Florida's Infant Mortality and Low Birth Weight Actual Rate Compared with Expected Rate by County and Healthy Start Coalition Areas, 2017 Update

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Introduction

The public health community uses infant mortality and birth weight statistics extensively as maternal and child health indicators because they are relevant, readily available, and reliable due to a relatively high level of completeness.

The purpose of this analysis is to identify geographic areas in the state that exhibit statistically significant differences in low birth weight (LBW) and infant mortality (IM) rates than would be expected considering the unique demographics of each county or Healthy Start Coalition (HSC) area.

IM and LBW rates in Florida vary across geographic areas. This variation is due, in part, to the unique demographic characteristics of the population in different geographic areas. In this analysis, adjustments are made to make valid comparisons among areas with different population sizes based on selected demographic characteristics. Three demographic characteristics are accounted for to calculate the expected IM and LBW: maternal race, marital status, and maternal education. These variables are used because of their known associations with the risks of LBW and IM.

Other demographic characteristics, such as young maternal age and smoking status, were not used to adjust IM and LBW estimates to avoid eliminating differences that could possibly be attributed to public health interventions. For example, counties or HSC areas with lower than expected LBW percentages may have implemented successful smoking cessation programs. If adjustments had been made for smoking status, differences between actual and expected statistics would not be apparent. In another example, births to women under the age of 20 can be influenced by teen pregnancy prevention interventions, and by the same logic, adjustments are not made for maternal age.

IM and LBW rates can also fluctuate due to random variation or chance. In this analysis, statistical methods are used to separate random from non-random variation, so rates reported as significantly higher or lower are most likely a result of non-random influences. Likewise, rates that are higher or lower than expected, but not statically significant, are most likely the result of random variation.

Methods

The data used in this analysis were extracted from the birth records for Florida residents who were born in calendar years 2016 and 2017. Infant mortality is defined as the death of a child less than one year of age (0 to 365 days). Infants born weighing less than 2,500 grams at delivery are considered LBW. This analysis uses three demographic variables to perform statistical adjustment on expected IM and LBW estimates: maternal race, marital status, and maternal education. Each demographic variable has two defined values as follows: maternal race as non-black or black; marital status as married or not married; and maternal education as high school or above, or less than high school graduation. All possible combinations of the three demographic variables form nine mutually exclusive categories. The ninth category includes birth records for which any of the three demographic variables had a missing value. The nine categories are as follows:

Category	Maternal Race	Marital Status	Maternal Education
1	Non-Black	Married	High School or More
2	Non-Black	Married	Less than High School
3	Non-Black	Not Married	High School or More
4	Non-Black	Not Married	Less than High School
5	Black	Married	High School or More
6	Black	Married	Less than High School
7	Black	Not Married	High School or More
8	Black	Not Married	Less than High School
9	Unknown	Unknown	Unknown

Calculating IM and LBW Expected Rates:
Using the classification scheme shown above, nine state-level categories-specific IM expected rates were calculated from the 2016 vital records (the latest year available at the time of this analysis for complete linked birth and infant death data). The infant death linkage indicator is not recorded on the birth record until up to one year after a birth. Therefore, 2017 linked infant birth-death records were not completed at the time of this analysis and 2016 data were instead used to calculate expected IM estimates. This adjustment technique is referred to as indirect adjustment. To obtain the 2017 expected number of infant deaths by county or Healthy Start Coalition (HSC) area, each of the nine state-level categories-specific IM rates for 2016 were multiplied by the total number of county-level or HSC area births in 2017 and then summed. To compute the 2017 expected infant mortality rates for each county or HSC area, the 2017 expected number of infant deaths was used as the numerator and the total number of births in 2017 was used as the denominator. Using the nine state-level categories-specific rates to estimate county-specific or HSC area expected IM counts and rates accounts for the unique sociodemographic composition of mothers in each county or HSC area who gave birth to an infant and mothers whose infants had died by adjusting for the influence of maternal race, marital status, and maternal education.

These methods were applied in the same way to calculate expected LBW counts. However, 2017 state-level birth counts for each category were used to calculate expected county-level or HSC area LBW percentages because birth weight is recorded at the time of delivery.

The normal approximation to the binomial distribution formula was used to test for statistically significant differences between actual and expected rates in most of the counties or HSC areas. In instances where the number of infant deaths or number of low birth weight infants was less than 30, the Poisson formula was used. The correlation between the actual to expected ratios for IM and LBW across the counties or HSC areas was assessed.

In March 2004, the recording of maternal race on the birth record was changed to allow the selection of more than one race. For this analysis, births where the only maternal race recorded was black were classified as black and all others were classified as non-black.

Results
The results of this analysis are shown in the following tables and maps for IM and LBW. In the tables, actual statistics are compared to expected statistics. The expected statistics are adjusted for the selected demographic characteristics in each county or HSC area, as described above. Counties or HSC areas with statistically significant higher than expected actual statistics are indicated in the tables with an H and those with an L indicate statistically significant lower than

expected actual statistics. The maps display the results of the statistical tests for significance. Counties or HSC areas where the actual statistics are significantly higher or lower are shaded in different colors, as indicated by the legend on the maps.

There was not a statistically significant correlation between the actual to expected LBW ratios and the actual to expected infant death ratios (Kendall's rank correlation coefficient = 0.16; p value of 0.057).

Also included in this report are summary tables for the years 2013 through 2017 that show the Hs and Ls for the counties and HSC areas for each of the past five years.

Summary

For 2017 IM rates: Actual vs. Expected

- Broward (4.88 vs. 6.60), Dade (5.09 vs. 6.01), and Palm Beach (4.45 vs. 6.42) counties (Table 1), which also each comprise their own HSC areas (Table 2), had statistically significant lower than expected IM rates. The counties and HSC areas with lower IM rates than expected are in the southeastern region of the state (Maps 1 and 2). Broward, Dade, and Palm Beach counties and their respective HSC areas presented lower IM rates than expected for all the five years studied (Tables 5 and 6).

