

12.3 PROJECT

CORRELATION: STORKS AND BABES

The Theory of the Stork¹ states that the number of out-of-hospital births in an area decreases as the number of storks in the area decreases and increases as the number of storks in the area increases. In the project for Section 5.2, you were introduced to a data set collected over a period of ten years consisting of pairs of storks in Brandenburg (the countryside around Berlin) and out-of-hospital births in the city of Berlin. That data set is reproduced below. In this project, we will determine the actual line of best fit for the data and determine whether there is a correlation between the number of pairs of storks and the number of out-of-hospital births in the area.

Year	Pairs of Storks (x)	Out-of-Hospital Births (y)
1990	970	900
1991	850	790
1992	980	780
1993	1210	890
1994	1280	960
1995	1270	1080
1996	1360	1070
1997	1120	1250
1998	1320	1130
1999	1370	1200

1. Create a scatter plot using this data set.
2. Find the equation of the regression line (line of best fit) for the data set and sketch the line on the scatter plot created in part 1.
3. Calculate the Pearson correlation coefficient for the data set. Then, check for significance at both the 0.05 and 0.01 levels. Is there a statistically significant correlation between stork pairs and out-of-hospital deliveries at both levels of significance?
4. If there are different conclusions for the different levels of significance in part 3, discuss potential causes and implications of this difference. If the conclusion is the same, did you find it surprising considering the scatter plot?
5. Use the equation of the regression line found in part 2 to predict the number of out-of-hospital births when during a given year 1100 pairs of storks were observed.
6. Use the equation of the regression line found in part 2 to predict the number of out-of-hospital births during a given year when 0 pairs of storks are observed.
7. Are the results obtained in parts 5 and 6 reasonable? Explain why or why not.

¹ Thomas Höfer, Hildegard Przyrembel, and Silvia Verleger, "New Evidence for the Theory of the Stork," *Paediatric and Perinatal Epidemiology*, Volume 18 (January 2004): 88–92.