

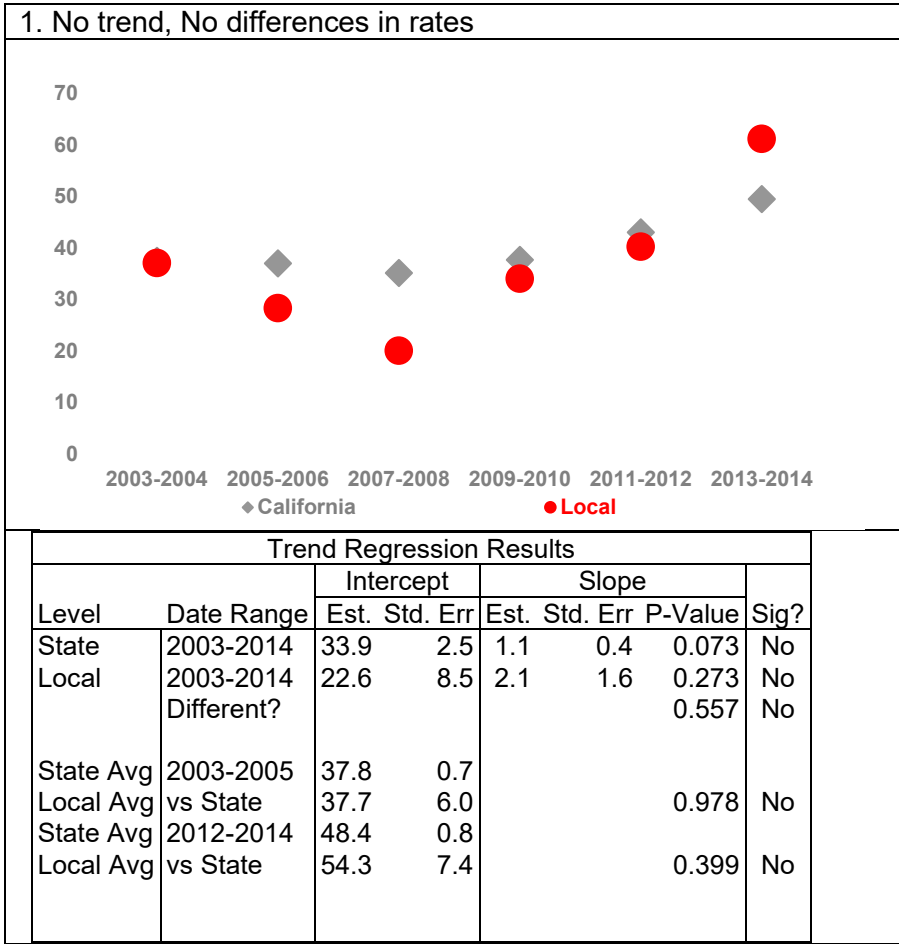
NOTE: The time frames in the sample graphs and tables are from a previous needs assessment cycle, but the instructions on interpreting the them are relevant for any time frame.

Why Trend Analysis?

- ❖ Allows us to look at rates over the time period and see if there are significant upward or downward trends on key indicators (rather than eyeballing the graphs and making an assumption)
- ❖ Useful for identifying and monitoring trends in disparities among racial/ethnic groups
- ❖ Allows for comparisons with the statewide trends on key indicators for different racial/ethnic groups
- ❖ Useful for identifying whether a problem is affecting people across groups or disproportionately impacting subgroups
- ❖ Allows local health jurisdictions to track their progress toward reaching Healthy People 2020 Goals

What do the trend charts and tables tell us?

- ❖ If there are significant upward or downward trends in rates over time in the local jurisdiction
- ❖ If there are significant upward or downward trends in rates over time in the local jurisdiction
- ❖ If the local trend and the state trend are significantly different
- ❖ If the local or state trend is curvilinear (as opposed to linear). Note: When the state or local has a curvilinear trend, it is not possible to test whether the curvilinear trend is significantly different from a linear trend or another curvilinear trend.
- ❖ Were the average rates at the beginning time period (e.g., 2003-2005) at the local level significantly different from the average rates at the state level
- ❖ Were the average rates at the end of the time period (e.g., 2012-2014) at the local level significantly different from the average rates at the state level



Look here to see if there is a significant:

- State trend (**No**)
- Local trend (**No**)
- and if they differ significantly from each other (**No**)

Look here to see if state and local average rates differed significantly in:

