

# Leishmaniases in the European Union and Neighboring Countries

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A questionnaire survey of animal and human health authorities in Europe revealed that leishmaniases are not notifiable in all countries with autochthonous cases. Few countries implement surveillance and control targeting both animal and human infections. Leishmaniases are considered emergent diseases in most countries, and lack of resources is a challenge for control.

Leishmaniases are endemic in humans and animals in part of the European Union (EU) and its neighboring countries. *Leishmania* species in this region are *L. major*, *L. tropica*, and the *L. donovani* complex species (including *L. infantum* and *L. donovani* sensu stricto). All cause cutaneous leishmaniasis (CL); visceral leishmaniasis (VL) is caused mainly by *L. donovani* complex species. There is evidence that the risk for leishmaniases is increasing in some EU and neighboring countries (1). We conducted a questionnaire survey to gather information on the epidemiologic situation, surveillance, prevention and control measures, and drivers of emergence of animal and human leishmaniases in this region during 2010–2020.

## The Study

The survey included an animal leishmaniasis (AniL) questionnaire referring to *L. infantum* infections in domestic or wildlife hosts and a human leishmaniases

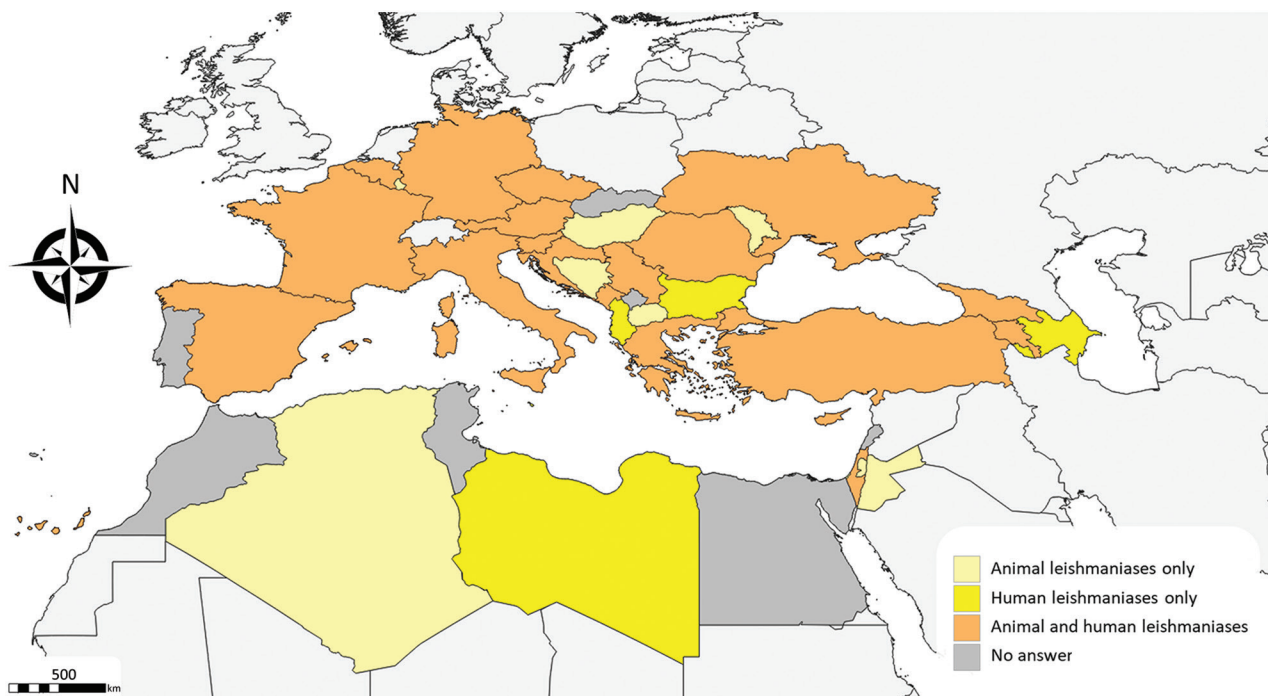
(HumL) questionnaire referring to infections by *L. infantum*, *L. major*, *L. tropica* and *L. donovani* s.s. (Appendix, <https://wwwnc.cdc.gov/EID/article/27/6/21-0239-App1.pdf>). The target audience was the national focal points (national institutes or ministries) of the European Centre for Disease Prevention and Control, the World Health Organization, the European Food Safety Authority, and the World Organisation for Animal Health in countries in which leishmaniases are endemic or those with confirmed or suspected presence of sand fly vectors (2). These countries were Albania, Algeria, Armenia, Austria, Azerbaijan, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czechia, Egypt, France, Georgia, Germany, Greece, Hungary, Israel, Italy, Jordan, Kosovo, Lebanon, Libya, Liechtenstein, Luxembourg, Malta, Moldova, Montenegro, Morocco, North Macedonia, Palestine, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Tunisia, Turkey, and Ukraine (Figure 1). The questionnaires were administered electronically using the EU survey tool and shared on September 11, 2020 (3). Twenty-seven countries (70%) replied to the AniL questionnaire and 24 countries (60%) to the HumL questionnaires; 19 countries (48%) replied to both (Table 1).

We reviewed the countries' epidemiologic status with regards to autochthonous *Leishmania* spp. infections in animals and humans and clinical forms in humans. The mapping of the countries with autochthonous transmission matches previous published information with few discrepancies. For instance, according to the questionnaire, Bosnia and Herzegovina and Hungary do not have autochthonous canine leishmaniasis cases, although such cases have been described (4,5). Human cases of leishmaniasis due to *L. tropica* were reported in Cyprus and Serbia and due to *L. major* in Georgia; however, none of the literature presents concurring evidence (Table 2).

Animal leishmaniases are notifiable in 17 countries and human leishmaniases in 20 countries (Table 1; Figure 2). In Palestine and Turkey, AniL is not notifiable despite a high prevalence among dogs (6,7). Similarly,

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DOI: <https://doi.org/10.3201/eid2706.210239>



**Figure 1.** Geographic distribution of countries that responded to survey questionnaires about animal and human leishmaniasis in Europe, 2020.

in France, neither AniL nor HumL are notifiable although the diseases are endemic in the south (8). Leishmaniasis surveillance is not mandatory at the EU level which constitutes a limitation for successful control.

