

Drug Testing

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(Copied from Wikipedia)

Suppose a drug test is 99% sensitive and 99% specific. That is, the test will produce 99% true positive results for drug users and 99% true negative results for non-drug users. Suppose that 0.5% of people are users of the drug.

| Hypothesis | Prior |
|------------|-------|
| user | 0.5% |
| non-user | 99.5% |

Now suppose Bob tests positive for the drug. What is the probability that he is actually a user?

| Hypothesis | Prior | Likelihood | Posterior |
|------------|-------|------------|-----------|
| user | 0.5% | 99.0% | 33.2% |
| non-user | 99.5% | 1.0% | 66.8% |