

Predicting the VD Rate

Your calculator or spread sheet can perform a linear regression for each of the following data sets. At this point, you should know how to enter the data into the calculator or computer, construct the scatterplots, and obtain the least squares lines that will describe the VD rates as functions of time. You will need to find one regression equation for Spartanburg County, and one for South Carolina.

Cases of Major Venereal Disease per 100,000 residents
for Spartanburg County, and for South Carolina

YEAR	1981	1982	1983	1984	1985	1986
Rate of VD (Sptbg. Co.)	198	347	289	295	412	486
Rate of VD (S. Carolina)	750	746	661	653	637	564

Once you have constructed the scatterplots, examine the data and note any trends that you see.

When you have found the regression equations, fill in the information below.

Record the slopes: _____ the y-intercepts: _____ (Spartanburg)
_____ (S. Carolina)

Interpret all four of these values in context (in English):

Write the equations of the lines: $y =$ _____ . (Spartanburg)
 $y =$ _____ . (S. Carolina)

Next, graph the regression lines on the scatterplots. How well do the lines fit the data?

Now use the equations you found to make some projections of VD rates:

Prediction for 1992: _____ 1995: _____ 1999: _____ (Spartanburg)
_____ (S. Carolina)

Now consider implications of your results:

- If one out of 20 people have condition X, then the probability that the next person you randomly encounter does NOT have condition X is $1 - 1/20 = 19/20 = .95$.
- So the probability that neither of the next TWO people you randomly encounter have X is $(.95)(.95) = .9025$.
- The probability that none of the next THREE people you randomly encounter have X is $(.95)(.95)(.95) = (.95)^3 = .857375$.
- For FOUR people, the answer is $(.95)^4$, etc.

Using the VD rate you projected for Spartanburg for 1999, what is the probability that none of the next 100 people you randomly encounter in Spartanburg in 1999 have VD? Show your calculations here:

Answer: _____