Smallpox: When Should Routine Vaccination Be Discontinued?

By Frauenthal, J. C.

Book Condition: New. Publisher/Verlag: Springer, Basel | The material discussed in this monograph should be accessible to upper level undergraduates in the mathemati cal sciences. Formal prerequisites include a solid intro duction to calculus and one semester of probability. Although differential equations are employed, these are all linear, constant coefficient, ordinary differential equa tions which are solved either by separation of variables or by introduction of an integrating factor. These techniques can be taught in a few minutes to students who have studied calculus. The models developed to describe an epidemic outbreak of smallpox are standard stochastic processes (birth-death, random walk and branching processes). While it would be helpful for students to have seen these prior to their introduction in this monograph, it is certainly not necessary. The stochastic processes are developed from first principles and then solved using elementary tech niques. Since all that turns out to be necessary are ex pected values of random variables, the differential-differ ence equatlon descriptions of the stochastic processes are reduced to ordinary differential equations before being solved. Students who have studied stochastic processes are generally pleased to learn that different formulations are possible for the same set of conditions. The choice of...

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