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*Filippov Models of Avian Influenza*

The growing number of reported avian influenza cases have prompted awareness of the effectiveness of pharmaceutical or/and non-pharmaceutical interventions which aim to suppress the transmission rate. We propose two Filippov models with threshold policy; the avian-only model with culling of infected birds and the SIIR model with quarantine. The dynamical systems of these two models are governed by nonlinear ordinary differential equations with discontinuous right-hand sides. The solutions of these two models will converge to either one of the two endemic equilibria or the sliding equilibrium on the discontinuous surface. Our results provide several useful insights which include the choice that can be made to fix the threshold level. For any desired threshold level that we choose, it can be observed that either the outbreak will be precluded or the infection will be stabilized. A well-defined threshold policy is essential in order for us to efficiently combat the outbreak.

Keywords: Avian influenza; Filippov model; threshold policy; culling of infected birds; quarantine