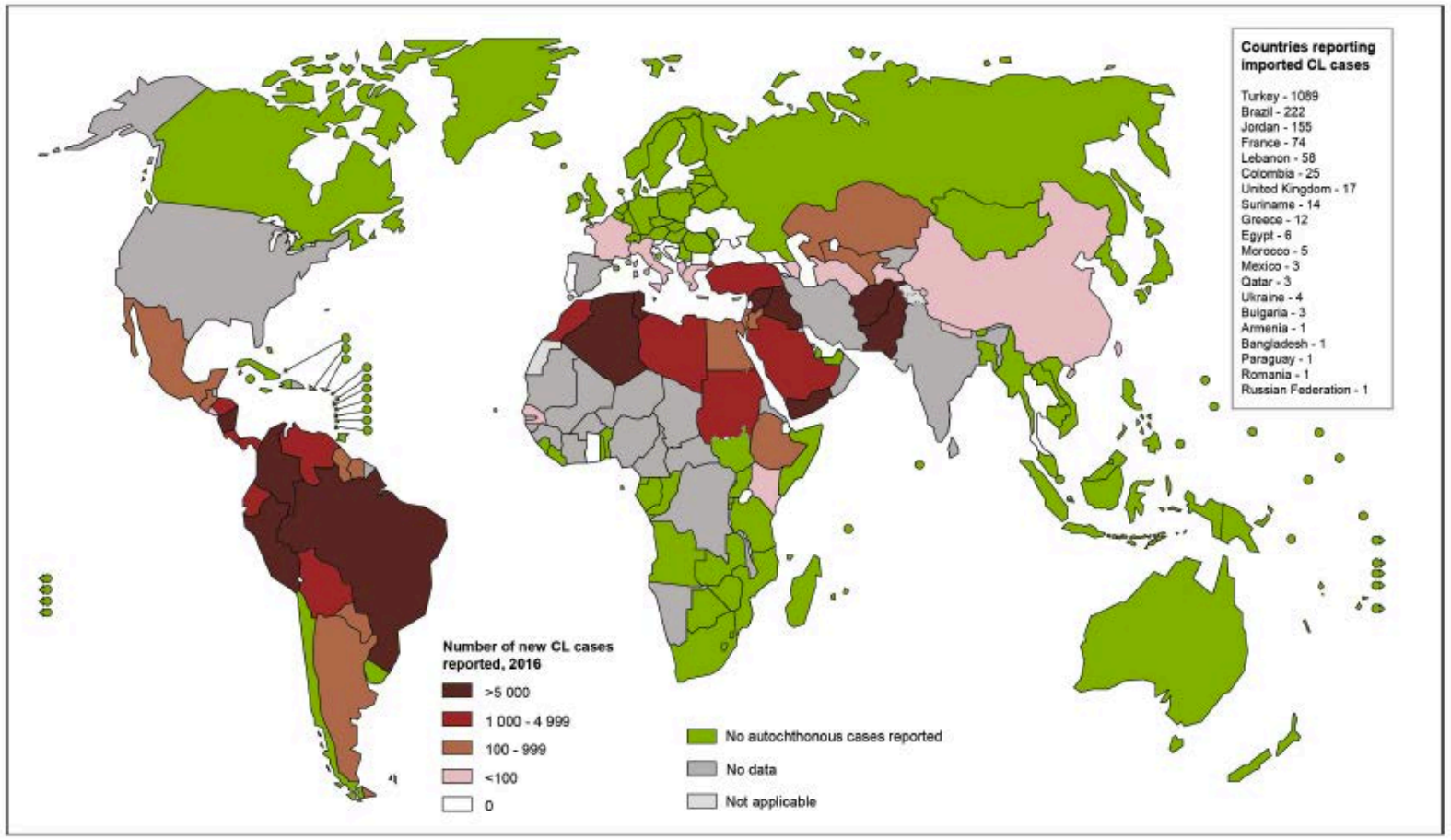
Dr Alvaro Acosta Serrano, PhD
alvaro.acosta-serrano@lstmed.ac.uk

