FLHealthCHARTS

Measure of Variability

Division of Public Health Statistics and Performance Management

Bureau of Community Health Assessment

Measure of Variability Definition

Addresses this question:

Is the difference between a county's health statistic and the statewide statistic, within the range of random variation?

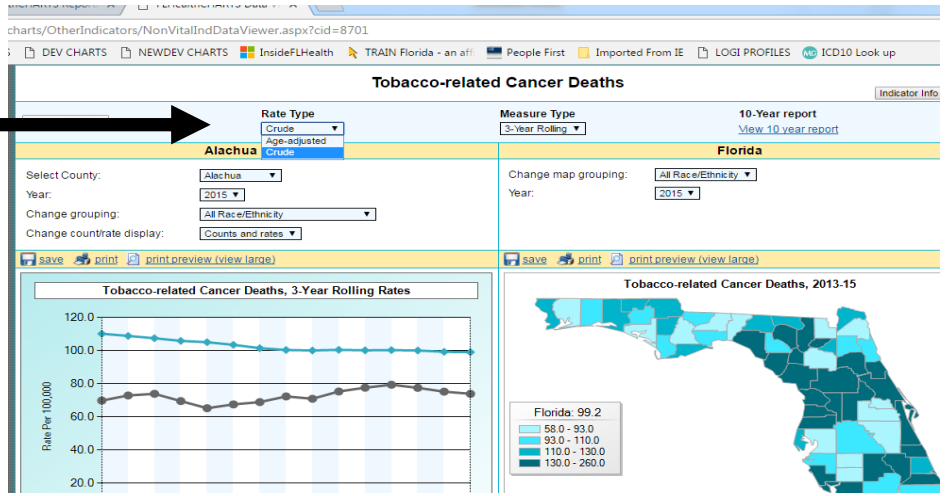
- MOV - Measure of Variability:
- Probable range of values resulting from random fluctuations in the number of events.
- Not calculated when numerator is below 5 or denominator is below 20 because the statistical formulas are not valid for very low numbers.

