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## LONG-TERM EPIDEMIOLOGIC PATTERN AND DISEASE BURDEN OF DENGUE IN VENEZUELA

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**Objectives:** To describe the long-term epidemiologic behaviour of dengue in Venezuela and assess the magnitude of its associated disease burden.

**Methods:** A retrospective analysis of the epidemiological pattern of the disease during a 60 year lapse (1950-2010), was carried out based on official national surveillance and mortality data from the Venezuelan Ministry of Health. Chronological tendency curves of morbidity, mortality and lethality were elaborated. Non parametric statistic tests were applied as indicated. The disease burden of both lethal and non-lethal cases was estimated (PYLL, DALY).

**Results:** The endemic period of 1950-1988 characterized by the exclusive occurrence of classic dengue with a low incidence (average: 1,000 cases per year, for an annual burden of only 12 DALYs) and a negligible mortality (1 death per year; 36.83 DALYs). A large national epidemic of severe dengue ensued for the first time in 1989 and extended until most of 1990, resulting in about 15,000 cases ( $\pm 180$  DALYs) and 70 deaths (2,578 DALYs). Smaller outbreaks were seen in the years 93/94/95/97 and 98, with a high incidence, affecting all age groups, genders and socioeconomic levels of the population in every region. During 2005-2009 the Potential Years of Life Lost rate averaged 9.52 per 1,000 inhabitants. Throughout the 2000s, six large epidemics were recorded (2001, 2005, 2006, 2007, 2009 and 2010), the latter associated with over 100,000 cases ( $\pm 12,000$  DALYs). Overall, dengue caused an average of 891 DALYs a year per million inhabitants over the same period. Case distribution tendency showed a positive correlation since 1995 ( $r= 0.76$ ;  $b= 3152.17$ ;  $p< 0.05$ ) with 3,152 more cases, annually. Mortality curves exhibited a close parallel relationship with those of morbidity, with the exception of 2005, when a corresponding increase in both parameters was not observed. Over the same period 2000-2012, mortality tendency showed a slight annual increment ( $r=1.96$ ;  $b=0.48$ ;  $p<0.05$ ). Of note, 56% of cases occur in patients older than 15 years. Whereas a higher lethality was registered in the 1990s; with peaks in non-epidemic years (1992 and 1996), it stabilized since 2000, falling to values of about 0.1% (4 times lower than initially). Virological surveillance reveals a clear predominance of DEN2 (40%), followed by DEN1 (27%), DEN3 (17%), and DEN4 (16 %). Simultaneous circulation of all four viral serotypes has been customary.

**Conclusion:** Chronologically, dengue displays 2 distinct epidemiological patterns in Venezuela. Although from 1950 to 1988 it was an endemic illness, since 1989 it became endemo-epidemic. Temporal morbidity and mortality series depict a polymodal distribution, corresponding to epidemic years, with a progressive increase in cases and deaths. While lethality reveals a gradual decline, probably as a consequence of better surveillance, earlier diagnosis and improvement in the treatment, dengue remains an important cause of disease burden.