

# Section 2A Discussion

Nov 19th, 2009

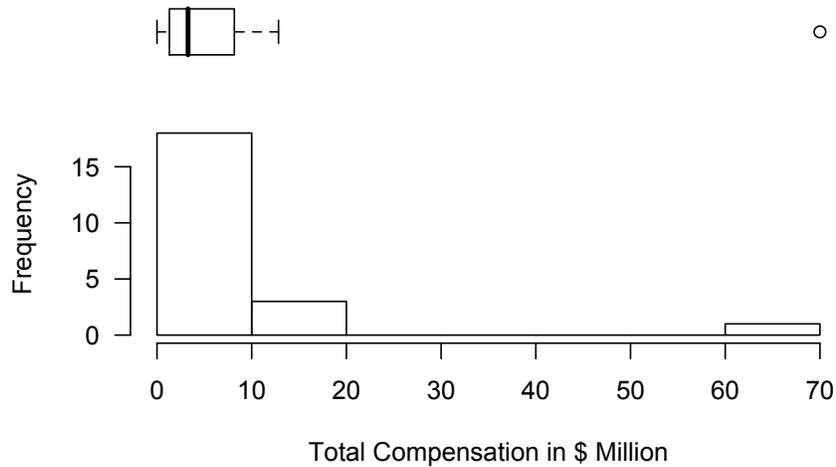
Answers to some questions below are provided.

## Exam recap

Run over the exam answers (quickly).

## p610, #11

A sample of 20 CEOs from the Forbes 500 shows total annual compensations ranging from \$0.1 to \$62.24 million. The histogram and boxplot are as follows:



Based on these data, a computer program found that a 95% confidence interval for the mean annual compensation of all Forbes 500 CEOs is (1.69, 14.20) \$ million. Why should you be hesitant to trusts this confidence interval?

## p611, #14

Hoping to lure more shoppers downtown, a city builds a new public parking garage in the central business district. The city plans to pay for the structure through parking fees. During a two-month period (44 weekdays), daily fees collected averaged \$126 with a standard deviation of \$15.

(a) What assumptions must you make in order to use these statistics for inference?

(b) Write a 90% confidence interval for a mean daily income this parking garage will generate.

(c) Explain in context what this confidence interval means.

We are 90% confident the true mean daily revenue for the parking garage is between \$122.20 and \$129.80.

(d) Explain what “90% confidence” means in this context.

90% of all such samples will produce intervals containing the true mean daily revenue.

(e) The consultant who advised the city on this project predicted that parking revenues would average \$130 per day. Based on your confidence interval, do you think the consultant was correct? Why?

No. \$130 is not in the interval so is not a plausible value. (Although it is possibly true, our data doesn't support it.)

## p613, #28

During an angiogram, heart problems can be examined via a small tube (a catheter) threaded into the heart from a vein in the patient's leg. It's important that the company that manufactures the catheter maintain a diameter of 2.00 mm. (The standard deviation is quite small.) Each day, quality control personnel make several measurements and test  $H_0 : \mu = 2.00$  against  $H_A : \mu \neq 2.00$  at a significance level of 5%. If they discover a problem, they will stop the manufacturing process until it is corrected.

(a) Is this a one-sided or two-sided test? In the context of the problem, why do you think this is important?

Two-sided. If it is too big, then it won't fit well through veins. If it is too small, it may not function properly.

(b) Explain in this context what happens if the quality control people commit a Type I error.

They stop production to fix an error that is not there.

(c) Explain in this context what happens if the quality control people commit a Type II error.

They produce lower quality catheters and these are sold for medical use.