

Birth Outcomes for SC NFP Clients Delivering Live Births in 2010-2011

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Overview

- Goal of Long-Term Analytic Plan
- Objectives for this Analysis
- Data Acquisition Process
- Analysis Methods
- Results
- Conclusions
- Next Steps

Goal of Long-Term Analytic Plan

“The main thing is to keep the main thing the main thing”

-Stephen Covey

Goal of Long-Term Analytic Plan

- To evaluate the effectiveness of the Nurse-Family Partnership, as implemented in SC, with respect to birth outcomes, child health outcomes, and potential cost savings.

Goal of Long-Term Analytic Plan

- Birth Outcomes
 - Preterm birth, low birthweight, NICU admission, delivery method, breastfeeding initiation
- Child Health Outcomes
 - Child well visits, emergency department visits, others?
- Potential Cost Savings
 - Average cost to Medicaid per visit, average total costs to Medicaid for all visits

Goal of Long-Term Analytic Plan

- Considerations
 - NFP is a young program in SC
 - Cumbersome data acquisition process
 - Lots of data needed, not much available (yet)
 - Iterative process

Where We've Been

- Analyzed 2009 birth certificate data linked to 2009-2011 Medicaid claims data
 - birth outcomes, child health outcomes, and potential cost savings
- Piloting process, methods, and outcomes of interest

Where We've Been

- Some evidence of reduced NICU admissions and fewer ED visits
- Small sample size – 62 NFP participants

Objectives for this Analysis

- Intermediate step – Add 2010-2011 birth certificate data
 - Increased sample size, statistical power
 - Another look at appropriateness of methodology
- Birth outcomes only, will need through 2012 and 2013 Medicaid data to examine child health outcomes and costs

Data Acquisition Process

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Data Acquisition Process - General

- Data to gather and link:
 - NFP identifiers → birth certificate → paid Medicaid claims
- 1. SCDHEC IRB approval and SCDHHS Medicaid Data Oversight Committee approval

Data Acquisition Process - General

2. Work with NFP State Nurse Consultant to have NFP sites send identifiers for women that were NFP participants at delivery to DHEC Division of Biostatistics in a secure manner
3. Matching identifiers to birth certificate data to create an indicator variable (inconsistent info – lots of “matching by hand” to ensure accuracy)

Data Acquisition Process - General

4. Securely send matched NFP-BC data to SC ORS for matching to Medicaid data
 5. Data de-identified and sent to SCDHEC MCH Bureau for analysis
- Limitation – Data from hospital NFP sites (Health Sciences SC IRB)

Data Acquisition Process – Intermediate

- **Data to gather and link:**
 - **NFP identifiers -> birth certificate -> paid Medicaid claims**
- 1. **SCDHEC IRB approval and SCDHHS Medicaid Data Oversight Committee approval**

Data Acquisition Process - Intermediate

- 2. Work with NFP State Nurse Consultant to have NFP sites send identifiers for women that were NFP participants at delivery to DHEC Division of Biostatistics in a secure manner**
- 3. Matching identifiers to birth certificate data to create an indicator variable (inconsistent info – lots of “matching by hand” to ensure accuracy)**

Data Acquisition Process - Intermediate

4. Securely send matched NFP-BC data to SC ORS for matching to Medicaid data
 5. **Data de-identified and sent to SCDHEC MCH Bureau for analysis**
- **Limitation – Data from hospital NFP sites (Health Sciences SC IRB)**

Analysis Methods

- Retrospective cohort study design comparing women “exposed” to NFP to “unexposed” groups for a variety of risk factors and outcomes
- Comparison Groups
 - Group 1 Group 2 Group 3
 - Methodology: Simple -----> Complex
 - Generalizability: High <----- Low
 - Internal validity: Low -----> High

Analysis Methods

- Simple statistics used for comparing groups
 - Prevalence, Chi-square tests of independence
- Simple to complex comparison groups + simple statistical analysis => highly valid results + easy to interpret + appropriate expectations for generalizability.

Intermediate Analysis Results

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Comparison Group 1

All SC resident women delivering first births in 2010-2011 that were anticipated to be paid by Medicaid.

Table 1: Characteristics and risk factors of NFP participants and **Comparison Group 1**. 2010-2011 birth certificate data.

Characteristic/Risk Factor	NFP Participants		Comparison Group 1*		P-value**
	Number	Percent	Number	Percent	
<i>Mother's Race</i>					
White	140	39.6	12,240	53.5	<0.0001
Black/African American	212	59.9	10,254	44.9	
Other	2	0.5	365	1.6	
<i>Mother's Education</i>					
Less than High School	130	36.9	6,818	29.9	0.004
High School or More	222	63.1	15,980	70.1	
<i>WIC Status</i>					
Non-WIC	12	3.5	3,235	14.4	<0.0001
WIC Participant	333	96.5	19,284	85.6	
<i>Mother's Pre-Pregnancy BMI</i>					
Underweight/Normal	192	54.6	11,104	49.5	0.06
Overweight/Obese	160	45.4	11,329	50.5	
<i>Adequacy of Prenatal Care</i>					
Inadequate/Intermediate	72	20.6	6,070	26.8	0.01
Adequate/Adequate Plus	277	79.4	16,614	73.2	

Table 1: Characteristics and risk factors of NFP participants and **Comparison Group 1**. 2010-2011 birth certificate data.