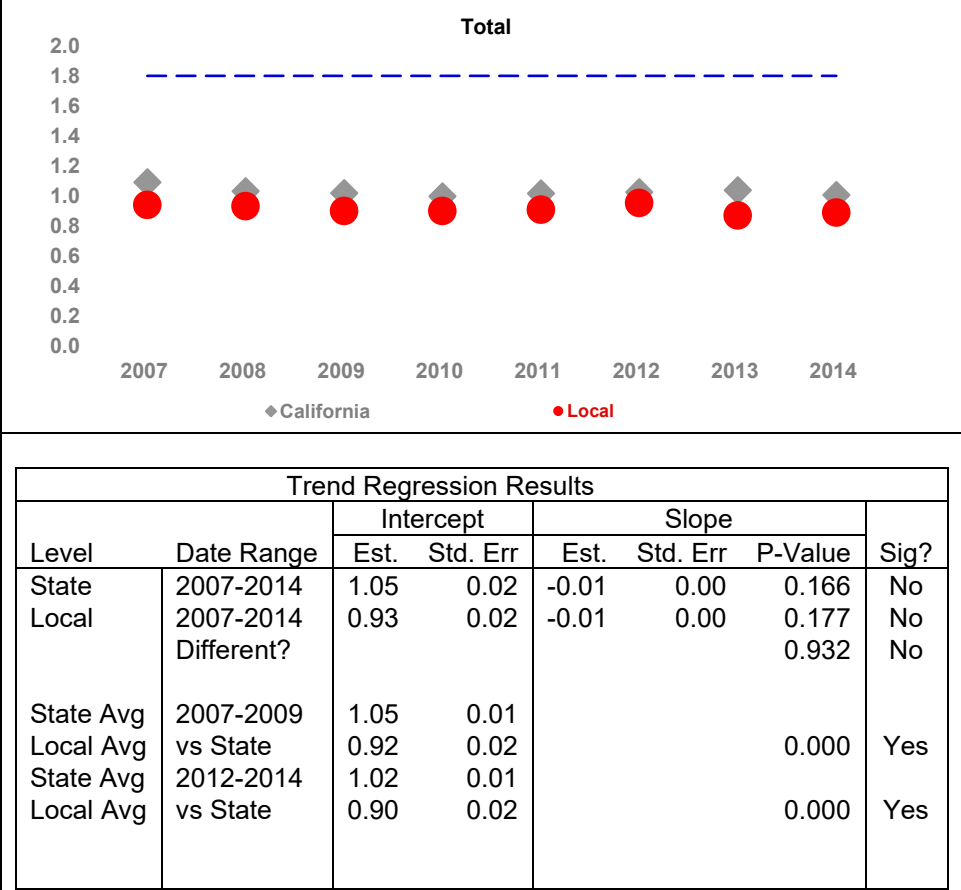
- 2003-2005 (**No**)
- 2012-2014 (**No**)

What this tells us: Neither state nor local had a statistically significant trend and Local was not different from the state. At period start and period end, the Local rate was not significantly different from State rate.

Sample explanation:

There is no significant upward or downward trend in rates for RACE/ETHNIC group in LOCAL and in the state from 2003-2014. The average rate for 2003-2005 for RACE/ETHNIC group in LOCAL was 37.7 and did not differ significantly from the average STATE rate of 37.8 for this group. For 2012-2014, the average LOCAL rate was 54.3 and did not differ significantly from the average STATE rate of 48.4.

2. No trend, Local below State at period start and end



Look here to see if there is a significant:

- State trend (**No**)
- Local trend (**No**)
- and if they differ significantly from each other (**No**)

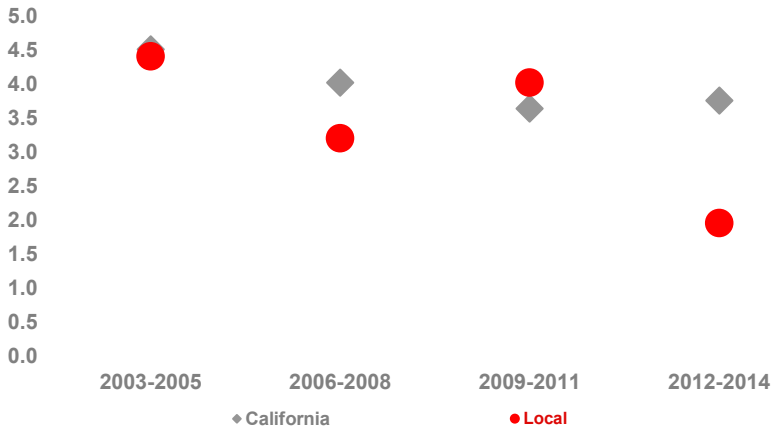
Look here to see if state and local average rates differed significantly in:

- 2007-2009 (**Yes**)
- 2012-2014 (**Yes**)

What this tells us: Neither Local nor State had statistically significant trends. And, the Local trend was not significantly different from the State trend. At period start and period end, the Local rate was lower than State rate.