MOV is useful for comparing rates to a goal or standard

MOV is calculated for crude rates in FLHealthCHARTS.com

Select CRUDE rate from the Rate Type dropdown

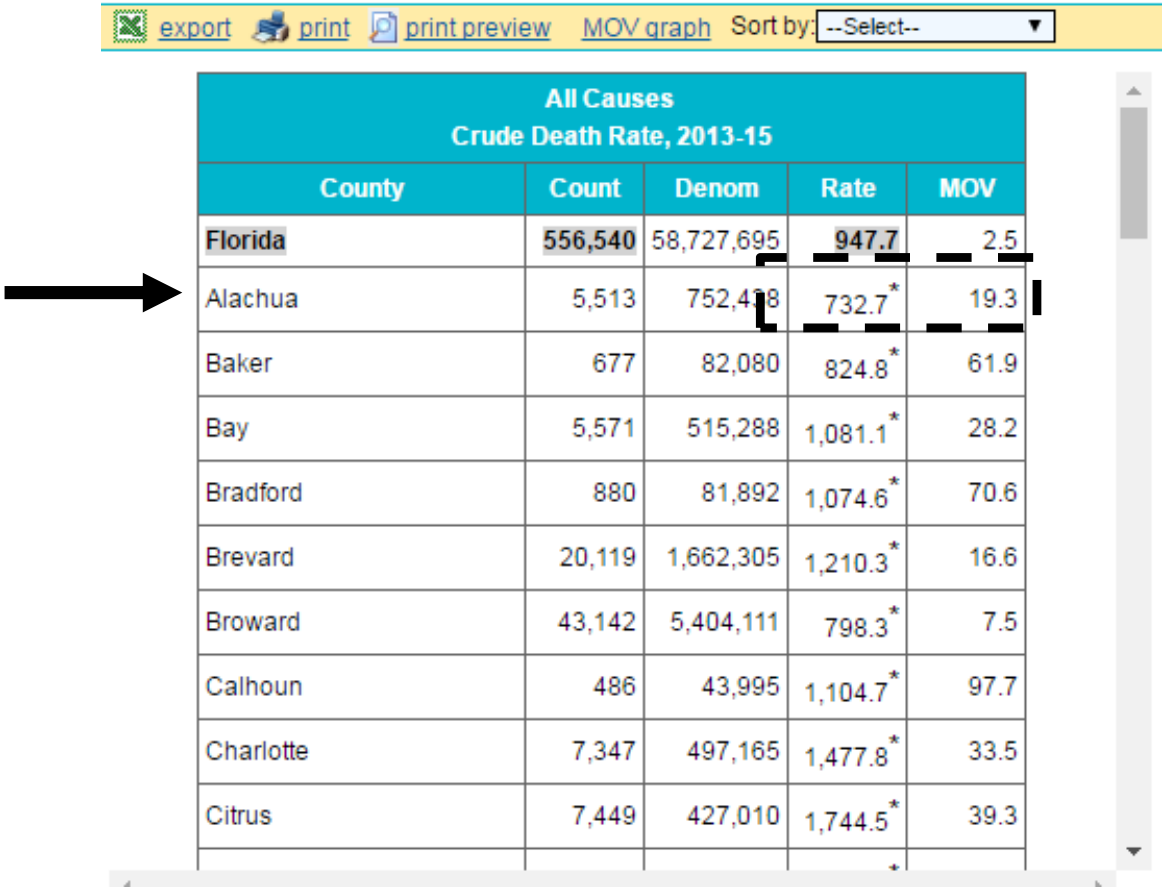
- If the absolute difference between the county rate and the statewide rate is less than the MOV, the county rate is not considered to be significantly different from the statewide rate (alpha level = 0.05).
- When the absolute difference between the county rate and the statewide rate is greater than the MOV, the county rate is significantly different from the statewide rate.



MOV in FLHealthCHARTS tables

MOV is the probable range of values resulting from random fluctuations in the number of events.

In this example, the probable crude death rate for Alachua County is 732.7 plus or minus 19.3, or 713.4 to 752.0.