Characteristic/Risk Factor	NFP Participants		Comparison Group 1*		P-value**
	Number	Percent	Number	Percent	
<i>Gestational Diabetes</i>					
No	340	96.1	21,977	96.1	0.93
Yes	14	3.9	882	3.9	
<i>Gestational Hypertension</i>					
No	330	93.2	21,324	93.3	0.96
Yes	24	6.8	1,535	6.7	
<i>Tobacco Use Before/During Pregnancy</i>					
No	309	87.3	19,511	85.4	0.32
Yes	45	12.7	3,335	16.7	
Total	354	100	22,859	100	

*Comparison Group 1 is made up of all SC resident women delivering first births in 2010-2011 that were anticipated to be paid for by Medicaid.

**P-values from chi-square tests of independence.

Table 2: Birth Outcomes for NFP participants and **Comparison Group 1**. 2010-2011 birth certificate data.

Birth Outcome	NFP Participants		Comparison Group 1*		P-value**
	Number	Percent	Number	Percent	
<i>Gestational Age at Delivery</i>					
Preterm (<37 weeks)	31	8.8	2,543	11.1	0.16
Term (37+ weeks)	323	91.2	20,310	88.9	
<i>Birth Weight</i>					
Low birth weight (<2,500 grams)	34	9.6	2,670	11.7	0.22
Normal birth weight (2,500+ grams)	320	90.4	20,129	88.3	
<i>Delivery Method</i>					
Vaginal	244	68.9	15,450	67.6	0.59
Cesarean	110	31.1	7,409	32.4	
<i>Breastfeeding Initiation</i>					
No	145	41.1	9,993	43.9	0.29
Yes	208	58.9	12,762	56.1	
<i>NICU Admission</i>					
No	337	95.2	21,011	91.9	0.02
Yes	17	4.8	1,848	8.1	
Total	354	100	22,859	100	

*Comparison Group 1 is made up of all SC resident women delivering first births in 2010-2011 that were anticipated to be paid for by Medicaid.

**P-values from chi-square tests of independence.

Comparison Group 2

All SC resident women delivering first births *in hospitals where NFP participants delivered* in 2010-2011 that were anticipated to be paid by Medicaid.

Table 3: Characteristics and risk factors of NFP participants and **Comparison Group 2**. 2010-2011 birth certificate data.

Characteristic/Risk Factor	NFP Participants		Comparison Group 2*		P-value**
	Number	Percent	Number	Percent	
<i>Mother's Race</i>					
White	140	39.6	6,988	53.7	<0.0001
Black/African American	212	59.9	5,802	44.6	
Other	2	0.5	215	1.7	
<i>Mother's Education</i>					
Less than High School	130	36.9	3,748	28.9	0.001
High School or More	222	63.1	9,219	71.1	
<i>WIC Status</i>					
Non-WIC	12	3.5	2,051	16.1	<0.0001
WIC Participant	333	96.5	10,723	83.9	
<i>Mother's Pre-Pregnancy BMI</i>					
Underweight/Normal	192	54.6	6,359	49.5	0.06
Overweight/Obese	160	45.4	6,495	50.5	
<i>Adequacy of Prenatal Care</i>					
Inadequate/Intermediate	72	20.6	3,384	26.3	0.02
Adequate/Adequate Plus	277	79.4	9,463	77.7	

Table 3: Characteristics and risk factors of NFP participants and **Comparison Group 2**. 2010-2011 birth certificate data.

Characteristic/Risk Factor	NFP Participants		Comparison Group 2*		P-value**
	Number	Percent	Number	Percent	
<i>Gestational Diabetes</i>					
No	340	96.1	12,424	95.5	0.64
Yes	14	3.9	581	4.5	
<i>Gestational Hypertension</i>					
No	330	93.2	11,944	91.8	0.35
Yes	24	6.8	1,061	8.2	
<i>Tobacco Use Before/During Pregnancy</i>					
No	309	87.3	11,080	85.2	0.28
Yes	45	12.7	1,919	14.8	
Total	354	100	13,005	100	

*Comparison Group 2 is made up of all SC resident women delivering first births *in hospitals where NFP participants delivered* in 2010-2011 that were anticipated to be paid for by Medicaid.