Seven countries conduct AniL surveillance (Table 1), indicative of its low priority among the animal health authorities. The target animal population for surveillance included symptomatic and asymptomatic dogs in Armenia, Cyprus, Italy, Spain, and Ukraine; we also studied wildlife in leishmaniasis foci in Spain. Testing subclinically infected dogs indicated awareness of their role as reservoirs of the parasite (1). Similarly, wild lagomorphs were the main reservoir of *L. infantum* in a HumL outbreak in Madrid in Spain (9). Surveillance of HumL is conducted in 19 countries, including all of those with autochthonous infections except Serbia (Table 1).

Antibody tests, including the immunofluorescence antibody test, ELISA, and the rapid immunochromatography test, are the main surveillance diagnostic methods used, followed by PCR. Antibody tests play a fundamental role in disease surveillance because they are relatively cheap and easy to use (10). However, their sensitivity to detect subclinical infections is lower than that of PCR tests (10), and they do not discriminate naturally infected from vaccinated dogs (11). PCR tests are ideal for epidemiologic studies to estimate *Leishmania* spp. infection prevalence in healthy hosts, but their diagnostic validity depends

on the sample used, the DNA sequence target, and the PCR protocol. Standardization of PCR tests in leishmaniasis diagnosis is needed (12).

Of the 7 countries that have ongoing AniL prevention and control programs (Table 1), 5 use topical insecticides for dogs, 5 are diagnosing and treating leishmaniasis in dogs, and 2 use canine leishmaniosis vaccines. In all countries, infected dogs may be euthanized on welfare grounds. Lack of funds and treatment costs were considered the most important AniL control challenges. Human leishmaniasis prevention and control activities are implemented in 12 countries (Table 1); for *L. infantum*, actions focused on the use of insecticides on dogs, and for *L. major*, *L. tropica*, and *L. donovani*, the common activity was the use of peridomestic and intradomestic insecticides. Lack of funds and capacity constraints are considered the main challenges for HumL.

Although zoonotic *L. infantum* strategies are centered on preventing and eliminating infections in dogs, the main parasite reservoir host, we found that insecticides and treatments are not fully effective and are expensive, and so provided to a relatively small proportion of dogs. Leishmaniasis control needs the One Health approach to account for the complexity of its transmission cycle involving humans, domestic animals, wildlife, and sand fly vectors (13).

Animal leishmaniasis are considered emergent diseases in Cyprus and Jordan and in parts of Algeria,

**Table 1.** Declared country status of leishmaniases surveillance and control, 2010–2020\*

Country	Autochthonous		Notifiable		Surveillance		Control	
	Animal	Human	Animal	Human	Animal	Human	Animal	Human
Albania	NR	VL, CL	NR	Yes	NR	Yes	NR	No
Algeria	Yes	NR	Yes	NR	Yes	NR	Yes	NR
Armenia	Yes	VL	Yes	Yes	Yes	Yes	Yes	Yes
Austria	Not known	No	No	No	No	No	No	No
Azerbaijan	NR	VL, CL	NR	Yes	NR	Yes	NR	Yes
Belgium	No	No	No	No	No	Yes	No	No
Bosnia and Herzegovina	No	NR	Yes	NR	No	NR	No	NR
Bulgaria	NR	VL	NR	Yes	NR	Yes	NR	Yes
Croatia	Yes	VL, CL	Yes	Yes	No	Yes	No	Not known
Cyprus	Yes	VL, CL	Yes	Yes	Yes	Yes	No	No
Czechia	Not known	No	Yes	Yes	No	No	No	No
France	Yes	VL, CL	No	No	No	Yes	No	No
Georgia	Yes	VL	Yes	Yes	No	Yes	No	Yes
Germany	Not known	No	No	No	No	No	No	No
Greece	Yes	VL, CL	Yes	Yes	No	Yes	Yes	Yes
Hungary	Not known	NR	No	NR	No	NR	No	NR
Israel	Yes	VL, CL	Yes	Yes	No	Yes	No	Yes
Italy	Yes	VL, CL	Yes	Yes	Yes	Yes	Yes	Yes
Jordan	Yes	NR	Yes	NR	No	NR	No	NR
Libya	NR	VL, CL	NR	Yes	NR	Yes	NR	Yes
Luxemburg	Not known	NR	No	NR	No	NR	No	NR
Malta	NR	VL, CL	NR	Yes	NR	Yes	NR	Yes
Moldova	No	NR	Yes	NR	No	NR	No	NR
Montenegro	No	VL	Yes	Yes	No	Yes	Yes	No
North Macedonia	Yes	NR	Yes	NR	Yes	NR	Yes	NR
Palestine	Yes	NR	No	NR	No	NR	Yes	NR
Romania	Yes	No	No	Yes	No	No	No	Not known
Serbia	Yes	VL, CL	No	No	No	No	No	Yes
Slovenia	Yes	No	Yes	Yes	No	Yes	No	No
Spain	Yes	VL, CL	Regionally	Yes	Yes	Yes	No	Yes
Turkey	Yes	VL, CL	No	Yes	No	Yes	No	Yes
Ukraine	Yes	VL	Regionally	Yes	Yes	Yes	No	No

\*Data source: questionnaires survey on animal and human leishmaniases to national focal points of the European Centre for Disease Prevention and Control, the World Health Organization, the European Food Safety Authority, and the World Organisation for Animal Health; survey conducted in 2020. CL, cutaneous leishmaniases; NR, no response; VL, visceral leishmaniases.

Armenia, France, Georgia, Jordan, Montenegro, North Macedonia, Romania, Slovenia, Turkey, and Ukraine. The most important AniL emergence risk factor is the lack of control. Human leishmaniases are considered emerging diseases in Cyprus, Libya and Malta and in parts of Albania, Austria, Armenia, Azerbaijan, Georgia, Israel, Italy, Montenegro, and Spain. The main risk factors for HumL emergence are vector expansion for *L. infantum*, and movement of infected persons between countries for *L. major*, *L. tropica*, and *L. donovani*.

In general, the perceived increasing risk for AniL and HumL was in line with the literature. In the EU and its neighborhood, the risks include movement of humans and dogs, increased number of immunosuppressed patients, climate warming, and other environmental changes affecting vector and reservoir host distribution (1,14). Limitations associated with existing surveillance and control programs, along with the fact that leishmaniases are often regarded as a local problem rather than a transnational problem, are deemed major obstacles to overcome to prevent leishmaniases emergence in the EU and its neighborhood.

## Conclusions

Leishmaniases are considered widespread, endemic, or emerging infections in the EU and its neighborhood, yet are neglected and underreported because they are low priority at the country and EU level. Our study revealed a clear need to strengthen leishmaniasis prevention and control programs in the EU and its neighborhood. We recommend analysis of leishmaniasis incidence in the region for an objective assessment of disease emergence, and also improvement of prevention and control programs based on a robust surveillance and following a One Health approach.