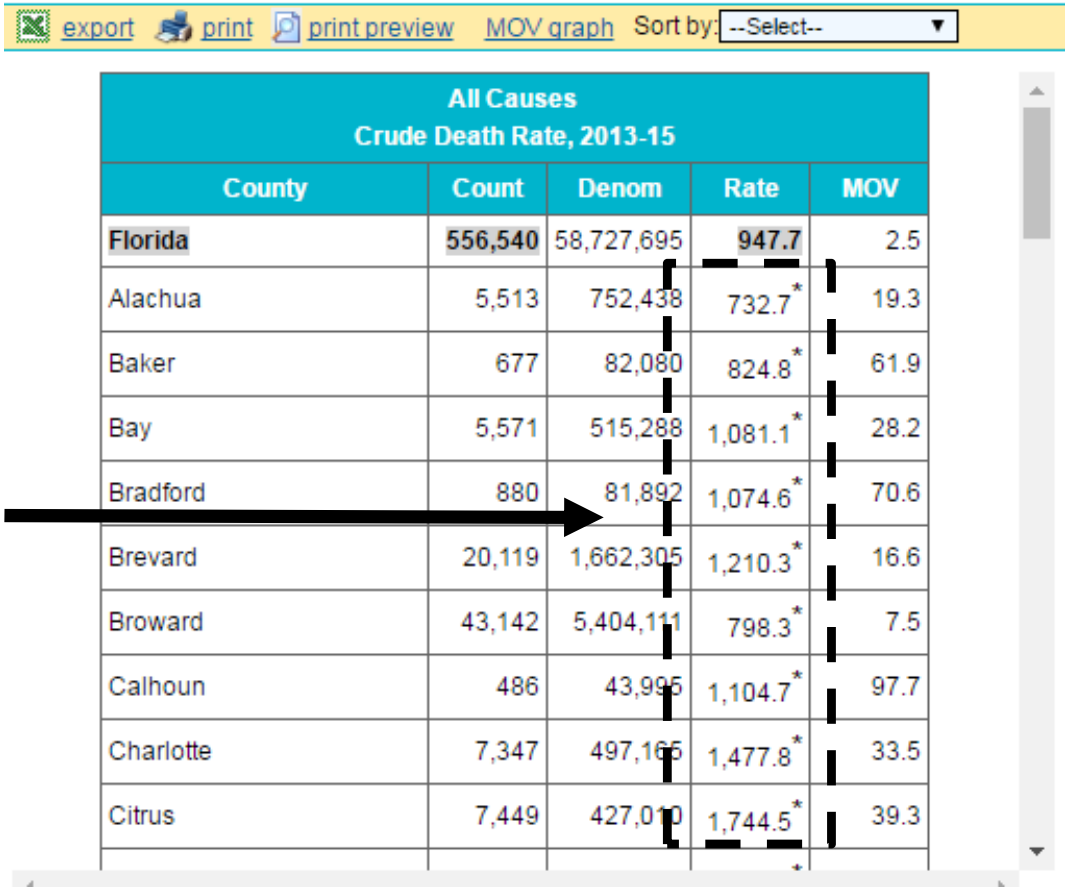


All Causes
Crude Death Rate, 2013-15

County	Count	Denom	Rate	MOV
Florida	556,540	58,727,695	947.7	2.5
Alachua	5,513	752,428	732.7*	19.3
Baker	677	82,080	824.8*	61.9
Bay	5,571	515,288	1,081.1*	28.2
Bradford	880	81,892	1,074.6*	70.6
Brevard	20,119	1,662,305	1,210.3*	16.6
Broward	43,142	5,404,111	798.3*	7.5
Calhoun	486	43,995	1,104.7*	97.7
Charlotte	7,347	497,165	1,477.8*	33.5
Citrus	7,449	427,010	1,744.5*	39.3

MOV in FLHealthCHARTS tables

An* indicates rates that are statistically significantly different from the state rate.



