

Strategies for Zika Response

A Retrospective Analysis of Population-Level Responses and Infant Health Outcomes

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Background

- The Zika virus is a flavivirus that may be spread to humans by mosquitos, and through vertical transmission, sexual contact, and blood transfusion.
- Zika infection may result in Guillain-Barré syndrome and flu-like symptoms in adults and serious health effects upon congenital infection, including microcephaly, Guillain-Barré syndrome, and other birth defects in infants.
- Objective:** This study compares societal costs of interventions used in the 2016 Zika response with lifelong Zika-associated costs and outcomes for infants born to mothers pregnant in Miami-Dade County.

2016 Florida Zika Outbreak

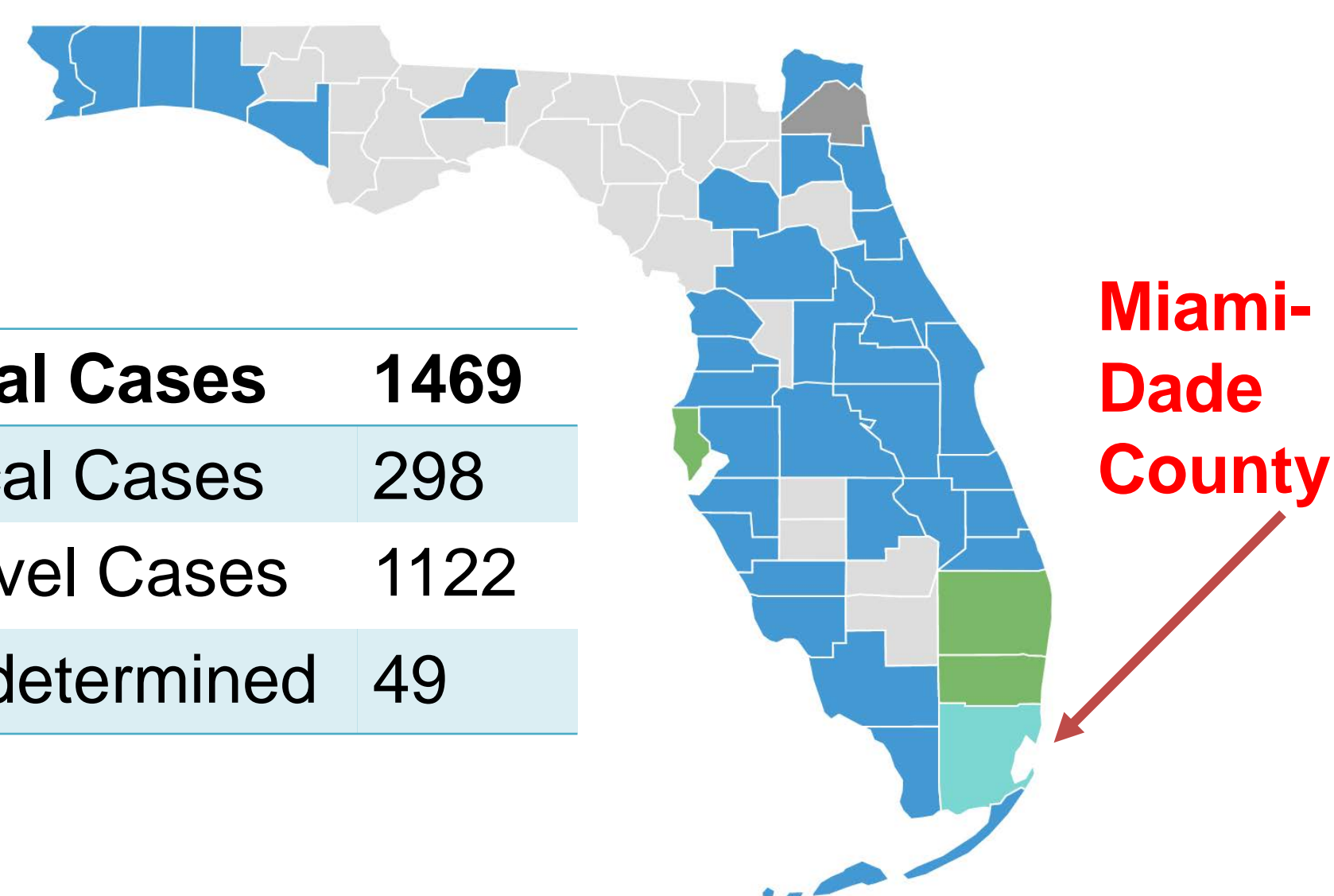
Areas of active transmission in Florida - 2016