**P-values from chi-square tests of independence.

Table 4: Birth Outcomes for NFP participants and **Comparison Group 2**. 2010-2011 birth certificate data.

Birth Outcome	NFP Participants		Comparison Group 2*		P-value**
	Number	Percent	Number	Percent	
<i>Gestational Age at Delivery</i>					
Preterm (<37 weeks)	31	8.8	1,646	12.7	0.03
Term (37+ weeks)	323	91.2	11,356	87.3	
<i>Birth Weight</i>					
Low birth weight (<2,500 grams)	34	9.6	1,718	13.3	0.04
Normal birth weight (2,500+ grams)	320	90.4	11,245	86.7	
<i>Delivery Method</i>					
Vaginal	244	68.9	8,700	66.9	0.42
Cesarean	110	31.1	4,305	33.1	
<i>Breastfeeding Initiation</i>					
No	145	41.1	5,006	38.7	0.36
Yes	208	58.9	7,938	61.3	
<i>NICU Admission</i>					
No	337	95.2	11,640	89.5	0.0005
Yes	17	4.8	1,365	10.5	
Total	354	100	13,005	100	

*Comparison Group 2 is made up of all SC resident women delivering first births *in hospitals where NFP participants delivered* in 2010-2011 that were anticipated to be paid for by Medicaid.

**P-values from chi-square tests of independence.

Comparison Group 3

All SC resident women delivering first births in hospitals where NFP participants delivered in 2010-2011 that were anticipated to be paid by Medicaid *matched to NFP participants on mother's race, mother's education, and WIC status.*

Table 5: Characteristics and risk factors of NFP participants and **Comparison Group 3**. 2010-2011 birth certificate data.

Characteristic/Risk Factor	NFP Participants		Comparison Group 3*		P-value**
	Number	Percent	Number	Percent	
<i>Mother's Race</i>					
White	139	39.5	139	39.5	N/A
Black/African American	211	59.9	211	59.9	
Other	2	0.6	2	0.6	
<i>Mother's Education</i>					
Less than High School	130	36.9	130	36.9	N/A
High School or More	222	63.1	122	63.1	
<i>WIC Status</i>					
Non-WIC	12	3.5	12	3.5	N/A
WIC Participant	332	96.5	332	96.5	
<i>Mother's Pre-Pregnancy BMI</i>					
Underweight/Normal	190	54.3	196	56.2	0.62
Overweight/Obese	160	45.7	153	43.8	
<i>Adequacy of Prenatal Care</i>					
Inadequate/Intermediate	72	20.8	80	23.1	0.46
Adequate/Adequate Plus	275	79.2	267	76.9	

Table 5: Characteristics and risk factors of NFP participants and **Comparison Group 3**.
2010-2011 birth certificate data.

Characteristic/Risk Factor	NFP Participants		Comparison Group 3*		P-value**
	Number	Percent	Number	Percent	
<i>Gestational Diabetes</i>					
No	338	96.0	337	95.7	0.85
Yes	14	4.0	15	4.3	
<i>Gestational Hypertension</i>					
No	329	93.5	320	90.9	0.21
Yes	23	6.5	32	9.1	
<i>Tobacco Use Before/During Pregnancy</i>					
No	307	87.2	308	87.5	0.91
Yes	45	12.8	44	12.5	
Total	352	100	352	100	

*Comparison Group 3 is made up of SC resident women delivering first births in hospitals where NFP participants delivered in 2010-2011 that were anticipated to be paid for by Medicaid *matched to NFP participants on mother's race, mother's education, and WIC status.*

**P-value from chi-square tests of independence.

Table 6: Birth Outcomes for NFP participants and **Comparison Group 3**. 2010-2011 birth certificate data.

Birth Outcome	NFP Participants		Comparison Group 3*		P-value**
	Number	Percent	Number	Percent	
<i>Gestational Age at Delivery</i>					
Preterm (<37 weeks)	29	8.2	61	17.3	0.0003
Term (37+ weeks)	323	91.8	291	82.7	
<i>Birth Weight</i>					
Low birth weight (<2,500 grams)	33	9.4	68	19.3	0.0002
Normal birth weight (2,500+ grams)	319	90.6	284	80.7	
<i>Delivery Method</i>					
Vaginal	242	68.8	248	70.5	0.62
Cesarean	110	31.2	104	29.5	
<i>Breastfeeding Initiation</i>					
No	145	41.3	155	44.2	0.45
Yes	206	58.7	196	55.8	
<i>NICU Admission</i>					
No	335	95.2	306	86.9	0.0001
Yes	17	4.8	46	13.1	
Total	352	100	352	100	

