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Linda J. Allen* (linda.j.allen@ttu.edu), Department of Mathematics & Statistics, Texas Tech University, Lubbock, TX 79409-1042. *Extinction Thresholds in Stochastic Epidemic Models with Periodic Environments*. Preliminary report.

Seasonality and contact patterns due to environmental fluctuations impact the dynamics of disease outbreaks. Recent results applied to deterministic and stochastic epidemic models with periodic environments show that the average basic reproduction number is insufficient to predict an outbreak. New results show that the basic reproduction number for models with periodic environments may be less than or greater than the average reproduction number. We apply these results to stochastic epidemic models with periodic transmission or demographics to show that if the basic reproduction number is greater than one, the probability of a disease outbreak is periodic. Therefore, the time at which an infected individual is introduced into a population impacts the probability of an outbreak. Implications of these results for emerging diseases and disease prevention are discussed. (Received August 28, 2018)