

Dengue infections in-utero and children's health

Dr Martin Foureaux Koppensteiner

POLICY CONTEXT

Half of the world's population is at risk of dengue fever. Climate change puts previously unaffected areas in the reach of the vector of dengue fever, *Aedes Aegypti*. While generally a mild illness, in rare cases dengue fever can have severe health consequences. Little was previously known about the consequences of mild infections.

RESEARCH

New research finds for the first time robust evidence that even mild dengue infections during pregnancy can have severe and long lasting consequences for the unborn child, with an increased risk of low birthweight and hospitalization for up to three years after births.

ADVICE

The results of the research are important for a set of policies related to dengue fever in countries affected by the disease, including on the adoption of vaccines, awareness campaigns for pregnant women and the advise on and provision of insect repellent.

KEY RESEARCH FINDINGS

In Foureaux Koppensteiner and Menezes (2023), we provide novel evidence on the negative health consequences of maternal dengue infections using large linked administrative data sets from Brazil. In a departure from previous work, this paper focuses on the vast majority of mild and moderate dengue infections previously considered unproblematic during pregnancy.

- To provide causal estimates, we focus on mothers with multiple births, enabling us to estimate maternal-fixed effects specifications. We essentially compare the outcomes for pregnancies with and without maternal dengue infections for the same mother and control for neighbourhood and time-varying mother and pregnancy characteristics. Contrary to previous studies, we document a significant negative effect of even mild and moderate dengue infections on a range of birth outcomes.
- We find that maternal dengue increases the risk for new-borns being classified as very and extremely low birth weight by 67% and 133% compared to the baseline incidence, respectively. Low birth weight has been shown to negatively affect socio-economic outcomes and health in adulthood, and our results indicate that maternal dengue contributes to the list of factors during pregnancy with long-lasting consequences for human capital.
- We also find that maternal dengue during pregnancy increases the risk of hospitalisation of children over a three-year period after birth substantially by 27% compared to the mean incidence. We also find that the effects are long-lasting, with the strongest relative effect sizes estimated in the second year after birth, leading to a 76% increase in hospitalisations. Using information on the costs of hospital treatment for each admission, we find that maternal dengue substantially increases subsequent medical expenditures from hospitalisation in the first and second year after birth.

POLICY RECOMMENDATIONS

- Adoption decisions for safe and effective new generation dengue vaccines should take into account the new evidence provided in this research on the short and long-term consequences of maternal dengue infections and in decisions on priority groups to receive the vaccines, considering women trying to conceive a priority.
- Pregnant women and women with the intention to conceive should be informed about the health risk of maternal dengue infections to the unborn baby, for example through a general public health information campaign. The information campaign should include information on how to lower the risk of getting dengue by protecting yourself from mosquito bites by using long clothing, applying approved mosquito repellents, sleeping under mosquito nets and using window screens.
- Pregnant women in areas where dengue is endemic should be informed directly on the health risk of maternal dengue infections during their first prenatal visit by their public or private health providers and receive information about the above measures to avoid dengue infections.
- Cost of effective insect repellents is a major obstacle to universal uptake in low-income groups. To facilitate the uptake, effective mosquito repellents should be provided for free or at subsidized prices to low-income pregnant women in endemic areas, for example during prenatal visits. Similarly, assistance with the purchase and treatment of mosquito nets should be considered for low income groups.
- Travel advice for pregnant women to countries where dengue is endemic should include information on the potential health risk of maternal dengue infections, recommending appropriate protection against infection.

Get in touch

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The original research (Foureaux Koppensteiner & Menezes (2023)), forthcoming in the *American Economic Journal: Applied Economics* can be found [here](#), and an ungated version of the paper can be accessed [here](#).

The policy summary 'Dengue infections in-utero and the health of children' is available from VoxDev [here](#).