- Bradford (17.73 vs. 6.03) and Levy counties (19.46 vs, 5.69) had statistically significant higher than expected IM rates (Table 1). Bradford and Levy counties are located within the Healthy Start of North Central Florida Coalition area, which also had a higher than expected IM rate (8.69 vs. 6.14). Duval (8.04 vs. 6.68) and Nassau (10.74 vs. 4.99) counties had statistically significant higher than expected IM rates and are located within the Northeast Florida Healthy Start Coalition area which also had a higher than expected (7.34 vs. 6.27) IM rate. Hernando County (10.95 vs. 5.67) had a higher than expected IM rate and is located within the Central Healthy Start Coalition area which also had a higher than expected IM rate (8.30 vs. 5.64). Orange County and its respective Orange County Healthy Start Coalition area (7.17 vs. 6.04) had a higher than expected IM rate. Polk County (7.77 vs. 5.98) had a higher than expected IM rate and is located within the Healthy Start Coalition of Hardee/Highlands/Polk Counties area which also had a higher than expected IM rate (8.04 vs. 5.94) (Tables 1 and 2). As can be observed on Map 1, all counties with higher than expected IM rates are generally located in the northeast, north central, and central parts of the state. Only the Healthy Start of North Central Florida area presented higher IM rates than expected in each of the last five years (Tables 5 and 6).

For 2017 low birth weight percentages: Actual vs. Expected

- Dade (8.36% vs. 8.70%), DeSoto (5.44% vs. 8.55%), Monroe (6.29% vs. 8.32%), Palm Beach (8.52% vs. 9.13%), and Sarasota (6.78% vs. 8.13%) counties, which also comprise their own respective HSC areas, each had statistically significant lower percentages of LBW than expected (Tables 3 and 4). Saint Johns (6.56% vs. 7.53%) had a statistically significant lower percentage of LBW than expected, but its associated in the Northeast Florida Healthy Start Coalition area, which had results within the expected range. The Healthy Start Coalition of Southwest Florida area (7.88% vs. 8.33%) had a lower LBW percentage than expected, but its constituent counties did not (Tables 3 and 4). These counties and Healthy Start Coalition areas with lower percentages of LBW are in the southern regions of the state (Map 4). Palm Beach

County/coalition area presented lower than expected percentages of low birth weight for five consecutive years (Tables 7 and 8).

- Alachua (10.86% vs. 9.24%), Putnam (12.34% vs. 9.31%), Suwannee (11.29% vs. 8.57%), and Union (12.95% vs. 8.29%) counties had significantly higher percentages of LBW than expected (Table 3). All four counties are included in the Healthy Start of North Central Florida area (8.69% vs. 6.14%), which had higher than expected LBW percentages as well (Table 4). Escambia (10.73% vs. 9.43%) and Hillsborough Counties/coalition areas (9.26 vs. 8.80%) had significantly higher percentages of low birth weight infants than expected. Volusia County (9.45% vs. 8.60%) and the coalition area where it is located, Healthy Start Prenatal and Infant Coalition of Flagler and Volusia Counties area (9.20% vs. 8.56%), had significantly higher percentages of LBW than expected. Holmes (11.61% vs. 7.98%) County had a statistically higher percentage of LBW than expected, but its associated HSC area, Chipola Healthy Start Coalition area, did not. Nassau (9.67% vs. 7.65%) County had statistically higher percentages of LBW than expected, but its associated HSC area, Northeast Florida Healthy Start Coalition area, did not (Tables 3 and 4). These counties are in the north and central regions of the state (Map 3). Escambia is the only county/coalition area with four years of higher percentages of LBW infants than expected (Tables 7 and 8), as well as the Healthy Start of North Central Florida, Inc. (Table 8).

Discussion

This analysis should be considered a preliminary step in the continuing endeavor to reduce IM and low birth weight in Florida. The results of this analysis can be used to focus further studies and public health efforts on areas of the state where the risks of poor infant health outcomes are significantly higher, and to further analyze factors that contribute to the lower risks seen in some areas.

One limitation of this analysis is the high variability of rates in smaller populations compared to those with larger populations. Consequently, larger differences in rates for small counties or HSC areas may not be statistically significant while the same or smaller differences may be statistically significant in larger counties or HSC areas. Actual rates that are statistically significantly higher than the expected rates are most likely not a result of random fluctuations, and may indicate a public health problem requiring further investigation and intervention. However, higher rates that are not statistically significant may warrant further investigation as well. Smaller counties or HSC areas with higher than expected rates for a period of several years may also be cause for concern.

Since adjustments were used to account for the differing demographic composition in each county or HSC area, further analysis could focus on other factors not included in this report, such as Medicaid birth rates and mother's age at birth. Unique factors in each county or HSC area contribute to IM and LBW. Local area analysis of factors associated with these outcomes should be undertaken to better understand the reasons for statistically significant lower or higher than expected rates with separate analyses performed for each area of concern. Finally, it should be noted that in this analysis, rates for each county or HSC area are compared to the statewide rates, after adjustment for maternal race, marital status, and maternal education. The issue of whether the statewide rates should be used as a baseline in these comparisons is not addressed in this analysis.

