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A Periodic SEIRS Epidemic Model with Time-dependent Latent Period.

Many infectious diseases have seasonal trends and exhibit variable periods of peak seasonality. Understanding the population dynamics due to seasonal change becomes very important for predicting and controlling disease transmission risks. In this talk, I will report our recent research on a periodic SEIRS epidemic model with time-dependent latent period. We introduce the basic reproduction ratio R_0 for this model and establish a threshold type result on its global dynamics in terms of R_0. More precisely, we show that the disease-free periodic solution is globally attractive if $R_0 < 1$; while the system admits a positive periodic solution and the disease is uniformly persistent if $R_0 > 1$. Numerical simulations are also carried out to illustrate the analytic results. This talk is based on a joint work with Dr. Xiaoqiang Zhao.