INFANT MORTALITY AND LOW BIRTH WEIGHT RATES COMPARED TO EXPECTED RATES BY HEALTHY START COALITION AREA
2001

By: Daniel Thompson, M.P.H.*, Melanie Simmons, M.S.*, Carol Graham, Ph.D.*

October 24, 2002

*Florida State University Center for Prevention and Early Intervention Policy
Consultant to Florida Department of Health

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.

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 2001. Births were classified as LBW if the birth weight on the birth record was in the range 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, or 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

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 0.581 with an associated p value of 0.00003.

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.

2001 FLORIDA ACTUAL INFANT DEATH RATES PER 1000 BIRTHS
COMPARED TO EXPECTED[1] RATES PER 1000 BIRTHS

1	2	3	4	5	6	7
Healthy Start Coalition	2001 Births	2001 Expected[1] Infant Deaths	2001 Actual Infant Deaths	2001 Expected Infant Death Rate Per 1000 Births	2001 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	2,108	13.8	18	6.56	8.54	
Broward HSC	22,384	174.5	147	7.80	6.57	L
Capital Area HSC	3,232	25.5	31	7.89	9.59	
Central HSC	5,010	32.7	33	6.53	6.59	
Charlotte HS	1,038	6.1	8	5.92	7.71	
Chipola	1,188	8.4	14	7.03	11.78	H
Desoto HS	448	3.4	4	7.63	8.93	
Escambia HSC	3,916	30.4	58	7.77	14.81	H
Florida Keys HSC	709	4.3	3	6.05	4.23	
Gadsden	703	7.4	9	10.47	12.80	
Miami-Dade HSC	32,425	249.9	189	7.71	5.83	L
Okaloosa/Walton	2,847	18.2	23	6.38	8.08	
North Central HS	8,976	66.2	71	7.37	7.91	
Sarasota HSC	2,787	17.3	10	6.22	3.59	L
Hardee/Highlands/Polk	8,239	61.6	64	7.47	7.77	
Hillsborough HSC	14,866	106.5	125	7.17	8.41	H
Jefferson/Madison/Taylor HSC	649	5.5	7	8.54	10.79	
Manatee HSC	3,194	22.6	29	7.07	9.08	
Palm Beach HSC	13,745	102.2	89	7.44	6.48	
Pasco HSC	3,871	23.0	24	5.93	6.20	
Pinellas HSC	9,425	64.1	81	6.80	8.59	H
Santa Rosa HSC	1,537	8.7	7	5.63	4.55	
Southwest HSC	9,590	66.3	56	6.91	5.84	
Saint Lucie HSC	2,228	17.4	9	7.80	4.04	L
Indian River HSC	1,124	7.7	4	6.84	3.56	
Martin HSC	1,219	8.1	12	6.65	9.84	
Northeast HSC	16,462	123.0	166	7.47	10.08	H
Okeechobee HSC	552	3.9	2	7.01	3.62	
Orange HSC	14,242	106.5	105	7.48	7.37	
Brevard HSC	4,789	31.0	24	6.48	5.01	
Seminole HSC	4,510	27.9	26	6.19	5.76	
Flagler/Volusia HSC	5,083	34.0	32	6.68	6.30	
Osceola HSC	2,704	16.9	15	6.25	5.55	
TOTAL	205,800	1,495	1,495	7.26	7.26	

[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

2001 ACTUAL FLORIDA LOW BIRTH WEIGHT PERCENTAGES [1]
COMPARED TO EXPECTED PERCENTAGES [2]

	1	2	3	4	5	6	7
Healthy Start Coalition		2001 Resident Births	2001 Expected LBW Births	2001 Actual LBW Births	2001 Expected LBW Percent	2001 Actual LBW Percent	H=Actual LBW % Signif.Higher [3] L=Actual LBW % Signif.Lower [3] Than Expected %
Bay, Franklin,Gulf		2108	172	166	8.16%	7.87%	
Broward HSC		22384	1938	1852	8.66%	8.27%	L
Capital Area HSC		3232	282	313	8.72%	9.68%	H
Central HSC		5010	380	375	7.58%	7.49%	
Charlotte HS		1038	76	79	7.30%	7.61%	
Chipola		1188	97	98	8.13%	8.25%	
Desoto HS		448	36	40	7.93%	8.93%	
Escambia HSC		3916	338	398	8.63%	10.16%	H
Florida Keys HSC		709	53	46	7.50%	6.49%	
Gadsden		703	74	79	10.57%	11.24%	
Miami-Dade HSC		32425	2728	2467	8.41%	7.61%	L
Okaloosa/Walton		2847	213	233	7.49%	8.18%	
North Central HS		8976	738	756	8.22%	8.42%	
Sarasota HSC		2787	206	201	7.40%	7.21%	
Hardee/Highlands/Polk		8239	667	673	8.09%	8.17%	
Hillsborough HSC		14866	1202	1242	8.09%	8.35%	
Jefferson/Madison/Taylor HSC		649	59	65	9.09%	10.02%	
Manatee HSC		3194	249	259	7.80%	8.11%	
Palm Beach HSC		13745	1155	1101	8.40%	8.01%	L
Pasco HSC		3871	278	299	7.19%	7.72%	
Pinellas HSC		9425	738	754	7.83%	8.00%	
Santa Rosa HSC		1537	107	135	6.93%	8.78%	H
Southwest HSC		9590	746	737	7.77%	7.69%	
Saint Lucie HSC		2228	189	178	8.48%	7.99%	
Indian River HSC		1124	89	82	7.87%	7.30%	
Martin HSC		1219	91	80	7.44%	6.56%	
Northeast HSC		16462	1387	1454	8.43%	8.83%	H
Okeechobee HSC		552	42	38	7.58%	6.88%	
Orange HSC		14242	1181	1301	8.29%	9.13%	H
Brevard HSC		4789	368	337	7.69%	7.04%	L
Seminole HSC		4510	339	338	7.51%	7.49%	
Flagler/Volusia HSC		5083	396	398	7.78%	7.83%	
Osceola HSC		2704	201	238	7.42%	8.80%	H
TOTAL		205800	16812	16812	8.17%	8.17%	

[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**