

Project: Correlation Study

Name _____

In a study of the effects of exposure to lead on the psychological and neurological well-being of children, a group of children who lived near a lead smelter in El Paso, Texas, were identified and their blood levels of lead were measured. An exposed group of 19 children were identified who had blood-lead levels of at least 40 mg/ml. This group of children is defined by group variable **leadtype** and was coded as 2. A control group of 63 children were also identified who had blood-lead levels less than 40 mg/ml, and is identified by the variable **leadtype** and was coded as 1. All children lived close to the lead smelter. The data is saved in SPSS format [leadtest-cat.sav](#). (Web address for this data file is: <http://www.cc.ysu.edu/~ghchang/stat/leadtest-cat.sav>) It can be downloaded from Dr. Chang's web site in Data Directory Link.

Variable Description

id	Identification number
area	Area where the children lived 1 = 0 to 1 mile from smelter 2 = 1 to 2.5 miles from smelter 3 = 2.5 to 4.1 miles from smelter
sex	Sex 1=Male, 0=Female
iqf	Full Scale of IQ test score
leadtype	Blood lead level group 0 = below 40 mg/ml 1 = greater or equal to 40 mg/ml
fwt_r	Finger-wrist tapping test right hand
fwt_l	Finger-wrist tapping test left hand
maxfwt	Larger of fwt_r and fwt_l as a proxy for the number of taps from the dominant hand

Objective: to test whether there is statistically significant correlation between the area they lived (**area** variable) and blood lead level (**leadtype** variable). Use SPSS to answer the following questions.

Answer the following questions:

1. State the statistical hypotheses.

Null hypothesis, H_0 :

Alternative hypothesis, H_a :

2. Perform a Chi-square test using SPSS and report the p-value for the Pearson's Chi-square test. P-value : _____
3. Use SPSS output on chi-square test to conclude your analysis and comment on whether statistically there is statistical significant correlation between the area these children lived and their blood lead level.

To perform the chi-square test, in SPSS main menu, click the following menu selections:

Analyze ⇒ **Descriptive Statistics** ⇒ **Crosstab ...**, and then select the variables to put in the row and column variable boxes, and check the Statistics button for selecting statistics options, check chi-square box for doing chi-square test.

Reference:

- SPSS video for chi-square test on WebCT, **Video for Chi-square Test of Independence for Un-organized Data** for instruction.
- [Exploratory Data Analysis](#) instruction pages 7 and 8 for instructions on how to run chi-square test.