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**Marie V Ozanne\*** ([mozanne@mtholyoke.edu](mailto:mozanne@mtholyoke.edu)). *Bayesian compartmental models and reproductive numbers for an infection with multiple infectious sources and transmission modes.*

Stochastic compartmental models comprise a class of techniques that can be used to study infection transmission dynamics. While various models have been developed to accommodate infections with an exposed (but not infectious) class or a less infectious carrier state, they do not accommodate an infection with two different infectious groups that are potentially equally important to maintaining infection in a population. We propose a Bayesian Susceptible, Asymptomatic, sYmptomatic, recoVered, Removed (SAYVR) model to address this scenario. We also present an Infection Source-specific Empirically Adjusted Reproductive Number (ISEARN) to quantify contributions from each of these two infectious classes to maintaining infection in a population of interest. We apply these methods to study the transmission dynamics of visceral leishmaniasis, a disease with two infectious class reservoirs, in the Americas. (Received September 13, 2019)