

Numerical simulation of a multi-group age-of-infection model

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Age of infection epidemic models [1, 3], based on non-linear integro-differential equations, naturally describe the evolution of diseases whose infectivity depends on the time since becoming infected. Here we consider a multi-group age of infection model [2] and we extend the investigations in [4], [5] and [6] to provide numerical solutions that retain the main properties of the continuous system. In particular, we use Direct Quadrature methods and prove that the numerical solution is positive and bounded. Furthermore, in order to study the asymptotic behavior of the numerical solution, we formulate discrete equivalents of the final size relation and of the basic reproduction number and we prove that they converge to the continuous ones, as the step-size of the discretization goes to zero.

References

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