Sample Explanation: There is no significant upward or downward trend in rates for RACE/ETHNIC group in LOCAL and in the state from 2007-2014. The average rate for 2007-2009 for RACE/ETHNIC group in LOCAL was 0.92 and was significantly lower than the state rate of 1.05 for this group. For 2012-2014, the average LOCAL rate of 0.90 was significantly lower than the state rate of 1.02.

3. No trend, Local same as State at start, above at end



Look here to see if there is a significant:

- State trend (**No**)
- Local trend (**No**)
- and if they differ significantly from each other (**No**)

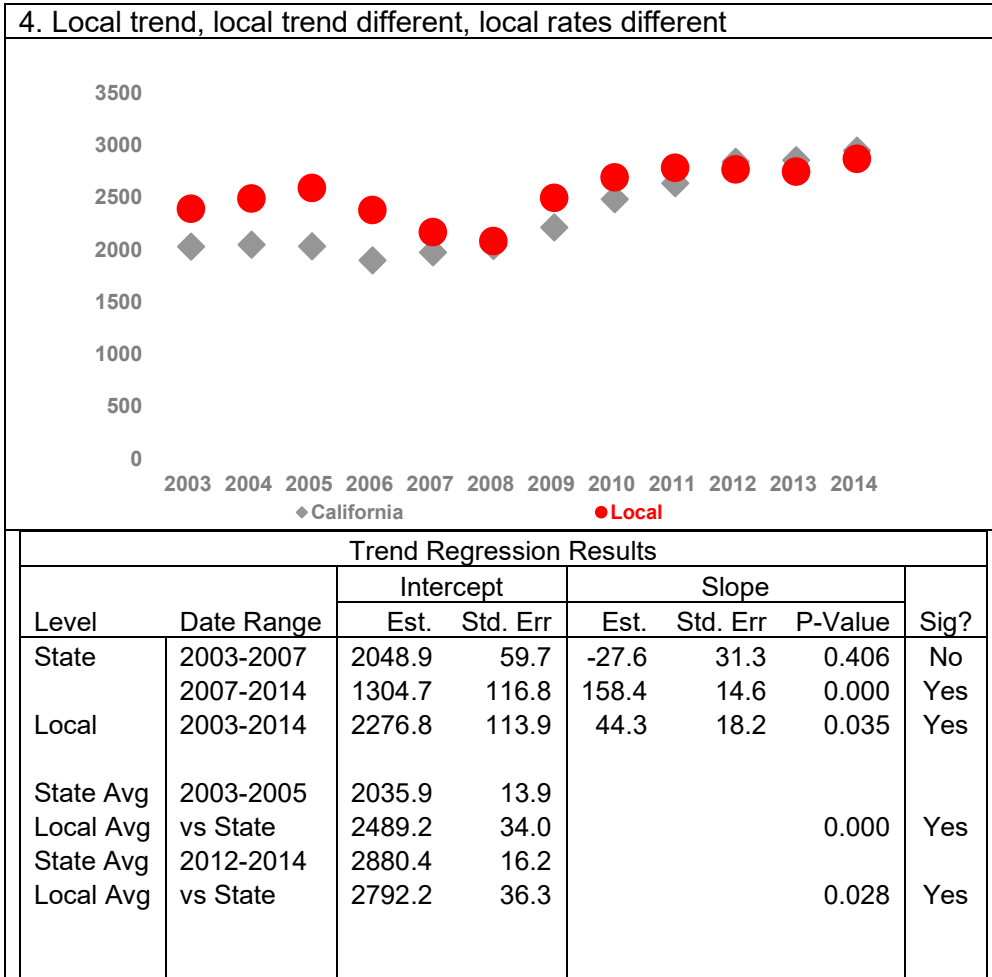
Trend Regression Results							
Level	Date Range	Intercept		Slope			Sig?
		Est.	Std. Err	Est.	Std. Err	P-Value	
State	2003-2014	4.46	0.19	-0.09	0.03	0.125	No
Local	2003-2014	4.60	0.71	-0.24	0.11	0.175	No
	Different?					0.212	No
State Avg	2003-2005	4.51	0.23				
Local Avg	vs State	4.41	0.70			0.892	No
State Avg	2012-2014	3.76	0.22				
Local Avg	vs State	1.96	0.52			0.012	Yes

Look here to see if state and local average rates differed significantly in:

- 2003-2005 (**No**)
- 2012-2014 (**Yes**)

What this tells us: Neither Local nor State had statistically significant trends. The Local trend was not significantly different from the State trend. At period start, the Local rate was not significantly different from State rate. At period end, the local rate was significantly lower than the State rate.

