Impact of timing of WIC enrollment on smoking cessation during pregnancy and postpartum smoking relapse

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This study will examine the association between trimester of WIC enrollment and:

- quitting smoking during pregnancy, and
- postpartum smoking relapse

Among women that are eligible for WIC.
Data source: Maternal and Infant Health Assessment (MIHA) survey

• Annual population-based survey of California women with a recent live birth (data from 1999-2015)

• Mail survey with telephone follow up to English and Spanish-speaking women ages 15 and older

• ~70% response rate

• Modeled after the CDC Pregnancy Risk Assessment Monitoring System (PRAMS)

• From 2010-2013, MIHA linked to WIC Management Information System (WIC MIS)
Smoking before, during, and after pregnancy by income, MIHA 2013-2014

Percent of women who smoked

- <=185% FPG
- >185% FPG

Before
- 14.7
- 7.2

During
- 4.4
- 0.9

After
- 8.1
- 2.4

Data Source: Maternal and Infant Health Assessment (MIHA) Survey, 2013-2014

Notes: MIHA data are weighted to represent all women with a live birth in California for a given year.

FPG = Federal Poverty Guideline
• California enrolls a high proportion of eligible women into prenatal WIC (~83%)

• Several studies have found a modest increase in quitting smoking among early prenatal WIC enrollees compared to later WIC enrollment.

• In California, is there an association between WIC enrollment and quitting smoking?
Study population

- From 2011-2013, there were **20,673** MIHA participants
  - Limited to women eligible for WIC (n=**14,712**) including:
    - *WIC participants* – if they had a prenatal record in WIC-MIS
    - *Eligible non-participants (ENPs)* – they did not have a WIC-MIS record but had:
      - Medi-Cal for prenatal care or delivery on the birth certificate or
      - Self-reported an income <= 185% FPG on the MIHA survey
  - Further limited to women who smoked during the 3 months before pregnancy (n=**2,472**)

Study timeline

Date of prenatal WIC enrollment

3 months before pregnancy

1\textsuperscript{st} trimester

3\textsuperscript{rd} trimester

Date of postpartum WIC enrollment/ recertification

Postpartum (2-7 months after birth)

Smoking status self-reported at 4 time points (MIHA data)

WIC data at 2 time points (WIC MIS administrative records)
Exposure variables – Trimester enrolled in prenatal WIC

Date of prenatal WIC enrollment

Date of LMP

3 months before pregnancy

1st trimester

3rd trimester

Postpartum (2-7 months after birth)

Date of LMP = Baby’s date of birth – obstetric estimate of gestational age

Month enrolled in prenatal WIC = Date of prenatal WIC enrollment – Date of LMP

Note: LMP = Last menstrual period
Exposure variables – Trimester enrolled in prenatal WIC

- Started **prenatal WIC** in the:
  - 1\(^{st}\) trimester (2-3 months)
  - 2\(^{nd}\) trimester (4-6 months)
  - 3\(^{rd}\) trimester (7-9 months)
  - Not on prenatal WIC (reference)

**Postpartum WIC**

Mom or infant on WIC postpartum (Yes, No)
Among women eligible for WIC who smoked before pregnancy (n=2,472):

- 77.8% enrolled in prenatal WIC
- 22.2% did not enroll in prenatal WIC
- 55.8% enrolled in WIC postpartum

Trimester enrolled in WIC:
- 1st trimester: 34.4%
- 2nd trimester: 29.5%
- 3rd trimester: 13.9%

95.9% recertified in WIC postpartum
Two outcome variables

1) Quit smoking during pregnancy
2) Postpartum smoking relapse
Among women eligible for WIC who smoked before pregnancy (n=2,472):

- 75.0% quit smoking
- 31.6% quit before pregnancy
- 43.4% quit during pregnancy
- 39.9% relapsed postpartum
Prevalence ratios obtained from the predicted marginals of a logistic regression model were used to examine the association between:

1) Quitting smoking = trimester enrolled in prenatal WIC + covariates

2) Postpartum smoking relapse = trimester enrolled in prenatal WIC + postpartum WIC + covariates

3) Postpartum smoking relapse = prenatal WIC + postpartum WIC + prenatal * postpartum WIC + covariates
No association between enrolling in WIC in the 1st, 2nd, or 3rd trimester and quitting smoking during pregnancy

*Adjusted for age, race/ethnicity, income, education, insurance before pregnancy, marital status, parity, pre-pregnancy BMI, binge drank before pregnancy, region, trimester started prenatal care, percent of census tract below poverty, and pregnancy intent
Association between WIC and postpartum smoking relapse

Adjusted prevalence ratio (95% CI)

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<th>Trimester enrolled in prenatal WIC</th>
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Adjusted for age, race/ethnicity, income, education, insurance before pregnancy, marital status, parity, pre-pregnancy BMI, binge drank before pregnancy, region, trimester started prenatal care, percent of census tract below poverty, pregnancy intent, quit smoking before or during pregnancy, babies age (months), trimester enrolled in prenatal WIC
Interaction between prenatal and postpartum WIC and postpartum smoking relapse

aPR adjusted for age, race/ethnicity, income, education, insurance before pregnancy, marital status, parity, pre-pregnancy BMI, binge drank before pregnancy, region, trimester started prenatal care, percent of census tract below poverty, pregnancy intent, quit smoking before or during pregnancy, and babies age (months)

* Estimate should be interpreted with caution due to low statistical reliability (RSE is between 30% and 50%)
Summary

- No association between prenatal WIC and:
  - quitting smoking during pregnancy
  - postpartum smoking relapse

- Association between postpartum WIC and reduced postpartum smoking relapse.

- However, this association appears to be driven by a subgroup of women who enroll in prenatal WIC, but do not recertify in WIC postpartum.
  - These women have a high smoking relapse prevalence (70%).
Discussion

• Possible reasons why we found no association:
  – Women are self-motivated to quit smoking before pregnancy or as soon as they find out they are pregnant (i.e., spontaneous quitters)
  – WIC is primarily a nutrition program, not a smoking cessation program.
  – Differences between our study and other studies:
    – Referent group (ENPs in MIHA vs. 3rd trimester enrollees)
    – Smaller sample size
    – Lower smoking prevalence before pregnancy
Limitations

• Self-reported smoking status

• Unmeasured confounding
  – The group of women on prenatal WIC, but not on postpartum WIC may have unmeasured reasons for not continuing enrollment.

• Cross sectional study
References

- State, County and Regional-level Estimates of WIC Eligibles and Program Reach, California 2011. Sacramento: California Department of Public Health, Center for Family Health; 2015.
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• Questions?