Leishmaniasis Epidemiology, Burden and Stigma

Worldwide distribution of Cutaneous Leishmaniasis

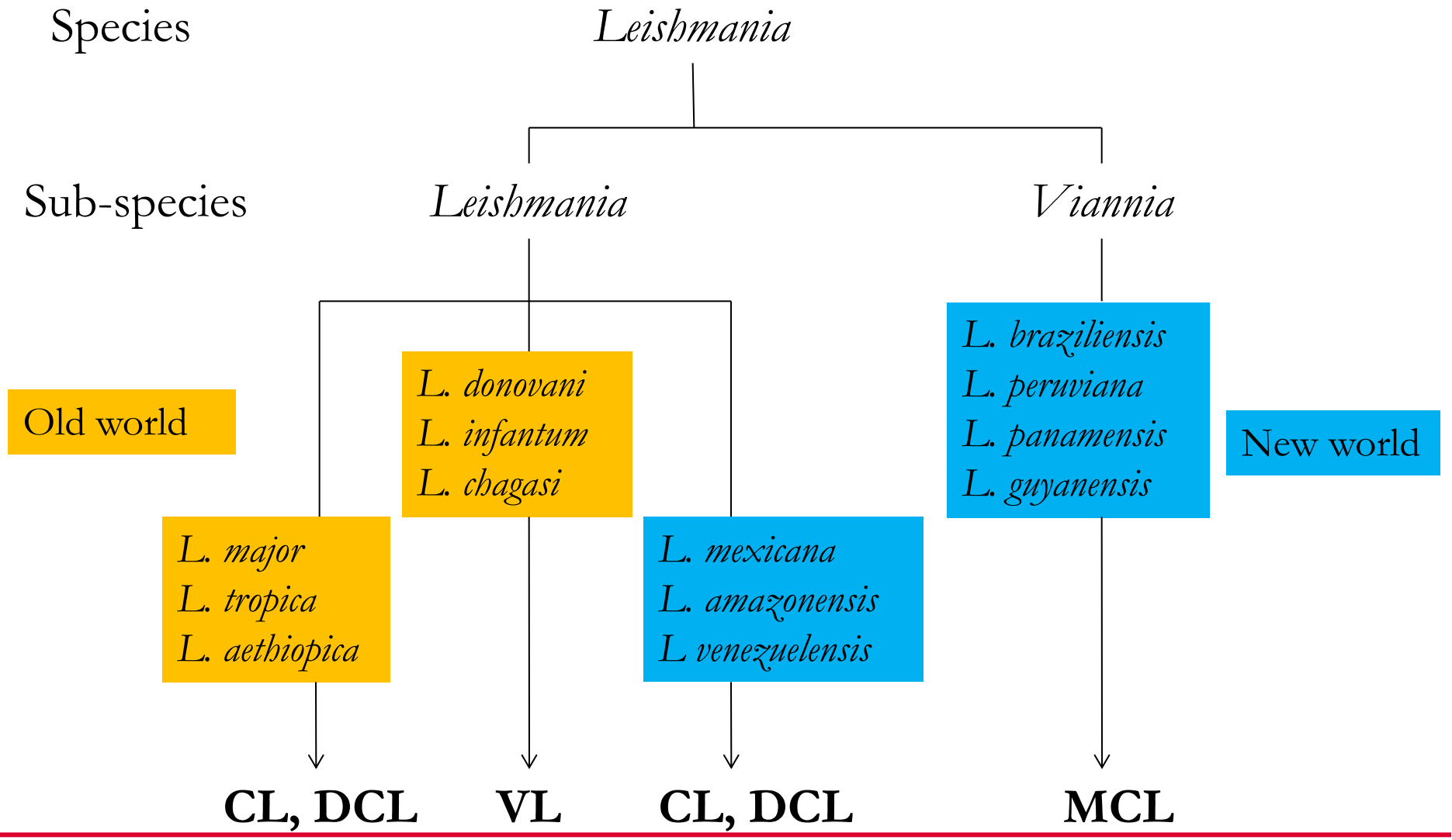


The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement. © WHO 2018. All rights reserved

