A COMPARISON OF THE THEORETICALLY PREDICTED DISTRIBUTION OF BACTERIAL S.T.I.S AND THEIR OBSERVED PREVALENCE IN URBAN PERU.

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Objectives: The expected distribution of sexually transmitted infections depends upon the pattern of risk behavior of the individual and the population, the biology of infection and also treatment seeking behavior and availability of appropriate care. A comparison of the observed and expected distribution of infection tests how well these interacting factors have been described within a theoretical framework.
Methods: A deterministic compartmental mathematical model of the spread of a curable STI has been developed to include rates and patterns of treatment and has been parameterized to represent syphilis, chlamydia, gonorrhoea and trichomoniasis. Sexual behavior in the model is based upon population-based surveys carried out in 24 cities throughout Peru which sampled 17000 individuals. The observed distribution of the 4 infections in the surveys is available for comparison with the pattern of infection predicted by the model.
Results: There was substantial variation in the prevalence of each STI in the general population in the different cities: chlamydia range 1% – 8%; trichonomiasis 1% – 10%; syphilis (in the 16 cities where it was detected) 1% – 4%. Also the prevalence of the different STIs was poorly correlated: the strongest correlation was between prevalence of chlamydia and trichonomiasis, (R=0.26). The distribution of infections amongst individuals by patterns of risk behavior can be readily explained within the model but the overall prevalence of the infections in the different populations is less easily predicted.
Conclusions: Stochastic variation is likely to play an important role in the epidemiology of bacterial STI due to their relatively short infectious periods, particularly where prevalence is low and in population subgroups with a relatively low risk of infection and transmission. In low prevalence situations the model predicts that small improvements in treatment patterns can have a major impact on the local incidence of infection.