A Conceptual Model for Optimizing Dengue Vaccine Coverage.

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Many vector-borne diseases co-circulate, as the viruses from the same family are also transmitted by the same vector species. For example, Zika and dengue viruses are both primarily transmitted by a common mosquito species Aedes aegypti. Zika outbreaks have also commonly occurred in dengue-endemic areas, and co-circulation and co-infection of both viruses have been reported. As recent immunological cross-reactivity studies have confirmed that convalescent plasma following dengue infection can enhance Zika infection, and as global efforts of developing dengue and Zika vaccines are intensified, it is important to examine whether and how vaccination against one disease in a large population may affect infection dynamics of another disease due to antibody-dependent enhancement. In this talk, I will present a conceptual co-infection dynamics model, and our evaluation results of the impact of a hypothetical dengue vaccination program on Zika infection dynamics in a single season.

References

[1] Tang, B., Huo, X., Xiao, Y., Ruan, S. and Wu, J., 2018. A conceptual model for optimizing vaccine coverage to reduce vector-borne infections in the presence of antibody-dependent enhancement. Theoretical Biology and Medical Modelling, 15(1), p.13.

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