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

World Health Organization
2017

Medically important *Leishmania* species

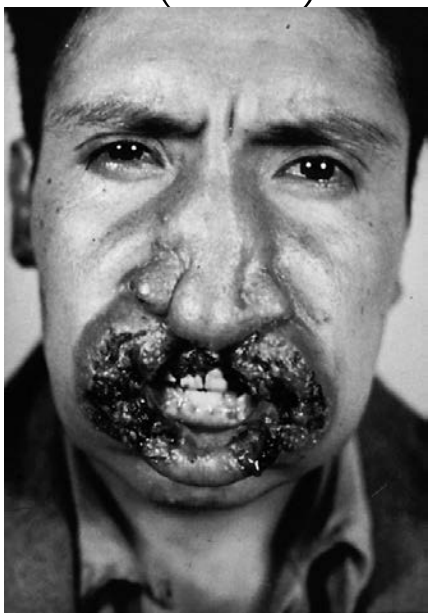


Leishmaniasis: a spectrum of diseases

Cutaneous (CL)

Diffuse Cutaneous (DCL)

Mucocutaneous (MCL)



CL immunological imbalance

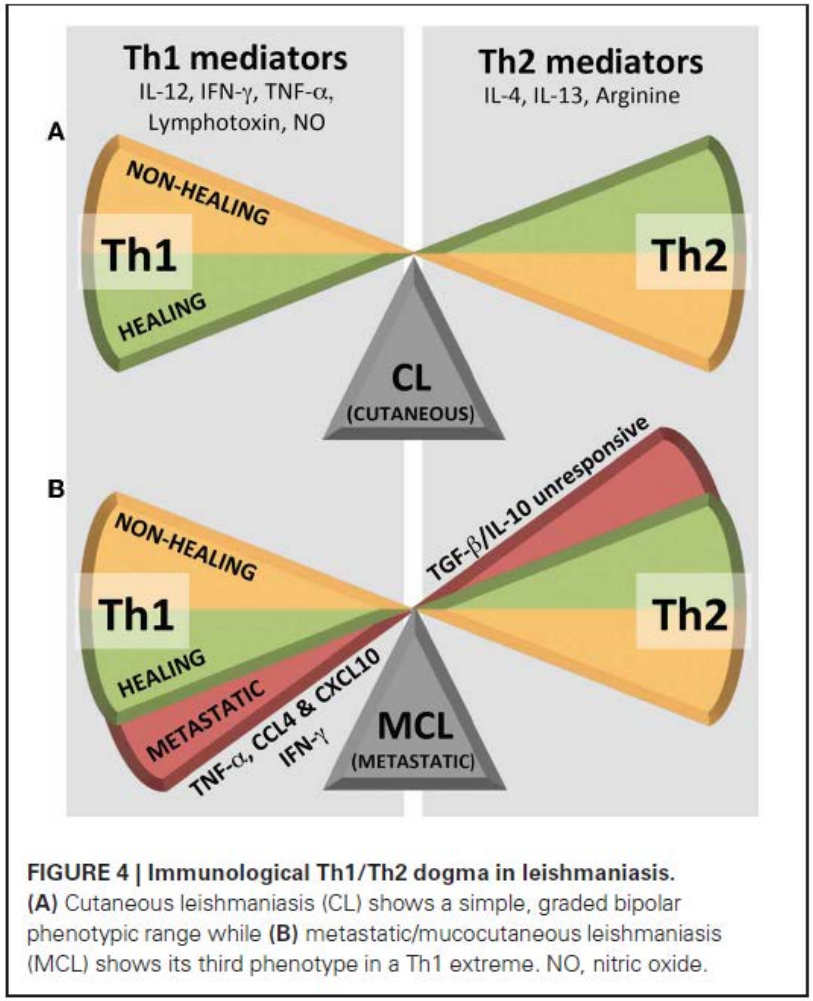


FIGURE 4 | Immunological Th1/Th2 dogma in leishmaniasis. **(A)** Cutaneous leishmaniasis (CL) shows a simple, graded bipolar phenotypic range while **(B)** metastatic/mucocutaneous leishmaniasis (MCL) shows its third phenotype in a Th1 extreme. NO, nitric oxide.

