We tested the hypothesis that strain-specific immunity occurs after gonococcal infection in a longitudinal study of 227 prostitutes resident in one small community who experienced frequent gonococcal infections. Women were examined and cultured for Neisseria gonorrhoeae at 2-wk intervals. Gonococcal isolates were typed according to protein 1 serovar, auxotype, and beta-lactamase plasmid type, and classified as to serovar and strain. The hypothesis was tested by comparing the predictions of the hypothesis with the observations of the study. Over the 14-mo period of the study, major changes in the prevalence of specific serovars were observed in the gonococcal population infecting these women. Women with HIV infection experienced a higher rate of gonococcal infection (0.56 +/- 0.03 vs. 0.46 +/- 0.04, P less than 0.05, t test) compared with HIV-negative women and were more likely to experience multiple infections with the same strain. The duration of prostitution was inversely related to the frequency of gonococcal infection. Women experiencing an infection with a specific gonococcal serovar were at a 2- to 10-fold reduced risk of reinfection with the same serovar, except for the 1B-1 serovar. The results of the study were consistent with all four predictions of the hypothesis. Infection with a specific gonococcal serovar results in specific but incomplete protection against subsequent infection with the homologous serovar. The mechanism of this protection remains to be determined.