Table 1. Florida Actual Vs. Expected Infant Mortality Rates per 1,000 Live Births by County, 2017

Mother's Resident County	*2017 Births*[3]	*2017 Expected*[1] *Infant Deaths*	*2017 Actual Infant Deaths*	*2017 Expected Infant Mortality Rate Per 1000 Births*	*2017 Actual Infant Mortality Rate Per 1000 Births*	*H=Actual Rate Signif.Higher*[2] *L=Actual Rate Signif.Lower*[2] *Than Expected*
ALACHUA	2,826	17	22	6.19	7.78	
BAKER	313	2	2	5.82	6.39	
BAY	2,314	15	13	6.70	5.62	
BRADFORD	282	2	5	6.03	17.73	H
BREVARD	5,201	29	27	5.58	5.19	
BROWARD	22,321	147	109	6.60	4.88	L
CALHOUN	125	1	2	5.44	16.00	
CHARLOTTE	1,060	6	9	5.50	8.49	
CITRUS	1,108	6	7	5.38	6.32	
CLAY	2,195	12	10	5.43	4.56	
COLLIER	3,182	18	19	5.52	5.97	
COLUMBIA	797	5	8	6.01	10.04	
DADE	31,797	191	162	6.01	5.09	L
DESOTO	386	2	4	5.95	10.36	
DIXIE	139	1	2	5.74	14.39	
DUVAL	13,180	88	106	6.68	8.04	H
ESCAMBIA	3,952	25	30	6.41	7.59	
FLAGLER	810	5	7	5.77	8.64	
FRANKLIN	114	1	1	6.04	8.77	
GADSDEN	559	5	4	8.71	7.16	
GILCHRIST	187	1	0	5.29	0.00	
GLADES	61	0	0	5.89	0.00	
GULF	123	1	2	5.69	16.26	
HAMILTON	160	1	0	7.20	0.00	
HARDEE	353	2	3	5.96	8.50	
HENDRY	578	4	5	6.16	8.65	
HERNANDO	1,552	9	17	5.67	10.95	H
HIGHLANDS	886	5	9	5.95	10.16	
HILLSBOROUGH	17,415	103	114	5.94	6.55	
HOLMES	224	1	1	5.53	4.46	
INDIAN RIVER	1,276	10	9	7.77	7.05	
JACKSON	512	3	1	6.30	1.95	
JEFFERSON	142	1	1	6.94	7.04	
LAFAYETTE	71	0	0	5.74	0.00	
LAKE	3,265	18	23	5.57	7.04	
LEE	6,679	37	35	5.60	5.24	
LEON	3,131	22	21	7.04	6.71	
LEVY	411	2	8	5.69	19.46	H
LIBERTY	86	0	0	5.73	0.00	
MADISON	175	1	1	7.38	5.71	
MANATEE	3,476	21	17	5.96	4.89	
MARION	3,496	21	27	6.02	7.72	
MARTIN	1,272	8	7	6.60	5.50	
MONROE	731	4	4	5.74	5.47	
NASSAU	838	4	9	4.99	10.74	H
OKALOOSA	2,681	14	12	5.27	4.48	
OKEECHOBEE	538	3	4	5.80	7.43	
ORANGE	16,887	102	121	6.06	7.17	H
OSCEOLA	4,387	23	17	5.21	3.88	
PALM BEACH	15,043	97	67	6.42	4.45	L
PASCO	5,134	27	29	5.21	5.65	
PINELLAS	8,228	51	49	6.17	5.96	
POLK	7,846	47	61	5.98	7.77	H
PUTNAM	843	6	7	6.84	8.30	
SAINT JOHNS	2,134	11	10	4.99	4.69	
SAINT LUCIE	3,019	20	14	6.58	4.64	
SANTA ROSA	1,925	9	8	4.77	4.16	
SARASOTA	2,819	17	15	5.98	5.32	
SEMINOLE	4,772	26	32	5.39	6.71	
SUMTER	461	3	6	5.73	13.02	
SUWANNEE	425	3	5	6.03	11.76	
TAYLOR	204	1	0	5.88	0.00	
UNION	139	1	1	5.72	7.19	
VOLUSIA	4,986	30	29	5.93	5.82	
WAKULLA	315	2	0	5.38	0.00	
WALTON	775	4	3	4.93	3.87	
WASHINGTON	250	2	2	6.21	8.00	
TOTAL	223,572	1,355	1,355	6.06	6.06	

[1] The expected number of infant deaths is calculated with adjusting for the maternal race, marital status, and maternal education characteristics of the mothers

[2] The significance level used is .05. [3] Total excluded 7 births with county unknown

Table 2. Florida Actual Vs. Expected Infant Mortality Rates per 1,000 Live Births by Healthy Start Coalition Area, 2017

Healthy Start Coalition (HSC) Area	*2017 Births*[3]	*2017 Expected*[1] *Infant Deaths*	*2017 Actual Infant Deaths*	*2017 Expected Infant Death Rate Per 1000 Births*	*2017 Actual Infant Death Rate Per 1000 Births*	*H=Actual Rate Signif.Higher*[2] *L=Actual Rate Signif.Lower*[2] *Than Expected*
Multiple Counties HSC Areas						
Bay, Franklin, Gulf Healthy Start Coalition Area.	2,551	17	16	6.66	6.27	
Capital Area Healthy Start Coalition Area.	3,446	24	21	6.96	6.09	
Central Healthy Start Area.	6,386	36	53	5.64	8.30	H
Chipola Healthy Start Coalition Area.	1,197	7	6	5.85	5.01	
Healthy Start Community Coalition Area of Okaloosa and Walton Counties.	3,456	18	15	5.21	4.34	
Healthy Start of North Central Florida Area.	9,776	60	85	6.14	8.69	H
Healthy Start Coalition Area off Hardee / Highlands / Polk Counties.	9,085	54	73	5.94	8.04	H
Healthy Start Coalition Area of Jefferson / Madison / Taylor Counties.	521	3	2	5.76	3.84	
Healthy Start Coalition Area of Southwest Florida.	10,500	59	59	5.62	5.62	
Northeast Florida Healthy Start Coalition Area.	18,660	117	137	6.27	7.34	H
The Healthy Start Prenatal & Infant Coalition Area of Flagler and Volusia Counties.	5,796	35	36	6.04	6.21	
Single County HSC[4] Areas						
Broward Healthy Start Coalition Area.	22,321	147	109	6.59	4.88	L
Charlotte County Healthy Start Coalition Area.	1,060	6	9	5.66	8.49	
Florida Department of Health in Desoto County.	386	2	4	5.18	10.36	
Escambia County Healthy Start Coalition Area.	3,952	25	30	6.33	7.59	
Florida Keys Healthy Start Coalition Area.	731	4	4	5.47	5.47	
Gadsden County Healthy Start Coalition Area.	559	5	4	8.94	7.16	
Healthy Start Coalition of Miami-Dade Area.	31,797	191	162	6.01	5.09	L
Healthy Start Coalition Area of Sarasota County.	2,819	17	15	6.03	5.32	
Healthy Start Coalition Area of Hillsborough County.	17,415	103	114	5.91	6.55	
Healthy Start Coalition Area of Manatee County.	3,476	21	17	6.04	4.89	
Healthy Start Coalition Area of Palm Beach County.	15,043	97	67	6.45	4.45	L
Healthy Start Coalition Area of Pasco County.	5,134	27	29	5.26	5.65	
Healthy Start Coalition Area of Pinellas County.	8,228	51	49	6.20	5.96	
Healthy Start Coalition Area of Santa Rosa County.	1,925	9	8	4.68	4.16	
Healthy Start Coalition Area of St. Lucie County.	3,019	20	14	6.62	4.64	
Indian River County Healthy Start Coalition Area.	1,276	10	9	7.84	7.05	
Martin County Healthy Start Coalition Area.	1,272	8	7	6.29	5.50	
Okeechobee County Family Health / Healthy Start Coalition Area.	538	3	4	5.58	7.43	
Orange County Healthy Start Coalition Area.	16,887	102	121	6.04	7.17	H
Healthy Start Coalition Area of Brevard County.	5,201	29	27	5.58	5.19	
Florida Department of Health in Seminole County	4,772	26	32	5.45	6.71	
The Healthy Start Coalition Area of Osceola County.	4,387	23	17	5.24	3.88	
TOTAL	223,572	1,355	1,355	6.06	6.06	

