1163-92-310 **Zhuolin Qu*** (zhuolin.qu@utsa.edu), Department of Mathematics, One UTSA Circle, San Antonio, TX 78249, and **Benjamin H. McMahon**, **Douglas J. Perkins** and **James M. Hyman**. *Staged progression epidemic model for the transmission of invasive nontyphoidal Salmonella (iNTS) with treatment.*

We develop and analyze a stage-progression compartmental model to study the emerging invasive nontyphoidal *Salmonella* (iNTS) epidemic in sub-Saharan Africa. iNTS bloodstream infections are often fatal, and the diverse and non-specific clinical features of iNTS make it difficult to diagnose. We consider immune-compromised subpopulations in the region with major risk factors for mortality, such as malaria and malnutrition among children and HIV infection and ART coverage in both children and adults. We parameterize the progression rates between infection stages using the branching probabilities and estimated time spent at each stage. We interpret the basic reproduction number $\mathcal{R}_0$ as the total contribution from an infinite infection loop produced by the asymptomatic carriers in the infection chain. The results indicate that the asymptomatic HIV+ adults without ART serve as the driving force of infection for the iNTS epidemic, and the worst disease outcome is among the pediatric population. Our sensitivity analysis indicates that the most effective strategies to reduce iNTS mortality in the studied population are to improve the ART coverage among high-risk HIV+ adults and reduce malnutrition among children. (Received September 01, 2020)