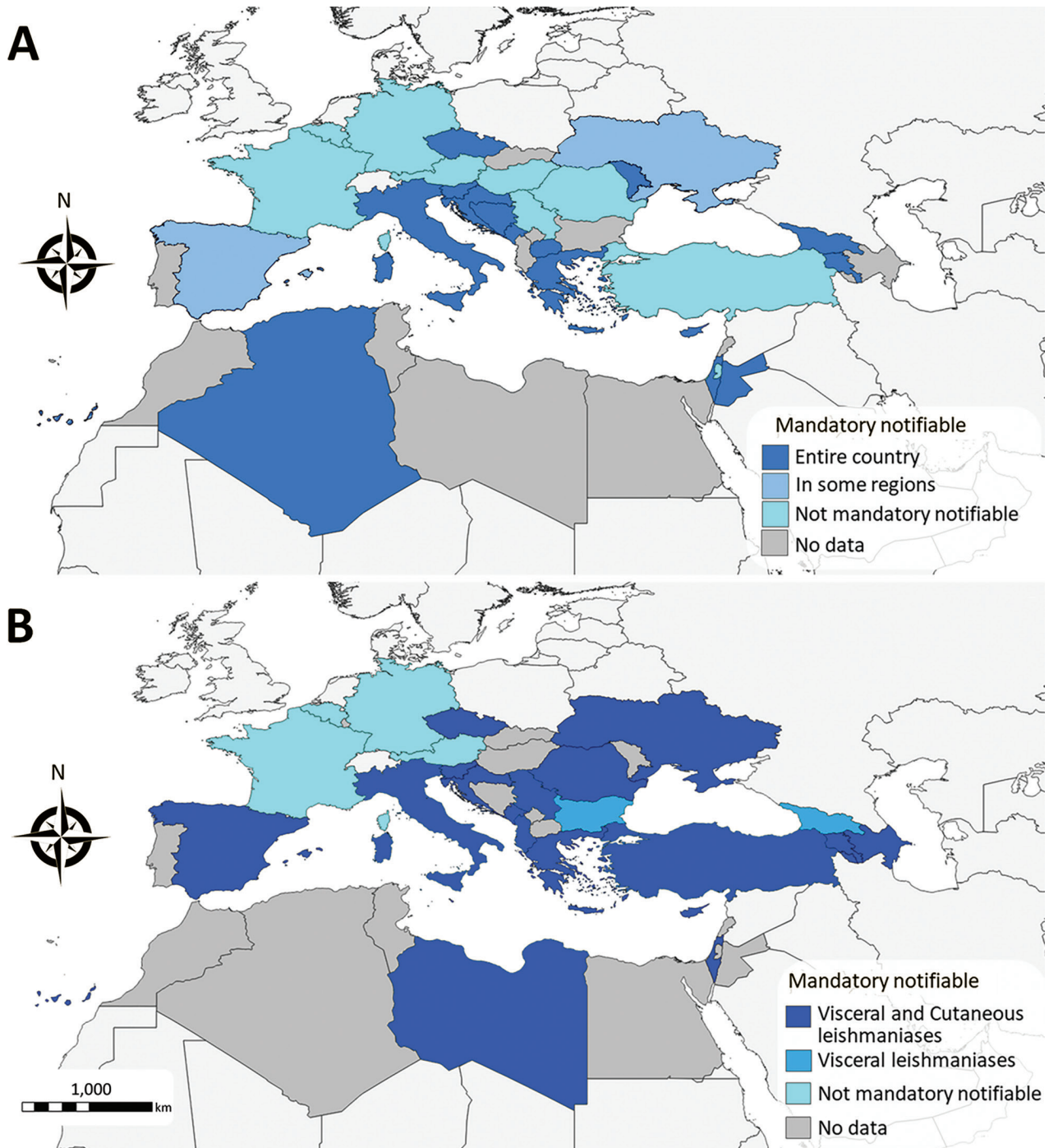
## Acknowledgments

We thank experts from the public health institutes, animal health institutes, ministries of health, and ministries of agriculture from Albania, Algeria, Armenia, Austria, Azerbaijan, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czechia, France, Georgia, Germany, Greece, Hungary, Israel, Italy, Jordan, Libya, Luxembourg, Malta, Moldova, Montenegro, North Macedonia, Palestine, Romania, Serbia, Slovenia, Spain, Turkey, and Ukraine for



taking the time to answer the questionnaires and providing us the information used to prepare this review on leishmaniasis. In particular, we thank: Silva Bino, Adela Vasili and Teita Myrseli (Albania), Ahmed Chawki El Karim Boughalem (Algeria), Arman Gevoryan, Lusine Paronyan and Narek Hayrapetyan (Armenia), Irene Kászoni-Rückerl and Julia Walochnik (Austria), Yagut

Garayeva (Azerbaijan), Javiera Rebolledo (Belgium), Aleksandar Nemet (Bosnia and Herzegovina), Rumen Harizanov (Bulgaria), Tihana Mišić, Ivana Lohman Janković and Eddy Listeš (Croatia), Maria G. Koliou and Vasiliki Christodoulou (Cyprus), Jerome Depaquit, Laurence Lachaud, Christophe Ravel and Patrick Bastien (France), Merab Iosava and Tegniz Chaligava (Georgia),



**Figure 2.** Geographic distribution of mandatory notification status for animal (A) and human (B) leishmaniasis, 2020.

**Table 2.** Declared status of endemicity of *Leishmania* spp. affecting humans, by country

Country	<i>Leishmania</i> species			
	<i>L. infantum</i>	<i>L. major</i>	<i>L. tropica</i>	<i>L. donovan</i>
Albania	Yes	No	No	No
Armenia	Yes	No	No	No
Austria	No	No	No	No
Azerbaijan	Yes	Yes	Yes	No
Belgium	No	No	No	No
Bulgaria	Yes	No	No	No
Croatia	Not known	Not known	Not known	Not known
Cyprus	No	No	Yes	Yes
Czechia	No	No	No	No
France	Yes	No	No	No
Georgia	Yes	Yes	No	No
Germany	No	No	No	No
Greece	Yes	No	No	No
Israel	Yes	Yes	Yes	No
Italy	Yes	No	No	No
Libya	Yes	Yes	Yes	Not known
Malta	Yes	No	No	No
Montenegro	Yes	Not known	Not known	No
Romania	No	No	No	No
Serbia	Yes	Not known	Yes	No
Slovenia	No	No	No	No
Spain	Yes	No	No	No
Turkey	Not known	Not known	Yes	Not known
Ukraine	No	No	No	No

