



Letters to editor

**Reflections on Afro-descendant origin and the outcome of dengue fever cases in Colombia.**

Reflexiones sobre el origen de los afrodescendientes y los casos de dengue en Colombia

Dear editors, cordial greetings

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As a group of researchers and professionals signing this letter to the editors, respectfully, we want to make a series of observations and reflections regarding the article “Afro-Colombian ethnicity, a paradoxical protective factor against dengue”<sup>1</sup>, published in your prestigious journal.

We considered that the article in question lightly concludes that the Afro-Colombian population present a lower risk of complications compared to the non-Afro-Colombian population. This situation, besides of not being completely based on data and facts that it describes and analyzes, is an assertion that can be a source of deeply disorientation for the Colombian health services, upon a time these conclusions get disseminated, and it can also mistakenly indicate to Afro-Colombian people that the risk of complications is lower in the presence of a virus causing a dengue disease.

In our point of view, several of the article’s affirmations can be object of xenophobic and exclusive evaluations towards the Afro-Colombian populations, mostly perceived when the authors conclude that in zones or neighborhoods with high number of Afro-Colombian there is a greater incidence of dengue among this population. The authors did not show data or measurements of this condition to identify whether (or not) Afro-descendants were infected at the site of evaluation and whether (or not) they developed the disease, so that these findings should have been assessed more rigorously before making this kind of affirmations and “risky” conclusion.

Although there are characteristics of Afro-descendants that may give to them less susceptibility to severe dengue manifestations, it is already known about the multifactorial pathogenesis of this disease; in which, variables such as environmental factors<sup>2</sup>, Age<sup>3</sup>, gender<sup>4</sup>, different blood types AB versus types A, O and B<sup>5</sup>, allele polymorphisms of human leukocyte antigens<sup>6</sup>, and factors associated with leakage Vascular...among others, play an important role.

The conditions related to host genetics and environmental factors might predispose to severe forms of the disease, but the important thing is to bear in mind that most of them have been the result of conclusions obtained by studies of association. In addition,

recent meta-analysis studies on factors that may influence dengue’s manifestations indicate that malnutrition has an inverse association with dengue shock syndrome and dengue hemorrhagic fever<sup>7,8</sup>. We might then, paradoxically, think that “malnutrition offers a kind of protection against the development of the severe form of the disease”. Therefore, being a person of black race does not mean that he/she is protected against some forms of dengue, neither it indicates that it is a risk factor for other ethnic groups<sup>9</sup>. It is also possible that the article is failing to measure or has bias in misclassification, regarding to the auto-recognition for each patient’s race<sup>10</sup>. A dichotomous classification as Afro-Colombian or non-Afro-Colombian can generate measurement errors; particularly, considering that an Afro descendant patient (mulatto, zambo, mestizo, and others) can be classified as non-Afro-Colombian. Additionally, genetics of their predecessors makes it much vulnerable to possible complications of external origin infectious events. It is possible that of the 402/431 cases of severe dengue cases with complications in non-Afro-Colombians reported by the authors, several of them have genetic elements and traits of Afro-Colombian population, generating a measurement error in which it would be needed to perform Genetic and biological measurements that were not considered.

On the other hand, it is confusing the fact that when comparing with the conclusions obtained by Rojas et al.<sup>1</sup> in relation to the epidemiological reports made by the National Institute of Health (NIH) in 2013, it differs substantially. For example, the NIH reported that the most prevalent provincial o territories (in order of magnitude) with cases of classical dengue and severe dengue are Tolima, Valle, Santander, Norte de Santander and Cundinamarca. In these territories/provinces, (with the exemption of Valle) there are low black race population<sup>11</sup>.

Although the authors state that there is no risk of a possible ecological fallacy, it is obvious that most conclusions were obtained with data analysis of population-level records, which exceed individual conclusions<sup>10</sup>. To avoid this type of situation, multi-level or multi-step method validations are required to ensure consistency between the two measurement levels.

Finally, it should be considered that dengue is a complex disease in which mechanisms and severe forms of infection have not been fully elucidated, requiring robust and ethical studies to establish new theories about viral pathogenesis, as to avoid making wrong assumptions for the individuals under the study.

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**Conflicts of interest:**

None to disclaim

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**Authors Response: Reflections on Afro-descendant origin and the outcome of dengue fever cases in Colombia.**

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**Answer letter to the Editor:**

We have carefully read Rengifo *et al.*<sup>1</sup>, views on our research on dengue and ethnicity<sup>2</sup>. Most of their observations point to the classification of ethnicity in the study design, in which we recognize a great difficulty to establish the category of Afro-descendant to each one of the individuals. Some proposals to classify that ethnic group in Latin American populations, based on genetic and biological tests, have shown a great miscegenation, which makes classification difficult<sup>3</sup>. The method of self-recognition of the ethnicity is imperfect as we see in the methodology of our study; but it is still valid for the scientific community at this time, while other more efficient, reliable and robust methods arise<sup>4,5</sup>.

We disagree with the letter correspondents in considering xenophobic any element of this research. The study design considered any risk of discrimination on the grounds that it directly affected the outcome, and that it safeguarded the principle of equity in the selection and evaluation of variables. Significant results were verified by adjusted models that in some cases refuted the original findings (cumulative incidence by age and ethnic origin). Our interpretations of the results also warn of a silent phase of dissemination of the epidemic in communities with a larger Afro-Colombian population, which may require sanitary adjustments to modify the case numbers of dengue and severe dengue.

Finally, we agree on the complexity of the disease and the limitations of ecological studies; but these two arguments do not detract from the value of the conclusions of the study beyond the limitations we recognize in the discussion. Public health research can contribute to better policy decisions in a region by allowing decision-makers to better understand a problem or situation. But defining what decisions authorities should take in health is a responsibility only of decision-makers, in which they have to take into account other aspects, such as social, economic, technical and reliance on other sciences<sup>6</sup>. In this way, our publication does not encompass defining moral and politically convenient decisions.

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