1109-92-85 **Necibe Tuncer** (ntuncer@fau.edu), Department of Mathematics, Florida Atlantic University, Boca Raton, FL 33431, FL 33431, **Juan Torres** (gatorcha@ufl.edu), Department of Mathematics, University of Florida, Gainesville, FL 32611, **Maia Martcheva*** (maia@ufl.edu), Department of Mahematics, University of Florida, Gainesville, FL 32611, **Mike Barfield** (mjb01@ufl.edu), Department of Biology, University of Florida, Gainesville, FL 32611, and **Robert D. Holt** (rdholt@ufl.edu), Department of Biology, University of Florida, Gainesville, FL 32611. *Dynamics of Low and High Pathogenic Avian Influenza in Wild and Domestic Bird Populations.*

We introduce a time-since-recovery structured, multi-strain, multi-population model of avian influenza. Influenza A viruses infect many species of wild and domestic birds and are classified into two groups based on their ability to cause disease: low pathogenic avian influenza (LPAI) and high pathogenic avian influenza (HPAI). Prior infection with LPAI provides partial immunity towards HPAI. The model structures LPAI-recovered birds (wild and domestic) with time-since-recovery and includes cross-immunity toward HPAI that can fade with time. We find a unique disease-free equilibrium (DFE), LPAI-only equilibrium and HPAI-only equilibrium and at least one coexistence equilibrium. LPAI and HPAI can coexist in sustained oscillations. Through simulations, we show that even if both populations (wild and domestic) are sinks; that is, have reproduction numbers and invasion numbers smaller than one, LPAI and HPAI can persist in both populations combined. (Received January 24, 2015)