Application exercise 3.4: Inference for a mean - interpretations

Submit your responses on Sakai, under the appropriate assignment. Only one submission per team is required. One team will be randomly selected and their responses will be discussed.

A hospital administrator hoping to improve wait times decides to estimate the average emergency room waiting time at her hospital. She collects a simple random sample of 64 patients and determines the time (in minutes) between when they checked in to the ER until they were first seen by a doctor. A 95% confidence interval based on this sample is (128 minutes, 147 minutes), which is based on the normal model for the mean.

1. Determine whether the following statements are true or false, and explain your reasoning.
   (a) This confidence interval is not valid since we do not know if the population distribution of the ER wait times is nearly normal.
   (b) We are 95% confident that the average waiting time of these 64 emergency room patients is between 128 and 147 minutes.
   (c) We are 95% confident that the average waiting time of all patients at this hospital's emergency room is between 128 and 147 minutes.
   (d) 95% of random samples have a sample mean between 128 and 147 minutes.
   (e) A 99% confidence interval would be narrower than the 95% confidence interval since we need to be more sure of our estimate.
   (f) The margin of error is 9.5 and the sample mean is 137.5.
   (g) In order to decrease the margin of error of a 95% confidence interval to half of what it is now, we would need to double the sample size.
2. Answer the following questions based on the confidence interval provided above.
   (a) A local newspaper claims that the average waiting time at this ER exceeds 3 hours. What do you think of their claim?
   (b) The Dean of Medicine at this hospital claims the average wait time is 2.2 hours. What do you think of her claim?
   (c) Without actually calculating the interval, determine if the claim of the Dean from part (b) would be considered reasonable based on a 99% confidence interval?