Both Local and Travel Cases

Travel Cases Only

Undetermined Cases

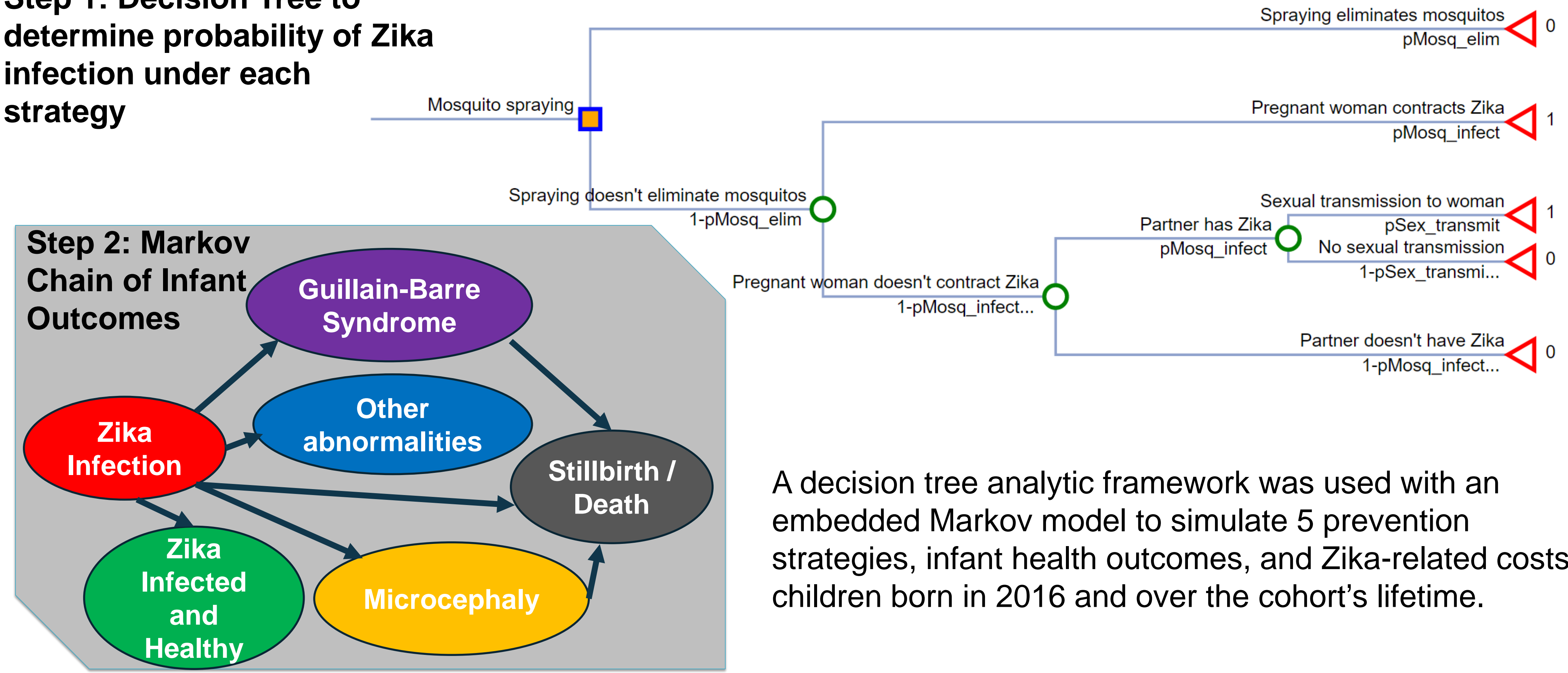
Active Zones



Florida Department of Health <https://zikafreefl.org/map/>

Decision Tree and Markov Chain

Step 1: Decision Tree to determine probability of Zika infection under each strategy

