Compared to What?

Discerning Healthy Start Impact on Birth Outcomes using Propensity Score Matching Methods

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CASE WESTERN RESERVE UNIVERSITY

Acknowledgements

- MomsFirst Staff
  - Lisa Matthews, M.B.A., Project Director
  - Tim Peyton, MPH, Quality Assurance Analyst
  - Megan Walsh, LISW-S, Deputy Project Director
- Poverty Center Staff
  - Youngmin Cho, Ph.D. candidate
  - Francisca Richter, Ph.D.
  - Meghan Atwell, Ph.D.

Overview of Presentation

1. Introduce the MomsFirst home visiting program
2. Estimating causal effects in the absence of RCT
3. Use of propensity score analysis to estimate the relationship between program receipt and:
   a. Low birth weight (LBW)
      Defined as <2500 grams
   b. Prematurity
      Defined as <37 weeks gestation

Racial disparity in Ohio (2014):

Black rate: **14.3**
White rate: **5.3***

} Black babies **2.7** times more likely to die than white babies.

*The MomsFirst IMR for 2010-2015 matches the White rate for the state of Ohio at 5.3

8
Case Managers and
36
Community Health Workers
Provided MomsFirst services
to
1,823
Participants and Their Families

397
Teen Participants

123
Incarcerated Participants

766
New Participants

695
Births to Program Participants

15,416
Home Visits Completed

9,863
Medical Appointments Attended

1,738
Depression Screenings Administered

1,525
Reproductive Life Plans Completed

1,461
Intimate Partner Violence Screenings Completed

134
Referrals to Job Training

Infant Mortality Rate:

MomsFirst:
8.6

City of Cleveland:
15.6*
(*preliminary)

"This program has given me hope to know there are people who can help and who care"
– MomsFirst participant

"Now that my baby is here, I feel I am prepared and knowledgeable to care for him without too many worries"
– MomsFirst participant

"This program is a help for moms like myself that try to do the best we can"
– MomsFirst participant

Estimating the Counterfactual

Receives the Treatment

Does not receive Treatment

?

Determining Program Effect

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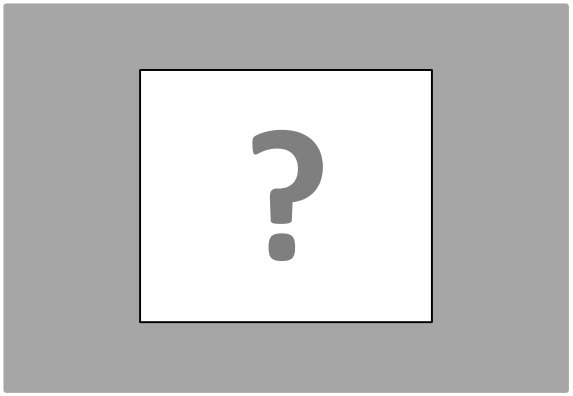

