

1014-92-1002

Maia Martcheva, Horst R Thieme (thieme@math.asu.edu) and **Thanate Dhirasakdanon*** (thanate@asu.edu), Department of Mathematics and Statistics, Arizona State University, Tempe, AZ 85287-1804. *Kolmogorov's differential equations and Markov population chains.*

Spatially implicit metapopulation models with discrete patch-size structure and host-macroparasite models which distinguish hosts by their parasite loads lead to infinite systems of ordinary differential equations. In several papers, a this-related theory will be developed in sufficient generality to cover these applications. In this paper the linear foundations are laid. They are of own interest as they apply to continuous-time population growth processes (Markov chains). Conditions are derived that the solutions of an infinite linear system of differential equations, known as Kolmogorov's differential equations, induce a C_0 -semigroup on an appropriate sequence space allowing for first moments. We derive estimates for the growth bound and the essential growth bound and study the asymptotic behavior. Our results will be illustrated for birth and death processes with immigration and catastrophes. (Received September 26, 2005)