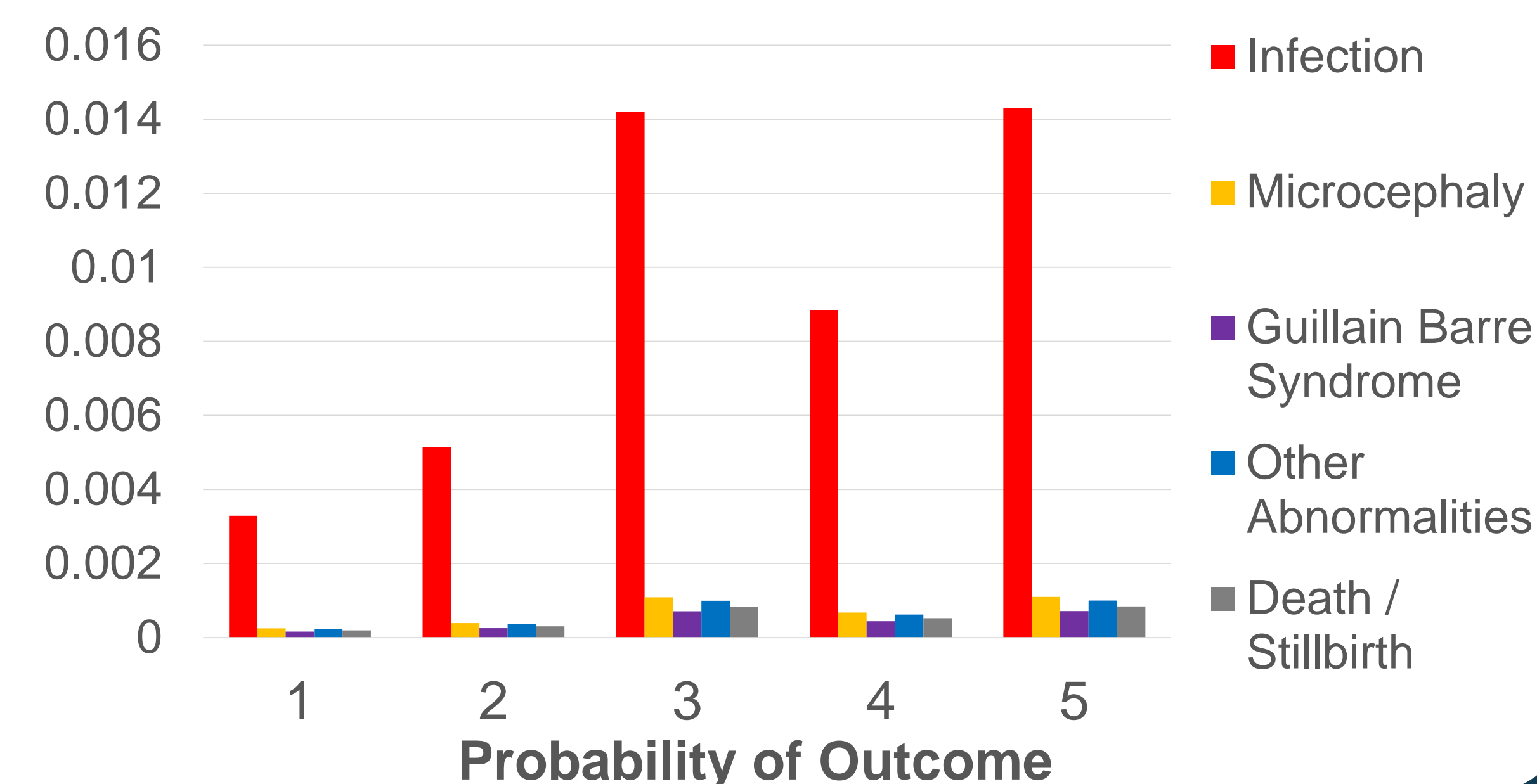


A decision tree analytic framework was used with an embedded Markov model to simulate 5 prevention strategies, infant health outcomes, and Zika-related costs for children born in 2016 and over the cohort's lifetime.