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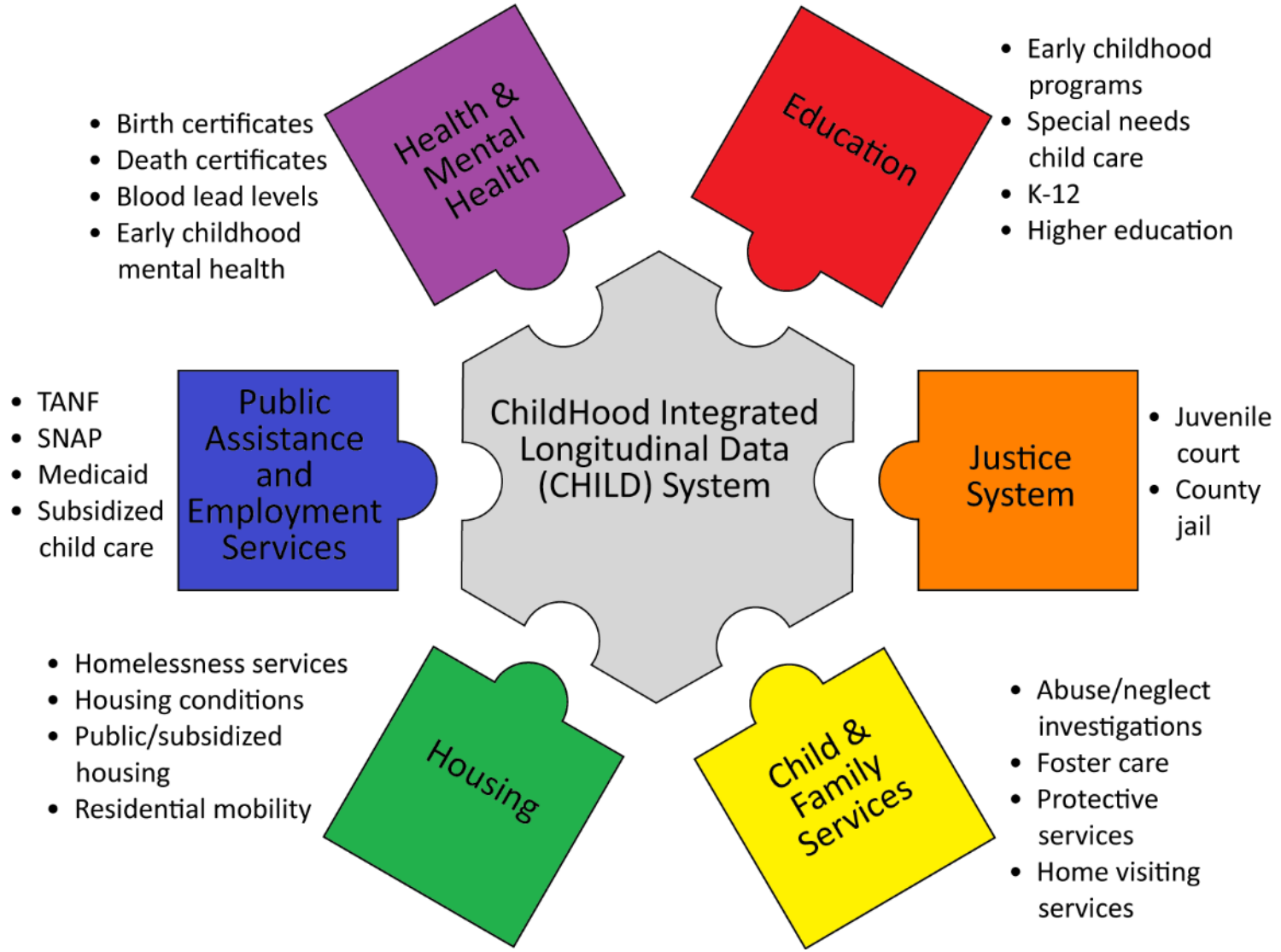
The result of pre-existing group differences


Health & Mental Health
Birth certificates
Death certificates
Blood lead levels
Early childhood mental health
Education
Early childhood programs
Special needs child care
K-12
Higher education
Public Assistance and Employment Services
TANF
SNAP
Medicaid
Subsidized child care
ChildHood Integrated Longitudinal Data (CHILD) System
Justice System
Juvenile court
County jail
Housing
Homelessness services
Housing conditions
Public/subsidized housing
Residential mobility
Child & Family Services
Abuse/neglect investigations
Foster care
Protective services
Home visiting services

Sources of Data

Raw data file: MomsFirst program records

↓

Geocode & Standardize

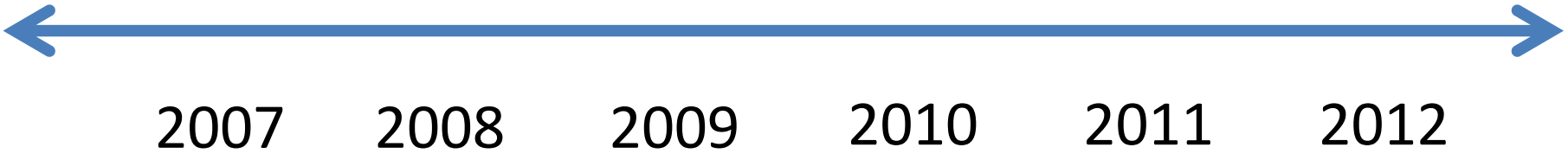
↓

CHILD System → Match MomsFirst records to CHILD System → Dataset that contains MomsFirst data linked at the individual child level to birth certificates

