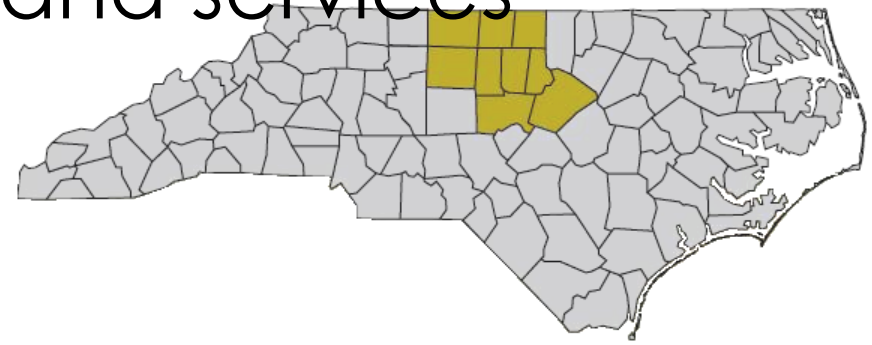
North Carolina Public Health Practice-Based Research Network-RACE 69499
Product Type: Meeting and Conference Presentation
Presenter Name(s): Marisa Domino
Presenter Affiliations: UNC
Title of Presentation: Effects of Maternal Care Coordination on Pregnancy and Health Service Outcomes
Meeting: Webinar to PBRNS
Sponsor Organization: National Coordinating Center for PHSSR & PBRNs
Date: February 1, 2013
Location: NA

Effects of Maternal Care Coordination on Pregnancy and Health Service Outcomes

Funding from the Robert Wood Johnson Foundation and HRSA gratefully acknowledged.

Academic-practice research section of NCPHA

- Identify key practice-focused research questions
- Conduct collaborative research projects
- Share the results to improve public health systems and services



Study Team Members:

Pennsylvania State University

- Marianne Hillemeier, PhD

UNC

- Rebecca Wells, PhD
- Dorothy Cilenti, DrPH
- Marisa Domino, PhD
- Ravi Goyal, MS
- Hye-Chung Kum, PhD

NC State Center for Health Statistics

- Timothy Whitmire PhD

Context

- Adverse pregnancy outcomes including low birth weight births among low-income and African-American women are a high-priority public health problem, contributing to the inferior U.S. ranking of 31st among industrialized nations in infant mortality in 2008 (USDHHS, Healthy People 2020; Heisler 2012)

Context

- Maternity Care Coordination (MCC) is a formal case management approach provided to women during and after pregnancy to improve birth outcomes.

- MCC consists of outreach, assessment of strengths and needs, service planning, coordination and referral, follow-up and monitoring, and education and counseling.

Context

- In NC, Medicaid eligible women could receive MCC services, including:
  - Fully Medicaid eligible pregnant women
  - Women receiving Medicaid benefits for pregnancy-related services only ("pregnancy waiver")
- MCC was provided through LHDs, FQHCs/RHCs, and private providers
  - In practice, >98% of women receiving MCC services received them from LHDs

Objectives

- To estimate the effect of MCC services on pregnancy and health outcomes and on the use of related Medicaid-funded health care services

Methods

- Because MCC was a voluntary program in NC which relied both on provider/LHD identification of eligible women and on self-selection by pregnant women to receive services, selection bias is a concern
- We used propensity score techniques to better balance observed baseline covariates and risk factors between MCC recipients and control participants
- We compared estimates to simple regression analyses, with and without covariates, to examine the influence of selection bias

Measures

- Outcomes examined include:
  - Birth outcomes
    - Low birthweight (<2500 g), preterm birth
  - Maternal behaviors
    - tobacco use during pregnancy, pregnancy weight gain

Measures

- Outcomes examined include:
  - Service use during pregnancy
    - Adequate prenatal care, number of OB visits, any OB visits in first trimester, receipt of WIC, number of PCP visits, number of ED visits
  - Service use post pregnancy
  - Medicaid expenditures

Data

- Merged data from birth certificate files, Medicaid claims, and WIC participation were obtained from the North Carolina State Center for Health Statistics.
- LHD characteristics were also obtained from a 2010 survey and from the 2008 Area Resource File

Sample

- 8000 randomly selected Medicaid-covered live births from 10/1/2008 – 10/1/2010
- Excluded births covered by emergency Medicaid, or with no Medicaid/Waiver eligibility during pregnancy
- Births covered by emergency Medicaid were excluded, thus requiring mothers in the sample to be covered by either full Medicaid or the Medicaid pregnancy waiver program for at least some of their pregnancy.
- This resulted in an analytic sample of 7,124 deliveries.
  - 2,255 mothers received at least one MCC service during their pregnancy
  - 4,869 women who were Medicaid or waiver enrollees and had Medicaid-funded deliveries, but did not receive MCC services during their pregnancy, were potential controls for the propensity score analysis.

