

Consider the distribution of hemoglobin levels for the population of children under the age of 6 who have been exposed to high levels of lead. Let's say we want to know whether the average hemoglobin level of this population is equal to the mean of the general population of children under the age of 6 ( $\mu = 12.29g/100ml$ ). We believe that if the hemoglobin levels of exposed children differ from those of unexposed children, they must on average be lower. A random sample of 74 children who have been exposed to high levels of lead has a mean hemoglobin level of  $10.6g/100ml$  and a standard deviation of  $0.85g/100ml$ . [*Principles of Biostatistics*, Pagano & Gauvreau, 2nd edition, 2000, pg. 238]

1. Test whether the hemoglobin levels of children under 6 exposed to lead is lower than those not exposed to lead. (Remember to write out the null and alternative hypotheses in words and symbols, calculate a test statistic, find a p-value, and conclude your test in the words of the problem.)
2. Find a 90% confidence interval for the true average hemoglobin level of children under 6 who have been exposed to lead.