

The Burden of Psychological Co-Morbidity in Cutaneous Leishmaniasis

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Background



Table 1. Evidence Base for Mental Health and NTDs. Selected Holistic, Psychological, and Intervention Studies (as per InfoNTD, Medline, and Other Online Sources, October 2018)

NTD	Holistic (CoL; stigma; physical disability)	Psychological (Anxiety; depression)	Holistic/psychological intervention
Buruli ulcer	Ackumey M.M. <i>et al.</i> (2012) [2]; Klis S. <i>et al.</i> (2014) [21]	Kpadonou T.G. <i>et al.</i> (2013) [9]	Amoussouhoui A.S. <i>et al.</i> (2016) [44]
Chagas' disease	van't Noordende A.T. <i>et al.</i> (2016) [3]; Sousa G.R. <i>et al.</i> (2018) [62]	Ozaki Y <i>et al.</i> (2011) [63]	–
Chikungunya	Soumahoro M.-K. <i>et al.</i> (2010) [23]; Courturier E. <i>et al.</i> (2012) [4]	–	–
Cutaneous and mucocutaneous leishmaniasis	Reithinger R. <i>et al.</i> (2005) [64]; Vares, B. <i>et al.</i> (2013) [65]; Al-Kamel M.A. (2017) [66]	Yanik M. <i>et al.</i> (2004) [12]; Simsek Z. <i>et al.</i> (2005) [14]; Torkashvand F. <i>et al.</i> (2016) [30]	Niforouzhadeh M.A. <i>et al.</i> (2010) [38]
Dengue	Lum L.C. <i>et al.</i> (2008) [67]	Bhatia M.S. <i>et al.</i> (2017) [22]; Gurathilaka N. <i>et al.</i> (2018) [31]	–
Echinococcosis	Torgerson P.R. <i>et al.</i> (2001) [68]	–	–
Foodborne trematodiasis	–	–	–
Guinea-worm disease	–	–	–
Human African trypanosomiasis	–	–	–
Leprosy	Tsutsumi A. <i>et al.</i> (2007) [13]; van Brakel W.H. <i>et al.</i> (2012) [69]; van't Noordende A.T. <i>et al.</i> (2016) [3]	Tsutsumi A. <i>et al.</i> (2007) [13]	Floyd-Richards M. <i>et al.</i> (2000) [39]; Semrittrong S. <i>et al.</i> (2014) [42]; Peters R.M.H. <i>et al.</i> (2015) [46]; Lusli M. <i>et al.</i> (2016) [47]
Lymphatic filariasis	Perera M. <i>et al.</i> (2007) [70]; Abdulmalik J. <i>et al.</i> (2018) [71]	Obindo J. <i>et al.</i> (2017) [10]	–
Mycetoma	Bakhiet S.M. <i>et al.</i> (2018) [5]	–	Bakhiet S.M. <i>et al.</i> (2018) [5]
Onchocerciasis	Hagan M. (1998) [72]; Okoye I.C. <i>et al.</i> (2007) [73]; Mbanefo E.C. <i>et al.</i> (2010) [74]	–	–
Podocniosis	Mousley E. <i>et al.</i> (2013) [6]	Bartlett J. <i>et al.</i> (2016) [11]	–
Rabies	–	–	–
Scabies	Jin-gang A. <i>et al.</i> (2010) [20]	–	–
Schistosomiasis	van't Noordende A.T. <i>et al.</i> (2016) [3]; Fürst T. <i>et al.</i> (2012) [7]	–	–
Snake bite	Williams S.S. <i>et al.</i> (2011) [15]	Williams S.S. <i>et al.</i> (2011) [15]	Wijesinghe C.A. <i>et al.</i> (2015) [40]
Soil-transmitted helminths	Fürst T. <i>et al.</i> (2012) [7]	–	–
Taeniasis	–	–	–
Trachoma	Dhalwal U. <i>et al.</i> (2006) [25]; Habtmu E. <i>et al.</i> (2015) [24] Habtmu E. <i>et al.</i> (2016) [28]	–	–
Visceral leishmaniasis and Post-kala-azar dermal leishmaniasis	van't Noordende A.T. <i>et al.</i> (2016) [3]; Pal B. <i>et al.</i> (2017) [8]	–	–
Yaws	–	–	–

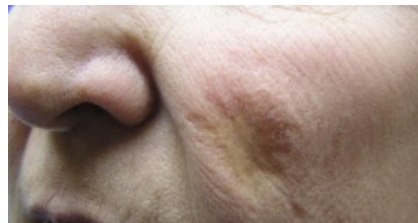
Cutaneous Leishmaniasis (CL)... AKA

“The scar will remain forever”
(KSA) “Aleppo evil”
(Syria) “Trace”
(Yemen) “Mountain leprosy”
(Amazonia)

- One of the most prevalent chronic NTDs
- Several disease classifications – New World vs Old World; Anthroponotic vs Zoonotic, Diffuse vs Localised
- However, none capture the lasting impact of permanent scarring