Franz J. Conraths (Germany), Danai Pervanidou and Michail Floros (Greece), Tamás Sréter (Hungary), Emilia Anis, Roe Singer, Yael Glazer and Michel Bellaiche (Israel), Alda Natale, Gianluca Rugna, Mose' Alise, Patrizia Parodi, Luigi Gradoni and Pellegrino Daniele (Italy), Mahmoud Alhanatleh (Jordan), Badereddin Annajar (Libya), Maxim Sirbu (Moldova), Mevlida Hrapovic and Nebojša Sekulić (Montenegro), Iyad Adra (Palestine), Alexandru Supeanu and Cristina Daniela Pop (Romania), Mitra Drakulovic and Sasa Ostojic (Serbia), Maja Sočan (Slovenia), Beatriz Fernández Martínez, Francisco Javier Moreno Nuncio, Francisco Javier Nieto Martínez, Soledad Collado Cortés, Jose Luis Sáez Llorente and Alejandro Pérez Riquelme (Spain), Anil Demeli, Ahmet Deniz and Seher Topluoglu (Turkey) and Ihor Kuzin (Ukraine). In addition, we thank Tamás Bakonyi for reviewing and testing the questionnaire.

Y.V.d.S. is employed with the European Food Safety Authority (EFSA) in the ALPHA Unit that provides scientific and administrative support to EFSA's scientific activities in the area of Animal Health and Welfare. The positions and opinions presented in this article are those of the authors alone and are not intended to represent the views or scientific work of EFSA.

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### References

1. Gradoni L. the leishmaniasis of the Mediterranean region. *Curr Trop Med Rep.* 2017;4:21–6. <https://doi.org/10.1007/s40475-017-0099-1>
2. European Centre for Disease Prevention and Control. VectorNet, Phlebotomine sandflies maps. 2021 [cited 2021 Mar 19]. <https://www.ecdc.europa.eu/en/disease-vectors/surveillance-and-disease-data/phlebotomine-maps>
3. European Commission. EUSurvey, version 1.5. 2021 [cited 2021 Mar 15]. <https://ec.europa.eu/eusurvey/home/welcome>
4. Colella V, Hodžić A, Iatta R, Baneth G, Alić A, Otranto D. Zoonotic leishmaniasis, Bosnia and Herzegovina. *Emerg Infect Dis.* 2019;25:385–6. <https://doi.org/10.3201/eid2502.181481>
5. Tánzos B, Balogh N, Király L, Biksi I, Szeredi L, Gyurkovsky M, et al. First record of autochthonous canine leishmaniasis in Hungary. *Vector Borne Zoonotic Dis.* 2012;12:588–94. <https://doi.org/10.1089/vbz.2011.0906>
6. Hamarsheh O, Nasereddin A, Damaj S, Sawalha S, Al-Jawabreh H, Azmi K, et al. Serological and molecular survey of *Leishmania* parasites in apparently healthy dogs in the West Bank, Palestine. *Parasit Vectors.* 2012;5:183. <https://doi.org/10.1186/1756-3305-5-183>
7. Ozbel Y, Oskam L, Ozensoy S, Turgay N, Alkan MZ, Jaffe CL, et al. A survey on canine leishmaniasis in western Turkey by parasite, DNA, and antibody detection assays. *Acta Trop.* 2000;74:1–6. [https://doi.org/10.1016/S0001-706X\(99\)00047-9](https://doi.org/10.1016/S0001-706X(99)00047-9)
8. Lachaud L, Dedet JP, Marty P, Faraut F, Buffet P, Gangneux JP, et al.; Working Group for the Notification of Human Leishmanioses in France. Surveillance of leishmaniasis in France, 1999 to 2012. *Euro Surveill.* 2013;18:20534. <https://doi.org/10.2807/1560-7917.ES2013.18.29.20534>
9. Carrillo E, Moreno J, Cruz I. What is responsible for a large and unusual outbreak of leishmaniasis in Madrid? *Trends Parasitol.* 2013;29:579–80. <https://doi.org/10.1016/j.pt.2013.10.007>
10. Thakur S, Joshi J, Kaur S. Leishmaniasis diagnosis: an update on the use of parasitological, immunological, and molecular methods. *J Parasit Dis.* 2020 Mar 16; 44:1–20.
11. Solano-Gallego L, Cardoso L, Pennisi MG, Petersen C, Bourdeau P, Oliva G, et al. Diagnostic challenges in the era of canine *Leishmania infantum* vaccines. *Trends Parasitol.* 2017;33:706–17. <https://doi.org/10.1016/j.pt.2017.06.004>
12. Varani S, Ortalli M, Attard L, Vanino E, Gaibani P, Vocale C, et al. Serological and molecular tools to diagnose visceral leishmaniasis: 2-years' experience of a single center in Northern Italy. *PLoS One.* 2017;12:e0183699. <https://doi.org/10.1371/journal.pone.0183699>
13. Palatnik-de-Sousa CB, Day MJ. One Health: the global challenge of epidemic and endemic leishmaniasis. *Parasit Vectors.* 2011;4:197. <https://doi.org/10.1186/1756-3305-4-197>
14. Wright I, Jongejan F, Marcondes M, Peregrine A, Baneth G, Bourdeau P, et al. Parasites and vector-borne diseases disseminated by rehomed dogs. *Parasit Vectors.* 2020;13:546. <https://doi.org/10.1186/s13071-020-04407-5>

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# Leishmaniases in the European Union and Neighboring Countries

## Appendix

Shown on the following pages are 2 surveys used to gather information on the epidemiologic situation, surveillance, prevention and control measures, and drivers of emergence of animal and human leishmaniases in Europe during 2010–2020. The first is an animal leishmaniasis questionnaire referring to *Leishmania infantum* infections in domestic or wildlife hosts. The second is a human leishmaniases questionnaire referring to infections by *L. infantum*, *L. major*, *L. tropica*, and *L. donovani* sensu stricto.

# ANIMAL LEISHMANIASIS BY LEISHMANIA INFANTUM IN THE EUROPEAN UNION AND ITS NEIGHBOURHOOD

Fields marked with \* are mandatory.

## A - INTRODUCTION

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Dear Participants,

The European Centre for Disease Prevention and Control (ECDC), in collaboration with the European Food Safety Authority (EFSA), the World Health Organization Regional Office for Europe (WHO EURO) and the World Organisation for Animal Health (OIE), initiated the review of the epidemiological situation of human and animal leishmaniasis in the European Union and its neighbourhood.