All Causes
Crude Death Rate, 2013-15

County	Count	Denom	Rate	MOV
Florida	556,540	58,727,695	947.7	2.5
Alachua	5,513	752,438	732.7*	19.3
Baker	677	82,080	824.8*	61.9
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Bradford	880	81,892	1,074.6*	70.6
Brevard	20,119	1,662,305	1,210.3*	16.6
Broward	43,142	5,404,111	798.3*	7.5
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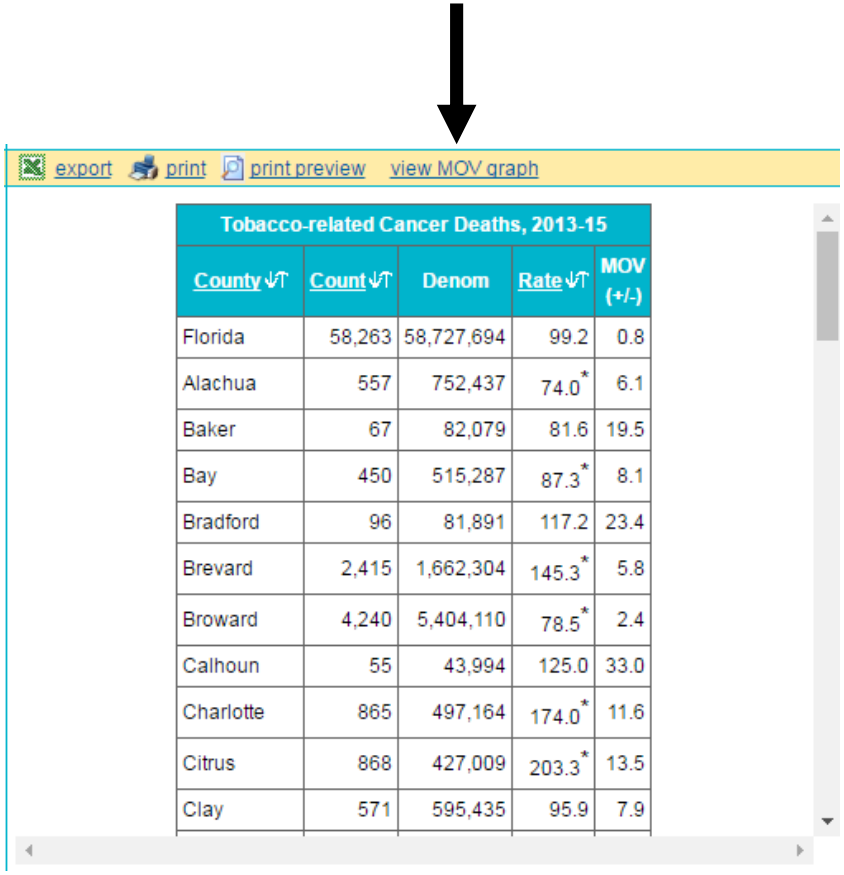
Charlotte	7,347	497,166	1,477.8*	33.5
Citrus	7,449	427,010	1,744.5*	39.3

