

---

**ZHISHENG SHUAI**, University of Central Florida  
*A Final Size Relation for Heterogeneous Epidemic Models*

We revisit the final size relation for epidemic models with homogeneous mixing and explore the challenges of extending it to heterogeneous settings. To address these, we develop a new systematic approach to construct first integrals in heterogeneous epidemic models. This approach enables a natural extension of the final size relation and yields new biological insights into reproduction numbers, turning points and peak infection levels.