[1] The expected number of infant deaths is calculated with adjusting for the maternal race, marital status, and education characteristics of the births in each area

[2] The significance level used is .05

[3] Total excludes 7 births with county unknown

[4] For each coalition comprised of a single county, their values are the same as in Table 1.

Table 3. Florida Actual Vs. Expected Low Birth Weight Percentages by County, 2017

Mother's Resident County	2017 Births[4]	2017 Expected[2] LBW Births	2017 Actual LBW Births	2017 Expected LBW Percent	2017 Actual LBW Percent	H=Actual Rate Signif.Higher [2] L=Actual Rate Signif.Lower [2] Than Expected
ALACHUA	2,826	261	307	9.24%	10.86%	H
BAKER	313	26	26	8.44%	8.31%	
BAY	2,314	200	186	8.65%	8.04%	
BRADFORD	282	25	29	8.93%	10.28%	
BREVARD	5,201	433	420	8.33%	8.08%	
BROWARD	22,321	2,138	2,164	9.58%	9.69%	
CALHOUN	125	10	10	8.02%	8.00%	
CHARLOTTE	1,060	86	90	8.10%	8.49%	
CITRUS	1,108	88	86	7.97%	7.76%	
CLAY	2,195	178	185	8.12%	8.43%	
COLLIER	3,182	261	241	8.20%	7.57%	
COLUMBIA	797	70	74	8.83%	9.28%	
DADE	31,797	2,766	2,657	8.70%	8.36%	L
DESOTO	386	33	21	8.55%	5.44%	L
DIXIE	139	12	12	8.30%	8.63%	
DUVAL	13,180	1,269	1,315	9.63%	9.98%	
ESCAMBIA	3,952	373	424	9.43%	10.73%	H
FLAGLER	810	67	62	8.33%	7.65%	
FRANKLIN	114	10	14	8.46%	12.28%	
GADSDEN	559	66	64	11.82%	11.45%	
GILCHRIST	187	15	14	7.79%	7.49%	
GLADES	61	5	6	8.80%	9.84%	
GULF	123	10	8	8.16%	6.50%	
HAMILTON	160	16	14	10.14%	8.75%	
HARDEE	353	29	31	8.29%	8.78%	
HENDRY	578	50	44	8.58%	7.61%	
HERNANDO	1,552	125	134	8.07%	8.63%	
HIGHLANDS	886	77	74	8.67%	8.35%	
HILLSBOROUGH	17,415	1,532	1,613	8.80%	9.26%	H
HOLMES	224	18	26	7.98%	11.61%	H
INDIAN RIVER	1,276	117	129	9.14%	10.11%	
JACKSON	512	47	45	9.24%	8.79%	
JEFFERSON	142	14	17	10.13%	11.97%	
LAFAYETTE	71	6	8	8.32%	11.27%	
LAKE	3,265	273	263	8.36%	8.06%	
LEE	6,679	559	536	8.37%	8.03%	
LEON	3,131	316	316	10.09%	10.09%	
LEVY	411	35	42	8.40%	10.22%	
LIBERTY	86	7	10	8.08%	11.63%	
MADISON	175	18	18	10.44%	10.29%	
MANATEE	3,476	294	271	8.45%	7.80%	
MARION	3,496	309	321	8.83%	9.18%	
MARTIN	1,272	105	91	8.26%	7.15%	
MONROE	731	61	46	8.32%	6.29%	L
NASSAU	838	64	81	7.65%	9.67%	H
OKALOOSA	2,681	210	221	7.84%	8.24%	
OKEECHOBEE	538	44	50	8.16%	9.29%	
ORANGE	16,887	1,512	1,495	8.95%	8.85%	
OSCEOLA	4,387	352	355	8.02%	8.09%	
PALM BEACH	15,043	1,373	1,281	9.13%	8.52%	L
PASCO	5,134	405	435	7.90%	8.47%	
PINELLAS	8,228	714	725	8.68%	8.81%	
POLK	7,846	690	669	8.79%	8.53%	
PUTNAM	843	79	104	9.41%	12.34%	H
SAINT JOHNS	2,134	161	140	7.53%	6.56%	L
SAINT LUCIE	3,019	279	259	9.24%	8.58%	
SANTA ROSA	1,925	143	143	7.43%	7.43%	
SARASOTA	2,819	229	191	8.13%	6.78%	L
SEMINOLE	4,772	391	391	8.19%	8.19%	
SUMTER	461	40	40	8.60%	8.68%	
SUWANNEE	425	36	48	8.57%	11.29%	H
TAYLOR	204	18	18	8.81%	8.82%	
UNION	139	12	18	8.29%	12.95%	H
VOLUSIA	4,986	429	471	8.60%	9.45%	H
WAKULLA	315	25	23	8.01%	7.30%	
WALTON	775	59	54	7.62%	6.97%	
WASHINGTON	250	22	21	8.64%	8.40%	
TOTAL	223,572	19,697	19,697	8.81%	8.81%	

