**WIC participation with prenatal care is associated with lower risk of low birthweight for Black mothers with Medi-Cal coverage in San Francisco: A county birth certificate analysis**

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**INTRODUCTION**

Infants who are born weighing less than 5.5 lbs at birth are significantly more likely to die in their first year of life, or experience physical and developmental complications throughout their life, including learning disabilities, obesity and cardiovascular disease

Reducing low birthweight (LBW) is a public health priority.

**WIC & PNC**

The federal Women, Infants, and Children Supplemental Nutrition (WIC) program provides prenatal care (PNC) referrals, and foods scientifically-selected to prevent and treat conditions such as substance abuse, chronic stress, and medical problems that may affect pregnancy outcome.

Studies consistently show that interventions that improve prenatal nutrition and/or decrease prenatal smoking and substance abuse reduce the risk of LBW. Studies also show that LBW is associated with maternal smoking and pre-pregnancy BMI.

In San Francisco, risk of LBW is above the national Healthy People 2020 objective (7.8%) for Black infants.

**LOCAL SITUATION**

In San Francisco, risk of LBW is above the national Healthy People 2020 objective (7.8%) for Black infants. 

**STUDY OBJECTIVES**

Objective
- This county-level analysis explored whether high LBW risk among Black mothers in San Francisco might reflect non-participation in WIC and/or effect modification by low PNC

Specific aims
- Describe WIC participation in conjunction with PNC for LBW risk among Black mothers
- Describe the LBW risk among WIC eligible Black mothers by WIC participation and PNC
- Determine if the effects of PNC and WIC interact

**STUDY METHODS**

Study design
- Cross-sectional analysis

Data source
- California Birth Statistical Master Files for San Francisco County, 2009-2010

Birth certificate data are collected from all San Francisco residents who have a live birth
- Mothers self-report WIC participation during pregnancy and prenatal care within 10 days of the live birth

Study inclusion criteria
- Non-Hispanic Black mother
- Singleton live birth
- Medi-Cal coverage for prenatal care, as proxy for WIC eligibility. WIC serves pregnant women who have an income at or below 185% of the federal poverty line

Statistical analysis
- WIC participation (Yes/No) with or without PNC (<7, 7+ visits, i.e. about 1 PNC visit/mo after pregnancy verification) was represented by 4 dummy variables
- Multivariable logistic regression models were used to estimate the relative odds of LBW associated with WIC participation with and without PNC, and test for interactive effects of WIC and PNC. The estimated odds ratio was adjusted for mother’s age, smoking, pre-pregnancy weight status, timing of the first PNC visit, education, and number of children

**STUDY POPULATION**

WIC eligible mothers
- There were 534 singleton live-births to Black women with Medi-Cal coverage

<table>
<thead>
<tr>
<th>Variable</th>
<th>WIC, &lt;7 PNC</th>
<th>WIC, 7+ PNC</th>
<th>No WIC, &lt;7 PNC</th>
<th>No WIC, 7+ PNC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>534 (100%)</td>
<td>129 (24%)</td>
<td>24 (5%)</td>
<td>451 (85%)</td>
</tr>
<tr>
<td>Age &lt;19 y</td>
<td>94 (18%)</td>
<td>23 (4%)</td>
<td>6 (2%)</td>
<td>75 (17%)</td>
</tr>
<tr>
<td>Age &gt;35 y</td>
<td>30 (6%)</td>
<td>32 (6%)</td>
<td>18 (7%)</td>
<td>101 (22%)</td>
</tr>
<tr>
<td>Smoker</td>
<td>69 (13%)</td>
<td>11 (2%)</td>
<td>5 (2%)</td>
<td>53 (11%)</td>
</tr>
<tr>
<td>Pre-pregnancy BMI&gt;25</td>
<td>285 (55%)</td>
<td>21 (4%)</td>
<td>0 (0%)</td>
<td>264 (58%)</td>
</tr>
<tr>
<td>1st Trimester PNC</td>
<td>211 (40%)</td>
<td>5 (1%)</td>
<td>0 (0%)</td>
<td>206 (43%)</td>
</tr>
<tr>
<td>High school or less</td>
<td>467 (91%)</td>
<td>17 (3%)</td>
<td>0 (0%)</td>
<td>450 (95%)</td>
</tr>
<tr>
<td>3+ children</td>
<td>148 (29%)</td>
<td>3 (1%)</td>
<td>0 (0%)</td>
<td>145 (30%)</td>
</tr>
</tbody>
</table>

**WIC PARTICIPATION & PNC**

Not all eligible mothers participated in WIC and PNC:
- 15% of eligible mothers did not participate in WIC
- 1 in 5 WIC participants had fewer than 7 PNC visits
- 5% of mothers did not participate in WIC and had fewer than 7 PNC visits

**RELATIVE ODDS OF LBW**

WIC modified the effect of low PNC and vice versa:
- WIC participation was associated with a 5-fold reduction in LBW risk for mothers with <7 PNC visits
- <7 PNC visits was associated with a 3-fold increase in LBW risk for WIC participants

**CONCLUSIONS**

High LBW risk among Black mothers in San Francisco could reflect non-participation in WIC and/or gaps in PNC:
- Not all eligible mothers participated in WIC and PNC
- Mothers who did not participate in WIC and PNC had a risk of LBW above the Healthy People 2020 objective
- For mothers with fewer than 7 PNC visits, WIC participation was associated with significantly lower risk
- Fewer than 7 PNC visits significantly limited the beneficial effect of WIC on LBW rates

Consistent with national and statewide reports, in this county-level analysis, WIC participation paired with PNC was associated with significantly lower risk of LBW.

The observed associations may reflect or depend on factors not accounted for in this analysis, including income, neighborhood characteristics, and social support.

To reduce excess LBW among Black mothers in San Francisco, further work is needed to characterize and support mothers who do not access services.

**REFERENCES**