A MOV graph is also available

Click to see the MOV graph



Tobacco-related Cancer Deaths, 2013-15				
County	Count	Denom	Rate	MOV (+/-)
Florida	58,263	58,727,694	99.2	0.8
Alachua	557	752,437	74.0*	6.1
Baker	67	82,079	81.6	19.5
Bay	450	515,287	87.3*	8.1
Bradford	96	81,891	117.2	23.4
Brevard	2,415	1,662,304	145.3*	5.8
Broward	4,240	5,404,110	78.5*	2.4
Calhoun	55	43,994	125.0	33.0
Charlotte	865	497,164	174.0*	11.6
Citrus	868	427,009	203.3*	13.5
Clay	571	595,435	95.9	7.9

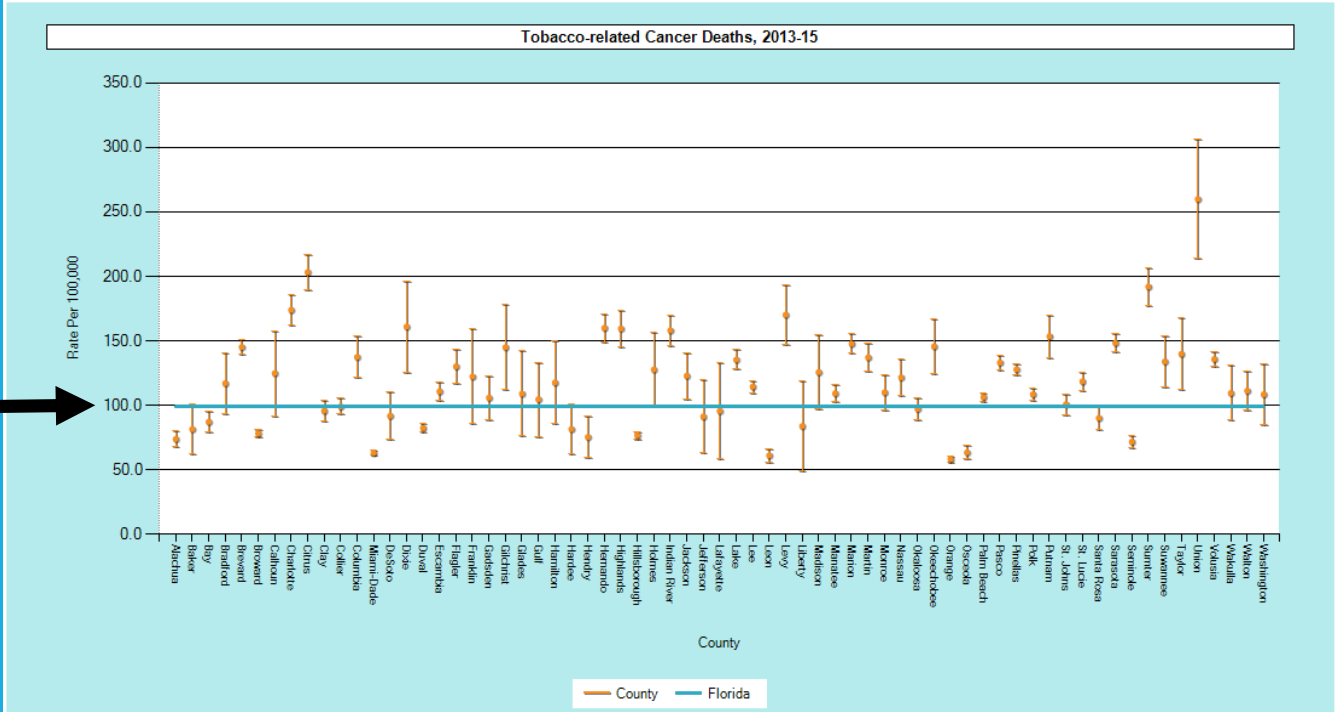
FLHealthCHARTS MOV graphs illustrate variation from the state rate