[1] LBW = Low Birth Weight, defined as birth weight below 2500 grams. [2] The expected number of low birth weigth births is calclulated with adjusting for the maternal race, marital status and maternal education characteristics of the mother. [3] The significant level is .05. [4] Total excludes 7 births with county unknown

Table 4. Florida Actual Vs. Expected Low Birth weight Percentages by Healthy Start Coalition Area, 2017

Healthy Start Coalition (HSC) Area	*2017 Births*[4]	*2017 Expected*[2] *LBW*[1] *Births*	*2017 Actual LBW Births*	*2017 Expected LBW Percent*	*2017 Actual LBW Percent*	*H=Actual Rate Signif.Higher*[3] *L=Actual Rate Signif.Lower*[3] *Than Expected*
Multiple Counties HSC Areas						
Bay, Franklin, Gulf Healthy Start Coalition Area.	2,551	220	208	8.62	8.15	
Capital Area Healthy Start Coalition Area.	3,446	341	339	9.90	9.84	
Central Healthy Start Area.	6,386	526	523	8.24	8.19	
Chipola Healthy Start Coalition Area.	1,197	104	112	8.69	9.36	
Healthy Start Community Coalition Area of Okaloosa and Walton Counties.	3,456	269	275	7.78	7.96	
Healthy Start of North Central Florida Area.	9,776	876	991	8.96	10.14	H
Healthy Start Coalition Area off Hardee / Highlands / Polk Counties.	9,085	796	774	8.76	8.52	
Healthy Start Coalition Area of Jefferson / Madison / Taylor Counties.	521	50	53	9.60	10.17	
Healthy Start Coalition Area of Southwest Florida.	10,500	875	827	8.33	7.88	L
Northeast Florida Healthy Start Coalition Area.	18,660	1,698	1,747	9.10	9.36	
The Healthy Start Prenatal & Infant Coalition Area of Flagler and Volusia Counties.	5,796	496	533	8.56	9.20	H
Single County HSC[4] Areas						
Broward Healthy Start Coalition Area.	22,321	2,138	2,164	9.58	9.69	
Charlotte County Healthy Start Coalition Area.	1,060	86	90	8.11	8.49	
Florida Department of Health in Desoto County.	386	33	21	8.55	5.44	L
Escambia County Healthy Start Coalition Area.	3,952	373	424	9.44	10.73	H
Florida Keys Healthy Start Coalition Area.	731	61	46	8.34	6.29	L
Gadsden County Healthy Start Coalition Area.	559	66	64	11.81	11.45	
Healthy Start Coalition of Miami-Dade Area.	31,797	2,766	2,657	8.70	8.36	L
Healthy Start Coalition Area of Sarasota County.	2,819	229	191	8.12	6.78	L
Healthy Start Coalition Area of Hillsborough County.	17,415	1,532	1,613	8.80	9.26	H
Healthy Start Coalition Area of Manatee County.	3,476	294	271	8.46	7.80	
Healthy Start Coalition Area of Palm Beach County.	15,043	1,373	1,281	9.13	8.52	L
Healthy Start Coalition Area of Pasco County.	5,134	405	435	7.89	8.47	
Healthy Start Coalition Area of Pinellas County.	8,228	714	725	8.68	8.81	
Healthy Start Coalition Area of Santa Rosa County.	1,925	143	143	7.43	7.43	
Healthy Start Coalition Area of St. Lucie County.	3,019	279	259	9.24	8.58	
Indian River County Healthy Start Coalition Area.	1,276	117	129	9.17	10.11	
Martin County Healthy Start Coalition Area.	1,272	105	91	8.25	7.15	
Okeechobee County Family Health / Healthy Start Coalition Area.	538	44	50	8.18	9.29	
Orange County Healthy Start Coalition Area.	16,887	1,512	1,495	8.95	8.85	
Healthy Start Coalition Area of Brevard County.	5,201	433	420	8.33	8.08	
Florida Department of Health in Seminole County	4,772	391	391	8.19	8.19	
The Healthy Start Coalition Area of Osceola County.	4,387	352	355	8.02	8.09	
TOTAL	223,572	19,697	19,697	8.81	8.81	

[1] LBW = Low Birth Weight, defined as birth weight below 2500 grams.

[2] The expected number of low birth weight births is calculated with adjusting for the maternal race, marital status, and education characteristics of the births in each area

[3] The significance level used is .05

[4] Total excludes 20 births with county unknown

[5] For each coalition comprised of a single county, their values are the same as in Table 3.

Table 5. Florida Actual Vs. Expected Infant Mortality Statistical Significance[1] Summary by County, 2013-2017

Mother's Resident County	*2013*	*2014*	*2015*	*2016*	*2017*	*Total L*	*Total H*
ALACHUA	H	H					2
BAKER	H						1
BAY		H					1
BRADFORD	H		H		H		3
BREVARD							
BROWARD	L	L	L	L	L	5	
CALHOUN							
CHARLOTTE	L					1	
CITRUS							
CLAY							
COLLIER							
COLUMBIA							
DADE	L	L	L	L	L	5	
DESOTO							
DIXIE							
DUVAL	H	H		H	H		4
ESCAMBIA							
FLAGLER							
FRANKLIN							
GADSDEN							
GILCHRIST							
GLADES							
GULF							
HAMILTON							
HARDEE							
HENDRY							
HERNANDO					H		
HIGHLANDS							
HILLSBOROUGH	H	H	H	H			4
HOLMES							
INDIAN RIVER							
JACKSON							
JEFFERSON	H						1
LAFAYETTE				H			1
LAKE		H	H				2
LEE							
LEON							
LEVY					H		
LIBERTY							
MADISON							
MANATEE							
MARION		H		H	H		3
MARTIN							
MONROE							
NASSAU					H		
OKALOOSA	H						1
OKEECHOBEE							
ORANGE	H	L			H	1	2
OSCEOLA							
PALM BEACH	L	L	L	L	L	5	
PASCO	H						1
PINELLAS							
POLK			H				1
PUTNAM		H			H		1
SAINT JOHNS							
SAINT LUCIE							
SANTA ROSA							
SARASOTA							
SEMINOLE							
SUMTER		H					1
SUWANNEE							
TAYLOR							
UNION							
VOLUSIA			H				1
WAKULLA							
WALTON							
WASHINGTON							

