmaniasis in Iran

<http://www.emro.who.int/emhj-volume-21-2015/volume-21-issue-10/epidemiological-status-of-leishmaniasis-in-the-islamic-republic-of-iran-19832012.html>

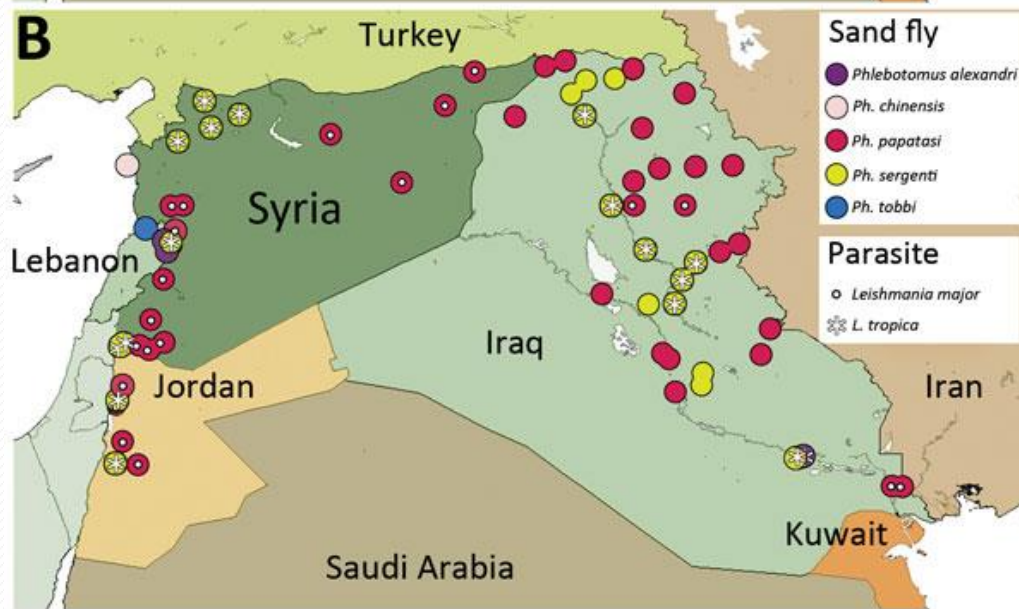
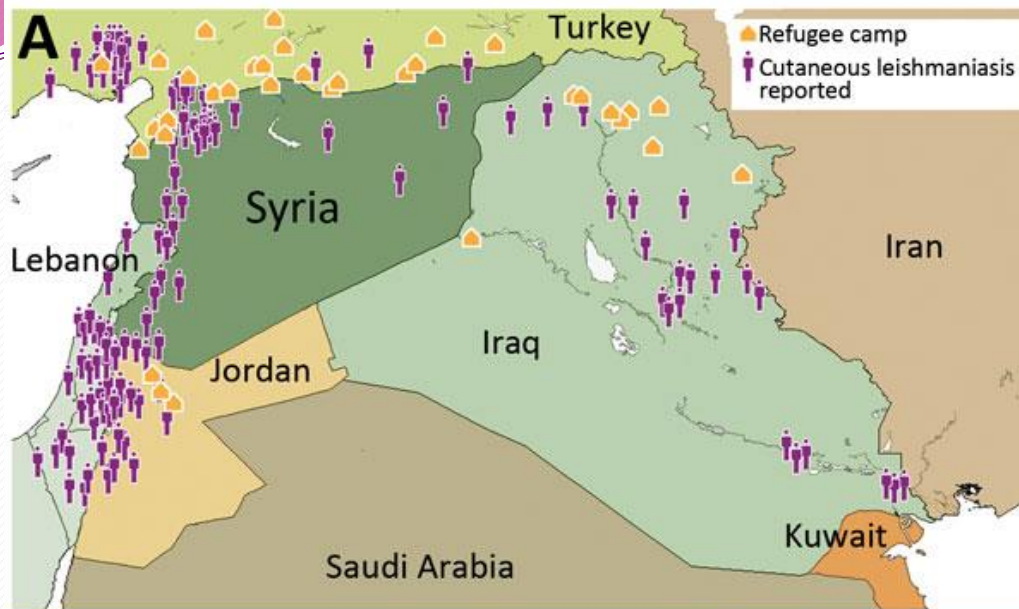
# Status of endemicity of visceral leishmaniasis, worldwide, 2013