Sample Explanation: There is no significant upward or downward trend in rates for RACE/ETHNIC group in LOCAL and in the state from 2003-2014. The average rate for 2003-2005 for RACE/ETHNIC group in LOCAL was 4.41 and did not differ significantly from the state rate of 4.51 for this group. For 2012-2014, the average LOCAL rate of 1.96 was significantly lower than the state rate of 3.76.



Look here to see if there is a significant:

- State trend (**No**)
- Local trend (**Yes**)
- and if they differ significantly from each other (**Yes**)

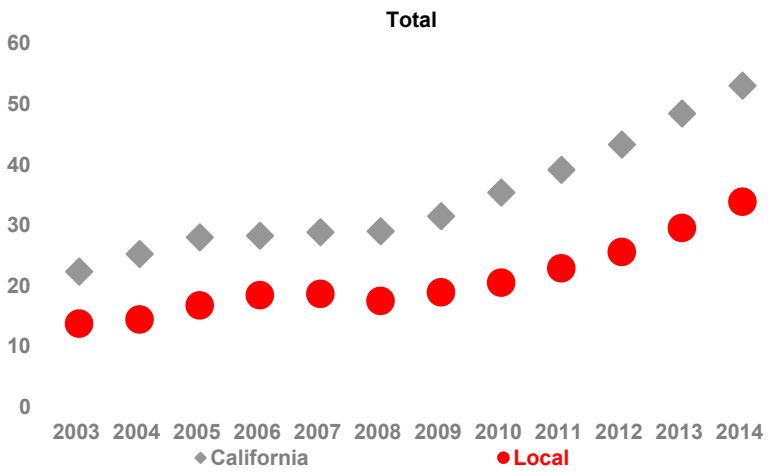
Look here to see if state and local average rates differed significantly in:

- 2003-2005 (**Yes**)
- 2012-2014 (**Yes**)

What this tells us: The State trend was only statistically significant in the second half of the period, while the Local trend had a statistically significant upward trend. The Local trend was significantly different from the State trend. At the period start and period end, the Local rate was significantly higher and lower than State rate.

Sample Explanation: There was a significant upward trend in rates for RACE/ETHNIC group in LOCAL but local rates were significantly higher than state rates which remained fairly flat from 2003-2007. The average rate for 2003-2005 for RACE/ETHNIC group in LOCAL was 2489.2 and was significantly higher than the state rate of 2035.9 for this group. For 2012-2014, the average LOCAL rate of 2792.2 was significantly lower than the state rate of 2880.4.

5. Upward trend, Local lower start and end



Trend Regression Results

Level	Date Range	Intercept		Slope			Sig?
		Est.	Std. Err	Est.	Std. Err	P-Value	
State	2003-2005	22.5	0.3	2.6	0.4	0.004	Yes
	2005-2009	26.2	1.0	0.7	0.2	0.036	Yes
	2009-2014	4.1	1.2	4.4	0.1	0.000	Yes
Local	2003-2011	14.1	0.6	1.0	0.1	0.000	Yes
	2011-2014	-10.0	9.3	4.0	0.9	0.004	Yes
State Avg	2003-2005	25.2	0.1				
Local Avg	vs State	15.0	0.2			0.000	Yes
State Avg	2012-2014	48.3	0.2				
Local Avg	vs State	29.7	0.3			0.000	Yes

Example with a Curvilinear Trend:

Look here to see if there is a significant:

- State trend (**Yes** – but note dates are broken into 3 ranges and each range has a different slope (0.4, 0.2, and 4.4) indicating there is a curvilinear trend
- Local trend (**Yes**)
- **NOTE** that there is no test to see if the state and local trends are different because you can't test to see if a curvilinear trend is statistically different



Look here to see if state and local average rates differed significantly in:

- 2003-2005 (**Yes**)
- 2012-2014 (**Yes**)