[1] H indicates the actual infant death rate was statistically significantly higher than the expected infant death rate for the county
L indicates the actual infant death rate was statistically significantly lower than the expected infant death rate for the county after adjusting for maternal race, marital status and maternal education characteristics in each county.
The significance level used is .05

Table 6. Florida Actual Vs. Expected Infant Mortality Statistical Significance[1] Summary by Healthy Start Coalition Area, 2013-2017

Healthy Start Coalition (HSC) Area	*2013*	*2014*	*2015*	*2016*	*2017*	*Total L*	*Total H*
Multiple Counties HSC Areas							
Bay, Franklin, Gulf Healthy Start Coalition Area.		H					1
Capital Area Healthy Start Coalition Area.							
Central Healthy Start Area.		H	H		H		3
Chipola Healthy Start Coalition Area.							
Healthy Start Community Coalition Area of Okaloosa and Walton Counties.	H						1
Healthy Start of North Central Florida Area.	H	H	H	H	H		5
Healthy Start Coalition Area off Hardee / Highlands / Polk Counties.					H		1
Healthy Start Coalition Area of Jefferson / Madison / Taylor Counties.							
Healthy Start Coalition Area of Southwest Florida.							
Northeast Florida Healthy Start Coalition Area.	H	H			H		3
The Healthy Start Prenatal & Infant Coalition Area of Flagler and Volusia Counties.			H				1
Single County HSC[2] Areas							
Broward Healthy Start Coalition Area.	L	L	L	L	L	5	
Charlotte County Healthy Start Coalition Area.	L					1	
Florida Department of Health in Desoto County.							
Escambia County Healthy Start Coalition Area.							
Florida Keys Healthy Start Coalition Area.							
Gadsden County Healthy Start Coalition Area.							
Healthy Start Coalition of Miami-Dade Area.	L	L	L	L	L	5	
Healthy Start Coalition Area of Sarasota County.							
Healthy Start Coalition Area of Hillsborough County.	H	H	H	H			4
Healthy Start Coalition Area of Manatee County.							
Healthy Start Coalition Area of Palm Beach County.	L	L	L	L	L	5	
Healthy Start Coalition Area of Pasco County.	H						1
Healthy Start Coalition Area of Pinellas County.							
Healthy Start Coalition Area of Santa Rosa County.							
Healthy Start Coalition Area of St. Lucie County.							
Indian River County Healthy Start Coalition Area.							
Martin County Healthy Start Coalition Area.							
Okeechobee County Family Health / Healthy Start Coalition Area.							
Orange County Healthy Start Coalition Area.	H	L			H	1	2
Healthy Start Coalition Area of Brevard County.							
Florida Department of Health in Seminole County							
The Healthy Start Coalition Area of Osceola County.							
TOTAL							

[1] H indicates the actual infant death rate was statistically significantly higher than the expected infant death rate for the county
L indicates the actual infant death rate was statistically significantly lower than the expected infant death rate for the county
after adjusting for maternal race, marital status and maternal education characteristics in each county.
The significance level used is .05. [2] For each coalition comprised of a single county, their values are the same as in table 5

Table 7. Florida Actual Vs. Expected Low Birth Weight Statistical Significance[1] Summary by County, 2013-2017

Mother's Resident County	*2013*	*2014*	*2015*	*2016*	*2017*	*Total L*	*Total H*
ALACHUA			H	H	H		3
BAKER	H						1
BAY							
BRADFORD	H		H				2
BREVARD	L					1	
BROWARD							
CALHOUN							
CHARLOTTE							
CITRUS			H				1
CLAY							
COLLIER		L	L	L		3	
COLUMBIA				H			1
DADE					L		
DESOTO					L	1	
DIXIE		L	H	H		1	2
DUVAL			H	H			2
ESCAMBIA		H	H	H	H		4
FLAGLER							
FRANKLIN							
GADSDEN		H					1
GILCHRIST			H				1
GLADES							
GULF							
HAMILTON							
HARDEE							
HENDRY		L				1	
HERNANDO	H			H			2
HIGHLANDS	L					1	
HILLSBOROUGH	H		H		H		3
HOLMES					H		1
INDIAN RIVER	L	L	L			3	
JACKSON							
JEFFERSON			L			1	
LAFAYETTE							
LAKE			H				1
LEE	H		L			1	1
LEON			L			1	
LEVY			H			1	1
LIBERTY							
MADISON	H						1
MANATEE	L	L	L	L		4	
MARION							
MARTIN		L	L			2	
MONROE		L	L	L	L	4	
NASSAU			H		H		2
OKALOOSA							
OKEECHOBEE							
ORANGE							
OSCEOLA		H					1
PALM BEACH	L	L	L	L	L	5	
PASCO		H					1
PINELLAS			L			1	
POLK			L	L		2	
PUTNAM		H			H		2
SAINT JOHNS				L	L	2	
SAINT LUCIE		L	L			2	
SANTA ROSA		H					1
SARASOTA	L	L				2	
SEMINOLE		L			L	2	
SUMTER		H					1
SUWANNEE	H				H		2
TAYLOR							
UNION					H		1
VOLUSIA			H		H		2
WAKULLA			H	L		1	1
WALTON							
WASHINGTON							