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Data Source: World Health Organization  
 Map Production: Control of Neglected Tropical Diseases (NTD)  
 World Health Organization



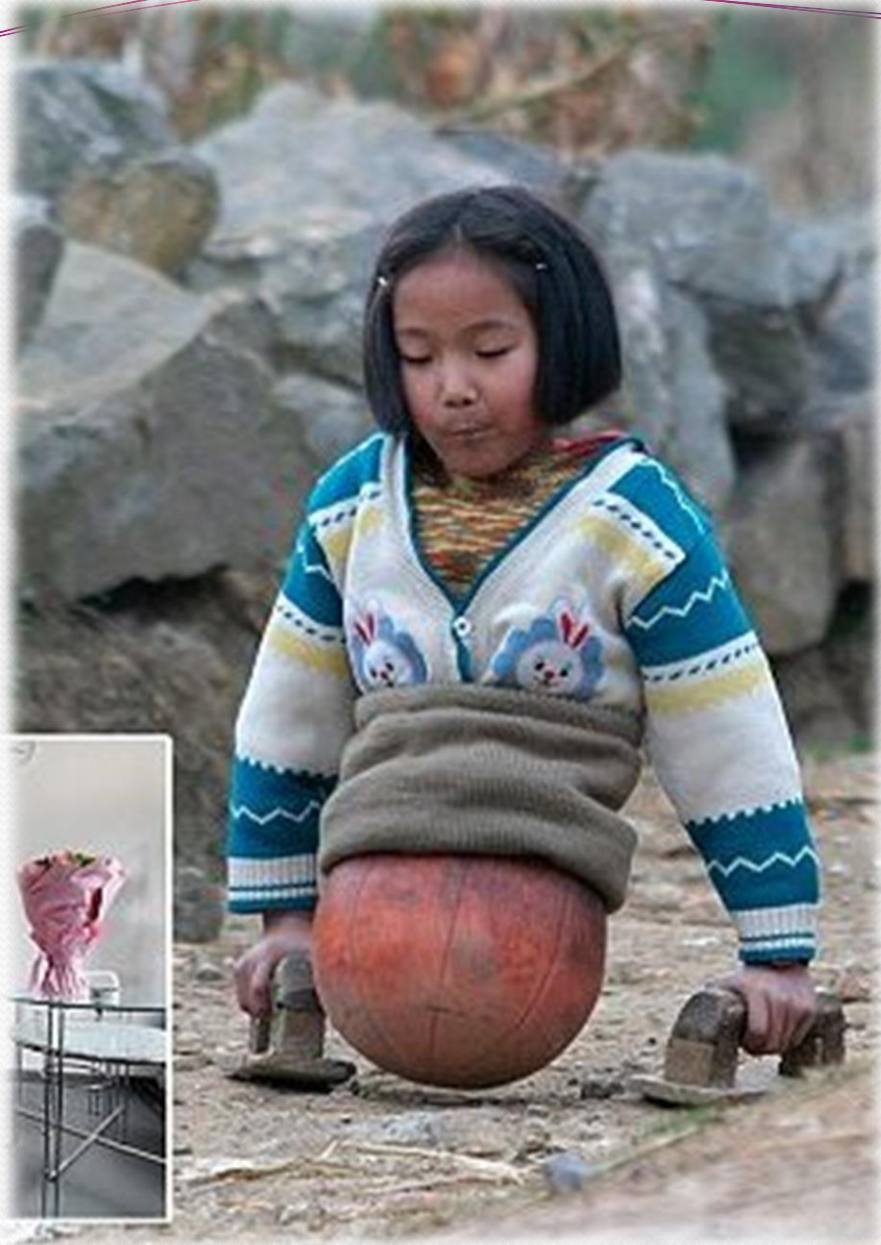


<http://www.natureasia.com/en/nmiddleeast/article/10.1038/nmiddleeast.2016.82>

10.1038/nmiddleeast.2016.82

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Thanks

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