

MATHEMATICAL MODELING OF SEXUALLY TRANSMITTED DISEASES.

H. Brazeau, P. Clark, Department of Mathematics and Statistics, hmb5518@rit.edu

Chlamydia is caused by a parasitic microorganism, known as *Chlamydia trachomatis*, that can only survive in a host cell. Spread through close sexual contact, Chlamydia infections are currently the most commonly reported and most rapidly growing sexually transmitted disease. In 2000, all 50 states and the District of Columbia were required to report Chlamydia cases to the Centers for Disease Control for the first time. However, because most Chlamydial infections are asymptomatic, there is clearly under detection and underreporting of cases. From the data collected by the Centers for Disease Control, an SIS epidemiology model was developed to characterize the transmission of the disease. From 1990-2003, the average number of secondary infections caused by each infective was 1.040 per year, with an average infective in sufficient contact with 1.223 persons. Utilizing the computed model, a carrying capacity of 3.84% of the US population was calculated, with an estimate of 272 years until this value is reached. The purpose of creating this model is to try and predict future cases, and learn more about the inherent nature of the transmission of this disease. Several limitations of the model, such as underreporting of cases, lack of knowledge of the characteristics of the disease, and lack of sufficient data, are currently being considered for future testing. Further examination, including corrections and improvements to the model, are ongoing.