To collect data on the surveillance, control, diagnosis and treatment of leishmaniasis, we would like you to complete the following questionnaire by 30 September. This will take you approximately 15 minutes. Note that this questionnaire targets the public health authorities and focuses on human leishmaniasis. A complementary questionnaire focusing on animal leishmaniasis will be sent to the animal health authorities in your country.

Based on the responses to this questionnaire and a literature review, a technical report will be prepared. If you want to receive the finalised technical report and have your contribution acknowledged in the technical report, please express this in the first part of the questionnaire.

## B - ECDC DATA PRIVACY STATEMENT

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\* Do you agree with the following ECDC privacy statement? *By agreeing with ECDC privacy statement and answering this questionnaire, you agree that your answers are used in the technical report that will be produced. Note that ECDC may contact you afterwards for clarification.*

Yes

Download

[ECDC Data Privacy Statement.pdf](#)

You can only proceed with the questionnaire by accepting ECDC data privacy statement.

## C - GENERAL INFORMATION

---

Name (only visible to ECDC). This information will be treated as strictly confidential.

Email (only visible to ECDC). This information will be treated as strictly confidential.

Affiliation

\* Country

- Albania
- Algeria
- Andorra
- Armenia
- Austria
- Azerbaijan
- Belgium
- Bosnia and Herzegovina
- Bulgaria
- Croatia
- Cyprus
- Czechia
- Denmark
- Egypt
- Estonia
- Finland
- France
- Georgia
- Germany
- Greece
- Hungary
- Ireland
- Israel
- Italy
- Jordan
- Kosovo
- Latvia
- Lebanon
- Libya
- Liechtenstein
- Lithuania



- Luxembourg
- Macedonia
- Malta
- Moldova
- Monaco
- Montenegro
- Morocco
- Netherlands
- North Macedonia
- Palestine
- Poland
- Portugal
- Romania
- Serbia
- Slovak Republic
- Slovenia
- Spain
- Sweden
- Switzerland
- Syria
- Tunisia
- Turkey
- Ukraine

\* Do you want to receive a final copy of the technical report (expected early 2021)?

- Yes
- No

\* Do you want to have your contribution acknowledged in the technical report that will be prepared?

*If yes, please make sure you provide your name and affiliation.*

- Yes
- No

## D - SURVEILLANCE OF ANIMAL LEISHMANIASIS

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\* 1. Have **autochthonous cases of animal** (dog or other domestic or wildlife) **leishmaniasis** been identified in your country **since 2010**?

*Animal leishmaniasis in this context refers to a laboratory confirmed infection case by **Leishmania infantum**. Other domestic animals include cats, horses, etc. Wildlife include foxes, wolves, rodents, rabbits, hares, etc. Autochthonous cases result from existing natural leishmania transmission in the country.*

- Yes
- No
- I don't know

*Selecting "No" or "I don't know" skips question 2*

2. Which of the following **clinical presentations** of autochthonous leishmaniasis have been **identified** in animals in your country? You may choose more than one.

- Visceral
- Cutaneous
- I don't know

\* 3. Is **animal** (canine or other) leishmaniasis a **mandatory notifiable disease** in your country?

*A notifiable disease is required by law to be reported to government authorities.*

- Yes, in the entire country
- Yes, in some regions only
- No
- I don't know

Please specify which region(s)

*Selecting "No" or "I don't know" skips question 4*

4. In which **host species** is leishmaniasis **notification** mandatory?

- All species (dogs and other domestic animals and wildlife)
- Dogs and other domestic animals only
- Dogs only
- I don't know

5. Is **SURVEILLANCE** of **animal leishmaniasis** implemented in your country?

*Surveillance refers to the systematic and continuous collection, management, analysis, interpretation and reporting of infection/disease data to drive health actions.*

- Yes
- No
- I don't know

*Selecting "No" or "I don't know" skips questions from 6 to 11*

6. What **type of SURVEILLANCE** system of animal leishmaniasis is implemented in your country?

- Comprehensive: by all providers of veterinary care, official and private in a particular geographical area
- Sentinel: by only a subset of veterinary care providers should report cases
- I don't know

7. What are the **SURVEILLANCE data providers** for animal leishmaniasis in your country? You may choose more than one.

- Laboratories from the official veterinary services or laboratories accredited by the National Veterinary Authority
- Laboratories from specialised, private companies not accredited by the National Veterinary Authority
- Veterinary practices and veterinary hospitals

- Other
- I don't know

Please specify:

8. What **type of SURVEILLANCE data** from animal leishmaniasis cases is reported in your country? You may choose more than one.

*Please note that the question also applies to non-endemic regions/countries in the event that a case was diagnosed.*

- Clinical
- Epidemiological
- Laboratorial
- Other
- I don't know

Please specify:

9. In addition to surveillance of clinical cases of leishmaniasis, is **SURVEILLANCE OF ASYMPTOMATIC (subclinical) INFECTIONS** implemented in your country?

- Yes
- No
- I don't know

*Selecting "No" or "I don't know" skips question 9*

10. What is the **target animal population** on which **SURVEILLANCE** of infection/disease is done? You may select more than one.

- Privately owned dogs (pets, farm, hunting)
- Animal shelter and kennel dogs not privately owned (e.g. police dogs)
- Captured strays and rescued dogs for rehoming
- Wild canids (e.g. foxes)
- Wild lagomorphs (e.g. rabbits)
- Wild rodents
- Other
- I don't know

Please specify:

11. What are the **diagnostic techniques used for SURVEILLANCE**? You may select more than one.

- Serology (antibody detection) by IFAT (indirect immunofluorescence test)
- Serology by ELISA (Enzyme linked immunosorbent assay)
- Serology by DAT (direct agglutination test)
- Serology by rapid immunochromatography (e.g. IDEXX snap test)
- PCR (Polymerase chain reaction) in blood samples
- PCR of skin/tissue samples
- PCR of conjunctival/oral swabs
- Microscopy of biological samples with or without prior culture
- Necropsy and PCR of biological samples
- Other
- I don't know

Please specify:

## E - PREVENTION AND CONTROL OF ANIMAL LEISHMANIASIS

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12. Following surveillance results, is there a **PREVENTION AND CONTROL PROGRAMME** implemented in your country by **veterinary authorities** against animal leishmaniasis?

*Prevention and control actions may include: treatment of infected animals, canine vaccination, culling of infected animals, testing animals coming from endemic areas, use of insecticides and mechanical barriers against sand fly vectors.*

- Yes
- No
- I don't know

*Selecting "No" or "I don't know" skips questions 13 and 14*

Which of the following actions are taken? You may select more than one.

