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Lora Billings* (billingsl@mail.montclair.edu), Department of Mathematical Sciences, Montclair, NJ 07043, and **Jackson Burton, Derek Cummings** and **Ira Schwartz**. *Disease Persistence in Epidemiological Models: The Interplay between Vaccination and Migration*. Preliminary report.

We consider the interplay of vaccination and migration rates on disease persistence in epidemiological systems. We show that short-term and long-term migration can inhibit disease persistence. This, in turn, changes how vaccination rates should be chosen to maintain herd immunity. In a system of coupled SIR models, we predict how the vaccination rates depend explicitly on short- and long-term migration rates to keep the disease free equilibrium stable. The analysis suggests novel vaccination policies that underscore the importance of optimal placement of finite resources. (Received January 11, 2012)