Hartley, MA et al 2012

In animal models:

- Disease resistance associated with a Th1 response
- Disease susceptibility linked to a Th2 response

In humans:

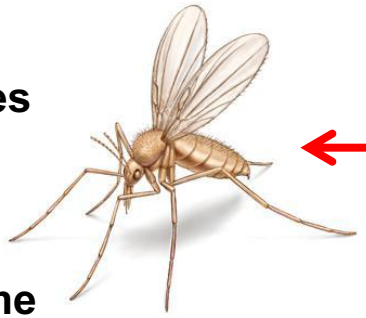
Response similar to animals, albeit less polarised

Factors involved in CL transmission and disease outcome

Sandfly species

Saliva

Gut microbiome



Genetics

Immunity

Skin microbiome

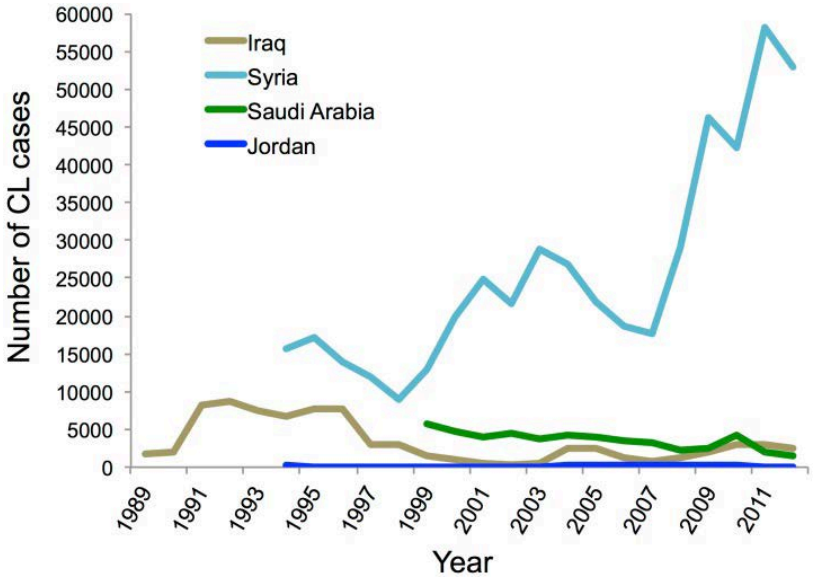
Animal reservoir

Parasite species

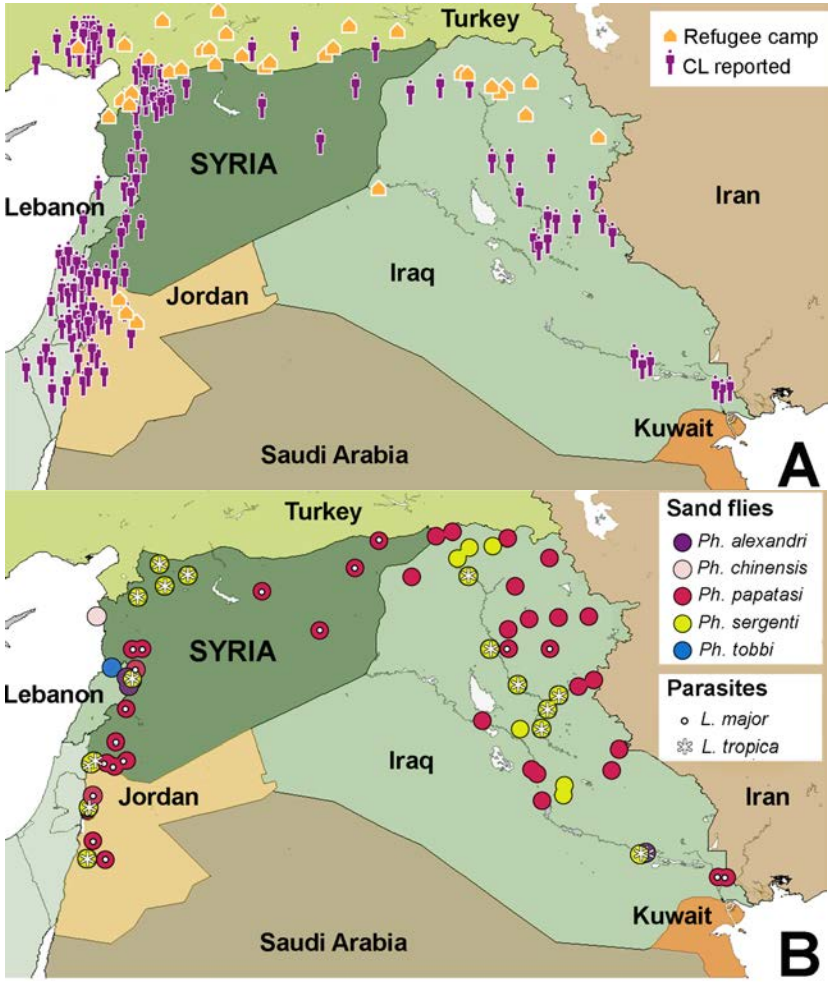
Cutaneous Leishmaniasis: Disease Burden

- Approximately 12 million people infected
- >1 million new cases occur each year
- Endemic in over 88 countries
- Hotspots:
  - 90% MCL occur in Bolivia, Brazil and Peru
  - 90% CL occur in Afghanistan, Brazil, Iran, Peru, Saudi Arabia and Syria
- No vaccine to prevent or treat CL
- Most countries still using highly toxic drugs
- No affordable RDT
- Vector control works, but it is insufficient

Cutaneous Leishmaniasis – War & Displacement (Syria and Conflict Area)

