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HDHHS will hold its Second Annual Administrative Professional Conference in conjunction with the Public Works and Engineering Department on April 26. [An informational brochure is now available on the HDHHS Intranet.](#)

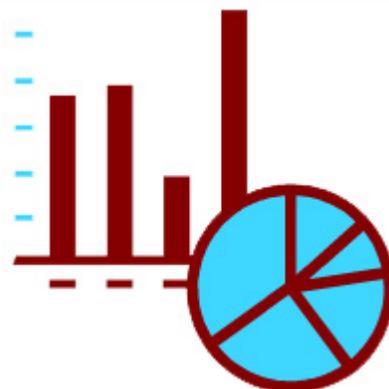
Epidemiology Corner: what 'statistically significant' means

A person who works in public health often uses statistics to prove conclusions made in studies done to understand health problems in the community. Statistics can help determine if a conclusion is due to chance or if it is real (not due to chance).

Here is a hypothetical example: many believe that children are more likely to have asthma if they live in an area with heavy air pollution. If we could demonstrate that air pollution causes asthma, then we could act to control pollution.

We would like to prove that heavy air pollution causes asthma. However, proving that air pollution causes asthma is difficult, even if we have a pathology laboratory to conduct tests. Nobody can say for sure that air pollution causes asthma. The best we can do is to observe that people who live in an area with heavy pollution seem to be more likely to have asthma.

By doing a careful study, we can directly compare people who live in an area with heavy air pollution to people who live in an area without pollution. Say our study finds that 13 percent of children who live in a certain area with heavy air pollution have asthma and only 11 percent of children who live in an area without air pollution have asthma. There is a two percent difference between the two groups. The question is: is the two percent difference *significant*?



Does it convince us that air pollution is causing asthma in children?

Statistics helps answer this. The question, in the language of statistics, is whether the two percent difference is "statistically significant"? If the two percent difference between the two groups is statistically significant, then the difference was probably not due to chance variation -- rather, the two percent difference found in the study means that air pollution really is associated with asthma.

Generally, a study is said to be statistically significant if the probability value (known as the p value) is five percent or less. This means that, if we conduct the study 100 times, then we would see a difference of two percent or more due to chance alone, only five times out of 100. Therefore, if a study has a p value of five percent, then 95 percent of the time the result is due to a real association (not due to chance).

It seems like a round about method to convince someone that air pollution causes asthma, but it is sometimes the closest thing we can find to an actual proof. In other words, it works.

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