State rates are represented by a flat, blue line.

County rates are represented by dots, and the MOV is represented by the end bars.

save print

Measure of Variability (MOV) graph



Data Note(s)

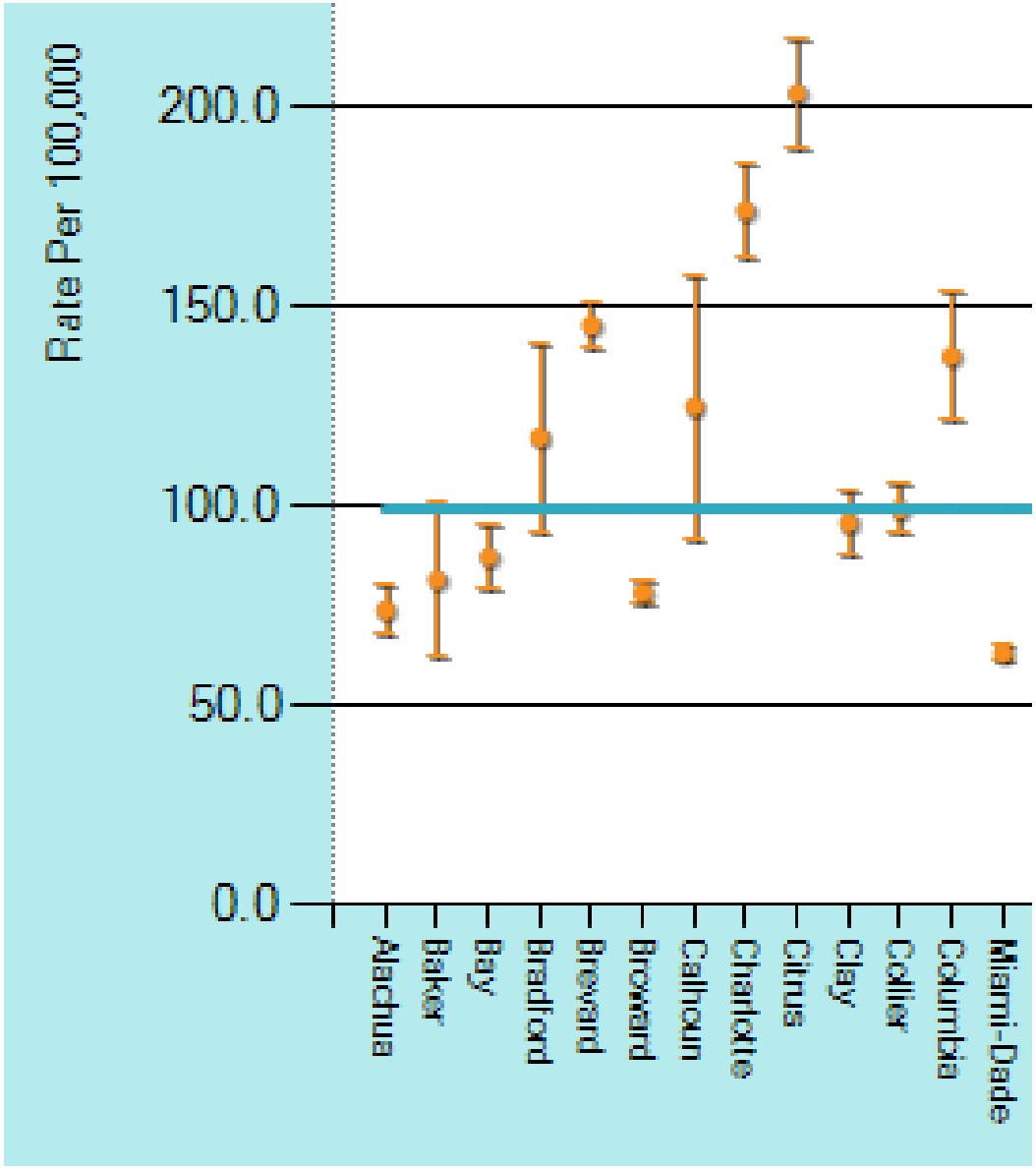
- The dots on the graph indicate the county statistic and the vertical lines indicate the county statistic plus and minus the MOV (measure of variability). The MOV is the probable range of values resulting from random fluctuations in the number of events.
- Only counties with a calculated MOV appear on the graph. The MOV is not calculated when the numerator is below 5 or the denominator is below 20 because the statistical formulas are not valid for very low numbers.
- The MOV is useful for comparing rates to a goal or standard. For example, if the absolute difference between the county rate and the statewide rate is less than the MOV, the county rate is not significantly different from the statewide rate (alpha level = 0.05). When the absolute difference between the county rate and the statewide rate is greater than the MOV, the county rate is significantly different from the statewide rate. MOV should not be used to determine if the rates of two different counties, or the county rates for two different years, are statistically significantly different.

An Example

Brevard, Charlotte, Citrus and Columbia County's rates are statistically significantly higher than the state rate because they are above the state rate and do not overlap the state rate line.

Baker, Bradford, Calhoun, Clay and Collier County's rates are NOT statistically significantly different than the state rate; they overlap the state rate line.

Alachua, Bay, Broward and Miami-Dade County's rates are statistically significantly lower than the state rate and do not overlap the state rate line.



