

## Article title: Neonatal Development in Prenatally Zika Virus-Exposed Infant Macaques with Dengue Immunity

### Key points:

- *Zika and Dengue viruses have similar properties, so exposure to both viruses may have an effect on developing fetuses.*
- *Macaque infants exposed to Zika and Dengue viruses in the womb had more difficulty with awareness of the objects around them, as well as following those objects as they move through the environment when compared to infants only exposed to Zika virus in the womb.*
- *There were no differences in motor or sensory development.*
- *When Macaque mothers have immunity to Dengue virus, a fetus' exposure to this virus as well as the Zika virus in the womb can worsen delays in a baby's development.*

### Glossary:

- *Macaque Monkey (picture)*
- *Zika virus- viral infection that primarily spreads through mosquito bites and has been linked to birth defects. Can cause fever, rash, headache, joint pain, and muscle pain.*
- *Dengue virus- viral infection primarily spread through the bite of an infected mosquito, can cause fever, nausea, rash, aches, and pains.*
- *Motor development- growth of children and their physical skills.*
- *Sensory development- senses of vision, hearing, taste, touch, and smell that allows us to take in information from the world.*



### Why this article matters:

*This study helps us understand how an expecting mother's exposure to Dengue and Zika viruses can impact the development of their children. Studying Macaque monkeys helps us to learn more about what to look for in humans.*

### Description of the study:

*Macaque monkeys who had been previously infected with Dengue virus as well as monkeys who had not had Dengue virus were both exposed to the Zika virus while pregnant, and a control group who had not had Dengue was exposed to a saline solution.*

*4 controls, 8 Zikv, 5 Denv/zikv*

*Three groups of macaque monkeys were present in the study with 8 exposed to only Zika virus, and 5 exposed to both Zika and Dengue virus, and 4 with no exposure to either Zika or DENV.*

*After the babies are born, the infant monkeys were tested using the Schneider Neonatal Assessment for Primates (SNAP) at 7, 14, 21, and 28 days of life.*

**Instructions for researchers:**

*This test looks at how long it takes the monkeys to respond to a change in the environment, their physical activity and motor development, how they use their senses to respond to the environment, and their developmental state.*

*Motor-*

*Emotional response (not in those words)*

*These were scored using the SNAP guidelines.*

**Research questions:**

*Why are some infants more affected than others by prenatal exposure to the Zika virus?*

*Does maternal Dengue virus immunity impact the severity of developmental delays in a fetus exposed to the Zika virus?*

*What developmental delays are seen in infants exposed to both viruses as compared to those only exposed to Zika?*

**Important results:**

*When Macaque mothers have immunity to Dengue virus, a fetus' exposure to this virus as well as the Zika virus in the womb can worsen delays in a baby's development.*

*Macaque infants exposed to Zika and Dengue viruses in the womb had more difficulty with awareness of the objects around them, as well as following those objects as they move through the environment when compared to infants only exposed to Zika virus in the womb.*

*There were no differences in motor or sensory development.*

**How the results will be used:**

*The results of this study will help researchers learn what signs to look for in human infants who have been exposed to both viruses. A future study could look into the long-term effects of this exposure on development and the impacts this could have into adulthood in humans.*

**Full article reference:** Ausderau, K., Kabakov, S., Razo, E., Mitzey, A. M., Bach, K. M., Crooks, C. M., Dulaney, N., Keding, L., Salas-Quinchucua, C., Medina-Magiães, L. G., Weiler, A. M., Bliss, M., Eickhoff, J., Simmons, H. A., Mejia, A., Antony, K. M., Morgan, T., Capuano, S., Schneider, M. L., ... Mohr, E. L. (2021). Neonatal development in prenatally zika virus-exposed infant macaques with dengue immunity. *Viruses*, 13(9), 1878. <https://doi.org/10.3390/v13091878>