Sample Description

- Women who received MCC services were:
  - younger, had lower education, more frequently black, and had a history of health problems including hypertension, mental health problems, and substance abuse.
  - more likely to receive full Medicaid during pregnancy and to be enrolled in the state's Healthy Start initiative (Baby Love Plus) , suggesting that women in this group were more likely to be identified as having high-risk status.
  - less likely to have had a prior live birth or infant death.
  - less likely to be served in an area where the local health department offers a high-risk maternity clinic or WIC, and more likely to be in an area where the local health department had comparatively more staff for MCC service provision and generated higher revenue per capita.

Selected characteristics by MCC status

	Propensity weighted means for MCC recipients (n=2255)	Propensity weighted means for controls (n=4455)
Younger than 18 at delivery	6.6%	6.6%
Age 35 or older at delivery	6.5%	6.4%
Less than high school education	19.2%	19.0%
Mother Hispanic ethnicity	15.0%	14.2%
Mother African American	35.8%	35.9%
Prior history of any mental health condition	19.5%	19.4%
Prior history of substance use treatment	8.5%	8.3%

All covariates balanced at <0.02 SD

Propensity weighted results on Pregnancy Outcomes

Pregnancy Outcome	Unadjusted simple regression estimates	Adjusted Multiple Regression Estimates	**Inverse Propensity weighted Effects**
Preterm birth	-0.0129 (0.0067)	-0.0197** (0.0070)	**-0.0175*** **(0.0073)**
Low birthweight	0.0049 (0.0068)	-0.0059 (0.0071)	**-0.0033** **(0.0072)**
Birthweight in grams	-37.80** (13.44)	8.66 (13.80)	**1.31** **(14.60)**
Prenatal tobacco use	0.029* (0.012)	0.024* (0.012)	**0.021** **(0.013)**
Pregnancy weight gain	-5.51 (3.72)	-8.28 (4.82)	**-7.37** **(4.23)**

Propensity weighted results on service use measures

Type of service use	Unadjusted simple regression estimates	Adjusted Multiple Regression Estimates	**Inverse Propensity weighted Effects**
Adequate prenatal care	0.023 (0.013)	0.020 (0.013)	**0.023 (0.014)**
Number of Medicaid-paid OB visits	3.36** (0.26)	3.07** (0.26)	**-2.96** (0.26)**
Any Medicaid-paid OB visits in the first trimester	0.065** (0.014)	0.059** (0.014)	**0.057** (0.015)**
Receipt of WIC during pregnancy	0.172** (0.010)	0.146** (0.011)	**0.151** (0.011)**

Propensity weighted results on service use measures, continued

Type of service use	Unadjusted simple regression estimates	Adjusted Multiple Regression Estimates	**Inverse Propensity weighted Effects**
Number of PCP visits	2.72** (0.20)	2.80** (0.20)	**2.81** (0.22)**
ED visits	0.099** (0.016)	0.068** (0.016)	**0.064** (0.016)**
Total Medicaid expenditures during prenatal period	235** (15)	246** (15)	**247** (16)**
Family planning received in first 3 months after delivery	0.115** (0.012)	0.131** (0.013)	**0.129** (0.013)**
Medicaid expenditures during 3 months post-partum	332** (114)	439** (133)	**437** (150)**

Conclusions

- We find that pregnancy women who received MCC services had a 1.8 percentage point reduction in the probability of delivering a premature infant.
- Results for low birthweight and birthweight analyzed as a continuous variable were in the direction of improved birth weight, but did not show significant effects for MCC participation in adjusted models.
- We find no effects of MCC on other pregnancy outcomes

Conclusions

- In terms of service use, we do not find evidence that MCC increased the proportion of women receiving adequate prenatal care as reported on the birth certificate
- We do find that women receiving MCC had greater contact with both the OB and primary care, were more likely to receive WIC and family planning services after delivery, but were also more likely to use the ED during pregnancy
- Medicaid costs were greater for women on MCC, both due to the cost of MCC visits as well as the greater level of overall service use

Limitations

- Rich set of linked data cannot capture important unmeasured factors, such as medical status, environmental factors, and motivation to see high quality care, and thus biases may remain between MCC recipients and non-recipients
- Important outcomes, such as satisfaction with care, child health, and costs to families cannot be measured with our data

Final words

- In view of the apparent advantage conferred by care coordination related to preterm birth, it may be desirable to expand access to MCC services among high-risk populations, depending on the cost-effectiveness of the intervention.
- In our North Carolina sample, only about one-third of Medicaid-enrolled women received care coordination services during the study period.
- North Carolina has since disbanded the MCC program and moved on to pregnancy medical homes within a primary care medical homes model. Future research should investigate whether services delivered through this system structure have similar advantageous effects on preterm birth.