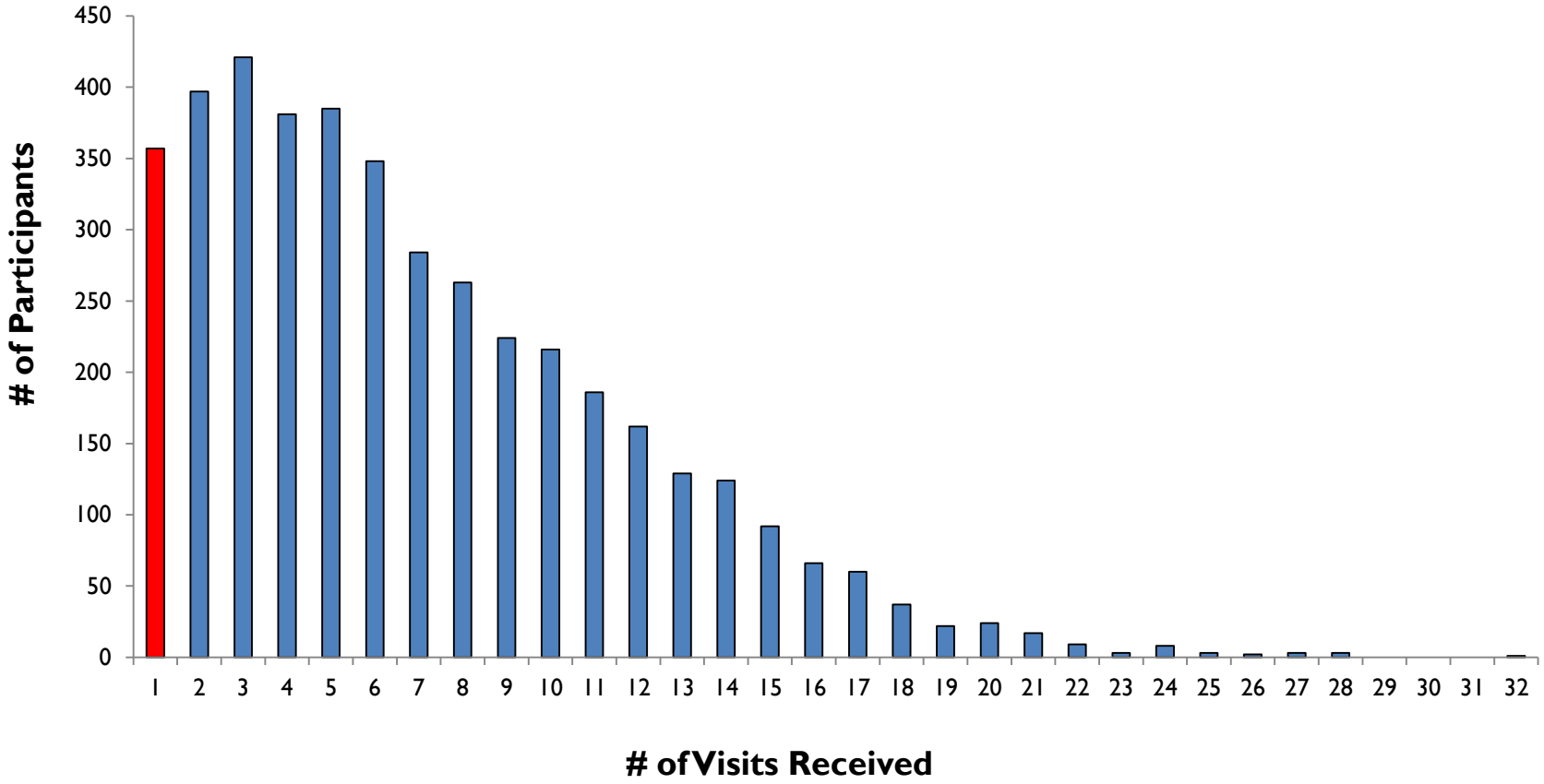
Timeframe for Analysis

MomsFirst program data (N=4,227)

