



Predicting Rain

Weather forecasters said a flash flood watch for the El Paso region will remain in place until late tonight. Today, the chance for scattered showers and thunderstorms in the morning and evening is 60 percent, which means that 60 percent of the city has a chance to see some precipitation.

Source: Daniel Borunda, "Heavy Rains Flood Areas Already Wet," *El Paso Times*, Aug. 16, 2006, pp. A1-2

1. Do you agree with the reporter's interpretation of what a 60 percent chance of precipitation means?
2. If it actually did not rain on the day of this forecast, would it be fair to say that the forecaster was wrong? Explain.
3. In order to evaluate the public's understanding of probability-of-precipitation (POP) forecasts, the National Weather Service developed a questionnaire that included the question below. Given the NWS's definition of POP as "the likelihood of occurrence, expressed as a percent, of a precipitation event at any given point in the forecast area within a clearly stated time period," how would you answer their question?

Today the meteorologist says, "chance of rain 60%." You understand this to mean:

- A. Rain will occur 60% of the day.
- B. At a specific point in the forecast area (for example, your house), there is a 60% chance of rain occurring.
- C. There is a 60% chance that rain will occur somewhere in the forecast area during the day.
- D. 60% of the forecast area will receive rain and 40% will not.

“Predicting Rain” answers

1. No. The National Weather Service Operations Manual (C-11, 8.3.1) states that a probability of precipitation forecast represents “the likelihood of occurrence, expressed as a percent, of a precipitation event at any given point in the forecast area within a clearly stated time period.” See www.nws.noaa.gov/wsom/manual/archives/NC118411.HTML.
2. No. A single instance of either precipitation or nonprecipitation does not indicate that a probability prediction is incorrect. If one were to examine the historical record for a locality and look back at all days when a 60 percent chance of precipitation was forecast, it would be hoped that, in accordance with the law of large numbers, on about 60 percent of those days there was some precipitation and on about 40 percent of those days there was no precipitation.
3. According to the National Oceanic and Atmospheric Administration (NOAA) Technical Memorandum NWS AR-44, the correct answer is B. Fewer than 9 percent of questionnaire respondents answered this question correctly. See pajk.arh.noaa.gov/info/articles/survey/intro.htm and pajk.arh.noaa.gov/info/articles/survey/poptext.htm.

The definition that a POP forecast represents “the likelihood of occurrence, expressed as a percent, of a precipitation event at any given point in the forecast area within a clearly stated time period” suggests that every listener in the forecast area should be able to assume that there is a 60 percent chance of rain occurring where he or she is and that unless the forecast says otherwise, the POP applies equally to each and every listener. Thus we have answer B. A forecast that there is a 60 percent chance that rain will occur somewhere in the forecast area does not help the individual listener who wants to know his or her chance of encountering rain. Since a listener could live anywhere in the area, a forecast needs to give a single number that applies equally to every point. ∞



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