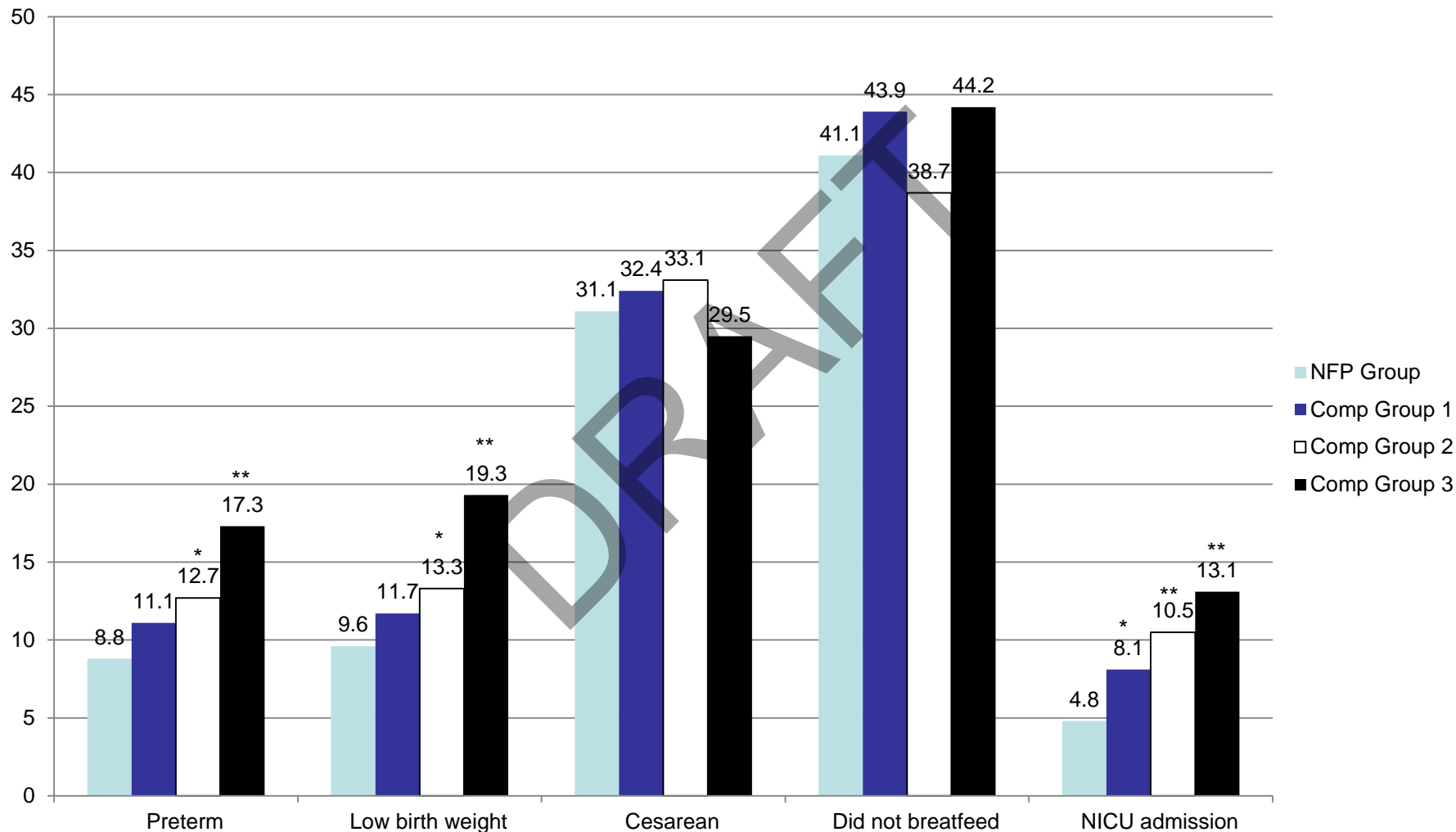
*Comparison Group 3 is made up of SC resident women delivering first births in hospitals where NFP participants delivered in 2010-2011 that were anticipated to be paid for by Medicaid *matched to NFP participants on mother's race, mother's education, and WIC status*.

**P-value from chi-square tests of independence.

Birth Outcomes Summary

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Percent of women with selected birth outcomes by group, 2010-2011 SC birth certificate data



*Chi-square p-value <0.05

**Chi-square p-value <0.001

Conclusions

Conclusions

- NFP participants differ substantially in terms of risk factors compared to potentially eligible non-participants, even in the same geographic areas.
 - DHEC sites, live births in 2010-2011
- After accounting for these differences, these NFP participants have significantly lower prevalence of LBW, PTB, and NICU admissions.

Next Steps

- GHS and SRS NFP site data
- 2010-2012 Medicaid data added to 2010 births
- More/different child health and financial outcome measures?

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Questions?

DRAFT

Contact Info

Michael G. Smith, MSPH
MCH Epidemiologist
Director, Division of Research and Planning
SC DHEC, Bureau of MCH
803-898-3740
smithm4@dhec.sc.gov