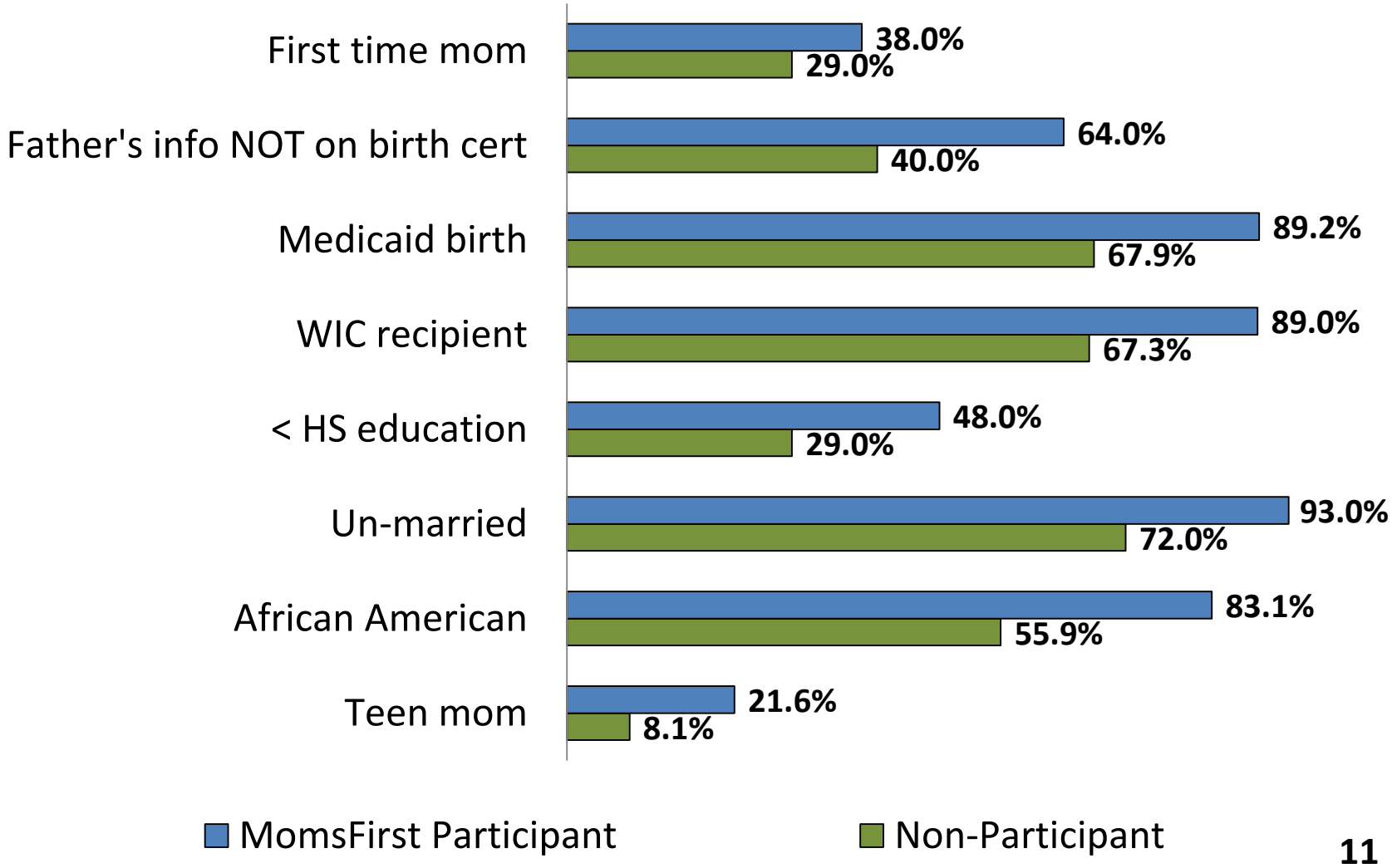
Birth certificates (N=27,810)



