

# Is Zika the cause of Microcephaly? Status Report June 27, 2016

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Questions have been raised about Zika as a cause of microcephaly as a result of the limited number of cases reported in Colombia [1]. In contrast to over 1,500 confirmed cases in Brazil [2], the number of confirmed cases in Colombia until June 11 is reported as 7 by the WHO [2] and 6 by the Colombian authorities [3]. The main explanation for the absence of cases is that the epidemic in Colombia has not yet led to many births of women exposed in the first or second trimesters. However, the timing of such births is immanent.

Colombian authorities just reported that until June 18, epidemiological weeks 1-24, there have been 11 confirmed cases of microcephaly linked with Zika [3]. This is an additional 5 cases over those previously confirmed in weeks 1-23, with the most recent additional case (the sixth) reported four weeks previously. The 5 additional cases may include confirmation of cases reported as under investigation in earlier weeks, as the cases are not identified by the week of birth. The new number represents a significant jump over previous reports and therefore may be consistent with a growing number of cases that reflect Zika infection induced microcephaly.

We have recently analyzed the preliminary results of a study published on June 15, 2016, in the *New England Journal of Medicine* [4] and the Zika and microcephaly reports, to determine

that in addition to the reported nearly 12,000 Zika symptomatic pregnancies until March 28, there can be expected to be four times as many non-symptomatic cases. The total number of symptomatic and non-symptomatic cases is therefore estimated to be over 60,000 in Colombia.

Using an estimated rate of microcephaly induced by Zika of 1 in 100 pregnancies exposed in the first trimester, or alternatively 0.5 in 100 of all pregnancies exposed in the first and second trimester [5], there should be 200 microcephaly cases arising from Zika exposure in Colombia of pregnancies infected until March 28. Zika infections rose rapidly starting in October 2015 and peaked at the beginning of February. If Zika is the cause of microcephaly, we expect the number of reported cases to increase to more than 10 per week over upcoming weeks.

These Zika induced cases should be in addition to the background rate of 2 in 10,000 births [6], which is consistent with the 6 or 7 cases reported from Colombia till this week.

The 5 additional cases reported this week are therefore the first indication that Zika is causing microcephaly in Colombia, while earlier reported cases are consistent with random co-occurrence of microcephaly and Zika infections. Confirmation will depend on reports in upcoming weeks.

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- [1] Y. Bar-Yam, *et al*, Is Zika the cause of Microcephaly? Status Report June 22, 2016, (June 22, 2016), <http://necsi.edu/research/social/pandemics/statusreport>.
- [2] Situation report 16 June 2016, *WHO* (June 16, 2016), <http://apps.who.int/iris/bitstream/10665/242439/1/zikasitrep-16Jun2016-eng.pdf?ua=1>.
- [3] Boletín Epidemiológico Semanal (BES), *Instituto Nacional de Salud* (June 2016), <http://www.ins.gov.co/boletin-epidemiologico/Paginas/default.aspx>.
- [4] O. Pacheco, *et al*, *NEJM* (June 15, 2016), <http://www.nejm.org/doi/full/10.1056/NEJMoa1604037#t=article>.
- [5] S. Cauchemez, *et al*, *Lancet* 387, 10033, p2125-2132 (21 May 2016), [http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(16\)00651-6/fulltext](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(16)00651-6/fulltext).
- [6] Facts about Microcephaly, *CDC*, <http://www.cdc.gov/ncbddd/birthdefects/microcephaly.html>.