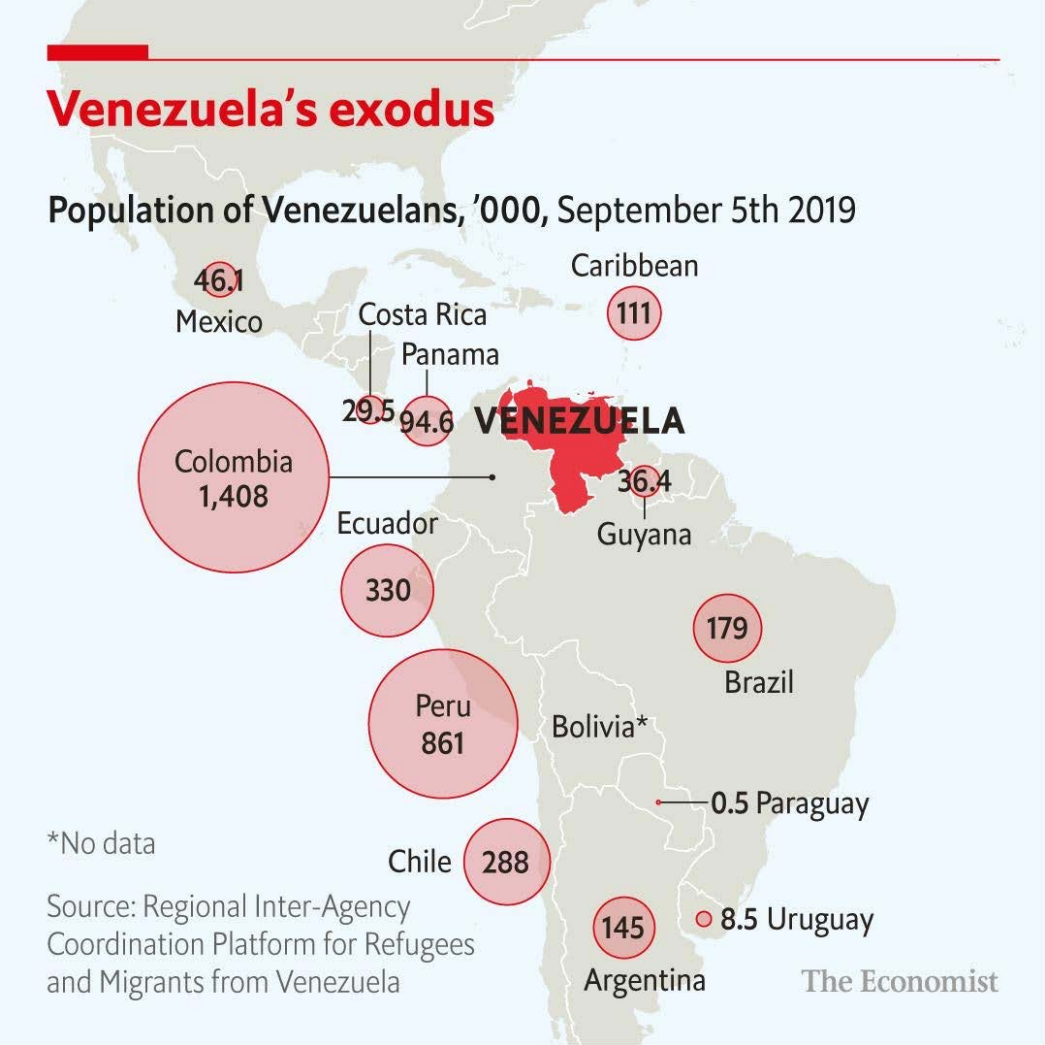


Salam et al 2014 / Du et al 2016



Al-Salem et al 2016

Leishmaniasis spread in LA from Venezuelan migrants?



The Economist Sept, 2019

CL scarring, stigma and mental health problems (1)

CL scarring, stigma and mental health problems (2)

CL lesions on left ankle

CL scarring

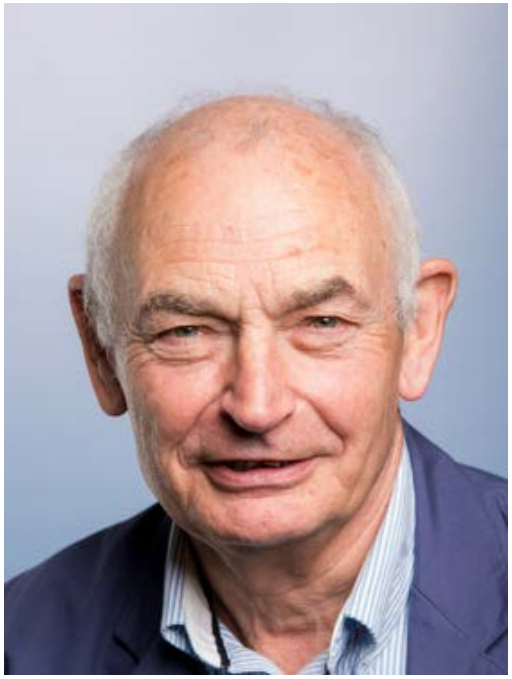
Credit: Dr Lee Haines

CL scarring, stigma and mental health problems (3)

Pip Stewart
(Journalist, writer, explorer)

Re-calculating CL burden

Freddie Bailey



David Molyneaux

- Jorge Alvar (DNDi)
- José Postigo (WHO)
- Peter Hotez (Baylor)
- Iván D. Vélez (PECET)
- Waleed Al-Salem (MoH, KSA)
- Julian Eaton (LSHTM)
- K. Mondragon-Shem (LSTM)
- Lee R Haines (LSTM)
- Emily Adams (LSTM)