	Yes	No	I don't know
Treatment of infected dogs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vaccination of dogs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insecticide use in dogs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Diagnostic testing of pet dogs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Diagnostic testing of pet dogs travelling from endemic areas (e.g. after holidays)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collect and test stray/abandoned dogs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collect and test wildlife (foxes, rabbits, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Euthanasia of dogs and other infected animals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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Please specify:

13. Do you have national **PREVENTION AND CONTROL official guidelines** for animal leishmaniasis?

- Yes
- No
- I don't know

Please provide the link where to find these guidelines:

14. Are you aware of **intersectorial (“One Health”) collaboration** between animal, human and environmental sectors to **PREVENT AND CONTROL** leishmaniasis in your country?

- Yes
- No
- I don't know

Please describe:

15. What are in your opinion the **challenges for the PREVENTION AND CONTROL** of leishmaniasis in animals in your country? Please rate from 0 (not important) to 3 (very important).

	0	1	2	3	I don't know
Lack of legislation from responsible authorities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of political willingness/awareness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of funding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaborative constraints (between stakeholders)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Operational capacity constraints (Knowledge, people, equipment)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of national/international regulation against culling infected/sick dogs/animals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Limited availability of diagnostic techniques	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



High cost of diagnosis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Limited availability of treatments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
High cost of treatment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Limited availability of vaccines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Limited availability of insecticides	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No regulatory basis for insecticide use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please specify:

## F - DIAGNOSIS AND TREATMENT OF ANIMAL LEISHMANIASIS

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16. Are there any **official guidelines** in your country for animal leishmaniasis **DIAGNOSIS**?

- Yes  
 No  
 I don't know

Please provide the link where to find these guidelines:

17. Which of the following **LABORATORY TECHNIQUES** are employed in your country for animal leishmaniasis **DIAGNOSIS** by governmental or private laboratories?

*Please note that this does not necessarily imply that animal leishmaniasis surveillance is being carried out in your country.*

	Yes	No	I don't know
Serology (antibody detection) by IFAT(indirect immunofluorescence antibody test)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Serology by ELISA (enzyme-linked immunosorbent assay)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Serology by DAT (direct agglutination test)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Serology by rapid immunochromatography (e.g. IDEXX snap test)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PCR (Polymerase chain reaction) of blood samples	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

PCR of skin/tissue samples	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Microscopy of biological samples with or without prior culture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please specify:

18. Are there any **guidelines** in your country for animal leishmaniasis **TREATMENT**?

- Yes  
 No  
 I don't know

Please provide the link where to find these guidelines:

19. What are the **DRUGS** (medicines) used for **animal leishmaniasis treatment** in your country?

	Yes	No	I don't know
Meglumine antimoniate (E.g. Glucantime®)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Allopurinol	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Miltefosine	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sodium stibogluconate (E.g. Pentostam®)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aminosidine	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Immunomodulatory drugs (e.g. Domperidone)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please specify

## G - DRIVERS OF EMERGENCE OF ANIMAL LEISHMANIASIS

---

*Emergence refers to the establishment of infection/disease in a previously free area or to an increase in incidence of infection/disease in an endemic area. Disease emergence is also considered when the rise in incidence occurs as a result of improved and wider diagnosis.*

20. Is **animal leishmaniasis emerging** in your country?

- Yes, in all the country
- Yes, in some regions
- No
- I don't know

Please specify which region(s)

21. **WHICH** of the following **DRIVERS** do you think that are important in your country? Please rate from 0 (not important) to 3 (very important).

	0	1	2	3
Pet animals travelling to Leishmania endemic areas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Importation of pet animals from Leishmania endemic areas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Immigration of Leishmania infected people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sand fly vector expansion into previously-free areas as a result of climate change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental changes other than climate change, with an impact in vectors and reservoir hosts (e. g. urbanization)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insufficient/lack of surveillance at regional/country level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insufficient/lack of prevention and control at regional/country level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please comment:

## H - CONCLUDING REMARKS

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Please provide any additional information you consider relevant:

# HUMAN LEISHMANIASIS IN THE EUROPEAN UNION AND ITS NEIGHBOURHOOD

Fields marked with \* are mandatory.

## A - INTRODUCTION

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Dear Participants,

The European Centre for Disease Prevention and Control (ECDC), in collaboration with the European Food Safety Authority (EFSA), the World Health Organization Regional Office for Europe (WHO EURO) and the World Organisation for Animal Health (OIE), initiated the review of the epidemiological situation of human and animal leishmaniasis in the European Union and its neighbourhood.

To collect data on the **surveillance, control, diagnosis and treatment of leishmaniasis, we would like you to complete the following questionnaire by 30 September**. This will take you approximately 15 minutes. Note that this questionnaire targets the public health authorities and focuses on human leishmaniasis. A complementary questionnaire focusing on animal leishmaniasis will be sent to the animal health authorities in your country.

Based on the responses to this questionnaire and a literature review, a technical report will be prepared. If you want to receive the finalised technical report and have your contribution acknowledged in the technical report, please express this in the first part of the questionnaire.

## B - ECDC DATA PRIVACY STATEMENT

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\* Do you agree with the following ECDC privacy statement? *By agreeing with ECDC privacy statement and answering this questionnaire, you agree that your answers are used in the technical report that will be produced. Note that ECDC may contact you afterwards for clarification.*

Yes

Download:

[ECDC Data Privacy Statement.pdf](#)

You can only proceed with the questionnaire by accepting ECDC data privacy statement.

## C - GENERAL INFORMATION

---

Name (only visible to ECDC). This information will be treated as strictly confidential

Email (only visible to ECDC). This information will be treated as strictly confidential

Affiliation

\* Country

- Albania
- Algeria
- Andorra
- Armenia
- Austria
- Azerbaijan
- Belgium
- Bosnia and Herzegovina
- Bulgaria
- Croatia
- Cyprus
- Czechia
- Denmark
- Egypt
- Estonia
- Finland
- France
- Georgia
- Germany
- Greece
- Hungary
- Ireland
- Israel
- Italy
- Jordan
- Kosovo
- Latvia
- Lebanon
- Libya
- Liechtenstein
- Lithuania



- Luxembourg
- Macedonia
- Malta
- Moldova
- Monaco
- Montenegro
- Morocco
- Netherlands
- North Macedonia
- Palestine
- Poland
- Portugal
- Romania
- Serbia
- Slovak Republic
- Slovenia
- Spain
- Sweden
- Switzerland
- Syria
- Tunisia
- Turkey
- Ukraine

\* Do you want to receive a final copy of the technical report (expected early 2021)?

