1086-92-2462 **Evelyn Kamaria Thomas*** (evelyn.k.thomas@gmail.com), **Katharine Gurski** and **Kathleen Hoffman**. *Analysis of SI Models with Multiple Interacting Populations Using Subpopulations with Forcing Terms.*

As a system of differential equations describing an epidemiological system becomes large with multiple connections between subpopulations, the expressions for reproductive numbers and endemic equilibria become algebraically complicated which makes drawing conclusions based on biological parameters difficult. We present a new method which deconstructs the larger system into smaller subsystems, captures the bridges between the smaller systems as external forces, and bounds the reproductive numbers of the full system in terms of reproductive numbers of the smaller systems, which are algebraically tractable. This method also allows us to analyze the size and stability of the endemic equilibria. (Received September 25, 2012)