Quantum Mechanics Applied to Susceptible–Infected Model

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Standard mathematical models of epidemiological dynamics are often constructed using ordinary differential equations (ODEs). These macroscopic deterministic models yield predictable results which assist researchers to make informed recommendations about public policy decisions. These ODE models are based on heuristic assumptions such as competition, decay, growth, homogeneous/preferential mixing, etc. This research takes a quantum viewpoint of a SI (susceptible and infected) model. The two basic assumptions are fission and successful infection transmission. The quantum approach predicts the same macroscopic behavior as the standard ODE model. However, the quantum approach also predicts that once an infection is introduced into a susceptible population, there is no disease free state. This suggests that the stochastic nature of this quantum model introduces a natural reservoir for the infection.