[1] H indicates the actual low birth weight % was statistically significantly higher than the expected low birth weight % for the county
L indicates the actual low birth weight % was statistically significantly lower than the expected low birth weight % for the county after adjusting for maternal race, marital status and maternal education characteristics in each county.
The significance level used is .05

Table 8. Florida Actual Vs. Expected Low Birth Weight Statistical Significance[1] Summary by Healthy Start Coalition Area, 2013-2017

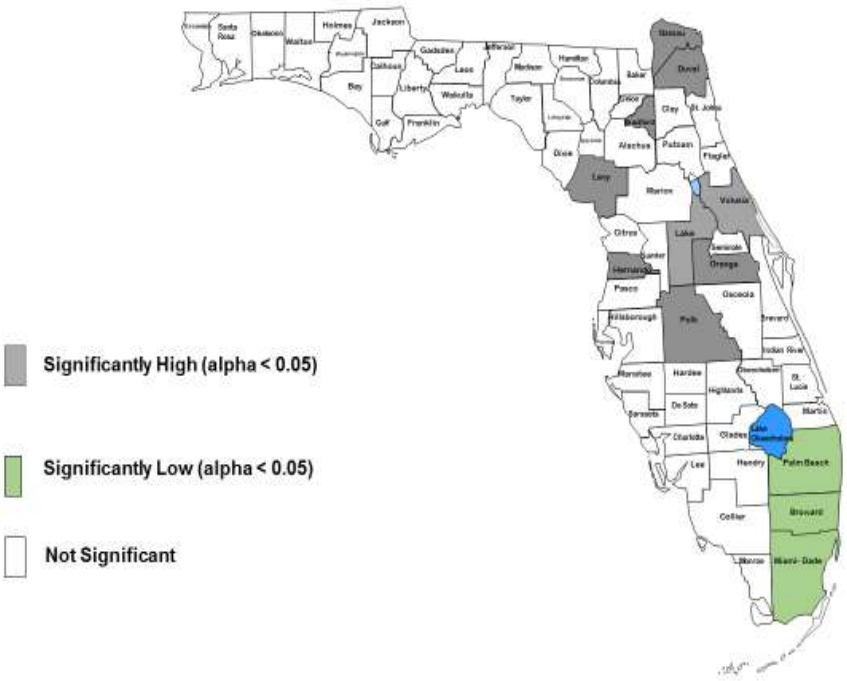
Healthy Start Coalition (HSC) Area	*2013*	*2014*	*2015*	*2016*	*2017*	*Total L*	*Total H*
Multiple Counties HSC Areas							
Bay, Franklin, Gulf Healthy Start Coalition Area.							
Capital Area Healthy Start Coalition Area.				L		1	
Central Healthy Start Area.		H	H	H			3
Chipola Healthy Start Coalition Area.							
Healthy Start Community Coalition Area of Okaloosa and Walton Counties.							
Healthy Start of North Central Florida Area.		H	H	H	H		4
Healthy Start Coalition Area off Hardee / Highlands / Polk Counties.			L	L		2	
Healthy Start Coalition Area of Jefferson / Madison / Taylor Counties.	H						1
Healthy Start Coalition Area of Southwest Florida.		L	L		L	3	
Northeast Florida Healthy Start Coalition Area.			H				1
The Healthy Start Prenatal & Infant Coalition Area of Flagler and Volusia Counties.					H		1
Single County HSC[2] Areas							
Broward Healthy Start Coalition Area.							
Charlotte County Healthy Start Coalition Area.							
Florida Department of Health in Desoto County.					L	1	
Escambia County Healthy Start Coalition Area.		H	H	H	H		4
Florida Keys Healthy Start Coalition Area.		L	L	L	L	4	
Gadsden County Healthy Start Coalition Area.		H	H				2
Healthy Start Coalition of Miami-Dade Area.					L	1	
Healthy Start Coalition Area of Sarasota County.	L	L			L	3	
Healthy Start Coalition Area of Hillsborough County.	H		H		H		3
Healthy Start Coalition Area of Manatee County.	L	L	L	L		4	
Healthy Start Coalition Area of Palm Beach County.	L	L	L	L	L	5	
Healthy Start Coalition Area of Pasco County.		H					1
Healthy Start Coalition Area of Pinellas County.			L			1	
Healthy Start Coalition Area of Santa Rosa County.		H					1
Healthy Start Coalition Area of St. Lucie County.		L	L			2	
Indian River County Healthy Start Coalition Area.	L	L	L			3	
Martin County Healthy Start Coalition Area.		L	L			2	
Okeechobee County Family Health / Healthy Start Coalition Area.							
Orange County Healthy Start Coalition Area.							
Healthy Start Coalition Area of Brevard County.	L					1	
Florida Department of Health in Seminole County		L				1	
The Healthy Start Coalition Area of Osceola County.		H					1
TOTAL							

[1] H indicates the actual low birth weight % was statistically significantly higher than the expected low birth weight % for the county

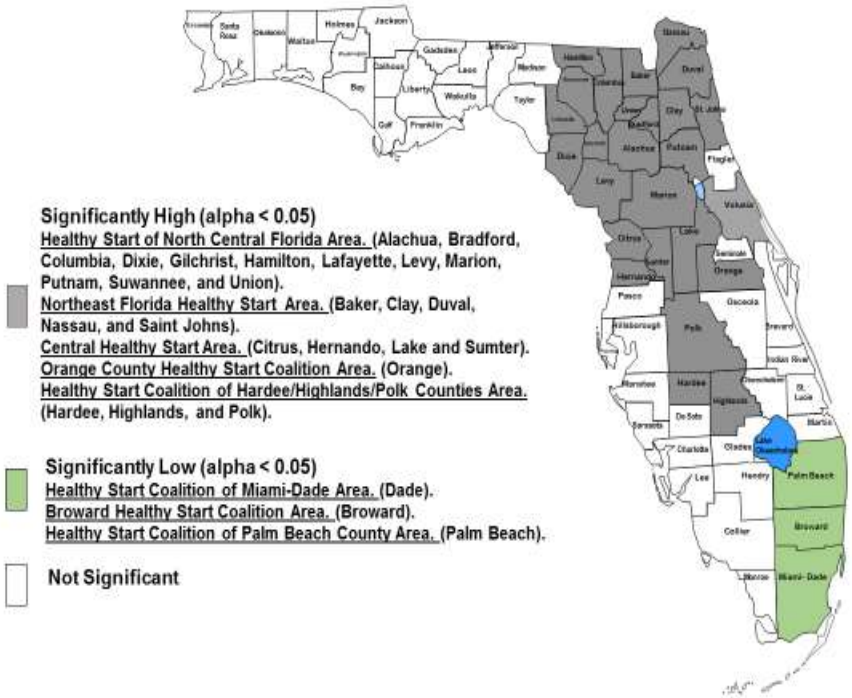
L indicates the actual low birth weight % was statistically significantly lower than the expected low birth weight % for the county after adjusting for maternal race, marital status and maternal education characteristics in each county.