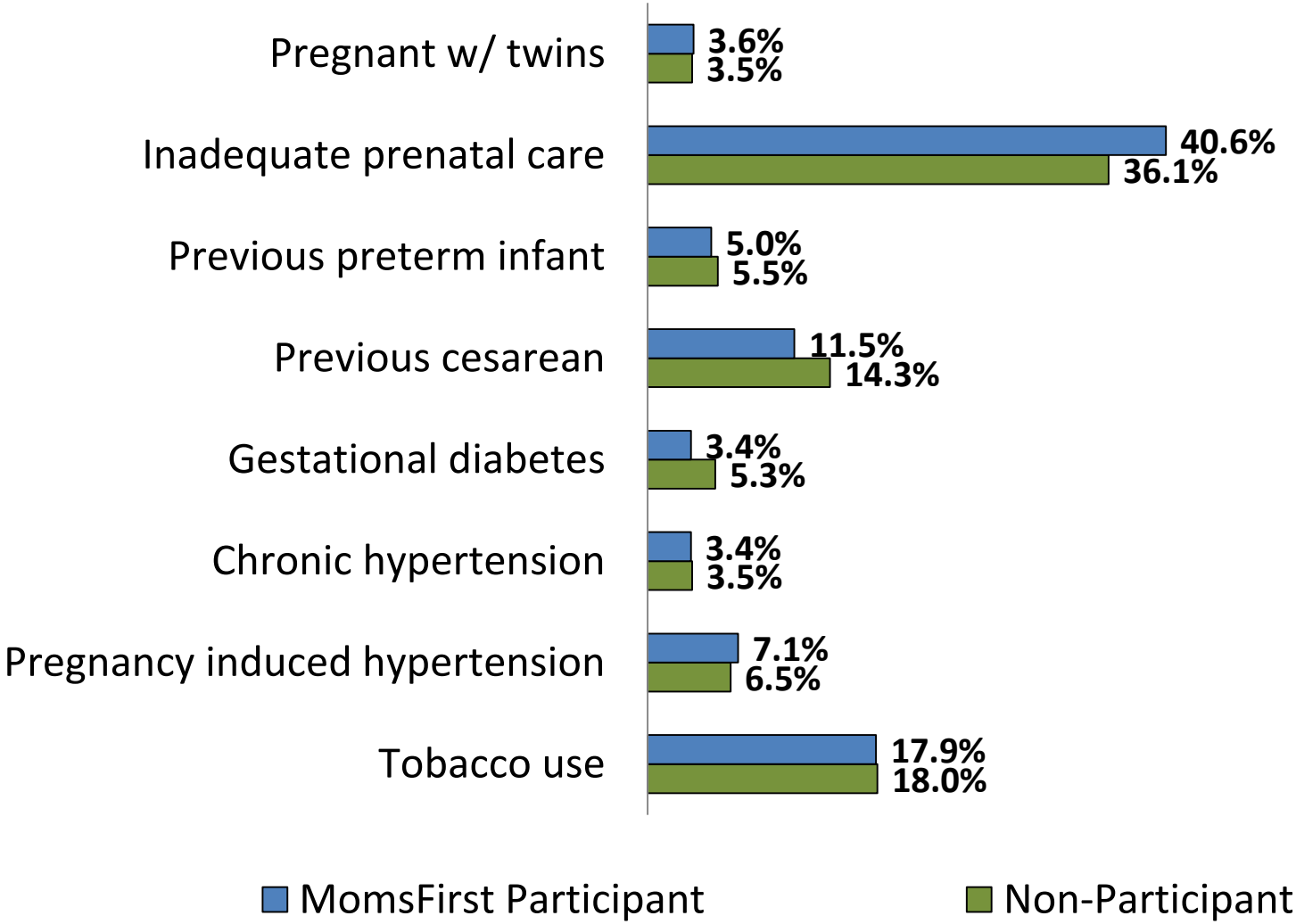
MomsFirst Dosage



Comparison: Demographic/Social Risk Factors

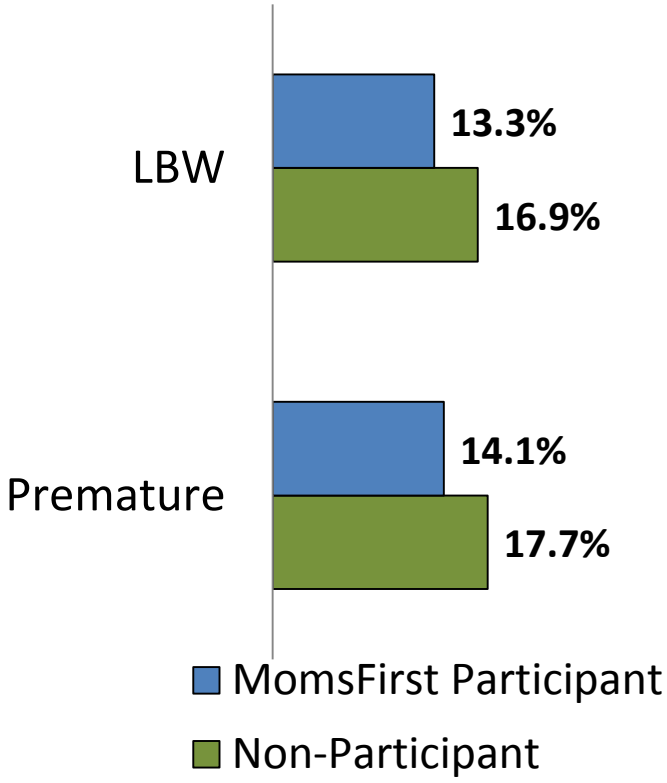


Comparison: Medical Risk Factors

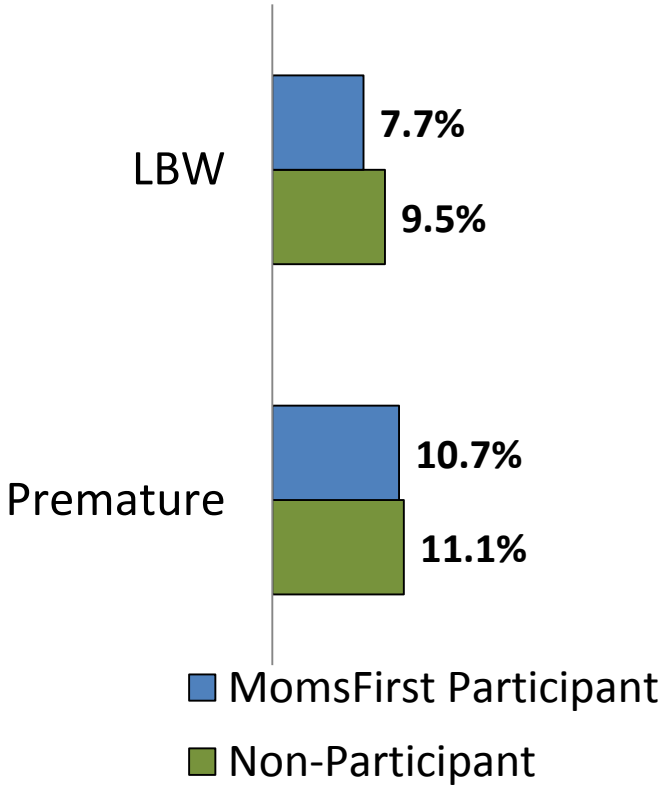


Birth Outcomes

African American Women



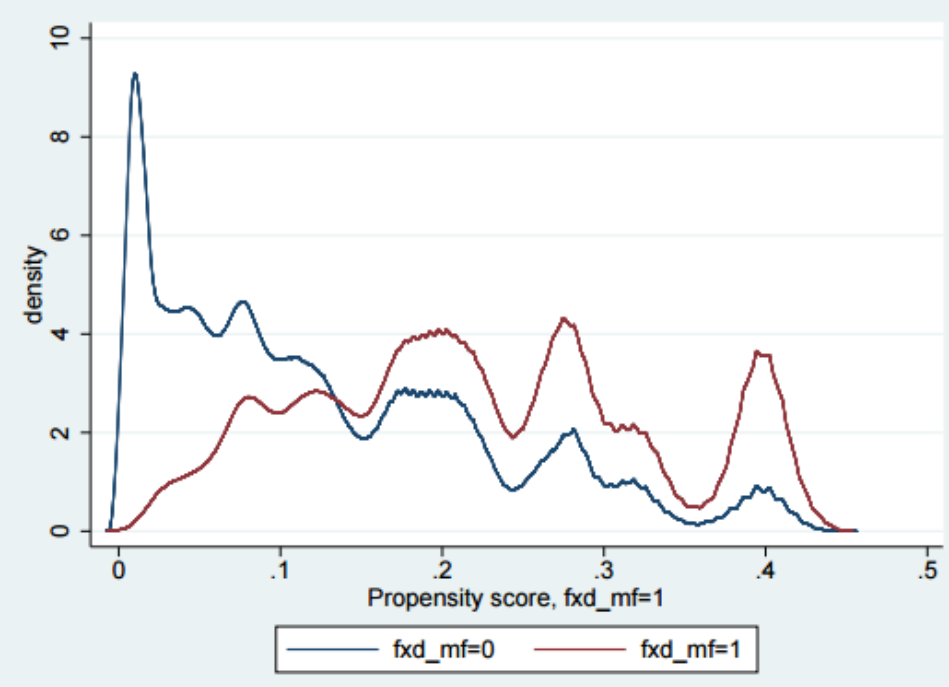
White Women



Calculating a Propensity Score: Selecting covariates

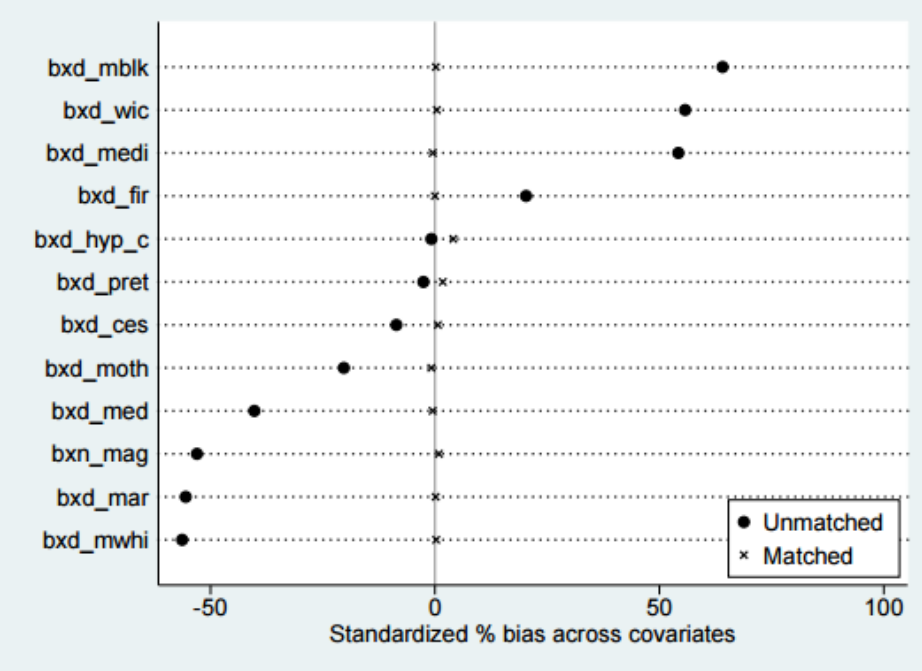
- Variables used to estimate PS included:
  - Demographics – Age, Race, Marital status, Education, First time parent
  - SES – WIC, Medicaid receipt
  - Medical risk factors – hypertension, previous preterm small infant, previous cesarean
- Nearest neighbor match with replacement using teffects psmatch in Stata

Calculating a Propensity Score: Exploring overlap



- Regressed propensity to receive MomsFirst on covariates using logistic model
- 93.2% of treatment participants matched (6.8% didn't match b/c of missing data)