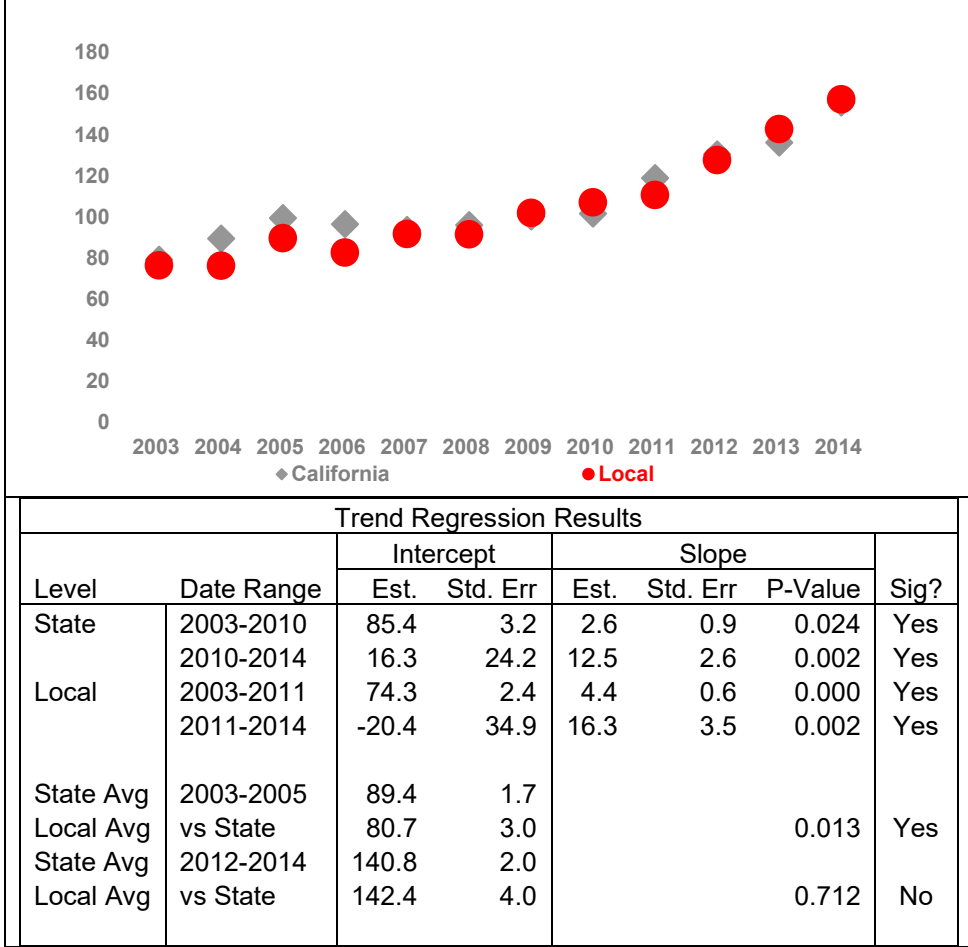


What this tells us: Both the Local and State had statistically significant trends. State and Local trends cannot be compared because the State trend was curvilinear. At period start and end, the Local rate was significantly less than the State rate.

Sample Explanation: There were significant upward trends in Local rates for RACE/ETHNIC group from 2003-2011, and then a significant downward trend from 2011-2014. The State trend was curvilinear and therefore the trends cannot be compared. The average rate for 2003-2005 for RACE/ETHNIC group at the Local level was 15.0 and was significantly lower than the State rate of 25.2 for this group. For 2012-2014, the average LOCAL rate was 29.7 and was also significantly lower than the state rate of 48.3.

6. Upward trend, Local lower start, same at end

Example with a Curvilinear Trend:



Look here to see if there is a significant:

- State trend (**Yes** – but note dates are broken into 2 ranges and each range has a different slope - indicating there is a **curvilinear trend**)
- Local trend (**Yes** and also curvilinear)
- NOTE that there is no test to see if the state and local trends are different because you can't test to see if curvilinear trends are statistically different

Look here to see if state and local average rates differed significantly in:

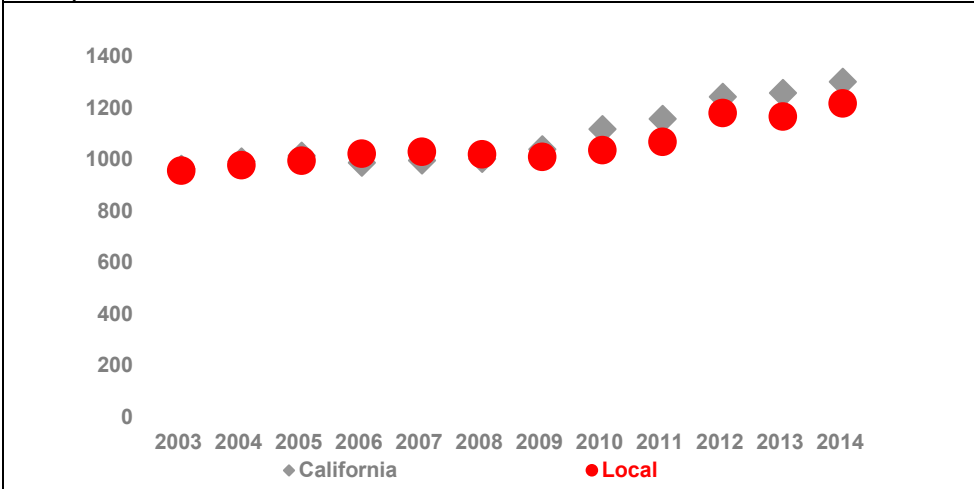
- 2003-2005 (**Yes**)
- 2012-2014 (**No**)