- Yes
- No

\* Do you want to have your contribution acknowledged in the technical report that will be prepared?

*If yes, please make sure you provide your name and affiliation.*

- Yes
- No

## D - SURVEILLANCE OF HUMAN LEISHMANIASIS

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\* 1. Have **autochthonous cases** of human leishmaniasis been **identified in your country** since 2010?

*A case of human leishmaniasis is a laboratory confirmed infection. Autochthonous cases result from existing natural Leishmania transmission in the country.*

- Yes
- No
- I don't know

*Selecting "No" or "I don't know" skips questions 2 and 3*

2. Which of the following **clinical presentations** of **autochthonous leishmaniasis** have been **identified in your country**? You may choose more than one.

- Visceral
- Cutaneous
- Mucocutaneous\*
- I don't know

3. Which of the following ***Leishmania* species** are considered **endemic among humans in all or some parts of your country**? You may choose more than one

3.1 ***Leishmania infantum*** (human and canine visceral and cutaneous leishmaniosis)

- Yes
- No
- I don't know

3.2 ***Leishmania major*** (human cutaneous leishmaniosis)

- Yes
- No
- I don't know

3.3 ***Leishmania tropica*** (human cutaneous leishmaniosis)

- Yes
- No
- I don't know

3.4 ***Leishmania donovani*** (human visceral and cutaneous leishmaniosis)

- Yes
- No
- I don't know

4. Is **human leishmaniasis** a **mandatory notifiable disease** in your country?

*A notifiable disease is required by law to be reported to government authorities.*

\* 4.1 **Visceral**

- Yes, in the entire country
- Yes, in some regions only
- No
- I don't know

Please specify which region(s)

\* 4.2 **Cutaneous**

- Yes, in the entire country

\* Note added after the completion of the questionnaire survey: by mistake the authors included mucocutaneous instead of mucosal leishmaniosis. The specific answers to mucocutaneous were therefore not included in the results presented in the manuscript "Surveillance, prevention and control of leishmaniases in the European Union and its neighborhood".

- Yes, in some regions only
- No
- I don't know

Please specify which region(s)

**\* 4.3 Mucocutaneous \***

- Yes, in the entire country
- Yes, in some regions only
- No
- I don't know

Please specify which region(s)

**5. Is SURVEILLANCE of human leishmaniasis implemented in your country?**

*Surveillance refers to the systematic and continuous collection, management, analysis, interpretation and reporting of infection/disease data to drive health actions.*

- Yes
- No
- I don't know

*Selecting "No" or "I don't know" skips questions from 6 to 10*

**What type of SURVEILLANCE system of human leishmaniasis is implemented in your country?**

- Comprehensive: All healthcare providers of at least one level of care are reporting their cases, e.g. all hospitals report cases
- Sentinel: Only a subset of healthcare providers report cases
- I don't know

**6. What are the SURVEILLANCE data providers for human leishmaniasis in your country? You may choose more than one.**

- Hospitals
- Local health care centers
- Private physicians
- Laboratories of the Public Health authority or accredited by the Public Health authority
- Laboratories from specialised, private companies not accredited by the Public Health authority
- Other
- I don't know

Please specify:

\* Note added after the completion of the questionnaire survey: by mistake the authors included mucocutaneous instead of mucosal leishmaniasis. The specific answers to mucocutaneous were therefore not included in the results presented in the manuscript "Leishmaniasis in the European Union and its neighbourhood: Neglected zoonotic diseases with increasing public health risk"

7. What **type of SURVEILLANCE data** from human leishmaniasis cases is reported in your country? You may choose more than one.

*Please note that the question also applies to non-endemic countries in the event that a case was diagnosed.*

- Clinical
- Epidemiological
- Laboratorial
- Other
- I don't know

Please specify:

8. In addition to surveillance of clinical leishmaniasis, is **SURVEILLANCE OF ASYMPTOMATIC (subclinical)** infections implemented in your country?

- Yes
- No
- I don't know

*Selecting "No" or "I don't know" skips question 9*

9. What is the **target human population** on which **SURVEILLANCE of ASYMPTOMATIC** leishmaniasis is done? You may select more than one.

- Blood donors
- Organ donors
- Other target risk groups: e.g. HIV+ patients, intravenous drug users, etc.
- Samples of patients admitted to hospital for reasons other than leishmaniasis
- People coming from endemic zones (travellers, migrants)
- Other
- I don't know

Please specify:

10. What are the **diagnostic techniques used for SURVEILLANCE of human leishmaniasis infection (clinical and subclinical)** in your country? You may select more than one.

- Serology (antibody detection) by IFAT (indirect immunofluorescence test)
- Serology by rapid immunochromatography (e.g. rK39 test)
- Serology by ELISA (Enzyme-linked immunosorbent assay)
- Serology by DAT (direct agglutination test)

- PCR (Polymerase chain reaction) of blood samples
- PCR of skin/tissue samples
- Microscopy of biological samples with or without prior culture
- Other
- I don't know

Please specify:

## E - PREVENTION AND CONTROL OF HUMAN LEISHMANIASIS

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11. Following surveillance results, is there a **PREVENTION AND CONTROL programme** implemented in your country **by national health authorities** against visceral and cutaneous leishmaniasis?

*Prevention and control actions include for example: treatment of animal and human cases, use of insecticides and mechanical barriers against sand fly vectors by people or in the environment, canine vaccination, culling of animal reservoirs, testing people and animals coming from endemic areas (travellers and migrants).*

- Yes
- No
- I don't know

*Selecting "No" or "I don't know" skips questions 12 and 13*

Which of the following **prevention and control actions** are taken? You may select more than one.

