



## Letter to the editor

**Mortality and fatality due to Chikungunya virus infection in Colombia**

Dear editor,

Chikungunya virus disease (CHIK) began its spread through Latin American countries in 2013, increasing its epidemiological burden and posing an important economic drawback to healthcare systems of most of the affected countries throughout 2014. Foregoing Disability Adjusted Life Years (DALYs) lost estimates reveal that its burden is actually expected to be higher than those reported in previous epidemics [1]. Currently, with ever-increasing reports of severe and fatal cases of CHIK, predicted DALYs are expected to escalate even higher. The case report of de la Hoz et al. [2], highlights the importance of severe and fatal CHIK in new endemic areas of Latin America. However, along these lines we would like to discuss the current status of CHIK mortality and fatality in Colombia, providing estimated rates, based on officially reported deaths during 2014 and up to the 15th epidemiological week of 2015 [3].

Between 2014 and the 15th week of 2015, 43 fatal cases of CHIK have been reported in the country, with 25 laboratory-confirmed cases (Table 1). Based on the number of deaths and considering the total sum of cases reported as well as the population from those areas where fatal cases have occurred, an overall case fatality rate (CFR) of 0.012% has been estimated herein (Table 1), ranging from 0.000 up to 0.040% (in Cundinamarca department). The overall estimated mortality rate was 0.128 deaths/100,000 population for areas reporting deaths, ranging from 0.000 up to

0.738 deaths/100,000 population (in North Santander department) (Table 1).

As stated by de la Hoz et al. [2], previous studies in other continents have reported fatal and severe CHIK [4–7]. Although fatal cases have not been reported in some important epidemics around the globe, an increased mortality during CHIK outbreaks has been highlighted in countries such as India [8,9] and, in Reunion Island where a CFR of 10.7–27.7% and about 1 death/100,000 population mortality were reported during the 2005–2006 epidemics [10,11].

Severe and fatal cases of CHIK have been an underestimated reality [2,7,10,12,13]. Fatality presents usually in patients over 60 years, with associated comorbidities and with dengue-like manifestations (thrombocytopenia, leucopenia, haemoconcentration and shock). Larger population studies are needed to better define the critical clinical signs and to characterize the diverse spectrum of CHIK symptoms, in order to allow timely recognition and prompt therapeutic interventions aiming to reduce and control disease burden. Public health managers should remain cautious about the possible impact, both from a human and economic standpoint when facing a possible spread of the disease, since an increase in patient mortality remains a plausible scenario. Molecular epidemiology studies are pivotal in order to identify potential strain variability of the virus that may be linked to the development of severe and fatal forms of the disease.

Finally, we would like to acknowledge de la Hoz et al. [2] and Torres et al. [13] in Colombia and Venezuela respectively, for their timely publications on CHIK which represent the first reports in the Latin American medical literature about fatal cases of CHIK.

**Table 1**

Estimations of CFR (%) and mortality rates due to CHIKV based on officially reported deaths during 2014 and first 15 epidemiological weeks of 2015, Colombia.

Territory	Notified deaths	Ruled out deaths	Deaths under study	Confirmed deaths (2014–2015)	Cases (2014)	Cases (2015) <sup>a</sup>	Population (2015)	CFR (%) <sup>b</sup>	Mortality rate <sup>c</sup> (deaths/100,000pop)
Norte de Santander	13	0	3	10	24,694	5,641	1,355,723	0.033	0.738
Huila	3	0	0	3	2,131	23,806	1,154,804	0.012	0.260
Sucre	3	0	1	2	14,741	6,140	851,526	0.010	0.235
Cundinamarca	7	1	0	6	1,816	13,148	2,680,041	0.040	0.224
Tolima	6	0	4	2	1,772	29,868	1,408,274	0.006	0.142
Cartagena	1	0	0	1	12,279	341	1,001,680	0.008	0.100
Barranquilla	2	0	1	1	4,341	3,952	1,218,737	0.012	0.082
Bolívar	3	0	3	0	18,190	426	2,097,086	0.000	0.000
Cesar	1	0	1	0	797	2,635	1,028,880	0.000	0.000
Santander	3	0	3	0	403	3,478	2,061,095	0.000	0.000
Valle del Cauca	1	0	1	0	375	44,179	4,613,377	0.000	0.000
Total	43	1	17	25	81,539	133,614	19,471,223	0.012	0.128

CFR = case fatality rate.