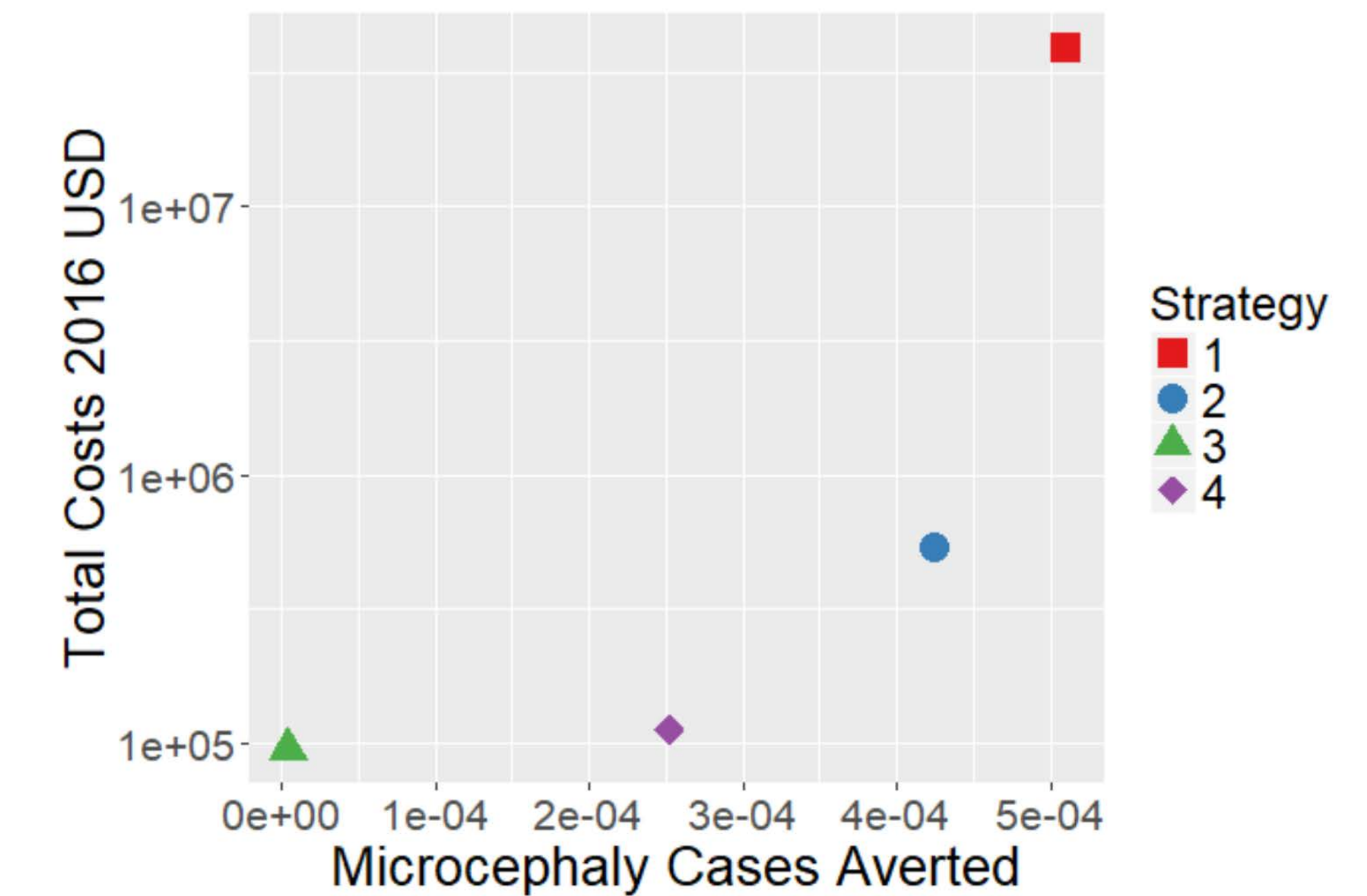
Response Strategies and Zika-Related Outcomes

- Strategy 1: Mosquito spraying** (ground and aerial) employed for larvicide and adulticide.
- Strategy 2: Limiting movement.** Pregnant women were advised to avoid travel to affected areas.
- Strategy 3: Zika Testing.** Pregnant women with Zika symptoms were recommended for Zika testing. Testing can inform women who would to terminate a pregnancy and for closer monitoring.
- Strategy 4: Condom provision.** Condom use may prevent sexual transmission from infected partners.
- Strategy 5: No action (reference).** In the absence of other strategies, the Florida Health Department promotes Zika prevention awareness raising.

Expected outcomes under each strategy



Cost-Effectiveness Results



Discussion

- Mosquito spraying was the most effective but most costly strategy.
- Sensitivity analyses varying the probability of Zika transmission by infected mosquitoes did not change the cost-effectiveness ranking of strategies.
- Cost-effectiveness of limiting movement is dependent upon societal costs, especially for tourism economies less robust to travel restrictions.
- Economic analyses should be considered when selecting prevention strategies for future epidemics.

Acknowledgments

Miami-Dade County Solid Waste Management; Florida Department of Health in Miami-Dade County; Fernando Alarid-Escudero, *dampack: An R package with useful functions to develop and analyze decision-analytic models*, 2018; Hilary Whitham, Office of Infectious Diseases, CDC; Karen Kuntz, HPM, UMN School of Public Health