Active CL
(plaque,
ulcer)



Inactive CL
(scarring)



Truer Prevalence of CL

- Based on figures, scarring (inactive CL) is also not included in prevalence estimates
- iCL (scarring) conservatively estimated based on life expectancy of 20 years and under-reporting factor of 6-10

	Active CL (GBD 2016) [18]	Inactive CL	Total
Ratio	~10	~90	100
Prevalence	4,320,000	33,883,900	38,203,900



Active CL
(plaque,
ulcer)



Inactive CL
(scarring)



Methodology

$$\text{DALY}_{(\text{MDD}\sim\text{CL})} = q * \text{DALY}_{(\text{CL})}$$

Or

$$\text{DALY}_{(\text{MDD}\sim\text{CL})} = \text{YLL}_{(\text{MDD}\sim\text{CL})} + \text{YLD}_{(\text{MDD}\sim\text{CL})}$$

YLL = Years of Life Lost due to a condition;

YLD = Years of Life Lived with Disability from a condition

$$\text{YLL}_{(\text{MDD}\sim\text{CL})} = \text{N}_{(\text{MDD}\sim\text{CL})} \times \text{L}_{(\text{MDD}\sim\text{CL})}$$

N = number of deaths;

L = standard life expectancy at age of death

$$\text{YLD}_{(\text{MDD}\sim\text{CL})} = \text{P}_{(\text{MDD}\sim\text{CL})} \times \text{DW}_{(\text{MDD})}$$

P = number of prevalent cases;

DW = disability weight

Disability Weights (GBD, 2019)

- Range from 0 (full health) to 1 (death)
- Based upon expert opinion
- Simplified (e.g. Same DW for “Disfigurement level 1” caused by diaphragmatic hernia, goiter, or Leprosy)

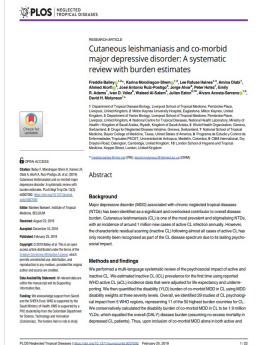
Mental Illness	DW
MDD (Depression)	
Mild	0.145
Moderate	0.396
Severe	0.658
GAD (Anxiety)	
Mild	0.03
Moderate	0.133
Severe	0.523

NTD	DW
CL	0.067
Leprosy	
Disfigurement level 1	0.011
Disfigurement level 2	0.067
Lymphatic Filariasis	
Acute adenolymphangitis	0.051
Hydrocoele	0.128
Lymphoedema	0.109

Other Physical Illness	DW
Severe atopic dermatitis	0.576
Symptomatic probable migraine	0.441
Medication-overuse headache	0.223
Very mild alcohol dependence	0.122
Moderate osteoarthritis (any joint)	0.071
Controlled asthma	0.015

Staged Model of Depression

Stage	Definition	CL estimate
Wellness	Absence of any sustained, distressing, emotional experiences	30%
Distress	Mild to moderate distressing emotional experiences of relatively short duration	50%
Major Depressive Disorder	Severely distressing experiences, lasting at least two to four weeks, with impairment of social functioning	20%
Recurrent Major Depressive Disorder	Unresponsive or relapsing depressive episodes	



Estimates of mental health co-morbidity in CL

	Active CL [†]	Inactive CL	Total CL
Prevalence	4,320,000 [18]	33,883,900	38,203,900
Prevalence with MDD (%)	20%	20%	20%
Disability Weights (GBD 2016) [75]	0.145 (Mild MDD) 0.396 (Moderate MDD) 0.658 (Severe MDD)	0.145 (Mild MDD) 0.396 (Moderate MDD) 0.658 (Severe MDD)	0.145 (Mild MDD) 0.396 (Moderate MDD) 0.658 (Severe MDD)
YLDs (Co-morbid MDD alone)	208,932	1,687,065	1,895,997
YLLs (Co-morbid MDD alone)	0	0	0
DALYs (Co-morbid MDD alone)	208,932	1,687,065	1,895,997

Top 10 NTDs by YLD, GBD 2016

	NTDs and Malaria	Prevalence	YLD
1	Intestinal nematode infections	1 507 853 000	2 946 000
2	Malaria	128 948 000	1 741 000
3	Schistosomiasis	189 774 000	1 496 000
4	LF	29 382 000	1 189 000
5	Dengue	6 046 000	982 000
6	Onchocerciasis	14 650 000	962 000
7	Cysticercosis	2 676 000	421 000
8	CL (aCL only)	4 320 000	273 000
9	Trachoma	3 338 000	245 000
10	Chagas disease	7 201 000	180 000

Top 10 NTDs by YLD, GBD 2016

	NTDs and Malaria	Prevalence	YLD
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2	Cutaneous leishmaniasis (aCL/iCL)	38 203 900	1 895 997
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Final Thoughts



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