The rise of leishmaniasis in the twenty-first century

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Received 19 June 2018; revised 26 June 2018; editorial decision 26 June 2018

Keywords: Desjeux, leishmaniasis

Almost 20 years ago, Philippe Desjeux (then at the World Health Organization) summarized a new set of twenty-first century risk factors that would promote the emergence or re-emergence of cutaneous, mucocutaneous and visceral leishmaniasis.1 Today Dr Desjeux works as a leishmaniasis specialist at DNDi (Drugs for Neglected Diseases Initiative), but I often highlight his 2001 paper for its prescience and the fact that, in subsequent years, his suggested risk factors had an even greater public health impact than he might have imagined back then.

The 2001 article reviews a group of new risk factors promoting the emergence of four different types of leishmaniasis—zoonotic cutaneous leishmaniasis (ZCL), anthroponotic cutaneous leishmaniasis (ACL), zoonotic visceral leishmaniasis (ZVL) and anthroponotic visceral leishmaniasis (AVL). He also differentiated these forms of leishmaniasis according to whether they were New World (Latin America) or Old World (Asia, Middle East, Southern Europe, Africa) variants.

For New World ZCL the rise of cutaneous and mucocutaneous leishmaniasis cases was attributed to deforestation and urbanization in Brazil and Venezuela, as well as human migrations from mountainous to low-lying areas in the Andes region, while Old World ZCL increases from Leishmania major infection were attributed to both urbanization and dam construction, among other factors.5 Similarly, Old World ACL due to L. tropica infection was linked to human migrations from rural to urban areas, cross-border movements of refugee populations, and poor sanitation in suburban areas of the Middle East and Central Asia, including Afghanistan, Iran, Iraq, Syria and Turkey.1

The emergence of New World ZVL from L. infantum/L. chagasi infection was attributed to urbanization in Colombia and Venezuela, and movements from rural areas of Brazil to northeastern urban centers.3 HIV/AIDS-leishmaniasis co-infections also represented a major factor in L. infantum infections in Southern Europe.5 Finally, AVL from L. donovani was noted to re-emerge in East Africa due to refugee movements in Southern Sudan and Ethiopia, while on the Indian subcontinent a variety of factors was responsible for maintaining AVL infection foci including cross-border movements, environmental degradation and human habitats in proximity to cow-sheds or river embankments.1

The Global Burden of Disease Study (GBD) 2016 recently tracked the changes in cutaneous and visceral leishmaniasis disease burdens since 1990 and 2006, with two different major trends noted.2 For instance, using disability adjusted life years (DALYs) as a metric, the DALYs from cutaneous and mucocutaneous leishmaniasis rose 43.5% between 1990 and 2016, and 12.5% between 2006 and 2016.2 Conversely, there was a substantial decline in the DALYs from visceral leishmaniasis over these periods, 77.4% and 61.1%, respectively.2

The continued emergence of cutaneous and mucocutaneous leishmaniasis probably reflects a continuation of the trends first noted by Philippe Desjeux in 2001, but in the years since the article was written there has been an explosion of Old World ACL and ZCL in Syria and Iraq in the Middle East.3 Due to ongoing civil and international conflict, and the resulting breakdown in health systems the GBD estimates that in Syria the number of prevalent cases of cutaneous leishmaniasis has increased almost 10-fold from approximately 30 000 cases in 2000 to more than 270 000 cases in 2016.6 Similarly, in Iraq the number of cases increased from almost 30 000 cases in 2000 to approximately 100 000 cases in 2016.

With regards to ZVL in the New World there are concerns that the collapse of health system infrastructure in Venezuela might also promote similar spectacular increases there.5 In contrast, the substantial reductions in visceral leishmaniasis due to L. donovani reflect the public health gains through concerted elimination efforts on the Indian subcontinent.6 However, L. donovani continues to re-emerge in East Africa due to wars and civil conflict in Sudan, South Sudan, and Somalia.7

Yet another important development in our understanding of the public health importance of leishmaniasis is that global disease burden estimates to better incorporate the mental health effects of scarring from cutaneous leishmaniasis,8 and the development of new or improved anti-parasitic drugs9 and vaccines.10

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The Desjeux paper and its aftermath link with a number of priority thematic areas of new focus for the RSTMH including neglected tropical diseases and their links with the sustainable development goals (SDGs), one health, planetary health, and emerging diseases. However, the story of leishmaniasis in the context of the SDGs and planetary health is far from over. As long as there is war, political instability, deforestation and climate change in both the New World and Old World we should expect epidemics to continue, with the only hope that visceral leishmaniasis elimination efforts in South Asia will accelerate, while simultaneously we develop and produce improved drugs, diagnostics and vaccines.

Authors’ Contributions: PJH has undertaken all the duties of authorship and is guarantor of the paper.

Acknowledgements: None.

Funding: None.

Competing interests: None declared.

Ethical approval: Not required.

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