The significance level used is .05. [2] For each coalition comprised of a single county, their values are the same as in table 5

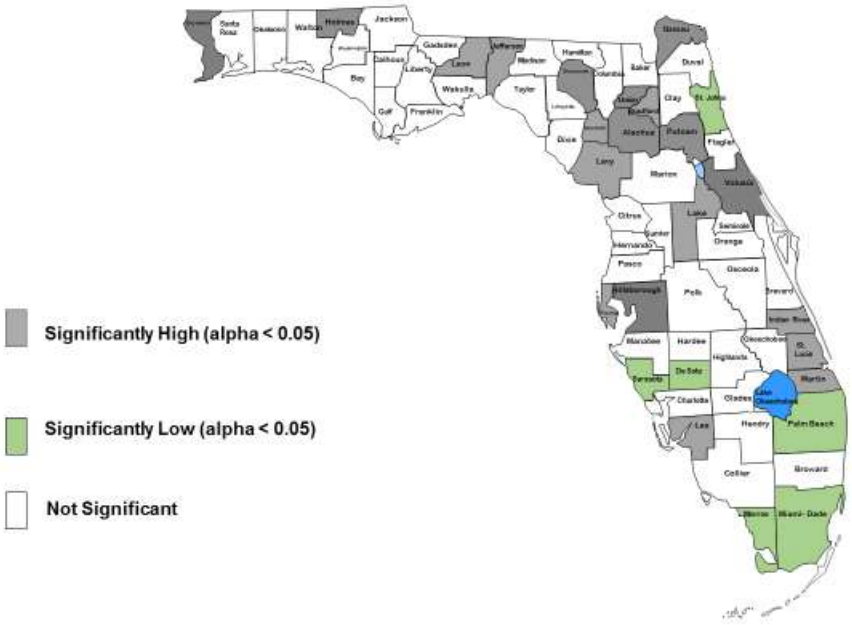
Map 1. Actual Vs. Expected Infant Mortality Rates per 1,000 Live Births by Counties, Florida 2017



Map 2. Actual Vs. Expected Infant Mortality Rates per 1,000 Live Births By Healthy Start Coalition Area, Florida 2017



Map 3. Actual Vs. Expected Low Birth Weight Percentages by Counties, Florida 2017

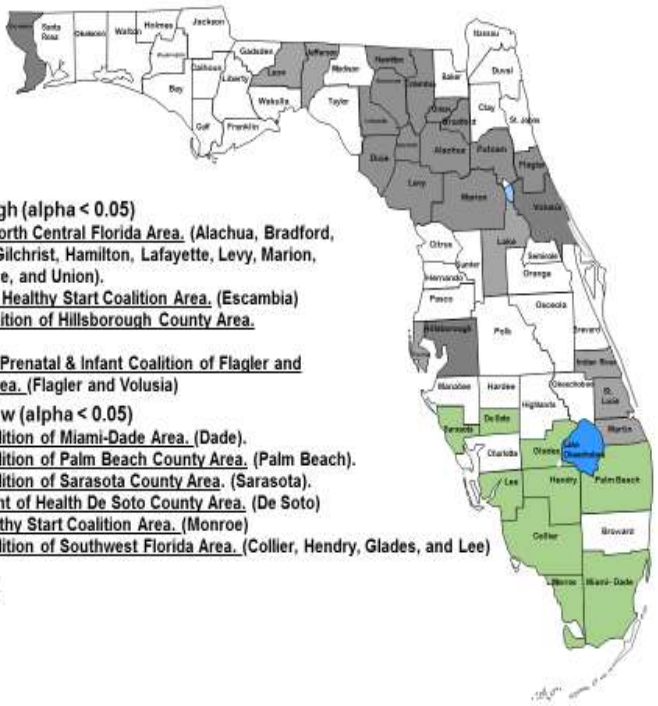


Significantly High (alpha < 0.05)

Significantly Low (alpha < 0.05)

Not Significant

Map 4. Actual Vs. Expected Low Birth Weight Percentages by Healthy Start Coalition Area, Florida 2017



Significantly High (alpha < 0.05)

Healthy Start of North Central Florida Area. (Alachua, Bradford, Columbia, Dixie, Gilchrist, Hamilton, Lafayette, Levy, Marion, Putnam, Suwannee, and Union).

Escambia County Healthy Start Coalition Area. (Escambia)

Healthy Start Coalition of Hillsborough County Area. (Hillsborough)

The Healthy Start Prenatal & Infant Coalition of Flagler and Volusia County Area. (Flagler and Volusia)

Significantly Low (alpha < 0.05)

Healthy Start Coalition of Miami-Dade Area. (Dade).

Healthy Start Coalition of Palm Beach County Area. (Palm Beach).

Healthy Start Coalition of Sarasota County Area. (Sarasota).

Florida Department of Health De Soto County Area. (De Soto)

Florida Keys Healthy Start Coalition Area. (Monroe)

Healthy Start Coalition of Southwest Florida Area. (Collier, Hendry, Glades, and Lee)

Not Significant