

A manufacturer of vacuum cleaners has decided that an assembly line is operating satisfactorily if less than 2% of the cleaners produced per day are defective. If 2% or more of the cleaners are defective, the line must be shut down and proper adjustments made. To check every cleaner as it comes off the line would be costly and time-consuming. The manufacturer decides to choose 30 cleaners at random from a specific day's production and test for defects.

- a) Describe the population of interest to the manufacturer
- b) Identify the variable of interest
- c) Describe the sample
- d) Give an example of an inference the manufacturer might make
- e) Describe the parameter of interest
- f) Describe the statistic

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Key to Practice Problem:

- a) All vacuum cleaners produced in a given day
- b) The "condition" of a vacuum cleaner
- c) Thirty randomly selected vacuum cleaners from a day's production
- d) If our sample proportion of defective vacuum cleaners is .10, an example of an inference: "Based on a random sample of 30 vacuum cleaners, I believe the proportion of defective vacuum cleaners in the day's production is around .10." Your decision based on your inference would be to shut down the assembly line because you inferred that the proportion of defective vacuum cleaners for the day's production is at least .02. Is it possible that you would shut down the assembly line unnecessarily?
- e) The proportion of defective vacuum cleaners in the day's production
- f) The proportion of defective vacuum cleaners in the random sample of 30 vacuum cleaners