Tools of the Trade:

COMPARING AGE-ADJUSTED RATES

We will discuss two basic methods for comparing age-adjusted rates - one for comparing an observed rate to a standard or goal to determine if the observed rate is significantly different than the standard and another for comparison between rates to determine if any significant difference exists.

When comparing an age-adjusted death rate with a standard, set goal or target value, the 95% confidence interval (see Confidence Intervals for an Age-Adjusted Rate) for the observed rate (the rate to be compared) determines the significance of difference. If the standard rate is included in the confidence interval of the rate to be compared, then there is no significant difference. For example, at first glance, Columbia County's age-adjusted suicide rate for 1994-1996 of 15.3 (based on 31 deaths) seems much higher than the corresponding state rate of 10.7. However, calculation of a 95% CI for Columbia County's rate would produce a rather wide range of 9.91 to 20.69. Since this range for Columbia County also includes 10.7 or the state rate, we can say that the county rate is not significantly different than the state rate, at the 95% confidence level.

When comparing two age-adjusted death rates (for two different or independent populations) to determine whether a significant difference exists between them, 95% confidence intervals for both rates are compared. If the intervals overlap, then there is no significant difference. An example of this would be the comparison of age-adjusted death rates for two counties. If County A's rate has a 95% confidence interval of 12.3-15.7 and the 95% confidence interval for County B is 14.5-16.3, then they overlap and there is no significant difference between the two county rates, at the 95% confidence level.

Please note that the smaller the number of events upon which the rate is based, the larger the confidence interval will be. This clearly demonstrates the wider variability (and less reliability) of rates based on smaller numbers. **As a general rule, age-adjusted rates based on less than 20 events should be considered unstable and are not recommended for comparative use or in determining significance** (see Calculating Reliable Rates).

NOTE: The instructions above and related formulas are crude and rather conservative approaches and, in some cases, may not be the most appropriate. The user may wish to utilize more precise and sophisticated calculations performed by computer software such as SPSS or SAS. Consultation with a statistician or other professional familiar with analyzing health statistics may also be a consideration before pursuing any further study.