What this tells us: Both the Local and State had statistically significant upward trends. The trends cannot be compared because the State trend was curvilinear. At period start, the Local rate was significantly less than State rate. At period end, the Local rate was not significantly different from State rate.

Sample Explanation: There were significant upward trends in rates for RACE/ETHNIC group in both LOCAL and in the state from 2003-2005. Local had a curvilinear trend in addition to the state's curvilinear trend and therefore the trends cannot be compared. The average rate for 2003-2005 for RACE/ETHNIC group in LOCAL was 80.7 and was significantly lower than the State rate of 89.4 for this group. For 2012-2014, the average LOCAL rate was 142.8 and did not differ significantly from the state rate of 142.4.

7. Upward trend, Local same at start, lower at end

Example with a Curvilinear Trend:



Look here to see if there is a significant:

- State trend (**No** trend for 2003-2008, but **Yes** trend for 2008-2014. Note dates are broken into 2 ranges and each range has a different slope - indicating there is a **curvilinear trend**)
- Local trend (**Yes**)
- NOTE that there is no test to see if the State and Local trends are different because you can't test to see if a curvilinear trend is statistically different from a linear trend

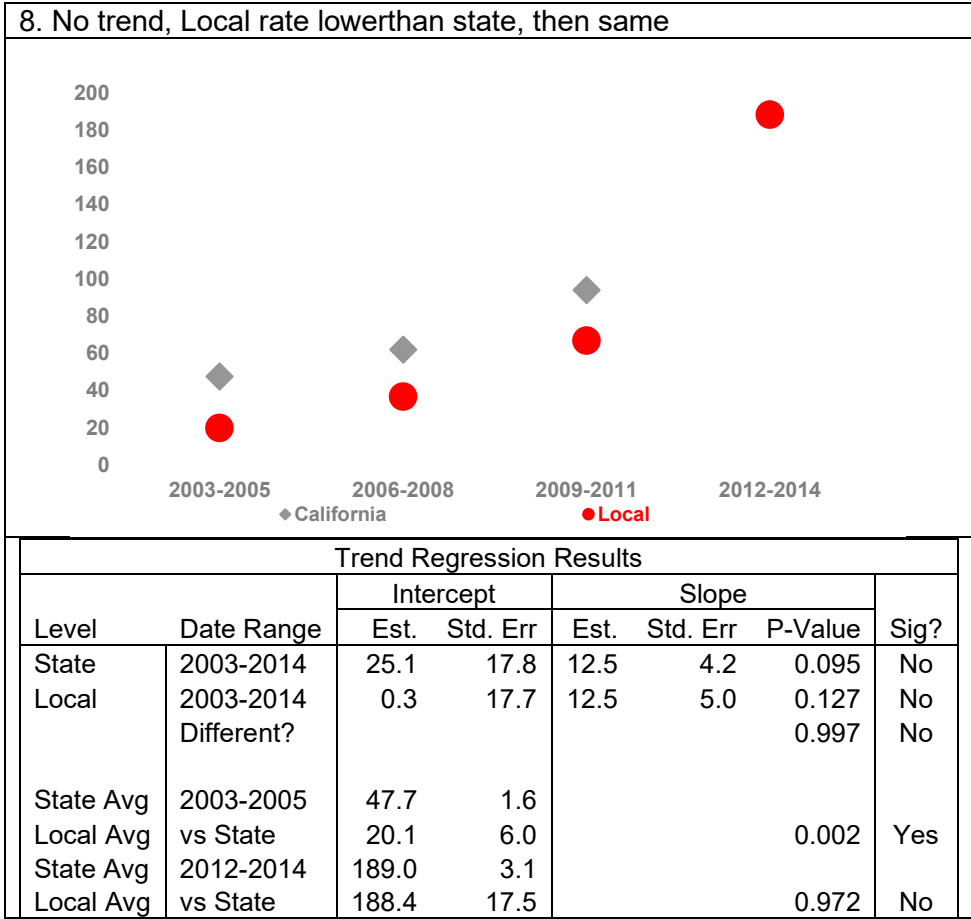
Trend Regression Results							
Level	Date Range	Intercept		Slope			Sig?
		Est.	Std. Err	Est.	Std. Err	P-Value	
State	2003-2008	980.8	13.4	4.8	5.5	0.412	No
	2008-2014	745.1	41.3	52.0	4.9	0.000	Yes
Local	2003-2010	971.3	15.0	10.1	4.3	0.050	Yes
	2010-2014	720.3	109.5	46.0	11.5	0.005	Yes
State Avg	2003-2005	990.9	3.3				
Local Avg	vs State	976.5	7.5			0.078	No
State Avg	2012-2014	1267.8	4.0				
Local Avg	vs State	1188.2	8.9			0.000	Yes