11.1. For *L. infantum* (human and canine visceral leishmaniasis).

	Yes	No	I don't know
Treatment of infected people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Treatment of infected dogs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vaccination of dogs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insecticide use in dogs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collect and test stray/abandoned dogs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collect and test wildlife (foxes, rabbits, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Euthanasia of dogs and other infected animals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Testing people and animals coming from endemic areas (travellers and migrants)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Please specify:

11.2 For *L. major* (cutaneous leishmaniasis in humans).

	Yes	No	I don't know
Treatment of cases	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leishmanisation: intradermal inoculation of live Leishmania to produce a self-healing lesion and stimulate immunity against reinfection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insecticide application in the peridomestic environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mechanical barriers for vectors in the peridomestic environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insecticide application in the intradomestic environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use of insecticide impregnated bed nets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use of insecticide impregnated bed linen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Destruction of animal reservoir habitat (e.g. rodent burrows)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Testing people and animals coming from endemic areas (travellers and migrants)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please specify:

11.3 For *L. tropica* (cutaneous leishmaniasis in humans).

	Yes	No	I don't know
Treatment of cases	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leishmanisation: intradermal inoculation of live Leishmania to produce a self-healing lesion and stimulate immunity against reinfection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insecticide application in the peridomestic environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mechanical barriers for vectors in the peridomestic environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insecticide application in the intradomestic environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use of insecticide impregnated bed nets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use of insecticide impregnated bed linen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Destruction of animal reservoir habitat (e.g. rodent burrows)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Testing people and animals coming from endemic areas (travellers and migrants)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please specify:

11.4 For *L. donovani* (visceral and cutaneous leishmaniasis in humans).

	Yes	No	I don't know
Treatment of cases	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leishmanisation: intradermal inoculation of live Leishmania to produce a self-healing lesion and stimulate immunity against reinfection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insecticide application in the peridomestic environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mechanical barriers for vectors in the peridomestic environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insecticide application in the intradomestic environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use of insecticide impregnated bed nets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use of insecticide impregnated bed linen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Destruction of animal reservoir habitat (e.g. rodent burrows)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Testing people and animals coming from endemic areas (travellers and migrants)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please specify:

12. Do you have national **PREVENTION AND CONTROL official guidelines** for human leishmaniasis?

- Yes
- No
- I don't know

Please provide the link where to find these guidelines:

13. Are you aware of **intersectorial (“One Health”) collaboration** between animal, human and environmental sectors to **PREVENT AND CONTROL** leishmaniasis in your country?

- Yes
- No
- I don't know

Please describe:

14. What are the **challenges** for the **PREVENTION AND CONTROL** of leishmaniasis in humans in your country? Please rate from 0 (not important) to 3 (very important).

	0	1	2	3	I don't know
Lack of legislation from responsible authorities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of political willingness/awareness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial constraints	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaborative constraints (between stakeholders)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Operational capacity constraints (knowledge, people, equipment)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
National/EU regulation against culling infected/sick dogs /animals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Limited availability of diagnostic techniques	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
High cost of diagnosis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Limited availability of treatments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
High cost of treatment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Limited availability of vaccines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Limited availability of rodenticides	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No regulatory basis for rodenticide use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Limited availability of insecticides	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No regulatory basis for insecticide use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental interventions to destroy the habitat of reservoirs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please specify:

## F - DIAGNOSIS AND TREATMENT OF HUMAN LEISHMANIASIS

---

15. Are there any **official guidelines** in your country for human leishmaniasis **DIAGNOSIS**?

- Yes
- No
- I don't know

Please provide the link where to find these guidelines:

16. Which of the following **LABORATORY TECHNIQUES** are employed in your country for human leishmaniasis **DIAGNOSIS** by governmental or private laboratories?

*Please note that this does not necessarily imply that human leishmaniasis surveillance is being carried out in your country.*

	Yes	No	I don't know
Serology (antibody detection) by IFAT(indirect immunofluorescence antibody test)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Serology by ELISA (enzyme-linked immunosorbent assay)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Serology by DAT (direct agglutination test)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Serology by rapid immunochromatography (e.g. rk39 test)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PCR (Polymerase chain reaction) in blood samples	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PCR in skin/tissue samples	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Microscopy of biological samples with or without prior culture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please specify:

17. Are there any **national guidelines** in your country for human leishmaniasis **TREATMENT**?

- Yes
- No

I don't know

Please provide the link where to find these guidelines:

18. What are the **DRUGS (medicines)** used for **human leishmaniasis treatment** in your country?

	Yes	No	I don't know
Liposomal amphotericin B	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Amphotericin B deoxicholate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sodium stibogluconate (E.g. Pentostam®)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Meglumine antimoniate (E.g. Glucantime®)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Miltefosine	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please specify

## G - DRIVERS OF EMERGENCE OF HUMAN LEISHMANIASIS

---

*Emergence refers to the establishment of infection/disease in a previously free area or to an increase in incidence of infection/disease in an endemic area. Disease emergence is also considered when the rise in incidence occurs as a result of improved and wider diagnosis.*

19. Is **cutaneous and/or visceral leishmaniasis emerging** in your country?

- Yes, in all the country
- Yes, in some regions
- No
- I don't know

Please specify which region(s)

*Selecting "No" or "I don't know" skips question 20*

20. **WHICH** of the following **DRIVERS** do you think that are important in your country? Please rate from 0 (not important) to 3 (very important) for the *Leishmania* species endemic in your country.

20.1 *L. infantum* (human and canine visceral and cutaneous leishmaniasis)

	0	1	2	3
Infected people and animals coming from endemic areas (travellers and migrants)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sand fly vector expansion into previously-free areas as a result of climate change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental changes other than climate change, with an impact in vectors and reservoir hosts (e. g. urbanization, agricultural projects)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insufficient/lack of surveillance at regional/country level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insufficient/lack of prevention and control at regional/country level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please comment:

20.2 *L. major* (human cutaneous leishmaniasis)

	0	1	2	3
Infected people and animals coming from endemic areas (travellers and migrants)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sand fly vector expansion into previously-free areas as a result of climate change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Human-made environmental changes with an impact in vectors and reservoir hosts (e. g. urbanization, agricultural projects)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insufficient/lack of surveillance at regional/country level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insufficient/lack of prevention and control at regional/country level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please comment:

20.3 *L. tropica* (human cutaneous leishmaniasis)

	0	1	2	3
Infected people and animals coming from endemic areas (travellers and migrants)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Sand fly vector expansion into previously-free areas as a result of climate change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Human-made environmental changes with an impact in vectors and reservoir hosts (e. g. urbanization, agricultural projects)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insufficient/lack of surveillance at regional/country level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insufficient/lack of prevention and control at regional/country level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please comment:

#### 20.4 *L. donovani* (human visceral and cutaneous leishmaniasis)

	0	1	2	3
Infected people and animals coming from endemic areas (travellers and migrants)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sand fly vector expansion into previously-free areas as a result of climate change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Human-made environmental changes with an impact in vectors and reservoir hosts (e. g. urbanization, agricultural projects)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insufficient/lack of surveillance at regional/country level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insufficient/lack of prevention and control at regional/country level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please comment:

## H - CONCLUDING REMARKS

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Please provide any additional information you consider relevant: