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## **Exceeding deaths during a chikungunya epidemic in Pernambuco, Brazil**

**Brito CA** - Deaths due to chikungunya in Pernambuco

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## **ABSTRACT**

In early 2016, there was suspect more deaths In Pernambuco then the priors years, during a epidemic of Chikungunya. This study verified if there was exceeding of death and if this increase could be related to chikungunya epidemic. In fact, there was an exceeding of 4235 deaths in 2016 when compared to the average of the four previous years, with the highest differences focused in the period of epidemic peak. It is evident that not all this deaths can be attributed to complications of Chikungunya. However, given the temporal overlap, part of these deaths may be due to aggravation of preexisting comorbidities or complications caused directly by CHIKV infection.

Key words: Chikungunya; arbovirus; exceeding death; Pernambuco.

In March 2016, physicians and nurses reported an increase in the number of deaths of patients with clinical presentation compatible with Chikungunya in different cities in the state of Pernambuco. However, until November 2016 there were only 54 deaths recorded as a result of this arboviruses in the official statistics , what would may represent an under notification (Brazil, 2016; Collucci 2016)

Considering that in several cities of Pernambuco were occurring chikungunya epidemics (Pernambuco, 2016), an hypothesis was raised: was Chikungunya causing an additional number of deaths, that was not identified by physicians as being due to that viral infection because of little knowledge of the potential complications of this emergent disease in Brazil?. For many of these deaths, it is possible that only the secondary cause was registered, such as pulmonary and heart disease, without reference to chikungunya or diagnosis or reported as suspected of other viral or bacterial infections.

Because the data on mortality were not available, and considering that most of the death happened in hospital environment, data of System of Hospital Information/SIH (Brazil, 2016) could be an adequate indirect source for analysis of this problem. So, we compared the number of hospital deaths occurred from January to November 2016 with the number of deaths from same period of the four previous years in Pernambuco/Brazil. We assessed the absolute number of exceeding deaths, valuing mainly the percentage increase with the average of the previous years (EDM – Exceeding of deaths in 2016 compared with the average of the four previous years in absolute numbers and in percentage). We also assessed if there was in 2016 an increase in absolute numbers and in percentage comparing with the equivalent months with the higher number of deaths from 2012 to 2015 (EDMHD – Exceeding of deaths in 2016 compared with the months with higher number of deaths from 2012 to 2015).

This analysis showed (Figure 1) there was an exceeding of 4235 deaths in Pernambuco State in the year 2016 when compared to the average of the four previous years, with the highest differences focused in the period from January to April, that correspond to the period of chikungunya epidemic peak. In Pernambuco, in the four first month of 2016, there were 2919 compared to the average of previous years: January (increase of 33%); February (48%); March exceeding deaths (66,1% of all deaths) and corresponding to the months of higher percentage (52%) and April (40%). If we compare the absolute number of deaths occurred in the four first months of 2016 with the months that registered the highest number of deaths in any year from 2012 to 2015 (MMO), it remains an important difference , totalizing an exceeding of 2061 deaths in the four months (Figure 1).

It is evident that not all this deaths excess can be attributed to the complications of chikungunya virus infections (CHIKV). However, given the temporal overlap of the highest proportion of excess deaths with the peak period of the epidemic of chikungunya, it is possible that part of these deaths may be due to aggravation of preexisting comorbidities associated with CHIKV infection and other part due to neurological complications caused directly by this virus. It should be noted that lethality by chikungunya above that has been detected in official records have already been reported by other authors in other countries (Mavalankar, 2008; Beesoon, 2008). The data presented indicate that is necessary to deepen this investigation and to elaborate protocol on alarm signals and special clinical management for severe cases of chikungunya or comorbidities decompensated due to CHIKV infections to aims prevent human deaths.

Conflict of Interest: The author declares there is no conflict of interest.

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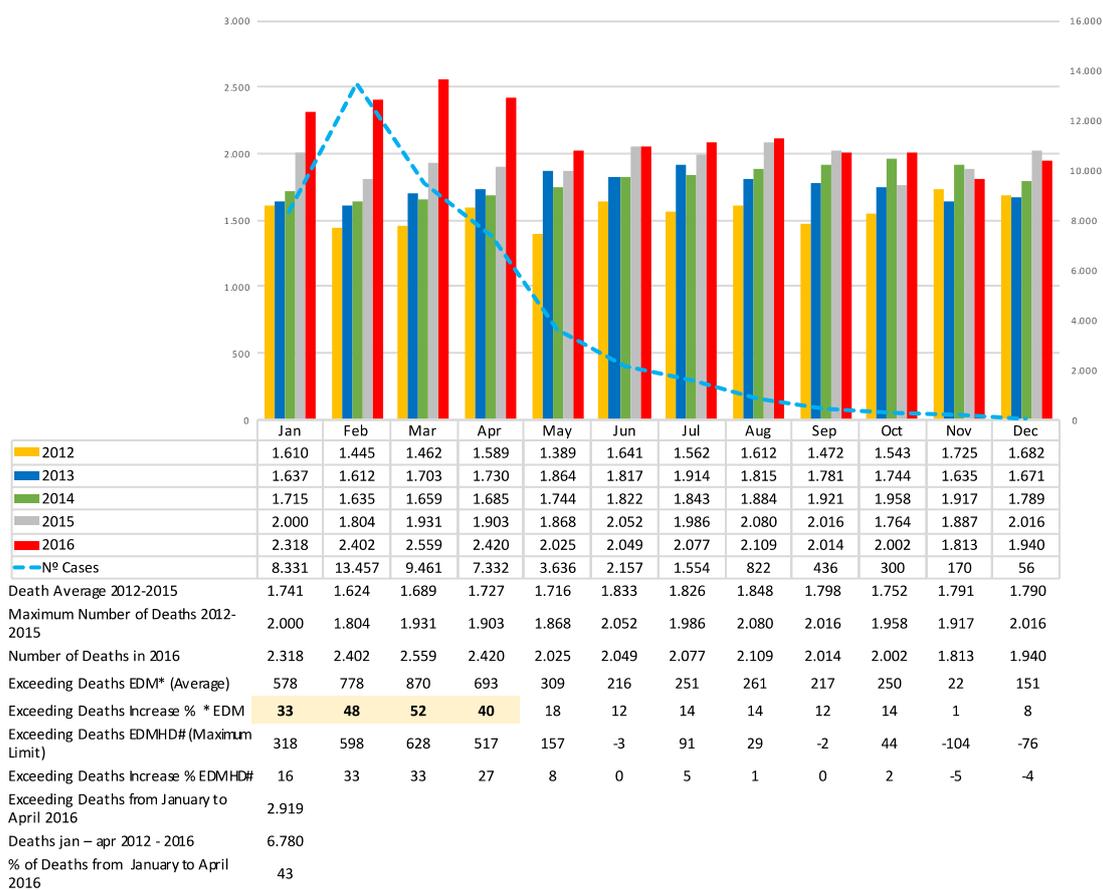
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**Figure 1. Number of Notified Cases of Chikungunya (on 2016) and Number of Hospital Deaths from All Causes according Year and Month. Pernambuco-Brazil, 2012-2016**



Sources: Information System of Notification Diseases/SINAN and Hospital Information System/SIH, MoH Brazil.

\*EDM – Exceeding of deaths in 2016 compared with the average of the four previous years in absolute numbers and in percentage

#EDMHD – Exceeding of deaths in 2016 compared with the months with higher number of deaths from 2012 to 2015