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The human will to preserve life makes models of infectious disease spread invaluable to society; for such models assist in disease prevention—the continuation of life. Artificial Neural Networks offer a means by which complex dynamic stochastic systems can be modeled using network structures. This paper involves the use of stochastic neural networks to model epidemiological processes that involve internal, external, and hereditary influences. The current model is an extension of the Markov network that has been used to model infectious diseases—under simpler conditions—in the past. (Received September 15, 2014)