

1145-92-1646

Mykhaylo M. Malakhov* (mykhaylo@andrews.edu), **Ishan Phadke** (iphadke473@gmail.com), **Junyan Duan**, **Jordan Pellett**, **Katriona Shea** and **Julie C. Blackwood**. *Federalism in Epidemic Modeling: Multi-objective Management of Interconnected Populations*. Preliminary report.

Public health policy is inextricably linked with the allocation of regulatory authority between different levels of government. While infectious disease dynamics are in general well-understood, few modeling studies have considered spatially heterogeneous populations that fall under multiple administrative jurisdictions and hence under levels of government with potentially differing objectives. We pose and numerically analyze a two-patch *SIRS*-type model that explicitly incorporates migration and allows managers to choose between quarantine, vaccination, border closure, medication, and a travel ban on infected individuals while aiming to minimize either the number of patients or the number of deaths. In particular, we consider three classes of manager: a central government that acts equitably, local governments that act selfishly, and a non-governmental organization that seeks to maximize the overall good. We establish general guidelines for optimal governance and demonstrate several anomalous cases of interest. (Received September 23, 2018)