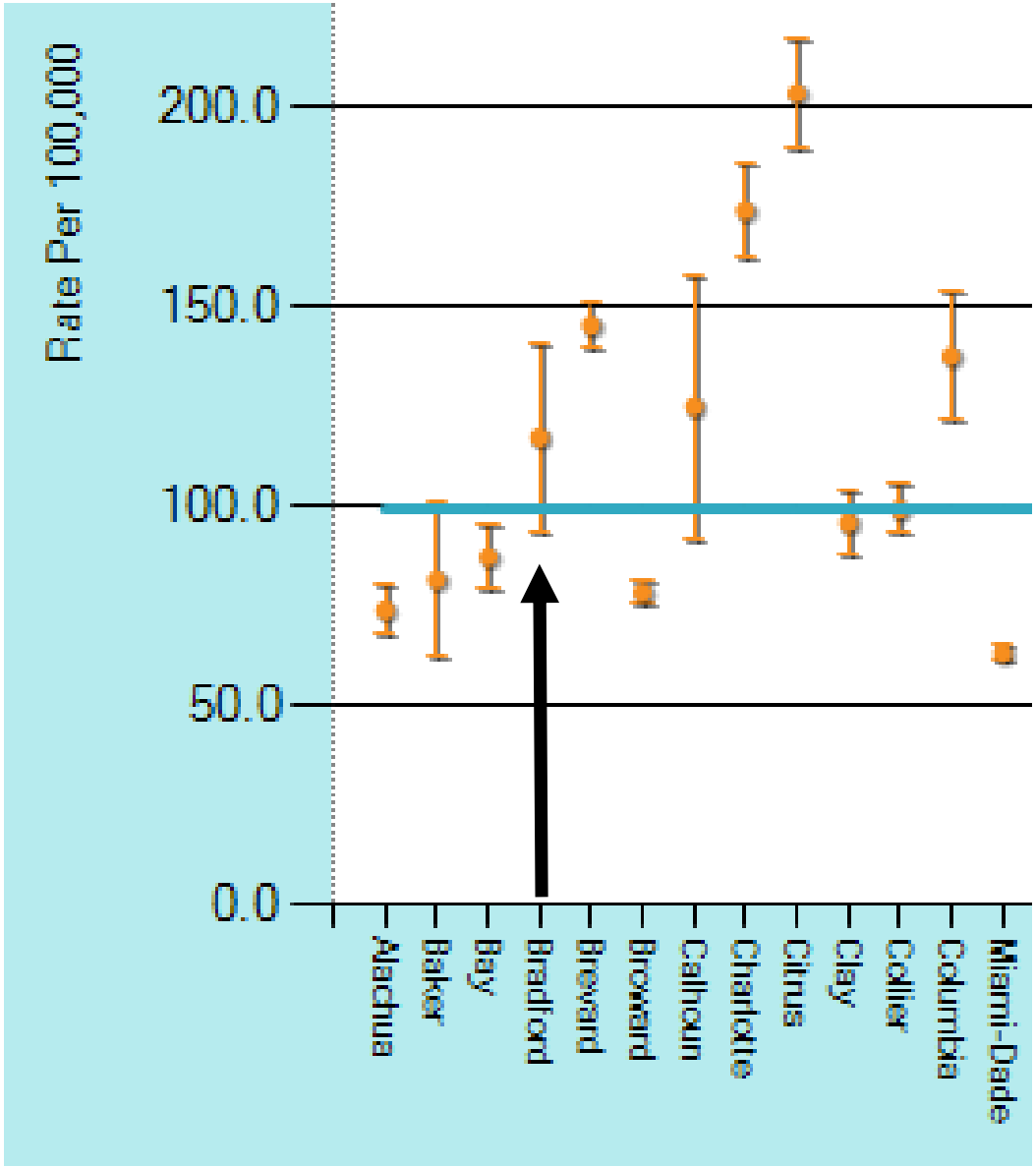
Interpretation Note

- For counties where the MOV range does not include the statewide percentage (these are indicated with * in the table), the difference between the county percentage and the statewide percentage may be due to factors other than random fluctuation.

- If this continues for more than one year it may warrant further investigation to determine what factors are associated with unusually high or low percentages/rates.

Relevance of MOV

- Without the MOV it is harder to determine whether a difference from the state rate is valid.
- For example, in this example, Bradford County's rate might seem much higher than the statewide rate.
- However, the MOV range indicates that random chance could have caused the rate to be higher than the state rate. Because the MOV range includes the state rate, we know it is not significantly higher.



Technical Note

- The MOV is calculated using the normal approximation to the binomial distribution, 2-tailed test, at the 95% confidence level.

- This method was tested and validated with simulations.

Conclusion

- The MOV provides valuable and relevant information in addition to the information provided by the rates and counts.

- Including the MOV with the rates and counts will lead to better, more informed decisions based on data.