



Letter to the Editor

Burden of chikungunya in Latin American countries: estimates of disability-adjusted life-years (DALY) lost in the 2014 epidemic



The burden of chikungunya virus disease (CHIK) in Latin America is an emerging concern, as virus spread is out of control and recent studies have reported that the disability-adjusted life-years (DALYs) lost in some parts of the region could be higher than those during the 2006 epidemics in India.^{1,2} Recent estimates indicate that between 385 835 and 429 058 patients in Latin America will develop post-CHIK chronic inflammatory rheumatism (pCHIK-CIR).³ However, the real disease burden and economic impact remain unknown and there are no current estimates of the expected disease burden in the region.

In this study, DALYs for pCHIK-CIR in Latin America were estimated by country, using the method of Murray.⁴ As no disability weight is available for pCHIK-CIR, the disability weight reported for rheumatoid arthritis (RA) (0.233) was used.^{2,5,6} Expected incident cases progressing to pCHIK-CIR and its duration were assumed on the basis of those reported previously.³

According to the estimates generated (Table 1), the expected burden of pCHIK-CIR in many countries is higher than that reported in the 2006 epidemics in India (25 888 DALYs).^{2,5,6} In Latin America the lower limit burden is estimated at 151 031 DALYs during 2014. However, this does not include the acute phase DALYs lost and thus the burden could be even higher.

The high burden in the Dominican Republic and El Salvador is of concern, given the socio-economic situation in those countries. However, the fact that a country such as Venezuela is among those with the highest burdens is also a worry, since its health system has shown a decreasing capability for vector-borne disease control that could lead to an increasing pCHIK-CIR burden.^{7,8} Furthermore, the long-running underinvestment in health care that began in Venezuela in 1998 has persisted until today, such that spraying campaigns, the distribution of insecticide-treated nets, health education, and even disease surveillance are no longer working properly.⁹ Although other countries in Latin America show lower DALYs, vector expansion in the context of climate change should raise attention and lead to the establishment of prevention and control measures.^{10,11}

Estimates for the dengue burden in the region have indicated that 69 000 DALYs were lost in 2004. This is two times lower than the estimate for pCHIK-CIR, suggesting that CHIK could become the new most important arbovirolosis in Latin America in terms of chronic disability.¹² Current arbovirus infections caused by chikungunya virus, but also by dengue and other emerging viruses, such as Zika and Mayaro, that have rheumatic manifestations and share overlapping symptoms, require integrated vector control, including significant community participation and integrated arboviral disease control programs in the endemic countries of the region.

Despite the limitations of this report, to the best of our knowledge it provides the first estimates of DALYs for Latin America. Previous estimates of the proportion of patients who will develop pCHIK-CIR are based on data from outside the region,³ hence follow-up of Latin American patients is required in order to improve the accuracy of pCHIK-CIR estimates. Another limitation is that the disability weight for RA was used, a disease with an insidious chronic outcome. Thus, detailed studies estimating the specific disability weight for CHIK are urgently needed in the region.

Finally, there is a need to act in order to achieve CHIK control in the region. Direct and indirect costs of disease, although unknown, continue to increase. The effects of pCHIK-CIR epidemics could lead to fragile health systems being overwhelmed and to an increase in the burden of other vector-borne diseases. Control strategies must be approached from a global perspective, since the disease spread and progression to chronic forms remain out of control. Fortunately, there is an upcoming dengue vaccine that has demonstrated an intention-to-treat efficacy of >95% in virologically confirmed severe dengue in a phase 3 trial that included 20 869 healthy children.¹³ However, an effective CHIK vaccine is still a long way off.

Table 1

Estimated DALYs related to pCHIK-CIR incidence by country in Latin America, 2014

Country	Cases ^a	pCHIK-CIR ^b		DALYs		DALYs per 100 000	
		Low	Upper	Low	Upper	Low	Upper
Dominican Republic	537 712	242 401	269 555	94 885	105 515	911.04	1013.10
El Salvador	135 383	61 031	67 867	23 890	26 566	376.78	418.99
Puerto Rico	28 619	12 901	14 347	5050	5616	148.23	164.83
Colombia	83 832	37 791	42 025	14 793	16 450	30.61	34.04
Guatemala	22 057	9943	11 057	3892	4328	25.16	27.98
Venezuela	37 015	16 686	18 556	6532	7263	21.48	23.89
Nicaragua	3556	1603	1783	627	698	10.32	11.48
Honduras	4086	1842	2048	721	802	8.90	9.90
Costa Rica	238	107	119	42	47	0.86	0.96
Brazil	3050	1375	1529	538	598	0.27	0.30
Panama	54	24	27	10	11	0.25	0.28
Cuba	40	18	20	7	8	0.04	0.05
Mexico	168	76	84	30	33	0.02	0.03
Paraguay	8	4	4	1	2	0.02	0.02
Chile	19	9	10	3	4	0.02	0.02
Ecuador	10	5	5	2	2	0.01	0.01
Argentina	28	13	14	5	5	0.01	0.01
Bolivia	4	2	2	1	1	0.01	0.01
Peru	11	5	6	2	2	0.01	0.01
Uruguay	0	0	0	0	0	0.00	0.00
Total region	855 890	385 835	429 058	151 031	167 950	25.45	28.31

DALYs, disability-adjusted life-years; CHIK, chikungunya virus disease; pCHIK-CIR, post-CHIK chronic inflammatory rheumatism.

^a Suspected, confirmed, and imported.

^b Based on previous estimates.³

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