Re-calculating CL burden

PLOS | NEGLECTED TROPICAL DISEASES

2017

VIEWPOINTS

A new perspective on cutaneous leishmaniasis—Implications for global prevalence and burden of disease estimates

Freddie Bailey[1,2], Karina Mondragon-Shem[3], Peter Hotez[4], José Antonio Ruiz-Postigo[5], Waleed Al-Salem[6], Álvaro Acosta-Serrano[3,7], David H. Molyneux[1,3]*

Re-calculating CL burden

Active CL

Treatment

Inactive CL
(scarring)

Re-calculating CL burden

Table 1. Reported and estimated incidence and prevalence of cutaneous leishmaniasis, 2002–2015.

Author	Study year	Reported		Estimated	
		Incidence	Prevalence	Incidence	Prevalence
Mathers et al. [14]	2002	-	-	1,157,000	2,157,000
Alvar et al. [15]	2002–2009	214,036	-	1,213,300	-
WHO WER [16]	2014	154,649*	-	-	-
WHO GHO [17]	2005–2015	187,855* (mean)	2,066,410* (11 years)	-	-
GBD 2010 [18]	2010	-	-	-	10,000,000
GBD 2013 [19]	2013	-	-	-	3,914,800*
GBD 2015 [20]	2015	-	-	-	3,895,900*

N.B. The studies below the dotted line (. . .) refer to Global Burden of Disease (GBD) studies conducted by the Institute of Health Metrics and Evaluation (IHME)

*MCL included

Abbreviations: GBD, Global Burden of Disease; GHO, Global Health Observatory; WER, Weekly Epidemiological Record

https://doi.org/10.1371/journal.pntd.0005739.t001

New calculations: prevalence of inactive CL in >40 million people

PLOS NEGLECTED TROPICAL DISEASES

2019

RESEARCH ARTICLE

Cutaneous leishmaniasis and co-morbid major depressive disorder: A systematic review with burden estimates

Freddie Bailey[1,2]*, Karina Mondragon-Shem[1,3], Lee Rafuse Haines[1,3], Amina Olabi[1], Ahmed Alorfi[4], José Antonio Ruiz-Postigo[5], Jorge Alvar[6], Peter Hotez[7], Emily R. Adams[1], Iván D. Vélez[8], Waleed Al-Salem[4], Julian Eaton[9,10], Álvaro Acosta-Serrano[1,3], David H. Molyneux[1]*

Minimising impact of CL scarring – Areas needing attention

- **Development and implementation of affordable molecular tests (no molecular test available)**
- **Introduction of safer drugs and treatment methods (most countries still using antimony as first line)**
- **Increase disease awareness in endemic areas**
- **Stigma and mental health problems**

ECLIPSE – Reducing CL stigma in endemic areas

- Empowering people with Cutaneous Leishmaniasis: Intervention Programme to improve patient journey and reduce Stigma via Community Education (ECLIPSE)
- Co-led by **Dr Helen Price** (parasitologist) and **Dr Lisa Dikomitis** (medical anthropologist) with teams in Brazil, Ethiopia, Sri Lanka
- Newly funded project for £4.6M starting on 1st November 2019

Dr Helen Price: h.price@keele.ac.uk

Dr Lisa Dikomitis: l.a.Dikomitis@keele.ac.uk

Twitter: @ECLIPSE_Keele

Acknowledgements

LSTM
- Freddie Bailey
- Kris Subramanian
- Karina Mondragon-Shem
- Lee Haines
- Yasser Alraey
- David Molyneux

DNDi
Jorge Alvar

WHO
José Postigo

Saudi Ministry of Health
Waleed Al Salem

Lebanon
Dima Elsafadi

Baylor
Peter Hotez

PECET
Iván D. Vélez

National Philanthropic Trust UK