Look here to see if state and local average rates differed significantly in:

- 2003-2005 (**No**)
- 2012-2014 (**Yes**)

What this tells us: The State had one range of not statistically significant upward trend and one that was statistically significant. Local had statistically significant upward trends. Trends cannot be compared because both trends were curvilinear. At period start, the Local rate was not significantly different from State rate. At the period end, the Local rate was significantly lower than State rate.

Sample Explanation: Both Local and State had trends that were curvilinear and therefore the trends cannot be compared. The average rate for 2003-2005 for RACE/ETHNIC group in LOCAL was 976.5 and it did not differ significantly from the state rate of 990.9 for this group. For 2012-2014, the average LOCAL rate was 1188.2 and was significantly lower than the state rate of 1267.8.



Look here to see if there is a significant:

- State trend (**No**)
- Local trend (**No**)
- and if they differ significantly from each other (**No**)

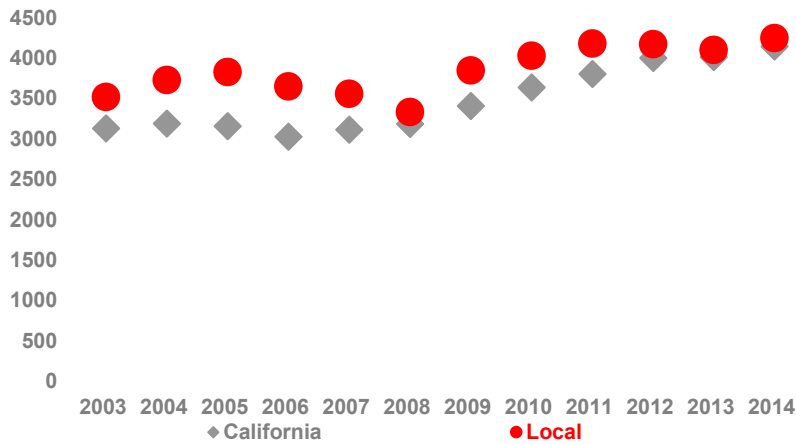
Look here to see if state and local average rates differed significantly in:

- 2003-2005 (**Yes**)
- 2012-2014 (**No**)

What this tells us: Neither state nor local had a statistically significant trend and Local was not different from state. At period start, the Local rate was significantly lower than the State rate. At period end, the Local rate was not significantly different from State rate.

Sample Explanation: There is no significant upward or downward trend in rates for RACE/ETHNIC group in LOCAL and in the state from 2003-2014. The average rate for 2003-2005 for RACE/ETHNIC group in LOCAL was 20.1 and was significantly lower than the state rate of 47.7 for this group. For 2012-2014, the average LOCAL rate of 188.4 did not differ significantly from the state rate of 189.0.

9. State curvilinear, Local trend upward, Local higher at start and end



Look here to see if there is a significant:

- State trend (**No** significant trend for 2003-2007, but **Yes trend** for 2007-2014. Note dates are broken into 2 ranges and each range has a different slope - indicating there is a **curvilinear trend**)
- Local trend (**Yes**)

