**INFANT MORTALITY AND LOW BIRTH WEIGHT RATES COMPARED TO
EXPECTED RATES BY HEALTHY START COALITION AREA 2002**

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Introduction

Infant mortality and birth weight statistics are used extensively in public health. These statistics are especially useful because of their relevance as maternal and child health indicators and because of their ease of availability. These data are also virtually 100 percent complete since they are recorded for every birth and death that occurs in the state.

The purpose of this analysis is to identify geographic areas in the state where low birth weight (LBW) rates and infant mortality (IM) rates are statistically significantly higher than would be expected considering the unique demographics of each area. These areas should then be the focus of further, more detailed analyses to determine the reasons for the high rates and to develop intervention strategies for improving the outcomes.

IM and LBW rates vary in relation to the demographic characteristics and the variation in rates across the Healthy Start Coalition areas is due in part to the unique demographic characteristics of the county populations. In this analysis, adjustments are made to account for the differences in demographic characteristics. The adjusted statistics can then be compared across areas independently of the demographic differences.

Three demographic variables are used in calculating the adjusted and expected statistics. These are maternal race, marital status, and education. These variables are used because they are known to be associated with risk of LBW and IM, and because public health interventions are not designed to influence these characteristics in the prenatal or infancy period. In an analysis of Florida resident births in 2001, linked to infant deaths, risk of infant death was found to be 133% higher for maternal race black, 89% higher for unmarried maternal marital status, and 41% higher for maternal education less than high school. In the same analysis, risk of LBW was found to be 82% higher for maternal race black, 44% higher for unmarried maternal marital status, and 22% higher for maternal education less than high school. These results were all statistically significant at the .05 alpha level. Maternal characteristics such as maternal age and smoking status are not used in the adjustment because there are public health efforts directed at changing these factors and adjusting for them would eliminate differences due to these factors. For example, if a county has an actual LBW percentage significantly lower than the expected LBW percentage, the difference could be due to the extraordinary success of a smoking cessation program in the county. If adjustments were made for smoking status, this difference would not be apparent. Maternal age can be influenced by reducing teen births, and by the same logic, adjustments are not made for maternal age.

IM and LBW rates also reflect random variation. In this analysis, statistical methods are used to separate the random variation from the non-random variation, so rates that are significantly high are most likely a result of non-random influences. Likewise, rates that are higher than expected,

but not significantly high, are likely to be the result of random variation and are said to be within the range of normal variation.

Methods

The data used in this analysis were extracted from the birth records for residents of Florida born in calendar year 2002. Births were classified as LBW if the birth weight on the birth record was in the range of 1 to 2499 grams. Three demographic variables were used in this analysis: mother's race, marital status, and education. These are recorded on the birth record, and for the purposes of this analysis, two categories were used for each variable. Mother's race was classified as black or non-black, marital status was classified as married or not married, and mother's education was classified as 12th grade or higher completed or less than 12th grade completed. The three variables were then used to classify the births into eight mutually exclusive categories. Birth records with unknown values for any of the three variables were placed in a ninth category. There were roughly 1500 birth records in the ninth category (less than one percent of the resident births). The nine categories are as follows:

Mother's Category	Mother's Race	Mother's Marital Status	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

* This includes records with unknown values in any of the three categories.

Using this classification, the category-specific rates were calculated from the statewide totals, and these rates were used with the births in each Healthy Start Coalition area to calculate the expected LBW births and infant deaths. In this way, the expected statistics are adjusted for the three demographic characteristics and then used to calculate the adjusted rates. The term for this adjustment technique is 'indirect adjustment'.

For example, if an area existed where all the births were in category 1, then the expected statistics for the area would be the same as the statewide statistics for category 1. Another area might have had births that were all in category 8. For this area, the expected statistics would be the same as the statewide statistics for category 8. These two hypothetical areas would have different expected statistics because they have populations with different demographic characteristics. If both areas had actual rates equal to the expected rates, they would be considered equal regarding the rates. Stated differently, both areas are doing equally well at preventing IM and LBW, considering their different demographic characteristics.

Results

The results of this analysis are shown in the following tables where actual statistics are compared to expected statistics. The expected statistics are adjusted for the demographic characteristics in each area, as described above.

There is a statistically significant correlation between areas with high LBW percentages and areas with high infant death rates. This means areas with high LBW percentages tend to have high infant death rates and areas with low LBW percentages tend to have low infant death rates. The correlation coefficient based on the ranks of the p values across coalition areas is 0.439 with an associated p value of 0.011.

Discussion

This analysis should be considered a preliminary step in the continuing endeavor to reduce risk of low birth weight and infant death in Florida. The rationale is to use the results of this analysis to focus further analysis and efforts on the areas where the risks are significantly high. Since adjustments were used to account for the differing demographic composition in each area, further analysis would focus on other factors such as smoking rates and mother's age at birth. The process becomes much more complicated at this point, and a separate analysis should be done for each area of concern.