Calculating a Propensity Score: Assess balance



- Prior to PS match:
  - 10 covariates significantly different between treatment and control
- After PS match:
  - 0 covariates significantly different between treatment and control

Results: Low Birth Weight

Total Sample

- MomsFirst participants are 1.025 times more likely to delivery a healthy birth weight baby, p<.001

African American Only

- MomsFirst participants are 1.027 times more likely to delivery a health birth weight baby, p<.001

For every 40 women served by MomsFirst, 1 more baby is born at healthy birth weight. In 2015, 695 babies were born to participating women. Had these women not received MomsFirst, 17 additional babies would have been born at low birth weight.

Results: Prematurity

Total Sample

- MomsFirst participants are 1.015 times more likely to delivery a full term baby, p=.033

African American Only

- MomsFirst participants are 1.019 times more likely to delivery a full term baby, p=.014

For every 66 women served by MomsFirst, 1 more baby is born at full term. In 2015, 695 babies were born to participating women. Had these women not received MomsFirst, 10 additional babies would have been premature.

Conclusions

1. The effect of MomsFirst is statistically significant, but modest in size.
   a. Women who participate in MomsFirst have statistically significantly better birth outcomes than they would have had, had they not participated.
2. The effect is larger for African American participants.

Next Steps

- Estimate program effect on infant mortality
- Follow-up subgroup analyses
  - High dose recipients
  - First-time mothers
- Further refine propensity score analysis
  - Including additional data from CHILD System
  - Exploring alternative matching techniques

Thank you!

Questions?