Trend Regression Results

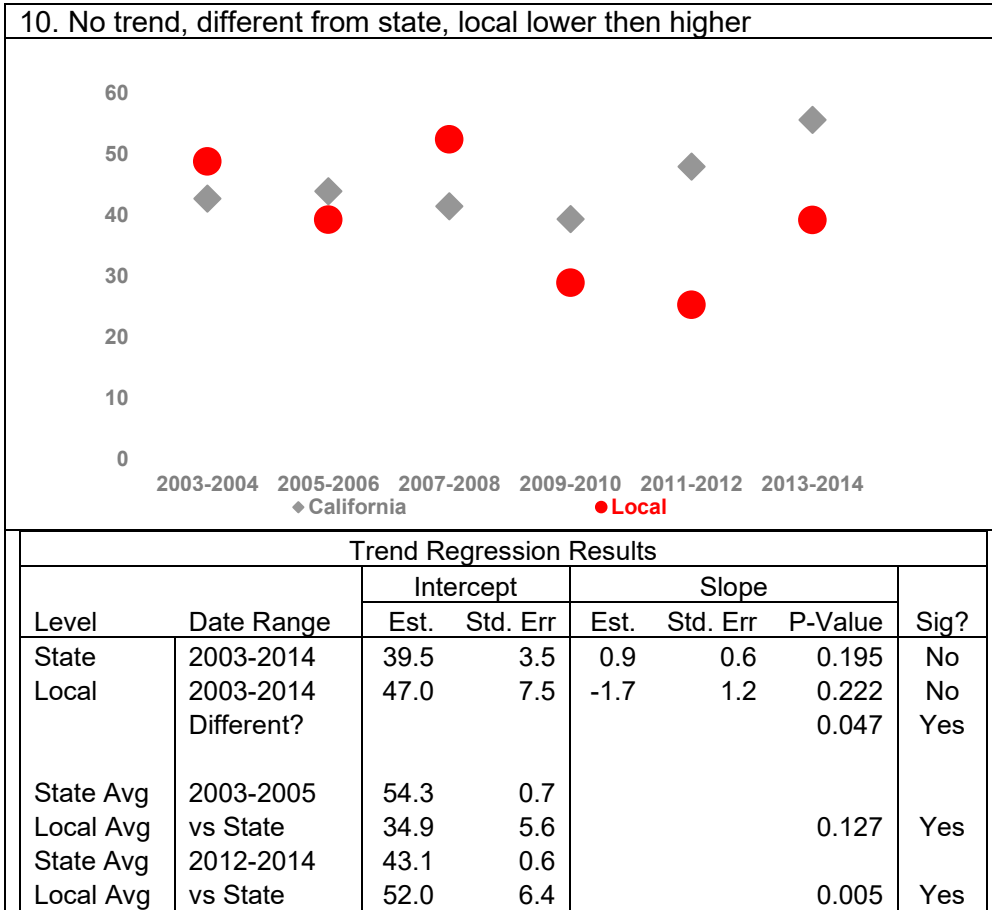
Level	Date Range	Intercept		Slope			Sig?
		Est.	Std. Err	Est.	Std. Err	P-Value	
State	2003-2007	3162.2	57.6	-18.3	30.7	0.569	No
	2007-2014	2438.1	116.6	162.7	14.5	0.000	Yes
Local	2003-2014	3494.4	108.4	62.8	17.5	0.005	Yes
State Avg	2003-2005	3160.3	14.2				
Local Avg	vs State	3690.1	33.0			0.000	Yes
State Avg	2012-2014	4052.6	16.6				
Local Avg	vs State	4173.7	36.8			0.002	Yes

Look here to see if state and local average rates differed significantly in:

- 2003-2005 (**Yes**)
- 2012-2014 (**Yes**)

What this tells us: State trend was curvilinear while Local had a statistically significant upward trend. At period start and period end, the Local rate was significantly higher than State rate.

Sample Explanation: There was a significant upward trend in rates for RACE/ETHNIC group in LOCAL but local rates were significantly higher than state rates. The average rate for 2003-2005 for RACE/ETHNIC group in LOCAL was 3,690.1 and was significantly higher than the state rate of 3,160.3 for this group. For 2012-2014, the average LOCAL rate was 4,173.7 and was significantly higher than the state rate of 4,052.6.



Look here to see if there is a significant:

- State trend (No)
- Local trend (No)
- and if they differ significantly from each other (Yes)

Look here to see if state and local average rates differed significantly in:

- 2003-2005 (Yes)
- 2012-2014 (Yes)

What this tells us: Both State and Local trends were statistically non-significant but moving in different directions. As a result, the Local trend is significantly different from State trend. At period start, Local rate was lower than State rate. At period end, Local rate was significantly higher than the state.

Sample Explanation: The LOCAL trend is significantly different from the state trend for the whole period. The average rate for 2003-2005 for RACE/ETHNIC group in LOCAL was 34.9 and was significantly lower than the state rate of 54.3 for this group. For 2012-2014, the average LOCAL rate of 52.0 was significantly lower than the state rate of 43.1.