	1	2	3	4	5	6	7

2002 FLORIDA ACTUAL INFANT DEATH RATES PER 1000 BIRTHS
COMPARED TO EXPECTED [1] RATES PER 1000 BIRTHS

Healthy Start Coalition	2002 Births	2002 Expected [1] Infant Deaths	2002 Actual Infant Deaths	2002 Expected Infant Death Rate Per 1000 Births	2002 Actual Infant Death Rate Per 1000 Births	H=Actual Rate Signif.Higher [2] L=Actual Rate Signif.Lower [2] Than Expected Rate
Bay, Franklin,Gulf	2,218	25.4	25	11.43	11.27	
Broward HSC	22,133	182.9	133	8.26	6.01	L
Capital Area HSC	3,203	25.5	38	7.95	11.86	H
Central HSC	5,162	34.2	43	6.63	8.33	
Charlotte HS	994	6.1	8	6.11	8.05	
Chipola	1,168	9.5	5	8.16	4.28	
Desoto HS	450	3.3	2	7.38	4.44	
Escambia HSC	3,869	30.5	37	7.88	9.56	
Florida Keys HSC	732	4.7	3	6.46	4.10	
Gadsden	698	7.7	10	11.06	14.33	
Miami-Dade HSC	32,131	240.1	192	7.47	5.98	L
Okaloosa/Walton	2,966	20.3	26	6.84	8.77	
North Central HS	8,949	65.8	92	7.36	10.28	H
Sarasota HSC	2,844	17.6	16	6.18	5.63	
Hardee/Highlands/Pc	8,156	60.3	74	7.39	9.07	H
Hillsborough HSC	15,088	117.3	133	7.78	8.81	
Jefferson/Madison/Ta	613	5.3	12	8.63	19.58	H
Manatee HSC	3,387	23.5	20	6.95	5.90	
Palm Beach HSC	13,886	118.2	119	8.51	8.57	
Pasco HSC	3,859	25.5	25	6.62	6.48	
Pinellas HSC	8,940	60.8	56	6.80	6.26	
Santa Rosa HSC	1,549	8.8	9	5.68	5.81	
Southwest HSC	9,725	67.1	59	6.90	6.07	
Saint Lucie HSC	2,289	17.7	18	7.74	7.86	
Indian River HSC	1,056	7.3	6	6.90	5.68	
Martin HSC	1,199	7.7	12	6.45	10.01	
Northeast HSC	16,355	130.4	144	7.97	8.80	
Okeechobee HSC	546	3.7	3	6.77	5.49	
Orange HSC	14,144	106.1	104	7.50	7.35	
Brevard HSC	4,807	32.6	43	6.78	8.95	H
Seminole HSC	4,526	28.6	27	6.32	5.97	
Flagler/Volusia HSC	5,043	35.0	31	6.94	6.15	
Osceola HSC	2,895	18.5	23	6.39	7.94	
TOTAL	205,580	1,548	1,548	7.53	7.53	

[1] The expected number of infant deaths is calculated based on the maternal
  race, marital status and education characteristics of the births in each county

[2] The significance level used is .05

	1	2	3	4	5	6	7

2002 FLORIDA ACTUAL LOW BIRTH WEIGHT PERCENTAGES [1]
COMPARED TO EXPECTED [2] PERCENTAGES

Healthy Start Coalition	2002 Births	2002 Expected [1] LBW Births	2002 Actual LBW Births	2002 Expected LBW Percent	2002 Actual LBW Percent	H=Actual Rate Signif.Higher [3] / L=Actual Rate Signif.Lower [3] Than Expected Rate
Bay, Franklin,Gulf	2,218	192.5	172	8.68	7.75	
Broward HSC	22,133	1975.2	1,951	8.92	8.81	
Capital Area HSC	3,203	289.6	306	9.04	9.55	
Central HSC	5,162	407.8	405	7.90	7.85	
Charlotte HS	994	75.2	78	7.56	7.85	
Chipola	1,168	97.4	120	8.34	10.27	H
Desoto HS	450	37.5	29	8.32	6.44	
Escambia HSC	3,869	344.9	378	8.91	9.77	H
Florida Keys HSC	732	55.7	44	7.60	6.01	
Gadsden	698	78.0	80	11.18	11.46	
Miami-Dade HSC	32,131	2768.0	2,591	8.61	8.06	L
Okaloosa/Walton	2,966	232.0	208	7.82	7.01	
North Central HS	8,949	760.0	798	8.49	8.92	
Sarasota HSC	2,844	217.8	193	7.66	6.79	L
Hardee/Highlands/Polk	8,156	687.8	675	8.43	8.28	
Hillsborough HSC	15,088	1269.2	1,275	8.41	8.45	
Jefferson/Madison/Taylor	613	57.8	63	9.43	10.28	
Manatee HSC	3,387	276.0	266	8.15	7.85	
Palm Beach HSC	13,886	1202.6	1,170	8.66	8.43	
Pasco HSC	3,859	290.5	313	7.53	8.11	
Pinellas HSC	8,940	723.1	718	8.09	8.03	
Santa Rosa HSC	1,549	113.0	118	7.30	7.62	
Southwest HSC	9,725	781.5	768	8.04	7.90	
Saint Lucie HSC	2,289	200.7	197	8.77	8.61	
Indian River HSC	1,056	85.9	71	8.14	6.72	L
Martin HSC	1,199	93.2	106	7.77	8.84	
Northeast HSC	16,355	1417.3	1,487	8.67	9.09	H
Okeechobee HSC	546	43.6	45	7.98	8.24	
Orange HSC	14,144	1214.3	1,379	8.59	9.75	H
Brevard HSC	4,807	383.4	399	7.98	8.30	
Seminole HSC	4,526	350.7	329	7.75	7.27	
Flagler/Volusia HSC	5,043	405.7	383	8.04	7.59	
Osceola HSC	2,895	222.3	235	7.68	8.12	
TOTAL	205,580	17,350	17,350	8.44	8.44	

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

[2] The expected LBW percentage is calculated based on the maternal race, marital status and education characteristics of the births in each county

[3] The significance level used is .05