<sup>a</sup> Until week 15.

<sup>b</sup> (Deaths 2014–2015/Cases 2014–2015) × 100.

<sup>c</sup> (Deaths 2014–2015/Population 2015) × 100,000pop.

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**Competing interests**

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**References**

- [1] J.A. Cardona-Ospina, A.J. Rodríguez-Morales, W. Villamil-Gómez, Burden of chikungunya in one coastal department of Colombia (Sucre): estimates of disability adjusted life years (DALY) lost in 2014 epidemic, *J. Infect. Public Health* (2015), <http://dx.doi.org/10.1016/j.jiph.2015.06.001>
- [2] J.M. de la Hoz, B. Bayona, S. Vilorio, J.L. Accini, H.S. Juan-Vergara, D. Viasus, Fatal cases of Chikungunya virus infection in Colombia: diagnostic and treatment challenges, *J. Clin. Virol.* 69 (2015) 27–29.
- [3] Instituto Nacional de Salud. Mortalidad Chikunguña. Bogotá: Ministerio de Salud, 2015, p. 2.
- [4] S. Casolari, E. Briganti, M. Zanotti, T. Zauli, L. Nicoletti, F. Magurano, et al., A fatal case of encephalitis associated with Chikungunya virus infection, *Scand. J. Infect. Dis.* 40 (2008) 995–996.
- [5] H.H. Chua, K. Abdul Rashid, W.C. Law, A. Hamizah, Y.K. Chem, A.H. Khairul, et al., A fatal case of chikungunya virus infection with liver involvement, *Med. J. Malaysia* 65 (2010) 83–84.
- [6] B. Bandyopadhyay, D. Bandyopadhyay, R. Bhattacharya, R. De, B. Saha, H. Mukherjee, et al., Death due to chikungunya, *Trop. Doct.* 39 (2009) 187–188.
- [7] I.C. Sam, A. Kamarulzaman, G.S. Ong, R.S. Veriah, S. Ponnampalavanar, Y.F. Chan, et al., Chikungunya virus-associated death in Malaysia, *Trop. Biomed.* 27 (2010) 343–347.
- [8] S.P. Manimunda, D. Mavalankar, T. Bandyopadhyay, A.P. Sugunan, Chikungunya epidemic-related mortality, *Epidemiol. Infect.* 139 (2011) 1410–1412.
- [9] D. Mavalankar, P. Shastri, T. Bandyopadhyay, J. Parmar, K.V. Ramani, Increased mortality rate associated with chikungunya epidemic, Ahmedabad, India, *Emerging Infect. Dis.* 14 (2008) 412–415.
- [10] B.V. Tandale, P.S. Sathe, V.A. Arankalle, R.S. Wadia, R. Kulkarni, S.V. Shah, et al., Systemic involvements and fatalities during Chikungunya epidemic in India, 2006, *J. Clin. Virol.* 46 (2009) 145–149.
- [11] A. Economopoulou, M. Dominguez, B. Helynck, D. Sissoko, O. Wichmann, P. Quenel, et al., Atypical Chikungunya virus infections: clinical manifestations, mortality and risk factors for severe disease during the 2005–2006 outbreak on Reunion, *Epidemiol. Infect.* 137 (2009) 534–541.
- [12] P. Renault, L. Jossereau, V. Pierre, Chikungunya-related fatality rates, Mauritius, India, and Reunion Island, *Emerg Infect Dis.* 14 (2008) 1327.
- [13] J.R. Torres, G. Leopoldo Códova, J.S. Castro, L. Rodríguez, V. Saravia, J. Arvelaez, et al., Chikungunya fever: a typical and lethal cases in the Western hemisphere, *IDCases* 2 (2015) 6–10.

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